ICAR-NBSS&LUP Sujala SWs-LRI Atlas No. 85

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ICAR - NBSS & LUP

Land Resource and Hydrological Inventory of Kamlapur Sub-watershed for Watershed Planning and Development Kalaburagi Taluk, Kalaburagi District, Karnataka (AESR 6.2)

Sujala – III
Karnataka Watershed Development Project- II
Funded by World Bank

The World Bank

ICAR - National Bureau of Soil Survey and Land Use Planning, Regional Centre, Bangalore
Watershed Development Department, Govt. of Karnataka, Bangalore

About ICAR - NBSS&LUP

The National Bureau of Soil Survey and Land Use Planning (NBSS&LUP), Nagpur, a premier Institute of the Indian Council of Agricultural Research (ICAR), was set up during 1976 with the objective to prepare soil resource maps at national, state and district levels and to provide research inputs in soil resource mapping and its applications, land evaluation, land use planning, land resource management, and database management using GIS for optimising land use on different kinds of soils in the country.

The Bureau has been engaged in carrying out soil resource survey, agro-ecological and soil degradation mapping at the country, state and district levels for qualitative assessment and monitoring the soil health towards viable land use planning. The research activities have resulted in identifying the soil potentials and problems, and the various applications of the soil surveys with the ultimate objective of sustainable agricultural development. The Bureau has the mandate to correlate and classify soils of the country and maintain a National Register of all the established soil series. The Institute is also imparting in-service training to staff of the soil survey agencies in the area of soil survey, land evaluation and soil survey interpretations for land use planning. The Bureau in collaboration with Panjabrao Krishi Vidyapeeth, Akola is running post-graduate teaching and research programme in land resource management, leading to M.Sc. and Ph.D. degrees.

Citation: Rajendra Hegde, B.A. Dhanorkar, S. Srinivas, K.M. Nair, K.V. Niranjana, R.S.Reddy and S.K. Singh (2016). "Land Resource and Hydrological Inventory of Kamlapur Sub-watershed for Watershed Planning and Development, Kalaburagi Taluk, Kalaburagi District, Karnataka", Sujala SWs-LRI Atlas No.85, ICAR – NBSS & LUP, RC, Bangalore. p.67.

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PART - A

Land Resource Inventory of Kamlapur Sub-watershed for Watershed Planning and Development, Kalaburagi Taluk, Kalaburagi District, Karnataka (AESR 6.2)

CONTENTS

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How to read and use the Atlas

The Land Resource Inventory of Kamlapur Sub -watershed (Kalaburagi Taluk, Kalaburagi District) for Watershed Planning (AESR 6.2) was undertaken to provide comprehensive site- specific cadastral level information useful for farm level planning and integrated development of the area under Sujala – III, Karnataka Watershed Development Project- II.

This atlas contains the basic information on kinds of soils, their geographic distribution, characteristics and classification. The soil map and soil based thematic maps derived from soils data on soil depth, soil gravelliness, slope, land suitability for various crops and land use management maps are presented on 1:12,500 scale. The maps of fertility status (soil reaction, organic carbon, available phosphorus, available potassium, available sulphur, available calcium, available copper, available manganese, available zinc, available iron, available boron and salinity (EC) on 1:12,500 scale were derived from grid point sampling of the surface soils from the watersheds.

The atlas illustrates maps and tables that depict the soil resources of the watershed and the need for their sustainable management.

The user, depending on his/her requirement, can refer this atlas first by identifying his/her field and survey number on the village soil map and by referring the soil legend which is provided in tabular form after the soil map for details pertaining to his/her area of interest.

The atlas explains in simple terms the different kinds of soils present in the watershed, their potentials and problems through a series of thematic maps that help to develop site-specific plans as well as the need to conserve and manage this increasingly threatened natural resource through sustainable land use management. The Land Resource Atlas contains database collected at land parcel/ survey number level on soils, climate, water, vegetation, crops and cropping patterns, socio-economic conditions, marketing facilities *etc.* helps in identifying soil and water conservation measures required, suitability for crops and other uses and finally for preparing a viable and sustainable land use options for each and every land parcel.

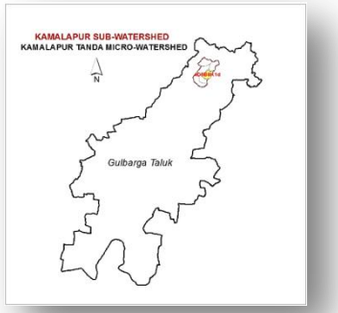
For easy map reading and understanding the information contain in different maps, the physical, cultural and scientific symbols used in the maps are illustrated in the form of colors, graphics and tables.

Physical, Cultural and Scientific symbols used in the Atlas

Each map in the atlas sheet is complemented with the physical, cultural and scientific symbols to facilitate easy map reading.

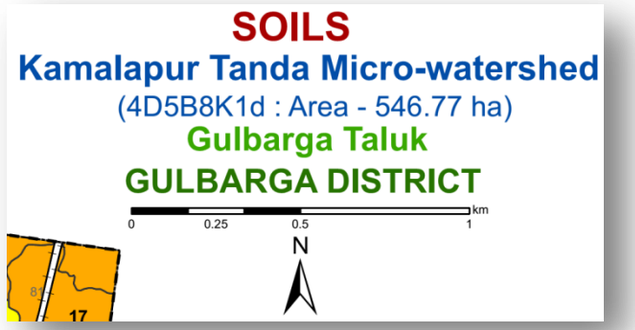
Inset map

Inset provided in each map conveys its strategic location i.e. Taluk, Sub-watershed and Micro-watershed.



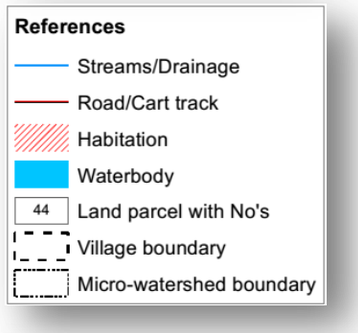
Map title

Map title conveys the relevance of thematic information presented along with a graphical scale, geographical location and watershed details in text form.



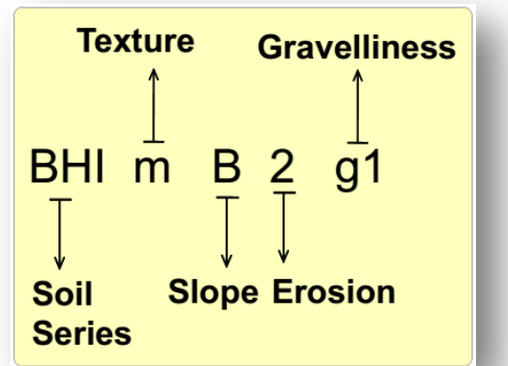
Legends and symbols

*Two legends accompany each map, a **map reference**, which depicts geographic features and a **thematic legend** which portrays spatial information. Picking up the symbol and colour of a particular enables one to go to the legends to obtain the required information.*



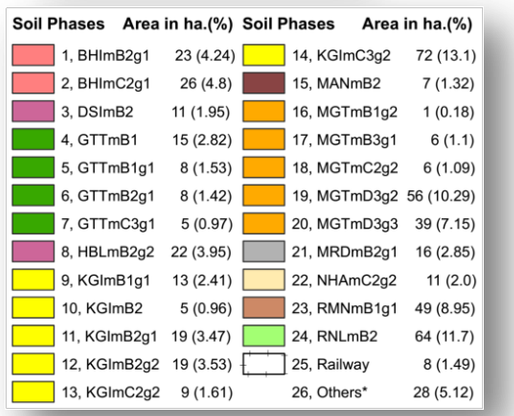
Soil Units

The soil map may be read at different levels. The most detailed level is that of the soil phase. Soil phases are distinguished within soil series mainly based on differences in surface of soil texture, slope, gravelliness , erosion ,etc.



Map colours

Different shades of colours are used as an aid to distinguish the different classes of soils, crop suitability and other maps.



Soil Phases	Area in ha.(%)	Soil Phases	Area in ha.(%)
1, BHlmB2g1	23 (4.24)	14, KGlmC3g2	72 (13.1)
2, BHlmC2g1	26 (4.8)	15, MANmB2	7 (1.32)
3, DSlmB2	11 (1.95)	16, MGTmB1g2	1 (0.18)
4, GTTmB1	15 (2.82)	17, MGTmB3g1	6 (1.1)
5, GTTmB1g1	8 (1.53)	18, MGTmC2g2	6 (1.09)
6, GTTmB2g1	8 (1.42)	19, MGTmD3g2	56 (10.29)
7, GTTmC3g1	5 (0.97)	20, MGTmD3g3	39 (7.15)
8, HBLmB2g2	22 (3.95)	21, MRDmB2g1	16 (2.85)
9, KGlmB1g1	13 (2.41)	22, NHAmC2g2	11 (2.0)
10, KGlmB2	5 (0.96)	23, RMNmB1g1	49 (8.95)
11, KGlmB2g1	19 (3.47)	24, RNLmB2	64 (11.7)
12, KGlmB2g2	19 (3.53)	25, Railway	8 (1.49)
13, KGlmC2g2	9 (1.61)	26, Others*	28 (5.12)

Land Management Units (LMU)

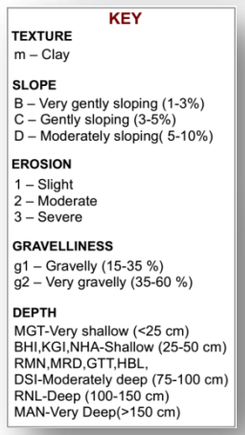
Grouping of similar soil areas based on their soil-site characteristics into management units that respond similarly for a given level of management are designated as land management units

Legend	Area in ha (%)
LMU-1	180 (32.90)
LMU-2	131 (24.00)
LMU-3	64 (11.67)
LMU-4	16 (2.85)
LMU-5	49 (8.95)
LMU-6	71 (13.02)
Railway	8 (1.49)
Others*	28 (5.12)

* - Habitation & Waterbody

Map key

There are many thematic types to be differentiated on the map solely based on colour. Therefore soils and suitability types and their limitations are distinguished by colours with a combination of alpha-numeric characters.

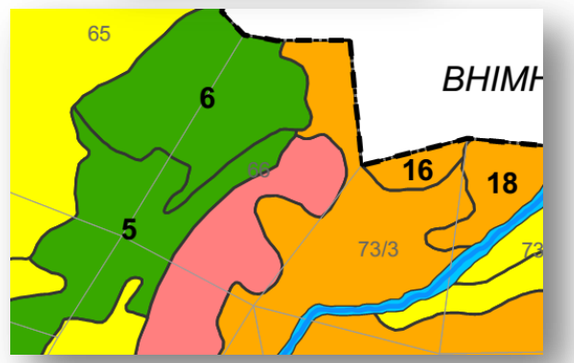


Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable

Limitations
r- rooting condition

Soil and plot boundaries

Soil units shown on the map are represented by both the color and a numeral. The soil boundaries are superimposed on land parcel with revenue survey number boundaries to visualize its spatial extent.



LAND RESOURCE INVENTORY OF KAMLAPUR SUB-WATERSHED FOR PLANNING KALABURAGI TALUK, KALABURAGI DISTRICT

A pilot study by ICAR-NBSS&LUP, Bangalore

INTRODUCTION

Land is a scarce resource and basic unit for any material production. It can support the needs of the growing population, provided they use land in a rational and judicious manner. But what is happening in many areas of the state is a cause for concern to anyone involved in the management of land resources at the grassroots level. In India the area available for agriculture is about 51 per cent of the total area and more than 60 per cent of the people are still relying on agriculture for their livelihood. The limited land area is under severe stress and strain due to increasing population pressure and competing demands of various land uses. Due to this, every year there is a significant diversion of farm lands and water resources for non-agricultural purposes. Apart from this, due to lack of interest for farming among the farmers in many areas, large tracts of cultivable lands are turning into fallows and this trend is continuing at an alarming rate.

The watershed management programs are aimed at designing suitable soil and water conservation measures, productivity enhancement of existing crops, crop diversification with horticultural species, greening the wastelands with forestry species of multiple uses and improving the livelihood opportunities for landless people.

The objectives can be met to a great extent when an appropriate Natural Resources Management (NRM) plan is prepared and implemented. It is essential to have site specific Land Resources Inventory (LRI) indicating the potentials and constraints for developing such a site specific plan. LRI can be obtained by carrying out detailed characterization and mapping of all the existing land resources like soils, climate, water, minerals and rocks, vegetation, crops, land use pattern, socio-economic conditions, infrastructure, marketing facilities and various schemes and developmental works of the government. From the data collected at farm level, the specific problems and potentials of the area can be identified and highlighted, conservation measures required for the area can be planned on a scientific footing, suitability of the area for various uses can be worked out and finally viable and sustainable land use options suitable for each and every land holding can be prescribed to the farmer and other land users of the area.

Gulbarga popularly known as Kalaburgi is located in the Northern part of the state and lies between 17 ^{o} 35’ and 17^{o} 45’ North latitude and between 76 ^{o} 10’ and 77 ^{o} 45’ east longitude. The district is biggest district in the state covering 8.49 % of the area. It has Bijapur district and Sholapur district of Maharastra on the West, Bidar district and Osmanabad district of Maharastra on the North, Raichur district on the South. The district has total geographical area of 16174 sq. kms. Major food crops grown in the district are pigeon pea, sorghum, bajra, and paddy. Commercial crops are sugarcane and cotton. Oilseed crops are groundnut and sunflower. The district economy is dominantly agricultural and nearly 75 per cent of population living in the rural areas are dependent on agriculture. Major geology in the district comprise of Deccan trap (basalt), followed by limestone. Laterite and shale were also noticed in patches.

As a pilot study, **ICAR-NBSS&LUP, Bangalore** carried out the generation of LRI for the Kamlapur sub-watershed in Kalaburagi Taluk, Kalaburagi District. It was selected for data base generation under batch VI of Sujala III project. This sub-watershed encompasses of 10 MWs namely, Bachnal (4D5B8K1a), Bhimnalli (4D5B8K1c), Chandranagar (4D5B8K2d), Dastapur (4D5B8K2c), Kamlapur Tanda (4D5B8K1d), Kamlapur-1 (4D5B8K1f), Kamlapur-2 (4D5B8K1e), Margutti Rf (4D5B8K1b), Nawandgihalla-1 (4D5B8K2a) and Nawandgihalla-2 (4D5B8K2b) micro watersheds. Land Resource Inventory (LRI) was generated for three among ten micro-watersheds.

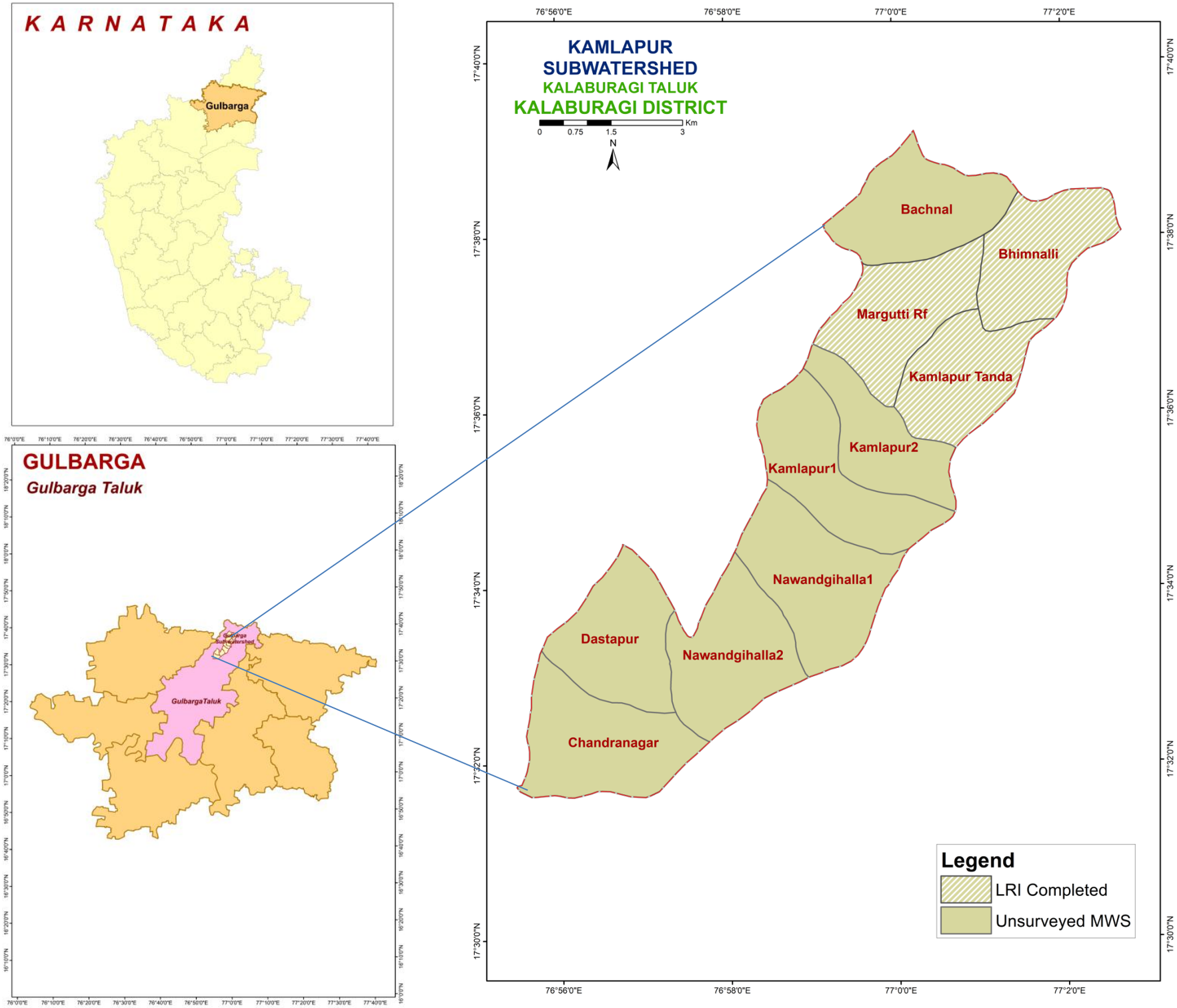
To be continued….

The major landforms identified in the sub-watershed are uplands and low lands. The database was generated by using cadastral map of the village as a base along with high resolution satellite imagery (IRS LISS IV and Cartosat-1). The objectives of the land resource survey, carried out in the Kamlapur Sub-watershed during February-March 2015 are indicated below.

- Detailed characterization of all the land resources like soil, water, land use, cropping pattern and other resources available at parcel level in the village.
- Delineation of homogenous areas based on soil-site characteristics into management units.
- Collection and interpretation of climatic and agronomical data for crop planning.
- Identification of problems and potentials of the area and strategies for their management.
- Assessment of the suitability of land resources for various crops and other uses.
- Establishment of village level digital land resources database in a GIS framework.
- Enable the watershed and other line departments to prepare an action plan for the integrated development of the watershed.

LOCATION AND EXTENT

LOCATION MAP OF KAMLAPUR SUB-WATERSHED



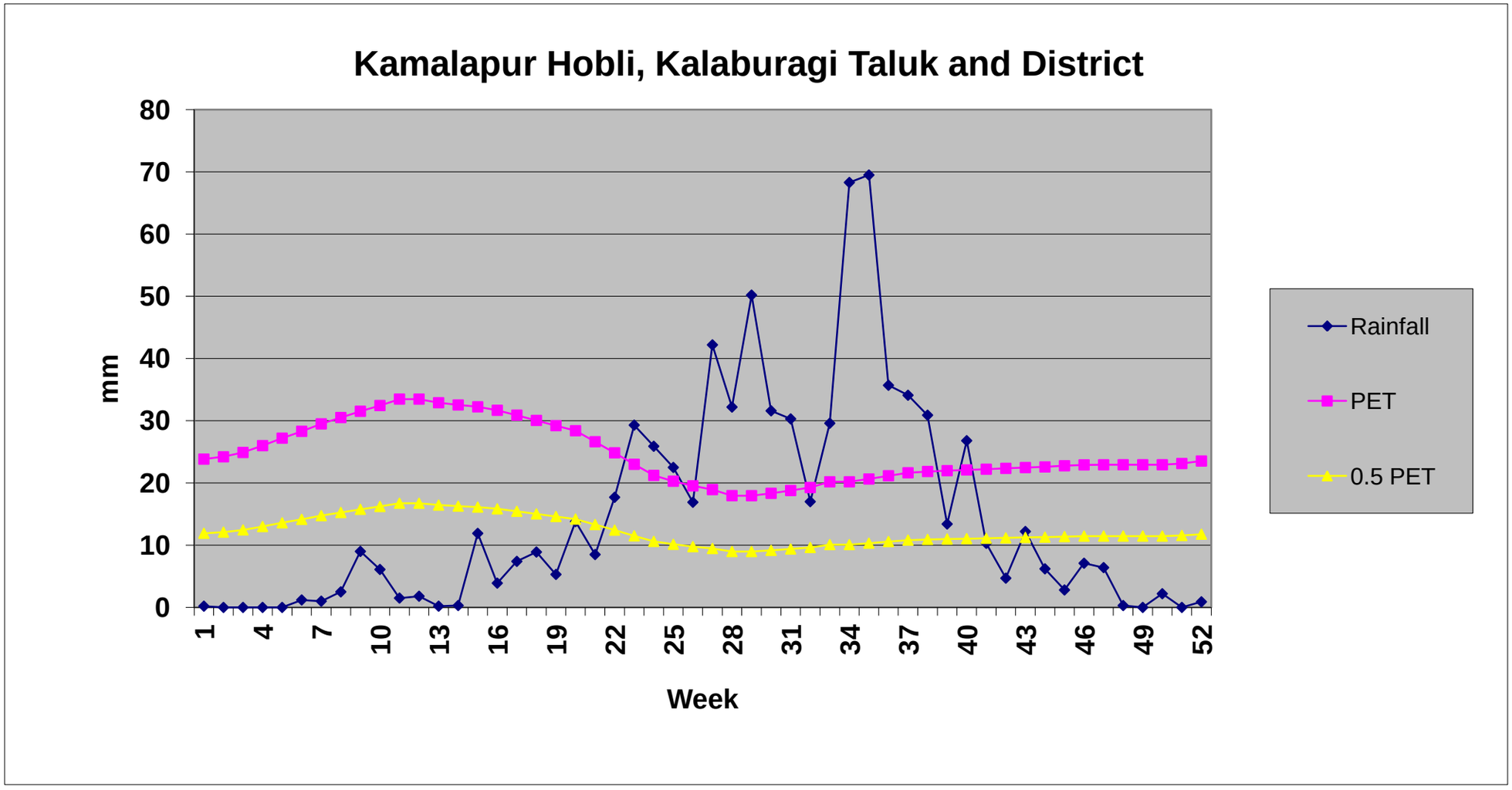
Kamlapur sub-watershed (Kalaburagi taluk, Kalaburagi district) is located between $17^0$30'58''-17^0 38'4'' North latitudes and $76^0$54'31''- $77^0$3'13'' East longitudes, covering an area of about 6157 ha.

Agro Ecological Sub Region (AESR) 6.2: Central and Western Maharashtra Plateau and North Karnataka Plateau and North Western Telangana Plateau, hot moist semi-arid ESR with shallow and medium loamy to clayey Black soils (medium and deep clayey Black soils as inclusion), medium to high AWC and LGP 120-150 days.

Agro-climatic Zone 2: North-eastern Dry Zone:
The total geographic area of this zone is about 1.76 M ha covering 8 taluks of Kalaburagi district and 3 taluks of Raichur. Net cultivated area in the zone is about 1.31 M ha of which about 0.09 M ha are irrigated. The mean elevation of the zone is 300-450 m MSL. The main soil type is deep to very deep soils with small pockets of shallow to medium black soils. The zone is cropped predominantly during rabi due to insufficient rainfall (465-785 mm). The principal crops of the zone are jowar, bajra, oilseeds, pulses, cotton and sugarcane.

NOTE: In this Sub-Watershed, Land Resource Inventory (LRI) was generated for three micro-watersheds (Bhimnalli -4D5B8K1c, Kamlapur Tanda- 4D5B8K1d and Margutti -4D5B8K1b) among the ten micro-watersheds.

Climate

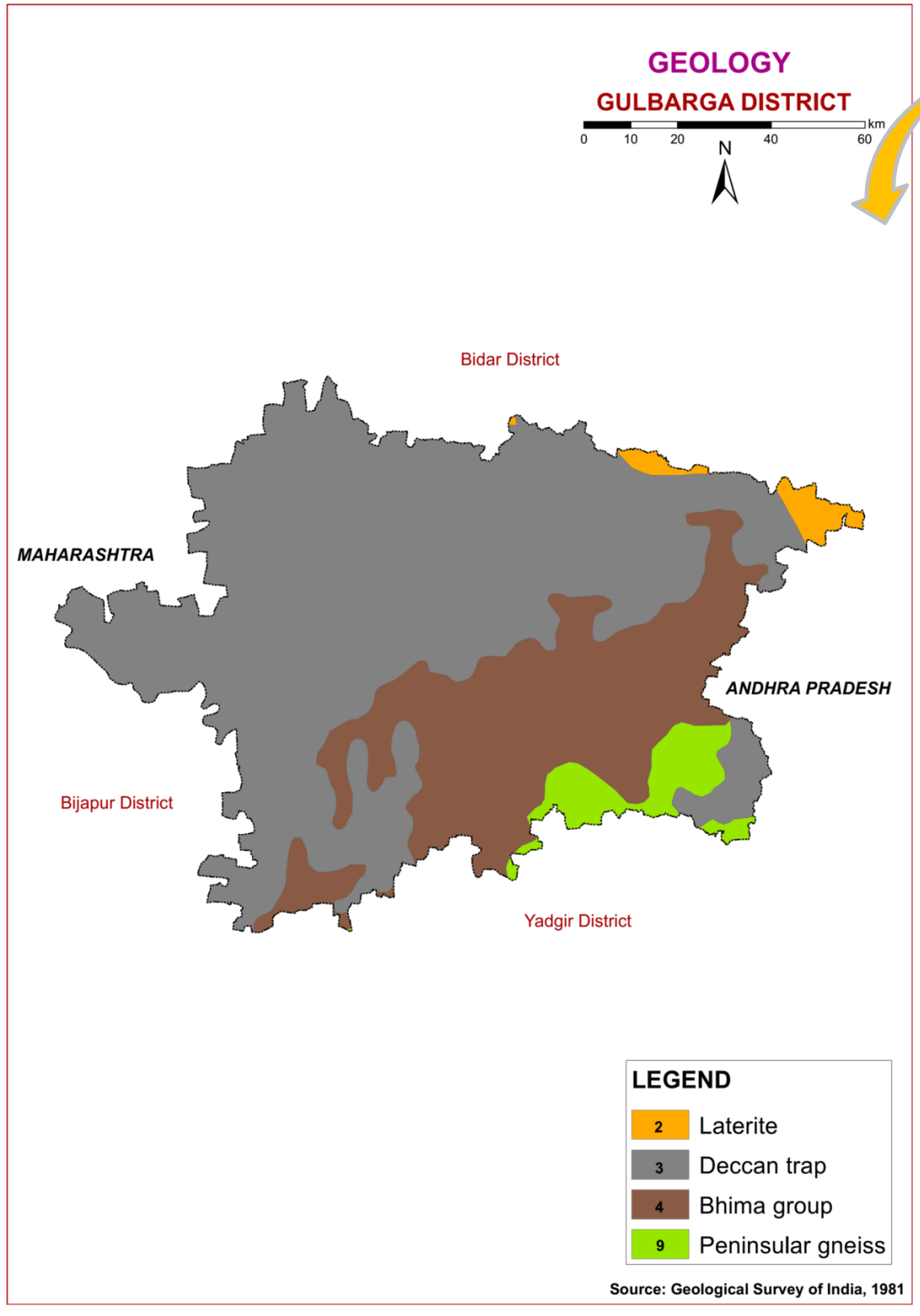


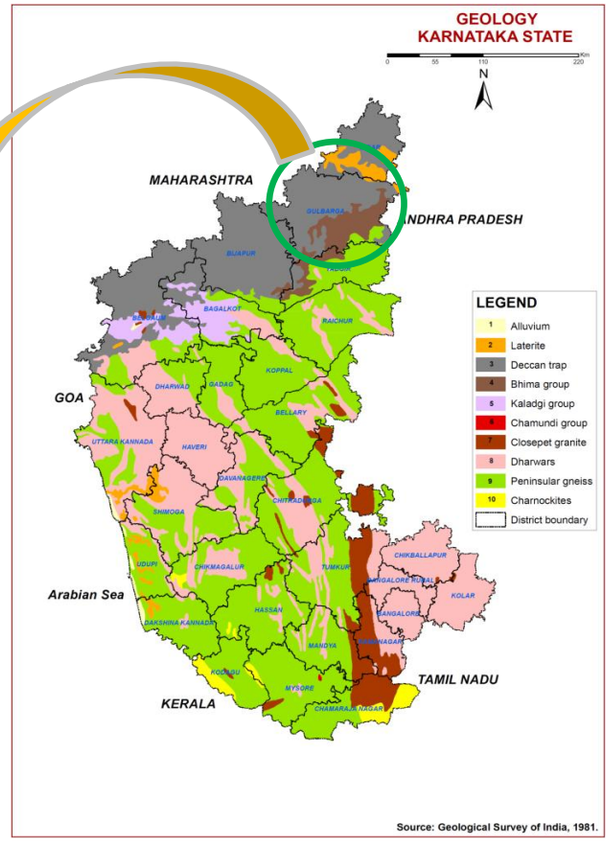
Length of Growing Period (LGP) is varying from May last week to 1st week of October (120-150 days)

Annual Rainfall : 760.7 mm. in the Kalaburagi taluk and district

Source: KSNMDC (1980-2011)

Geology





GEOLOGY - KARNATAKA STATE

Karnataka forms part of the Peninsular Shield, which is an ancient stable block of the earth's crust. The shield is composed of geologically ancient rocks of diverse origin. These rocks have undergone various degrees of metamorphism and crushing. Overlying these ancient rocks are Proterozoic, lete Creteceous to Palaeocene, Palaeocene to Recent, and Recent sediments.

In the stratigraphic succession of rocks in Karnataka the Archaean group is the oldest, followed by Proterozoic, Mesozoic and Cainozoic formations.

GEOLOGY - KALABURAGI DISTRICT

Cainozoic Group

The Palaeocene and Recent formations of Karnataka are the laterites and alluvium of marine and riverine origin

Laterite: Laterite is a porous, pitted, clay-like rock with yellow, red, brown, grey and mottled colours, and is composed mainly of hydrated oxides of iron and aluminium.

Mesozoic Group

Towards the end of the Cretaceous Period there was tremendous volcanic activity in the Peninsular part of India with eruption of a series of lava flows which came out through fissures and cracks. This formation is Known as the Deccan Trap.

Deccan Trap: The Deccan Trap covers the whole of Bidar district, and parts of Kalaburagi, Bijapur and Belgaum districts, occupying an area of 25,000 sq. km.

Upper Proterozoic Group

Formations of the Upper Proterozoic in Karnataka are closepet granites, Chamundi granites, Kaladgi series and Bhima series.

Bhima series: This series, equivalent to the Kurnool formations, is named after the Bhima river and occurs in Bijapur and Kalaburagi districts.

Archaean Group

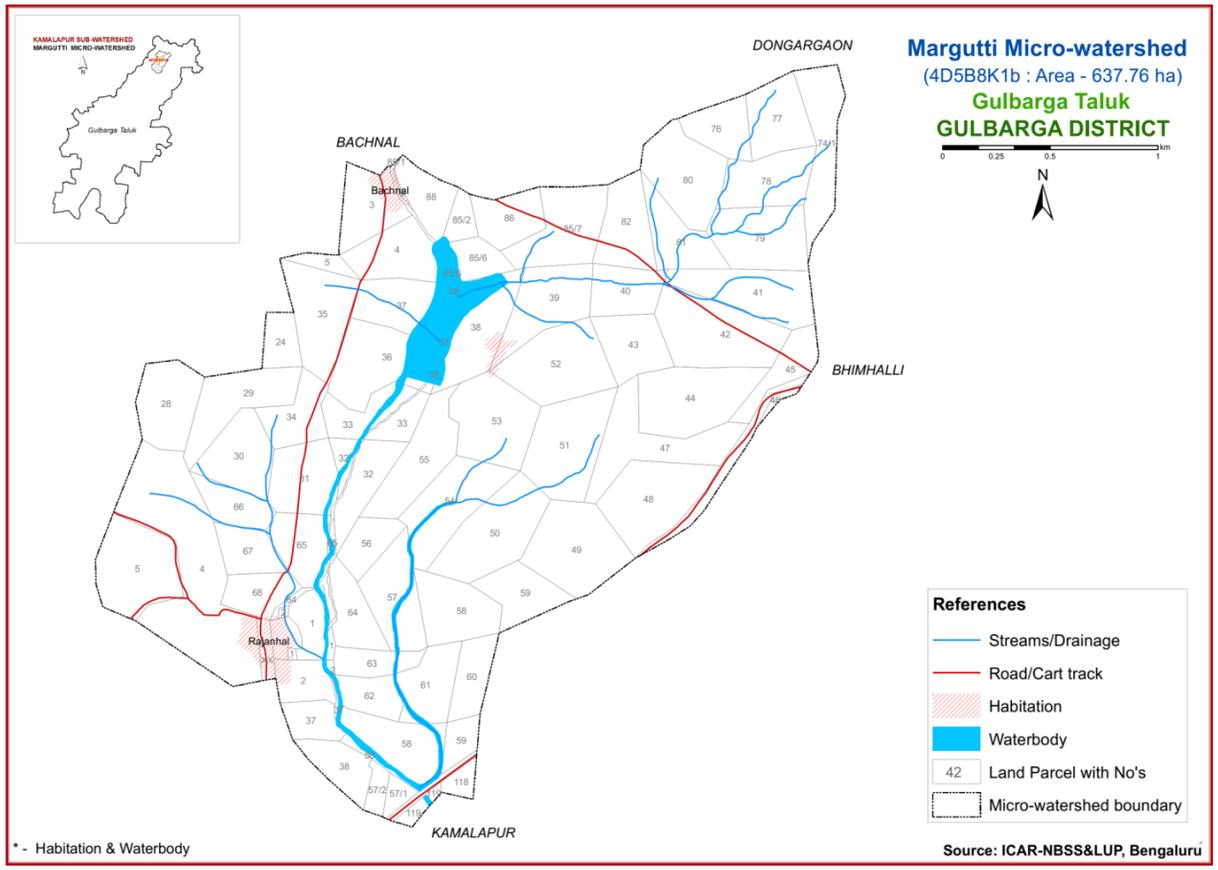
The important formations of this group are Peninsular Gneiss, Dharwar schists, and Charnockites.

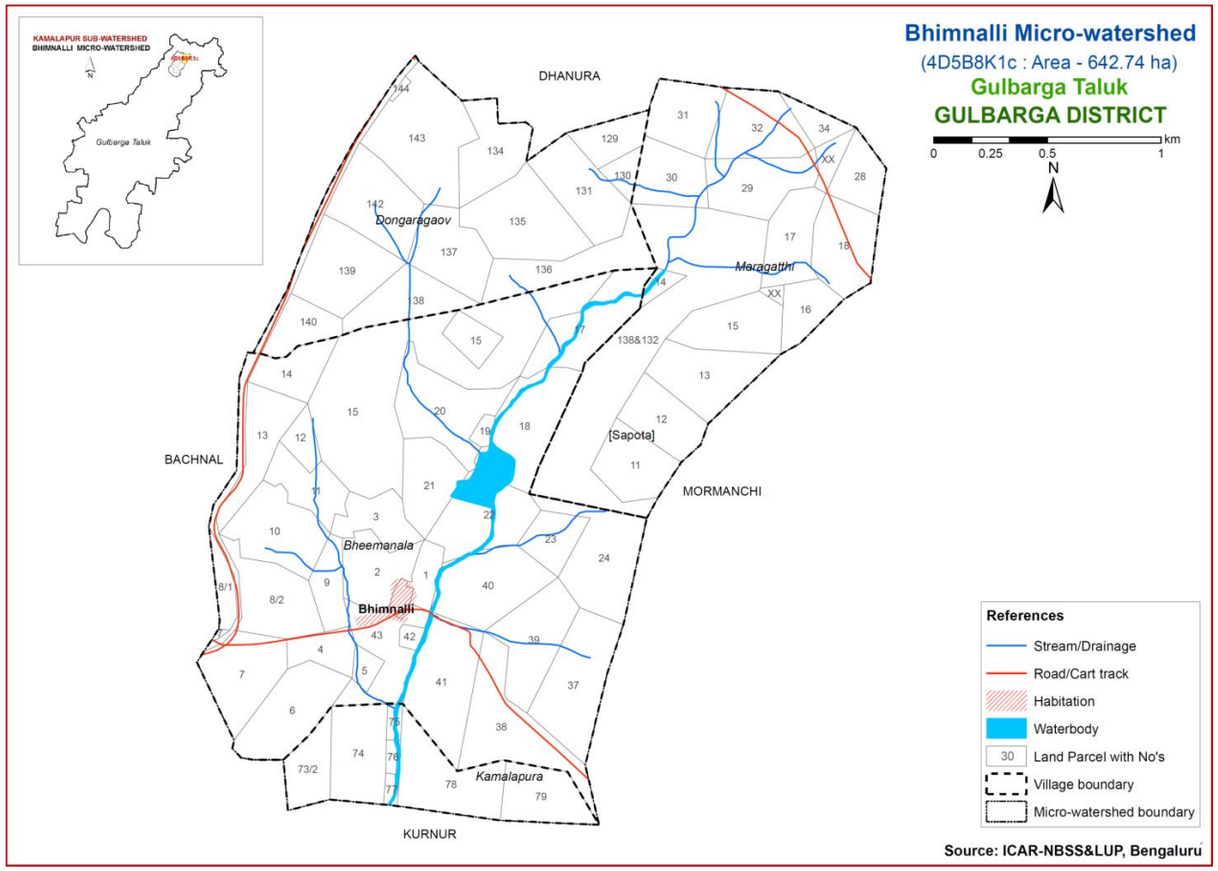
Peninsular Gneiss: Exposed over a large area of Karnataka in all the districts except Bidar is the Peninsular Gneiss which includes granites of all shades with varying composition.

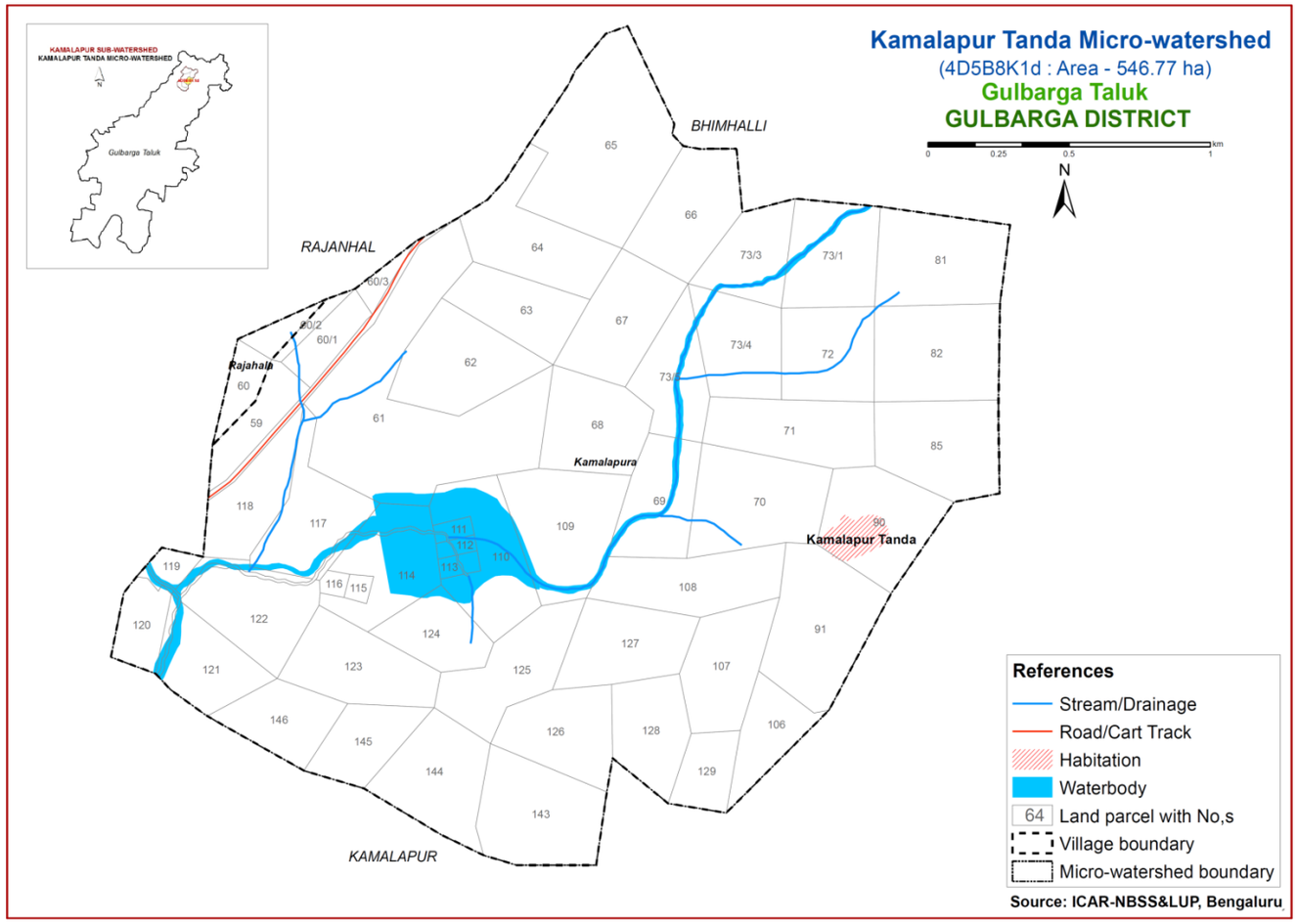
SURVEY METHODOLOGY
Sequence of activities in generation of LRI

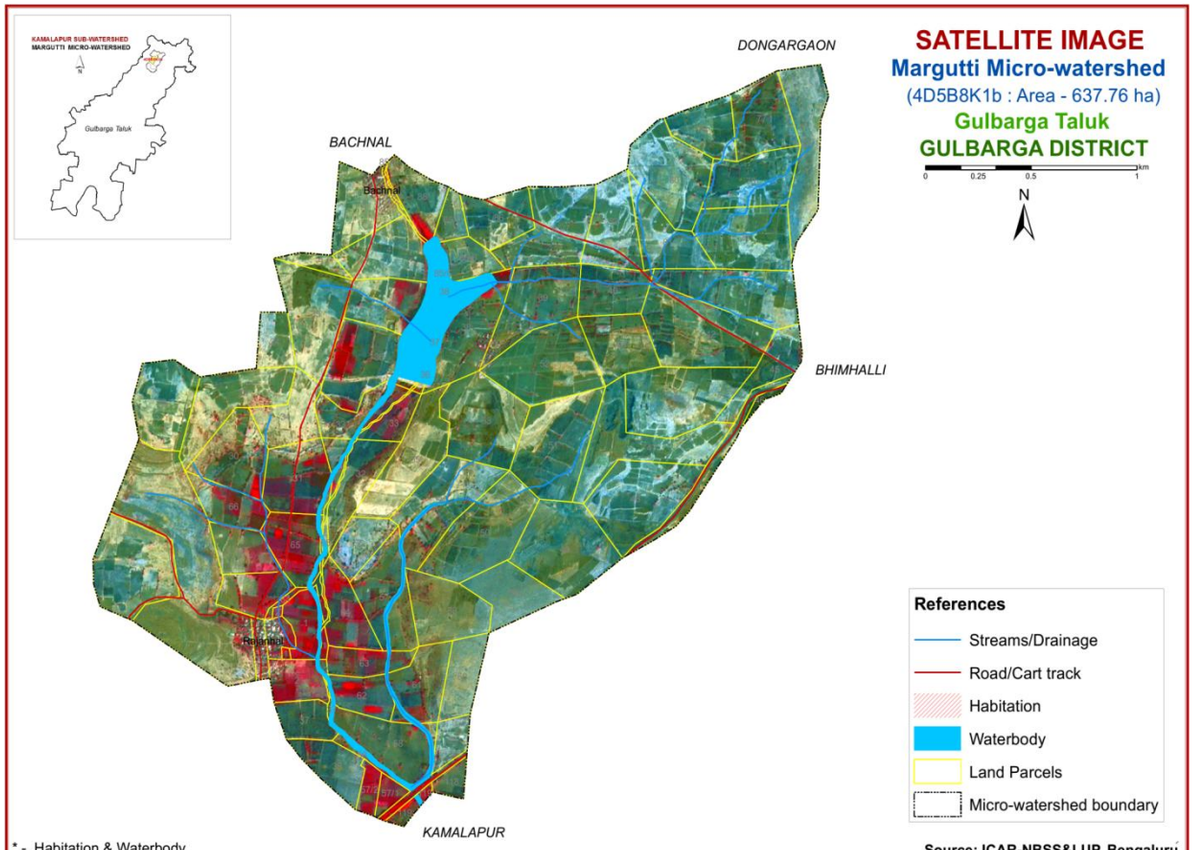
- Traversing the watershed using cadastral maps and imagery as base
- Identifying landforms, geology, land use and other features
- Selecting fields representing land units
- Opening profiles to 2 m depth
- Studying soil and site characteristics
- Grouping similar areas based on their soil-site characteristics into land management units
- Preparation of crop, soil and water conservation plan
- Socio-economic evaluation

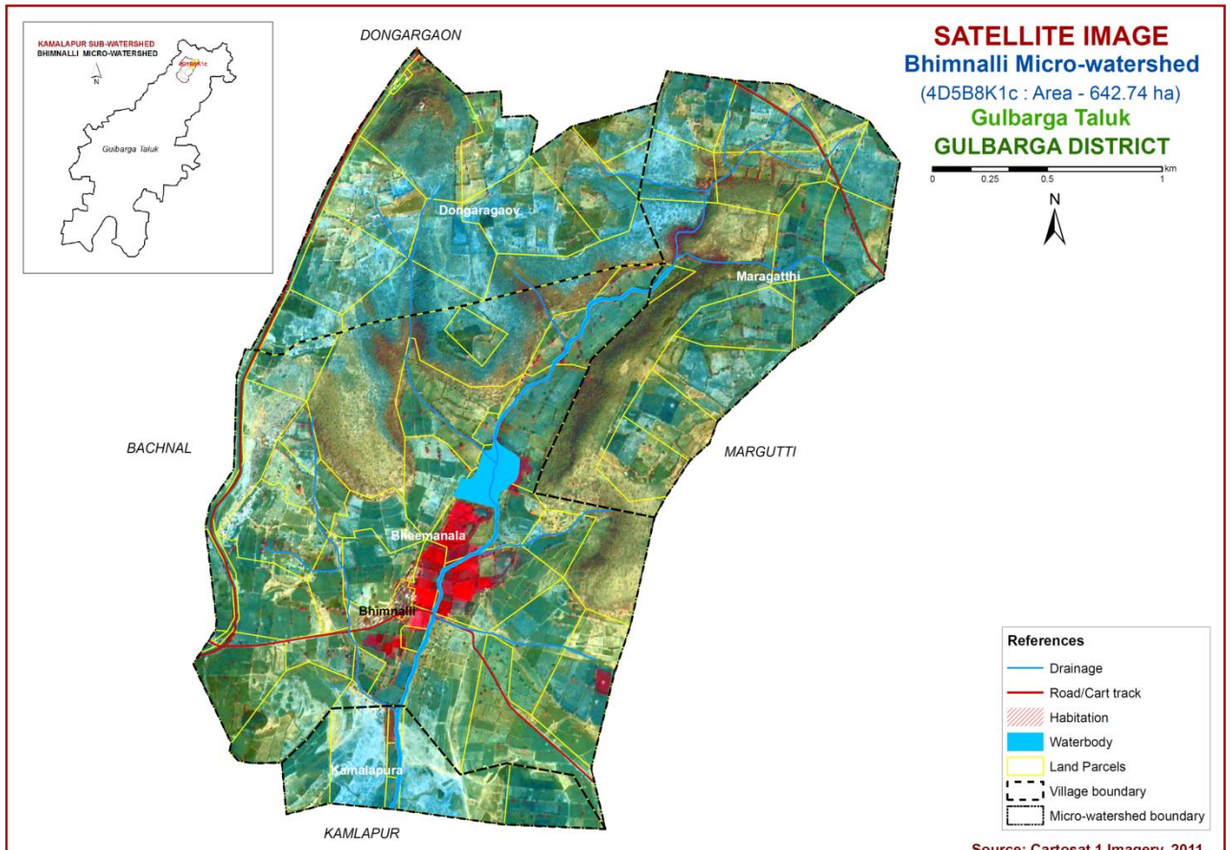
The required site and soil characteristics are described and recorded on a standard proforma by following the protocols and guidelines given in the soil survey manual and field guide. Collection of soil samples from representative pedons for laboratory characterization and collection of surface soil samples from selected fields covering most of the management units for macro and micro-nutrient analysis is being carried out (250m grid intervals). Further processing of data at chemical lab and GIS lab are carried out to generate various thematic maps for each of the study area.

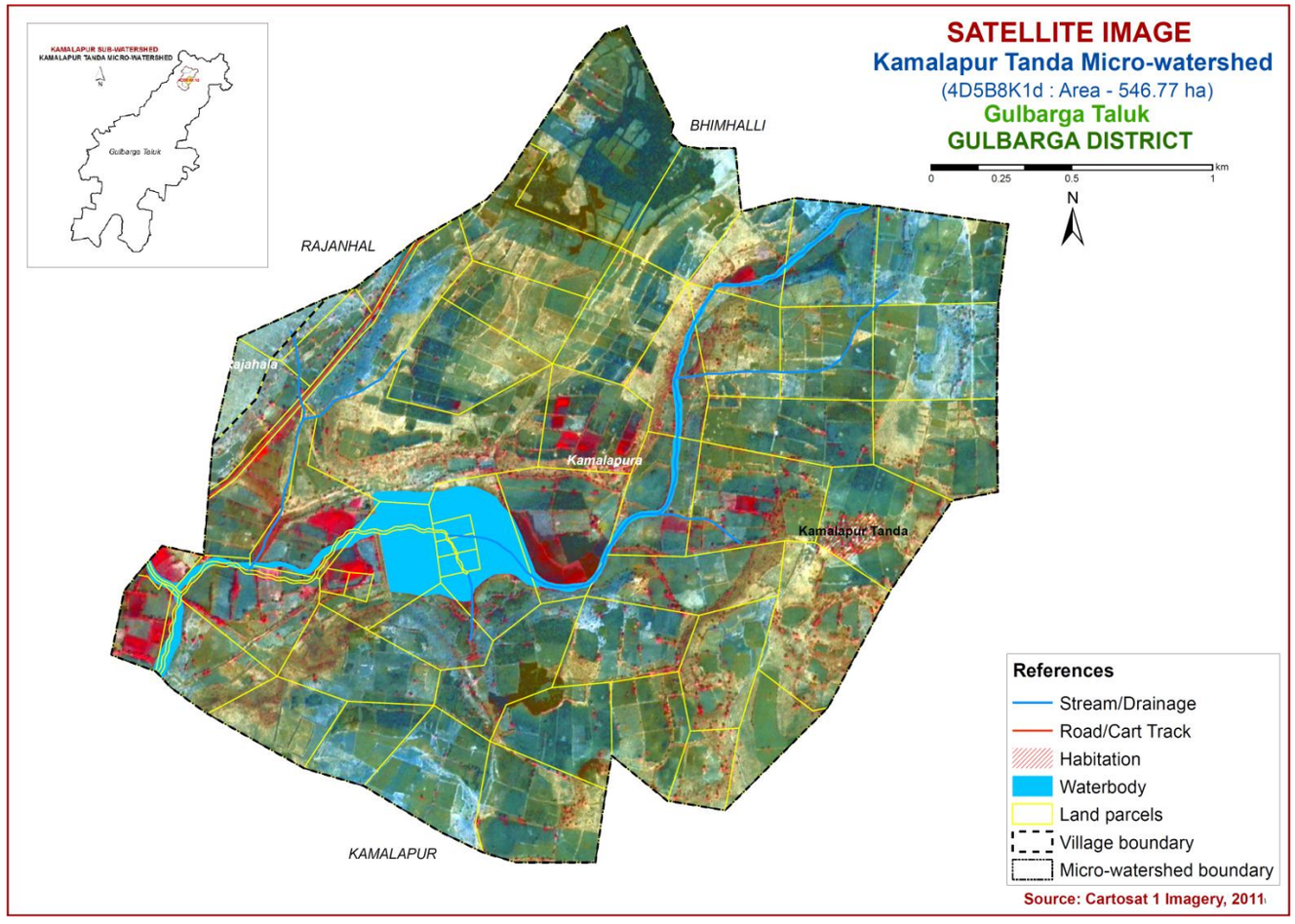

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Rajanhal
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

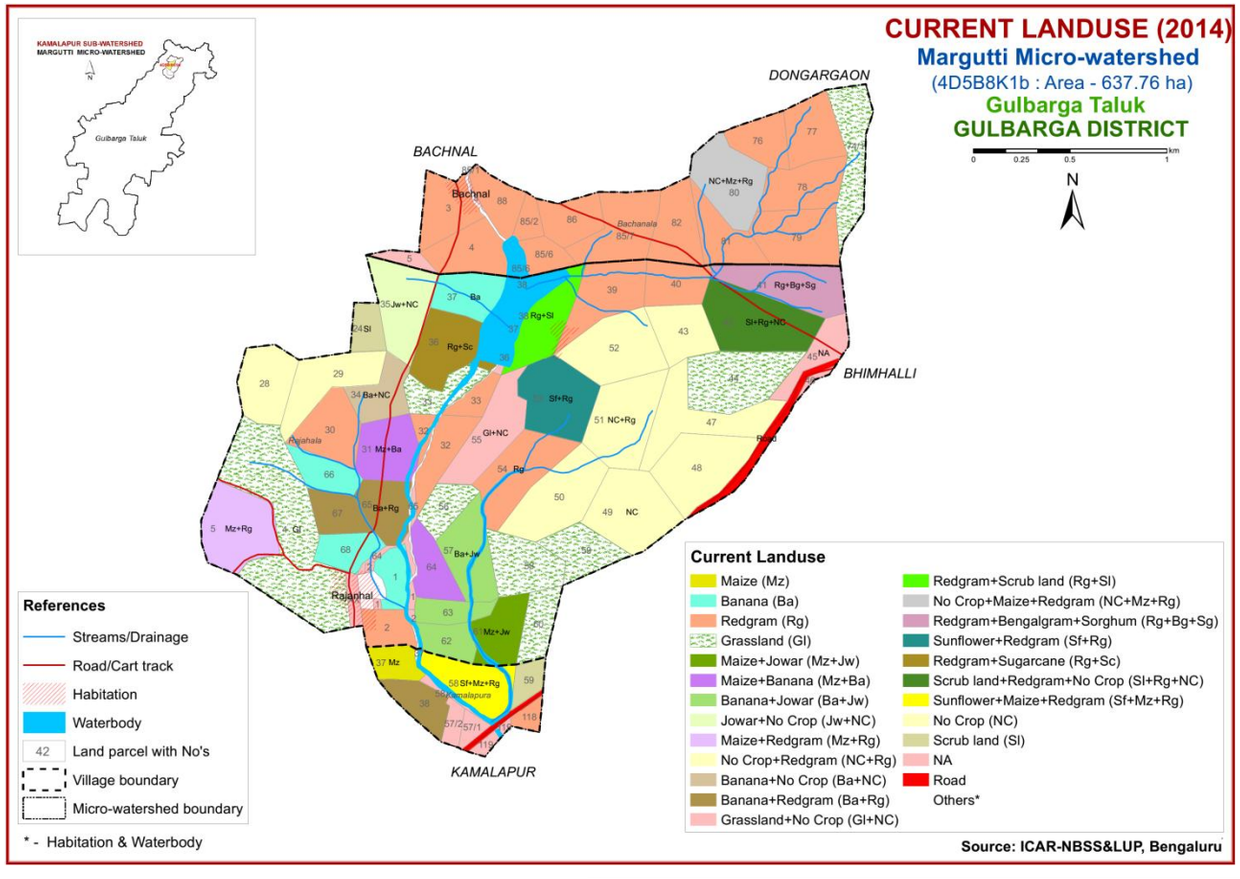

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
[Sapota]
Bheemanala
Bhimnalli
Kamalapura
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

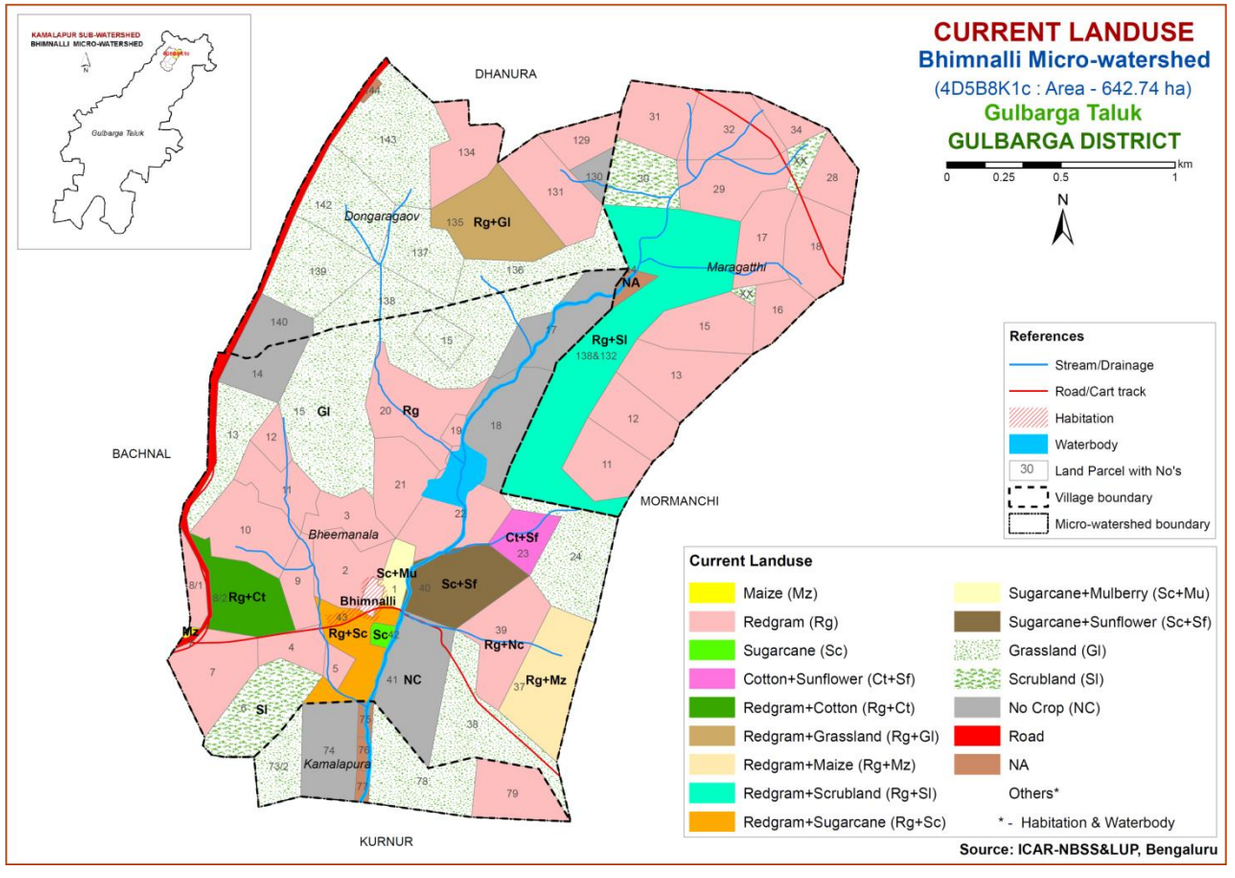

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
References
Stream/Drainage
Road/Cart Track
Habitation
Waterbody
64 Land parcel with No,s
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

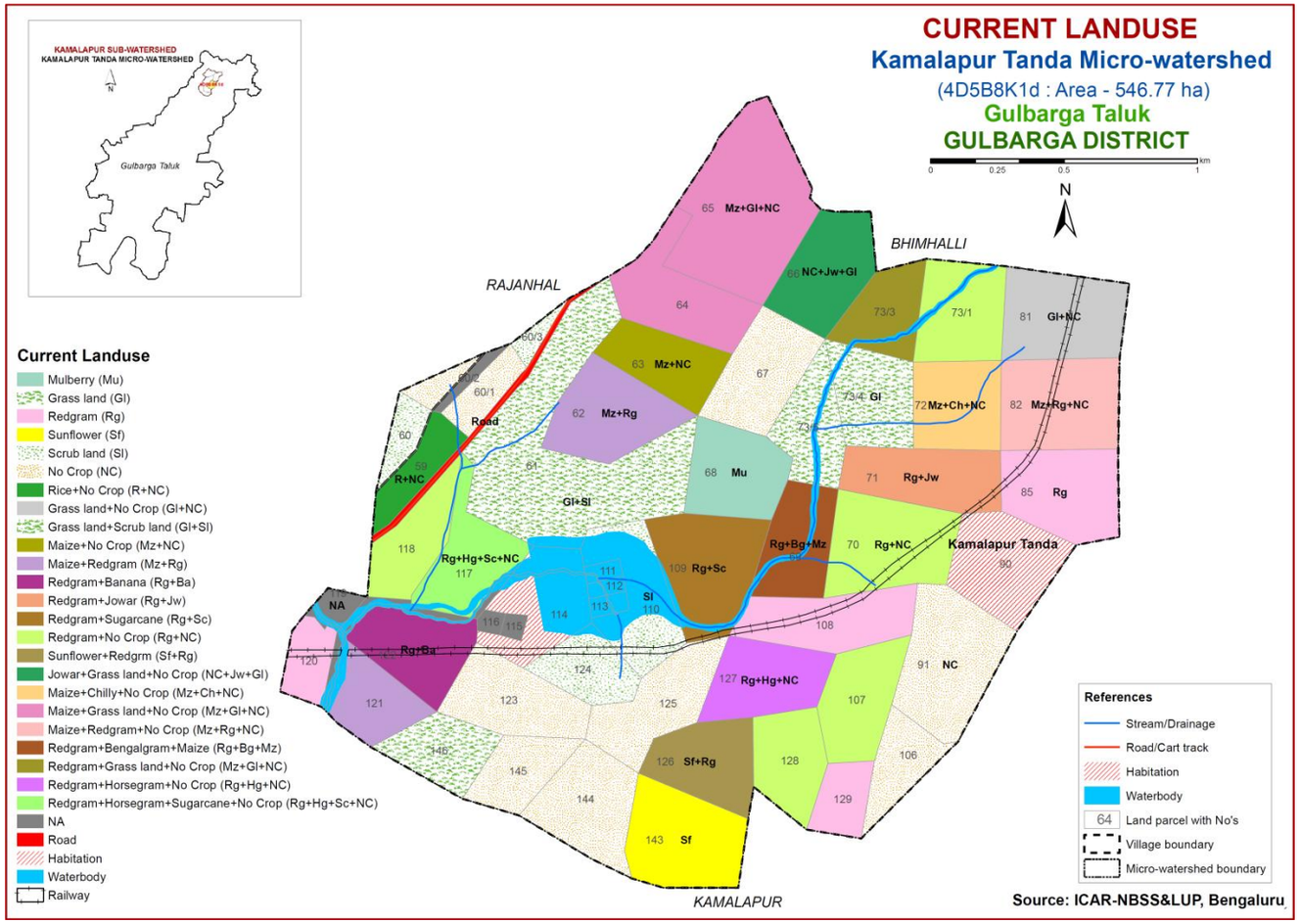

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
SATELLITE IMAGE
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcels
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

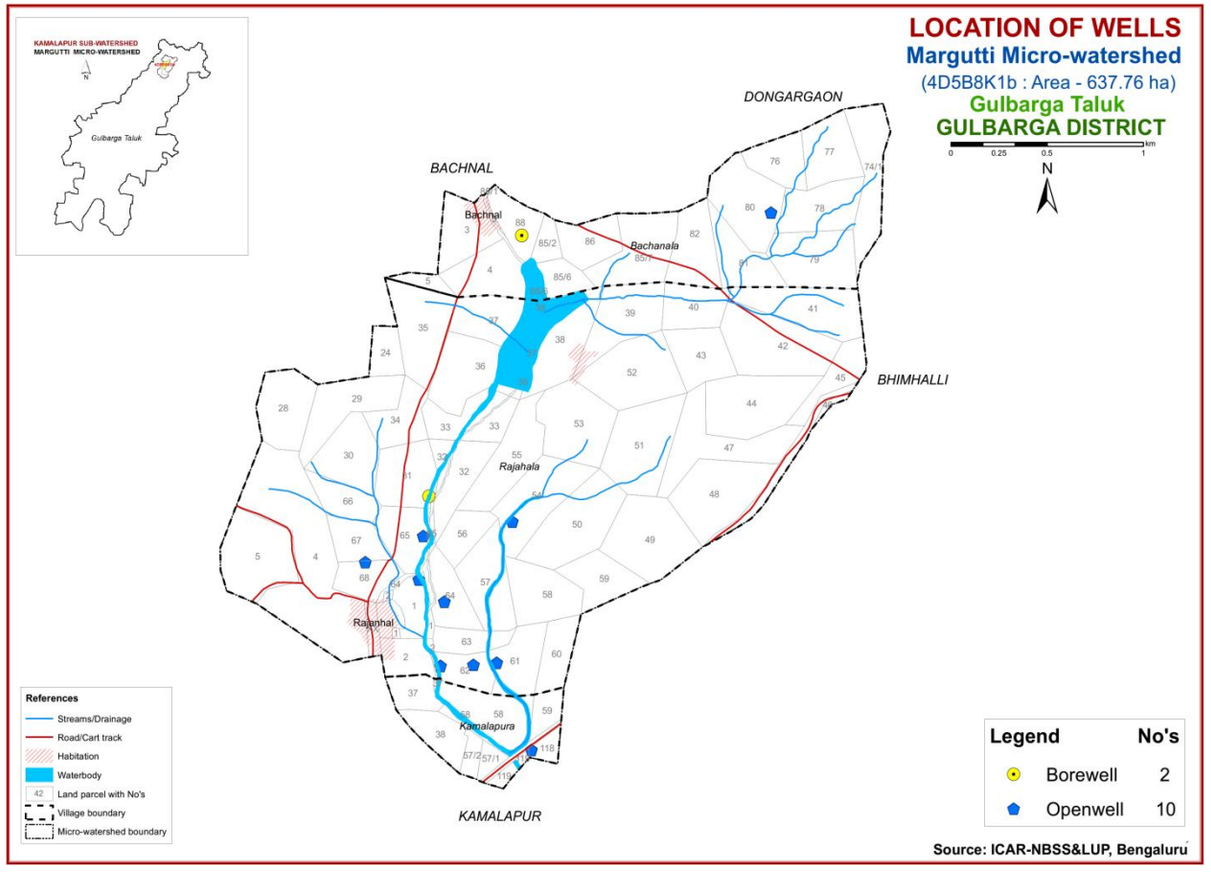

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
SATELLITE IMAGE
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
MARGUTTI
KAMLAPUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
References
Drainage
Road/Cart track
Habitation
Waterbody
Land Parcels
Village boundary
Micro-watershed boundary
Source: Cartosat 1 Imagery, 2011

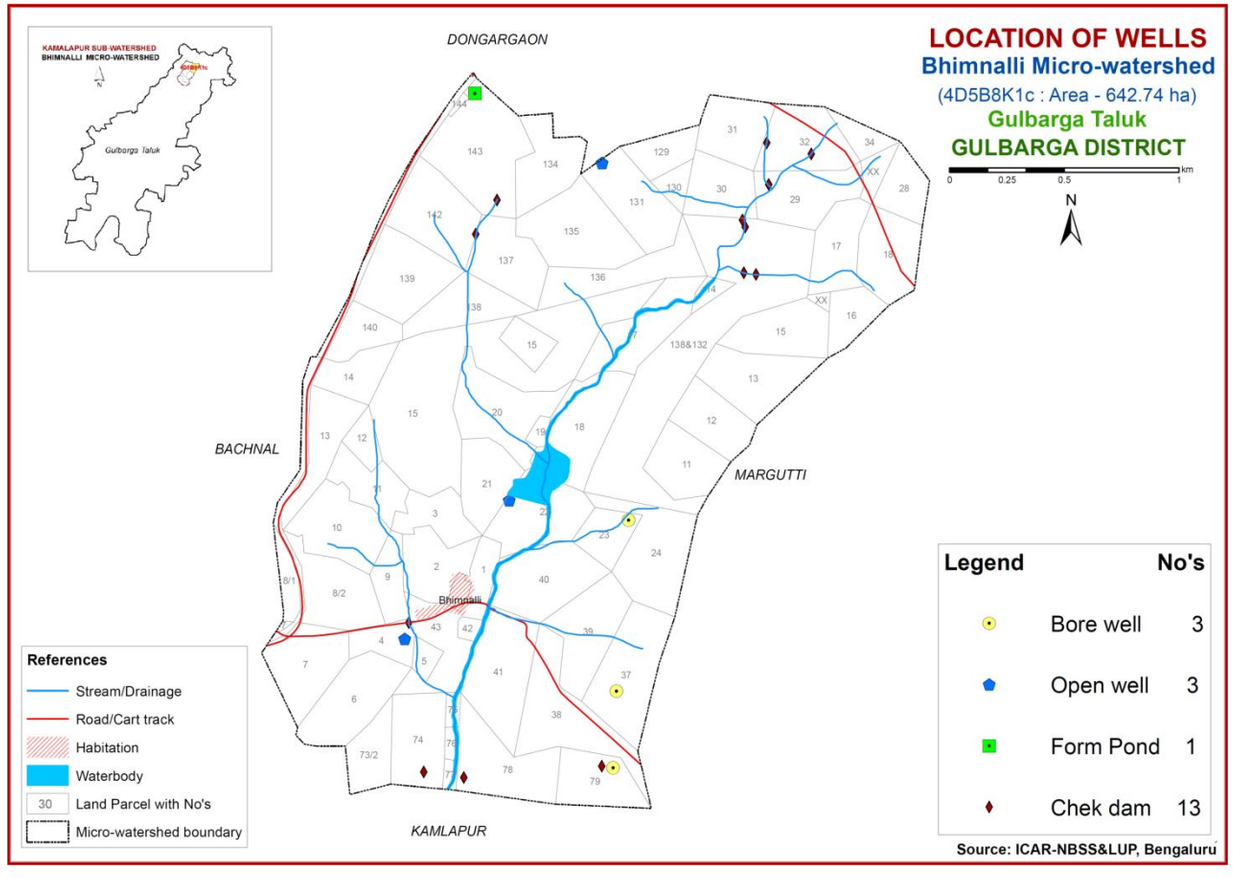

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
SATELLITE IMAGE
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
KAMALAPUR
Kamalapura
Kamalapur Tanda
References
Stream/Drainage
Road/Cart Track
Habitation
Waterbody
Land parcels
Village boundary
Micro-watershed boundary
Source: Cartosat 1 Imagery, 2011

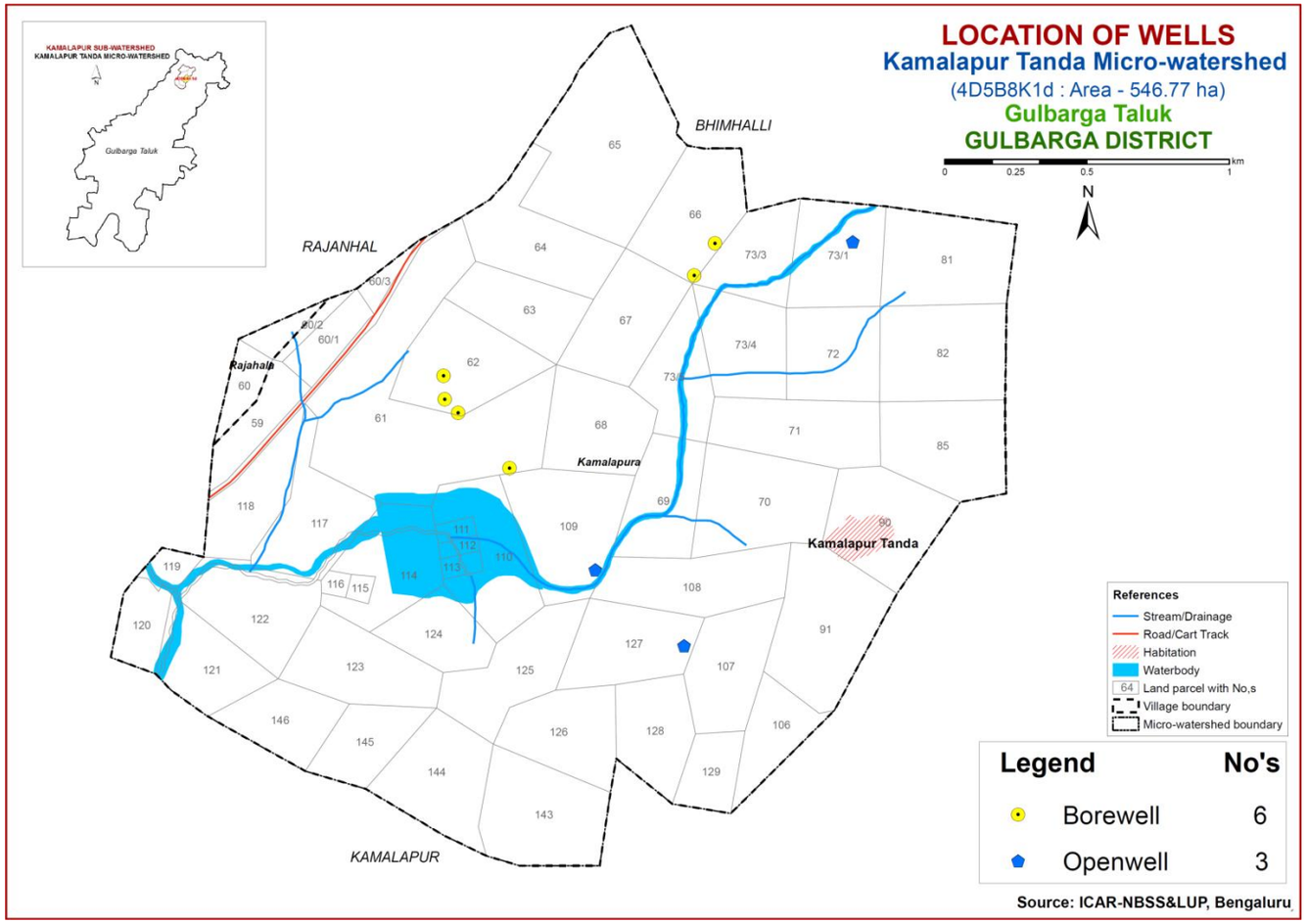

CURRENT LANDUSE (2014)
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Bachanala
Rajahala
Rajanhal
Kamalapura
Current Landuse
Maize (Mz)
Banana (Ba)
Redgram (Rg)
Grassland (Gl)
Maize+Jowar (Mz+Jw)
Maize+Banana (Mz+Ba)
Banana+Jowar (Ba+Jw)
Jowar+No Crop (Jw+NC)
Maize+Redgram (Mz+Rg)
No Crop+Redgram (NC+Rg)
Banana+No Crop (Ba+NC)
Banana+Redgram (Ba+Rg)
Grassland+No Crop (Gl+NC)
Redgram+Scrub land (Rg+Sl)
No Crop+Maize+Redgram (NC+Mz+Rg)
Redgram+Bengalgram+Sorghum (Rg+Bg+Sg)
Sunflower+Redgram (Sf+Rg)
Redgram+Sugarcane (Rg+Sc)
Scrub land+Redgram+No Crop (Sl+Rg+NC)
Sunflower+Maize+Redgram (Sf+Mz+Rg)
No Crop (NC)
Scrub land (Sl)
NA
Road
Others*
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

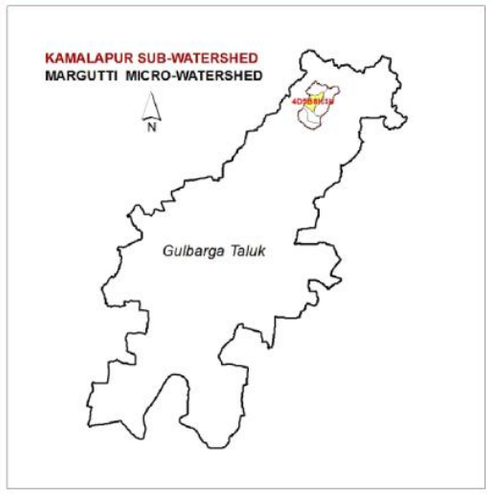

CURRENT LANDUSE
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Bheemanala
Bhimnalli
Kamalapura
Maragatthi
Current Landuse
Maize (Mz)
Redgram (Rg)
Sugarcane (Sc)
Cotton+Sunflower (Ct+Sf)
Redgram+Cotton (Rg+Ct)
Redgram+Grassland (Rg+Gl)
Redgram+Maize (Rg+Mz)
Redgram+Scrubland (Rg+Sl)
Redgram+Sugarcane (Rg+Sc)
Sugarcane+Mulberry (Sc+Mu)
Sugarcane+Sunflower (Sc+Sf)
Grassland (Gl)
Scrubland (Sl)
No Crop (NC)
Road
NA
Others*
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru


CURRENT LANDUSE
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
RAJANHAL
BHIMHALLI
KAMALAPUR
Kamalapur Tanda
Road
Current Landuse
Mulberry (Mu)
Grass land (Gl)
Redgram (Rg)
Sunflower (Sf)
Scrub land (Sl)
No Crop (NC)
Rice+No Crop (R+NC)
Grass land+No Crop (Gl+NC)
Grass land+Scrub land (Gl+Sl)
Maize+No Crop (Mz+NC)
Maize+Redgram (Mz+Rg)
Redgram+Banana (Rg+Ba)
Redgram+Jowar (Rg+Jw)
Redgram+Sugarcane (Rg+Sc)
Redgram+No Crop (Rg+NC)
Sunflower+Redgrm (Sf+Rg)
Jowar+Grass land+No Crop (NC+Jw+Gl)
Maize+Chilly+No Crop (Mz+Ch+NC)
Maize+Grass land+No Crop (Mz+Gl+NC)
Maize+Redgram+No Crop (Mz+Rg+NC)
Redgram+Bengalgram+Maize (Rg+Bg+Mz)
Redgram+Grass land+No Crop (Mz+Gl+NC)
Redgram+Horsegram+No Crop (Rg+Hg+NC)
Redgram+Horsegram+Sugarcane+No Crop (Rg+Hg+Sc+NC)
NA
Road
Habitation
Waterbody
Railway
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru


KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
LOCATION OF WELLS
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Bachanala
Rajahala
Rajanhal
Kamalapura
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Legend
No's
Borewell 2
Openwell 10
Source: ICAR-NBSS&LUP, Bengaluru


KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
LOCATION OF WELLS
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
MARGUTTI
KAMLAPUR
Bhimnalli
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Micro-watershed boundary
Legend
No's
Bore well 3
Open well 3
Form Pond 1
Chek dam 13
Source: ICAR-NBSS&LUP, Bengaluru


KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
LOCATION OF WELLS
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
RAJANHAL
BHIMHALLI
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
References
Stream/Drainage
Road/Cart Track
Habitation
Waterbody
Land parcel with No,s
Village boundary
Micro-watershed boundary
Legend
No's
Borewell 6
Openwell 3
Source: ICAR-NBSS&LUP, Bengaluru



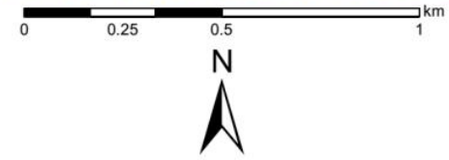
SOILS

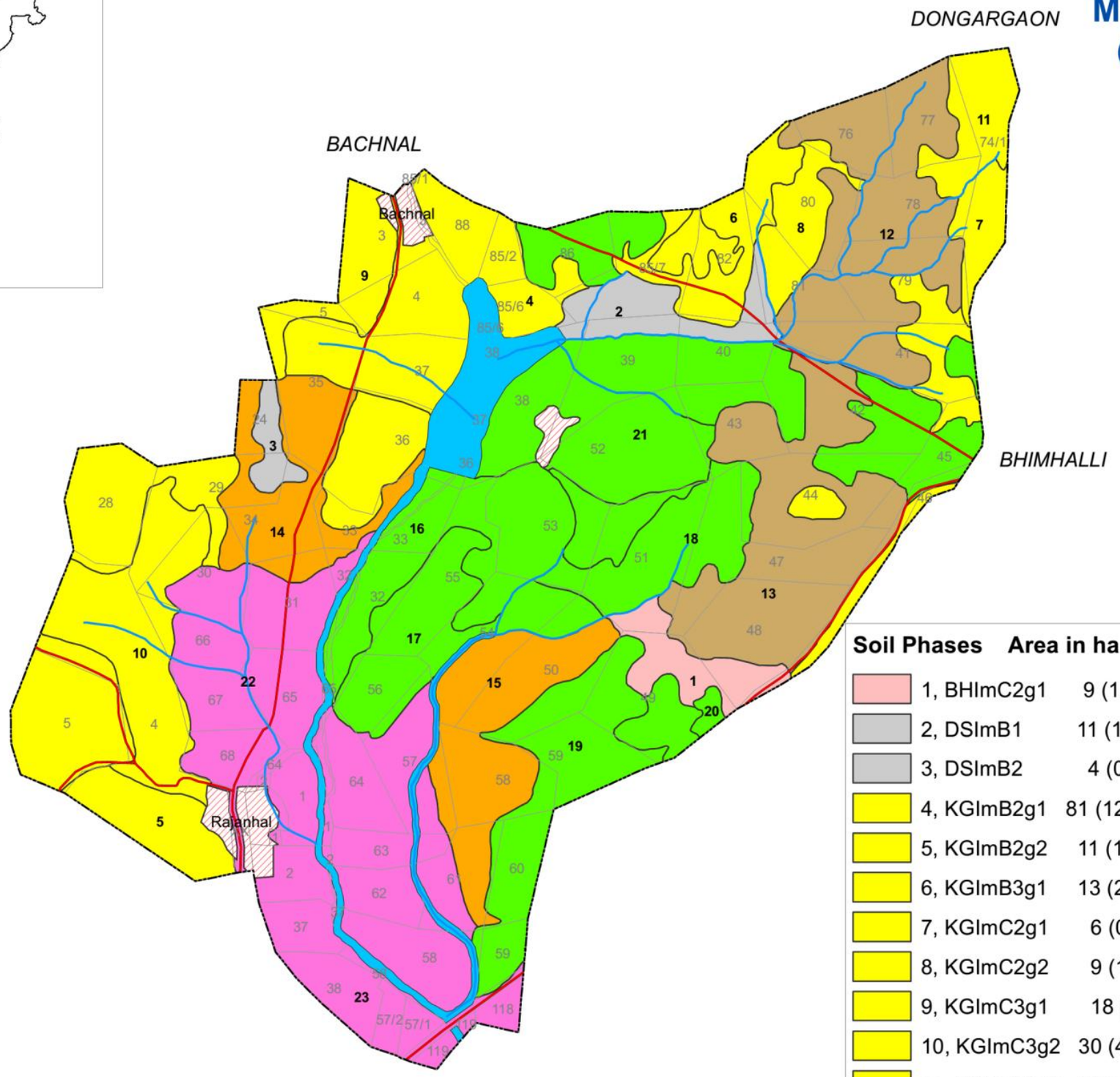
Margutti Micro-watershed

(4D5B8K1b : Area - 637.76 ha)

Gulbarga Taluk

GULBARGA DISTRICT





References

- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- 42 Land Parcel with No's
- Micro-watershed boundary

Soil Phases	Area in ha.(%)	Soil Phases	Area in ha.(%)
1, BHImC2g1	9 (1.46)	13, KMPmB2g1	43 (6.75)
2, DSImB1	11 (1.72)	14, MGTmC3g1	23 (3.53)
3, DSImB2	4 (0.57)	15, MGTmC3g2	27 (4.19)
4, KGImB2g1	81 (12.65)	16, NHAmB2g1	67 (10.55)
5, KGImB2g2	11 (1.68)	17, NHAmB2g2	29 (4.52)
6, KGImB3g1	13 (2.04)	18, NHAmB3g1	22 (3.43)
7, KGImC2g1	6 (0.94)	19, NHAmB3g2	27 (4.25)
8, KGImC2g2	9 (1.41)	20, NHAmC2g2	1 (0.19)
9, KGImC3g1	18 (2.8)	21, NHAmC3g2	24 (3.79)
10, KGImC3g2	30 (4.77)	22, RNLmB1	76 (11.84)
11, KGImD3g2	12 (1.86)	23, RNLmB2	23 (3.68)
12, KMPmB2	44 (6.84)	24, Others*	29 (4.56)

Texture ↑ **Gravelliness** ↑

KGI m B 2 g1

Soil Series | Slope | Erosion

KEY

TEXTURE
m – Clay

SLOPE
B – Very gently sloping (1-3%)
C – Gently sloping (3-5%)
D – Moderately sloping(5-10%)

EROSION
1 – Slight
2 – Moderate
3 – Severe

GRAVELLINESS
g1 – Gravelly (15-35 %)
g2 – Very gravelly (35-60 %)

DEPTH
MGT-Very shallow (<25 cm)
BHI,KGI,NHA-Shallow (25-50 cm)
DSI-Moderately shallow (50-75 cm)
KMP-Moderately deep (75-100 cm)
RNL-Deep (100-150 cm)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

Table 1. Mapping unit description of Margutti (4D5B8K1b) Micro-watershed – Kalaburagi Taluk & District (Kamlapur Sub-watershed)

Sl.No*	Mapping unit	Description	Area in ha. (%)
1	BHImC2g1	Shallow, black clay soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5% slope, moderately eroded, slightly gravelly, 15-35 per cent gravels.	9.29 (1.46)
2	DSImB1	Moderately shallow, black clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, slightly eroded	11.00 (1.72)
3	DSImB2	Moderately shallow, black clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded	3.64 (0.57)
4	KGImB2g1	Shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded, slightly gravelly, 15-35 per cent gravels.	80.70 (12.65)
5	KGImB2g2	Shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded, slightly gravelly, 15-35 per cent gravels moderately gravelly, 35-60 per cent gravels.	10.69 (1.68)
6	KGImB3g1	Shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, severely eroded, slightly gravelly, 15-35 per cent gravels.	13.00 (2.04)
7	KGImC2g1	Shallow, black gravelly clay soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5% slope, moderately eroded, slightly gravelly, 15-35 per cent gravels.	6.00 (0.94)
8	KGImC2g2	Shallow, black gravelly clay soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5% slope, moderately eroded, slightly gravelly, 15-35 per cent gravels, moderately gravelly, 35-60 per cent gravels.	8.96 (1.41)
9	KGImC3g1	Shallow, black gravelly clay soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5% slope, severely eroded, slightly gravelly, 15-35 per cent gravels.	17.85 (2.80)
10	KGImC3g2	Shallow, black gravelly clay soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5% slope, severely eroded, moderately gravelly, 35-60 per cent gravels.	30.42 (4.77)
11	KGImD3g2	Shallow, black gravelly clay soils developed from weathered basalt on moderately sloping uplands; clay surface on 5-10% slope, severely eroded, moderately gravelly, 35-60 per cent gravels.	11.85 (1.86)
12	KMPmB2	Moderately deep, black clayey soils developed from weathered basalt on very gently uplands; clay surface on 1-3% slope, moderately eroded	43.60 (6.84)

To be continued….

Sl.No*	Mapping unit	Description	Area in ha. (%)
13	KMPmB2g1	Moderately deep, black clayey soils developed from weathered basalt on very gently uplands; clay surface on 1-3% slope, moderately eroded, slightly gravelly, 15-35 per cent gravels.	43.06 (6.75)
14	MGTmC3g1	Very shallow, black gravelly clay soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5 % slope, severely eroded, slightly gravelly, 15-35 per cent gravels.	22.51 (3.53)
15	MGTmC3g2	Very shallow, black gravelly clay soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5 % slope, severely eroded, slightly gravelly, 15-35 per cent gravels, moderately gravelly, 35-60 per cent gravels.	26.74 (4.19)
16	NHAmB2g1	Shallow, black clayey soils developed from weathered basalt on very gently uplands; clay surface on 1-3% slope, moderately eroded, slightly gravelly, 15-35 per cent gravels.	67.26 (10.55)
17	NHAmB2g2	Shallow, black clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded, moderately gravelly, 35-60 per cent gravels.	28.80 (4.52)
18	NHAmB3g1	Shallow, black clayey soils developed from weathered basalt on very gently uplands; clay surface on 1-3% slope, severely eroded, slightly gravelly, 15-35 per cent gravels.	21.90 (3.43)
19	NHAmB3g2	Shallow, black clayey soils developed from weathered basalt on very gently uplands; clay surface on 1-3% slope, severely eroded, moderately gravelly, 35-60 per cent gravels.	27.08 (4.25)
20	NHAmC2g2	Shallow, black clayey soils developed from weathered basalt on gently sloping uplands; clay surface on 1-3% slope, moderately eroded, moderately gravelly, 35-60 per cent gravels.	1.18 (0.19)
21	NHAmC3g2	Shallow, black clayey soils developed from weathered basalt on gently sloping uplands; clay surface on 1-3% slope, severely eroded, moderately gravelly, 35-60 per cent gravels.	24.19 (3.79)
22	RNLmB1	Deep, black clayey soils developed from weathered basalt on very gently uplands; clay surface on 1-3 % slope, slightly eroded	75.51 (11.84)
23	RNLmB2	Deep, black clayey soils developed from weathered basalt on very gently uplands; clay surface on 1-3 % slope, moderately eroded	23.45 (3.68)

*Soil map unit numbers are continuous for the taluk, not the micro-watershed

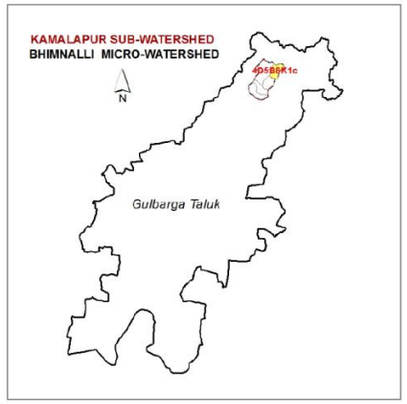
SOILS

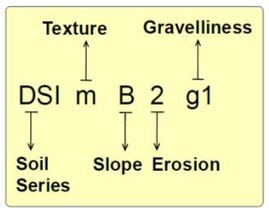
Bhimnalli Micro-watershed

(4D5B8K1c : Area - 642.74 ha)

Gulbarga Taluk

GULBARGA DISTRICT





KEY

TEXTURE

i – Sandy clay
m – Clay

SLOPE

B – Very gently sloping (1-3%)
C – Gently sloping (3-5%)
D – Moderately sloping(5-10%)

EROSION

1 – Slight
2 – Moderate
3 – Severe
4 – Very severe

GRAVELLINESS

g1 – Gravelly (15-35 %)
g2 – Very gravelly (35-60 %)
g3 – Extremely gravelly (60-80 %)

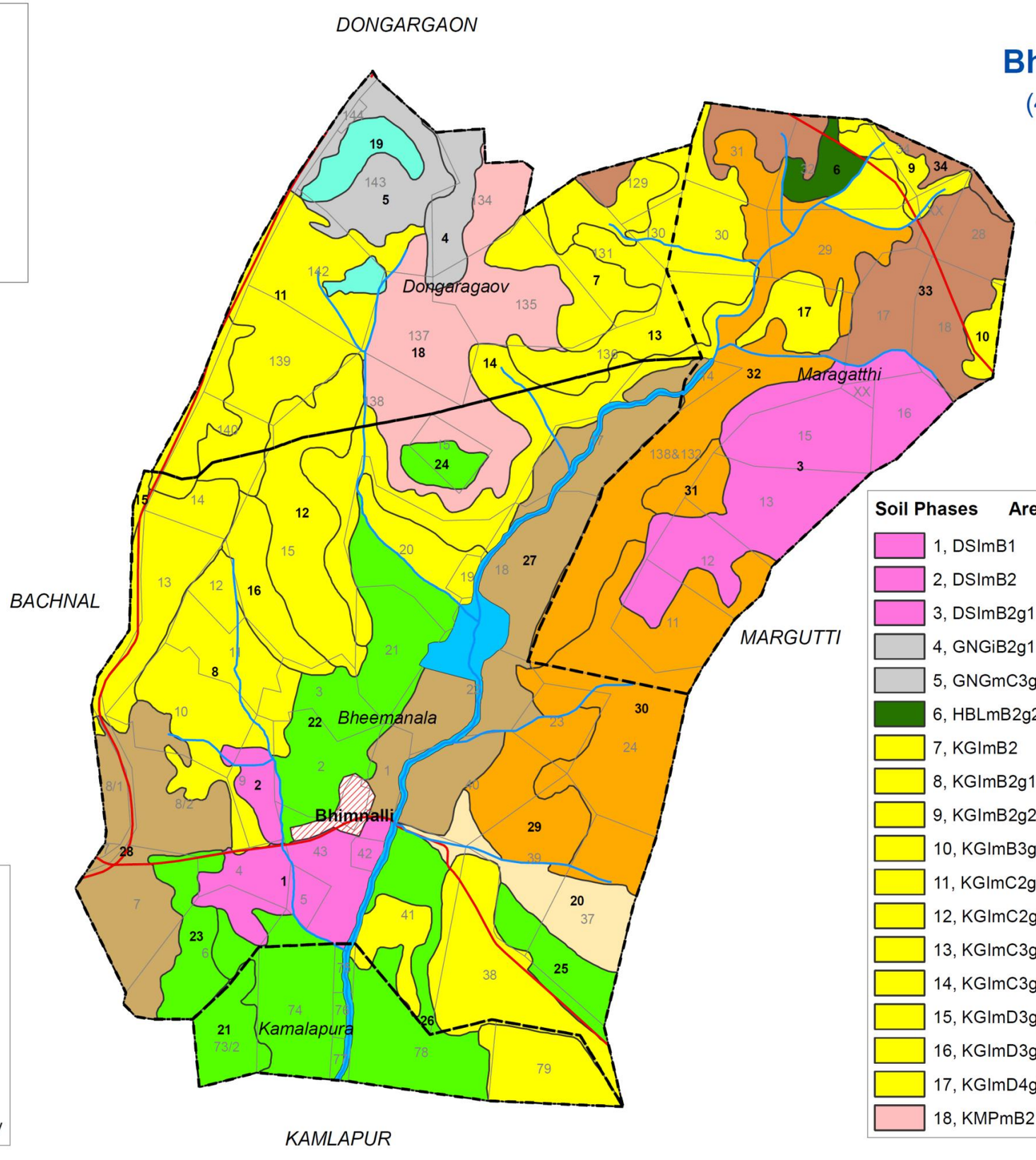
DEPTH

MGT- Very shallow (<25 cm)
KGI,NHA- Shallow (25-50 cm)
DSI,HBL- Moderately shallow (50-75 cm)
KMP,KTI,RMN- Moderately deep (75-100 cm)
GNG,RNL- Deep (100-150 cm)
MAN- Very deep (>150 cm)

References

- Stream/Drainage
- Road/Cart track
- Habitation
- Waterbody
- 30 Land Parcel with No's
- Village boundary
- Micro-watershed boundary

* - Habitation & Waterbody



0 0.25 0.5 1 km

N

Soil Phases	Area in ha.(%)	Soil Phases	Area in ha.(%)
1, DSImB1	16 (2.41)	19, KTliC3g1	6 (1.01)
2, DSImB2	4 (0.56)	20, MANmB2	11 (1.77)
3, DSImB2g1	38 (5.97)	21, MGTmB1g2	6 (0.99)
4, GNGiB2g1	6 (0.98)	22, MGTmB2g1	25 (3.86)
5, GNGmC3g1	13 (1.98)	23, MGTmB2g2	8 (1.22)
6, HBLmB2g2	4 (0.57)	24, MGTmB3g1	3 (0.51)
7, KGImB2	10 (1.53)	25, MGTmB3g2	7 (1.14)
8, KGImB2g1	61 (9.5)	26, MGTmC2g2	35 (5.42)
9, KGImB2g2	4 (0.64)	27, NHAmB1	37 (5.82)
10, KGImB3g1	3 (0.39)	28, NHAmB2g1	26 (4.08)
11, KGImC2g1	53 (8.24)	29, RMNmB2g1	14 (2.13)
12, KGImC2g2	36 (5.64)	30, RMNmC2g2	38 (5.97)
13, KGImC3g1	17 (2.66)	31, RMNmC3g2	4 (0.65)
14, KGImC3g2	26 (3.97)	32, RMNmD3g2	37 (5.73)
15, KGImD3g2	1 (0.09)	33, RNLmB1	29 (4.55)
16, KGImD3g3	8 (1.21)	34, RNLmB2g1	2 (0.35)
17, KGImD4g2	5 (0.84)	35, Others*	12 (1.85)
18, KMPmB2	37 (5.74)		

Source: ICAR-NBSS&LUP, Bengaluru

Table 2. Mapping unit description of Bhimnalli (4D5B8K1c) Micro-watershed in Kalaburagi Taluk, Kalaburagi District

Sl.No*	Map unit	Description	Area	Percent
1	DSImB1	Moderately shallow, black clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, slightly eroded	15.50	2.41
2	DSImB2	Moderately shallow, black clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded	3.61	0.56
3	DSImB2g1	Moderately shallow, black clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded, slightly gravelly, 15-35 per cent gravels.	38.39	5.97
4	GNGiB2g1	Deep, gravelly red clay soils developed from laterite on very gently sloping uplands; sandy clay surface on 1-3% slope, moderately eroded, slightly gravelly, 15-35 per cent gravels.	6.31	0.98
5	GNGmC3g1	Deep, gravelly red clay soils developed from laterite on gently sloping uplands; clay surface on 3-5% slope, severely eroded, slightly gravelly, 15-35 per cent gravels.	12.74	1.98
6	HBLmB2g2	Moderately shallow, black clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded, moderately gravelly, 35-60 per cent gravels.	3.65	0.57
7	KGImB2	Shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded,	9.82	1.53
8	KGImB2g1	Shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded, slightly gravelly, 15-35 per cent gravels.	61.07	9.50
9	KGImB2g2	Shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded, moderately gravelly, 35-60 per cent gravels.	4.13	0.64
10	KGImB3g1	Shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, severely eroded, slightly gravelly, 15-35 per cent gravels.	2.52	0.39
11	KGImC2g1	Shallow, black gravelly clay soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5% slope, moderately eroded, slightly gravelly, 15-35 per cent gravels.	52.96	8.24
12	KGImC2g2	Shallow, black gravelly clay soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5% slope, moderately eroded, moderately gravelly, 35-60 per cent gravels.	36.28	5.64
13	KGImC3g1	Shallow, black gravelly clay soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5% slope, severely eroded, slightly gravelly, 15-35 per cent gravels.	17.08	2.66
14	KGImC3g2	Shallow, black gravelly clay soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5% slope, severely eroded, moderately gravelly, 35-60 per cent gravels.	25.55	3.97
15	KGImD3g2	Shallow, black gravelly clay soils developed from weathered basalt on moderately sloping uplands; clay surface on 5-10% slope, severely eroded, moderately gravelly, 35-60 per cent gravels.	0.61	0.09
16	KGImD3g3	Shallow, black gravelly clay soils developed from weathered basalt on moderately sloping uplands; clay surface on 5-10% slope, severely eroded, highly gravelly, more than 60 per cent gravels.	7.81	1.21

To be continued…

Sl.No*	Map unit	Description	Area	Per cent
17	KGImD4g2	Shallow, black gravelly clay soils developed from weathered basalt on moderately sloping uplands; clay surface on 5-10% slope, very severely eroded, moderately gravelly, 35-60 per cent gravels.	5.41	0.84
18	KMPmB2	Moderately deep, black clayey soils developed from weathered basalt on very gently uplands; clay surface on 1-3% slope, moderately eroded	36.89	5.74
19	KTIiC3g1	Moderately deep, gravelly red clay soils developed from laterite on gently sloping uplands; clay surface on 3-5% slope, severely eroded, slightly gravelly, 15-35 per cent gravels.	6.49	1.01
20	MANmB2	Very deep, black clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded	11.41	1.77
21	MGTmB1g2	Very shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, slightly eroded, moderately gravelly, 35-60 per cent gravels.	6.35	0.99
22	MGTmB2g1	Very shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded, moderately gravelly, 15-35 per cent gravels.	24.81	3.86
23	MGTmB2g2	Very shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded, moderately gravelly, 35-60 per cent gravels.	7.81	1.22
24	MGTmB3g1	Very shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, severely eroded, slightly gravelly, 15-35 per cent gravels.	3.28	0.51
25	MGTmB3g2	Very shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, severely eroded, moderately gravelly, 35-60 per cent gravels.	7.30	1.14
26	MGTmC2g2	Very shallow, black gravelly clay soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5 % slope, moderately eroded, moderately gravelly, 35-60 per cent gravels.	34.85	5.42
27	NHAmB1	Shallow, black clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, slightly eroded	37.39	5.82
28	NHAmB2g1	Shallow, black clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, slightly gravelly, 15-35 per cent gravels.	26.25	4.08
29	RMNmB2g1	Moderately deep, black clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded, slightly gravelly, 15-35 per cent gravels.	13.71	2.13

*Soil map unit numbers are continuous for the taluk, not the micro-watershed

SOILS

Kamalapur Tanda Micro-watershed

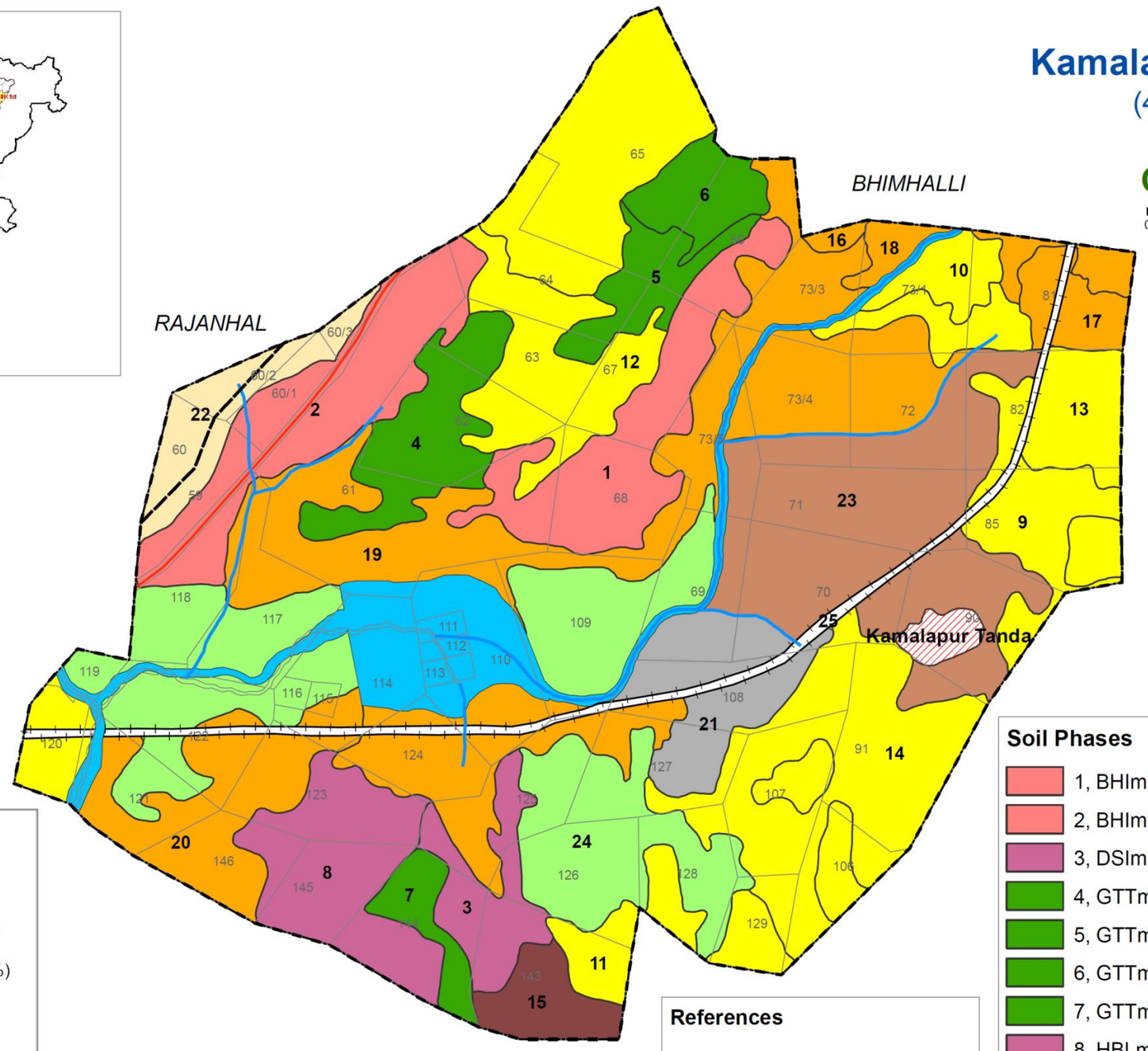
(4D5B8K1d : Area - 546.77 ha)

Gulbarga Taluk

GULBARGA DISTRICT

0 0.25 0.5 1 km

N



Texture — Gravelliness

BHI m B 2 g1

Soil Series — Slope — Erosion

KEY

TEXTURE
m – Clay

SLOPE
B – Very gently sloping (1-3%)
C – Gently sloping (3-5%)
D – Moderately sloping(5-10%)

EROSION
1 – Slight
2 – Moderate
3 – Severe

GRAVELLINESS
g1 – Gravelly (15-35 %)
g2 – Very gravelly (35-60 %)

DEPTH
MGT-Very shallow (<25 cm)
BHI,KGI,NHA-Shallow (25-50 cm)
RMN,MRD,GTT,HBL,
DSI-Moderately deep (75-100 cm)
RNL-Deep (100-150 cm)
MAN-Very Deep(>150 cm)

References

- Stream/Drainage
- Road/Cart track
- Habitation
- Waterbody
- 64 Land parcel with No's
- Village bounadry
- Micro-watershed boundary

Soil Phases	Area in ha.(%)	Soil Phases	Area in ha.(%)
1, BHImB2g1	23 (4.24)	14, KGImC3g2	72 (13.1)
2, BHImC2g1	26 (4.8)	15, MANmB2	7 (1.32)
3, DSImB2	11 (1.95)	16, MGTmB1g2	1 (0.18)
4, GTTmB1	15 (2.82)	17, MGTmB3g1	6 (1.1)
5, GTTmB1g1	8 (1.53)	18, MGTmC2g2	6 (1.09)
6, GTTmB2g1	8 (1.42)	19, MGTmD3g2	56 (10.29)
7, GTTmC3g1	5 (0.97)	20, MGTmD3g3	39 (7.15)
8, HBLmB2g2	22 (3.95)	21, MRDmB2g1	16 (2.85)
9, KGImB1g1	13 (2.41)	22, NHAmC2g2	11 (2.0)
10, KGImB2	5 (0.96)	23, RMNmB1g1	49 (8.95)
11, KGImB2g1	19 (3.47)	24, RNLmB2	64 (11.7)
12, KGImB2g2	19 (3.53)	25, Railway	8 (1.49)
13, KGImC2g2	9 (1.61)	26, Others*	28 (5.12)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

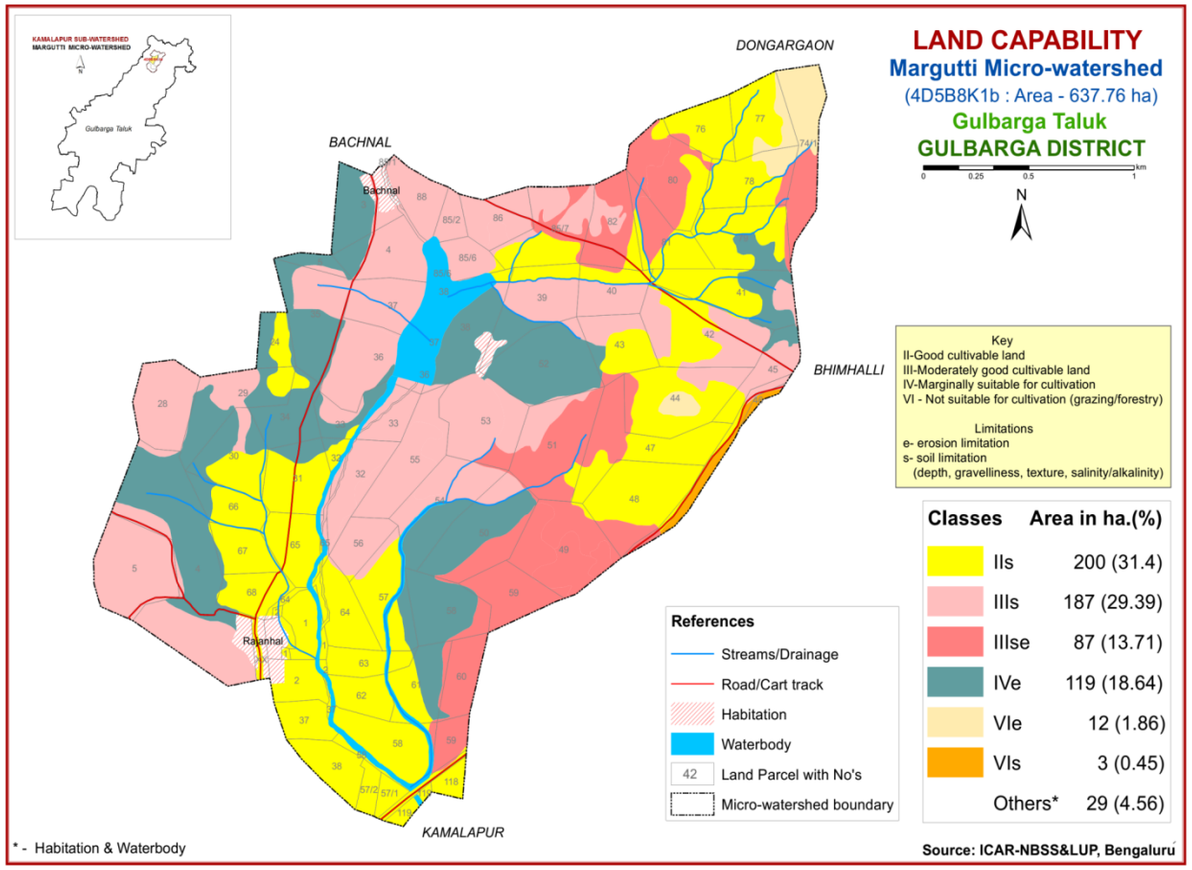
Table 3. Mapping unit description of Kamalapur Tanda (4D5B8K1d) Micro-watershed in Kalaburagi Taluk, Kalaburagi District

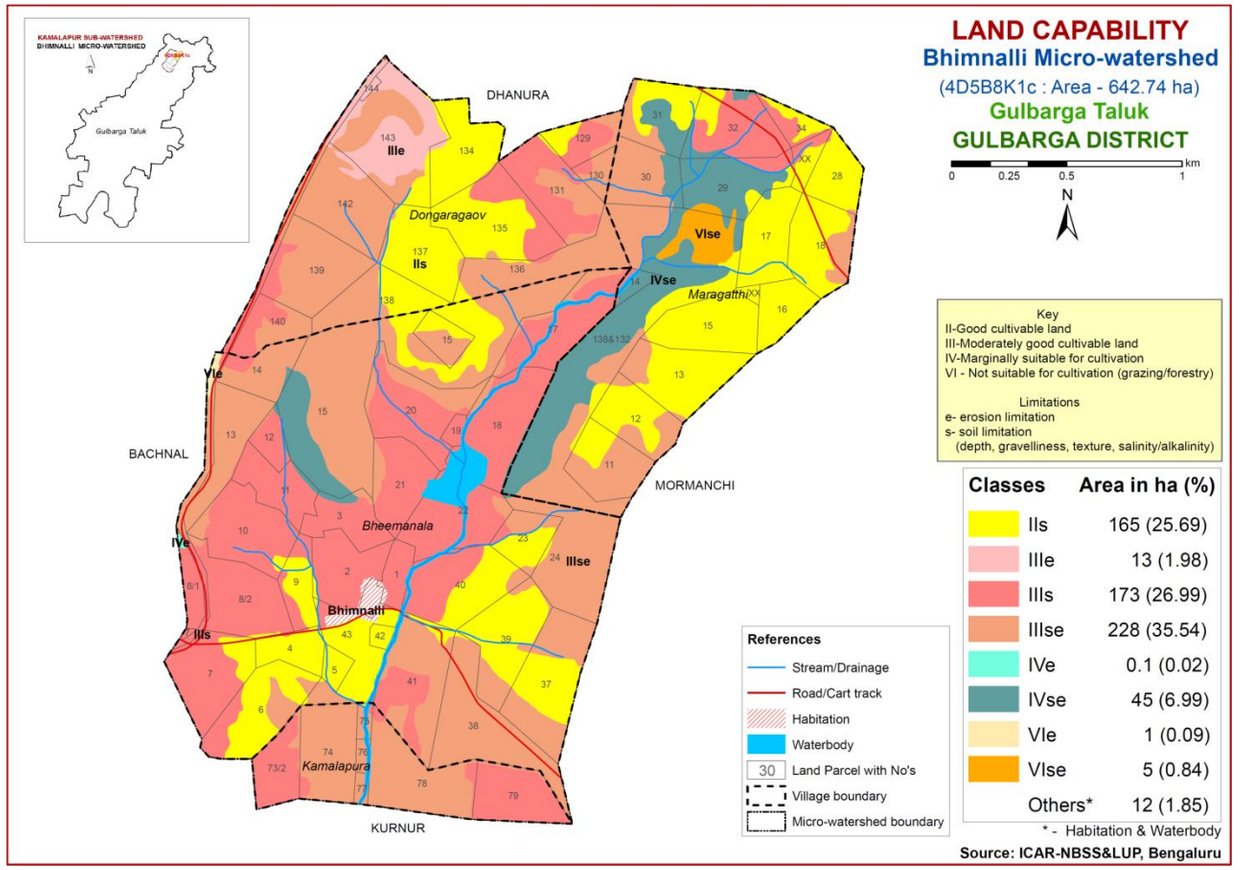
Sl.No*	Map unit	Description	Area	Percent
1	BHImB2g1	Shallow, black cracking clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded, slightly gravelly, 15-35 per cent gravels.	23.17	4.24
2	BHImC2g1	Shallow, black cracking clay soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5 % slope, moderately eroded, slightly gravelly, 15-35 per cent gravels.	26.24	4.80
3	DSImB1	Moderately shallow, black cracking clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, slightly eroded	10.64	1.95
4	GTTmB1	Shallow, black cracking clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, slightly eroded	15.44	2.82
5	GTTmB1g1	Shallow, black cracking clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, slightly eroded, slightly gravelly, 15-35 per cent gravels.	8.38	1.53
6	GTTmB2g1	Shallow, black cracking clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded, slightly gravelly, 15-35 per cent gravels.	7.76	1.42
7	GTTmC3g1	Shallow, black cracking clayey soils developed from weathered basalt on gently sloping uplands; clay surface on 1-3% slope, severely eroded, slightly gravelly, 15-35 per cent gravels.	5.33	0.97
8	HBLmB2g2	Moderately shallow, black clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded, moderately gravelly, 35-60 per cent gravels.	21.61	3.95
9	KGImB1g1	Shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, slightly eroded, 15-35 per cent gravels.	13.20	2.41
10	KGImB2	Shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded,	5.27	0.96
11	KGImB2g1	Shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded, slightly gravelly, 15-35 per cent gravels.	18.95	3.47
12	KGImB2g2	Shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded, moderately gravelly, 35-60 per cent gravels.	19.33	3.53
13	KGImC2g2	Shallow, black gravelly clay soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5% slope, moderately eroded, moderately gravelly, 35-60 per cent gravels.	8.80	1.61

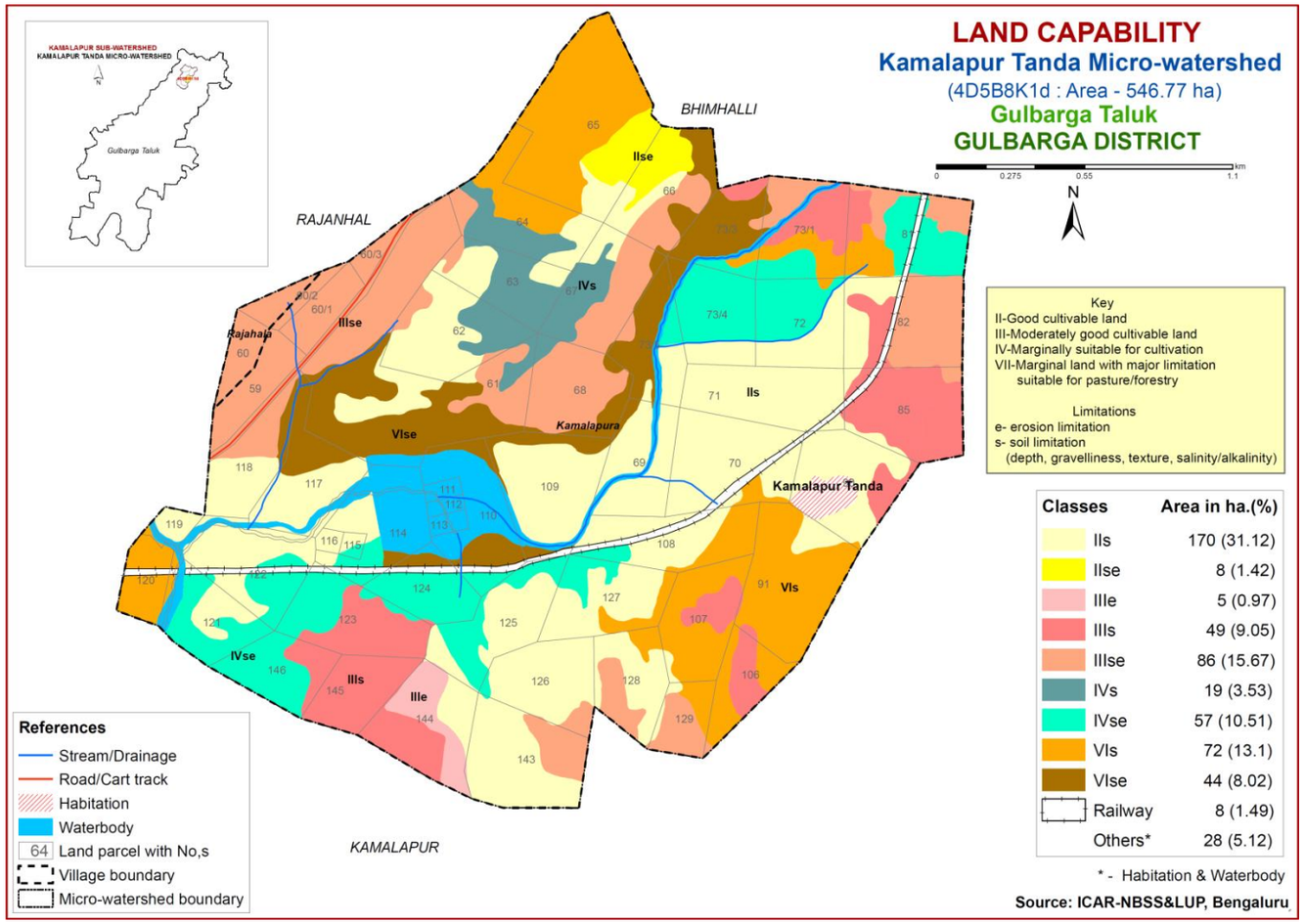
To be continued…

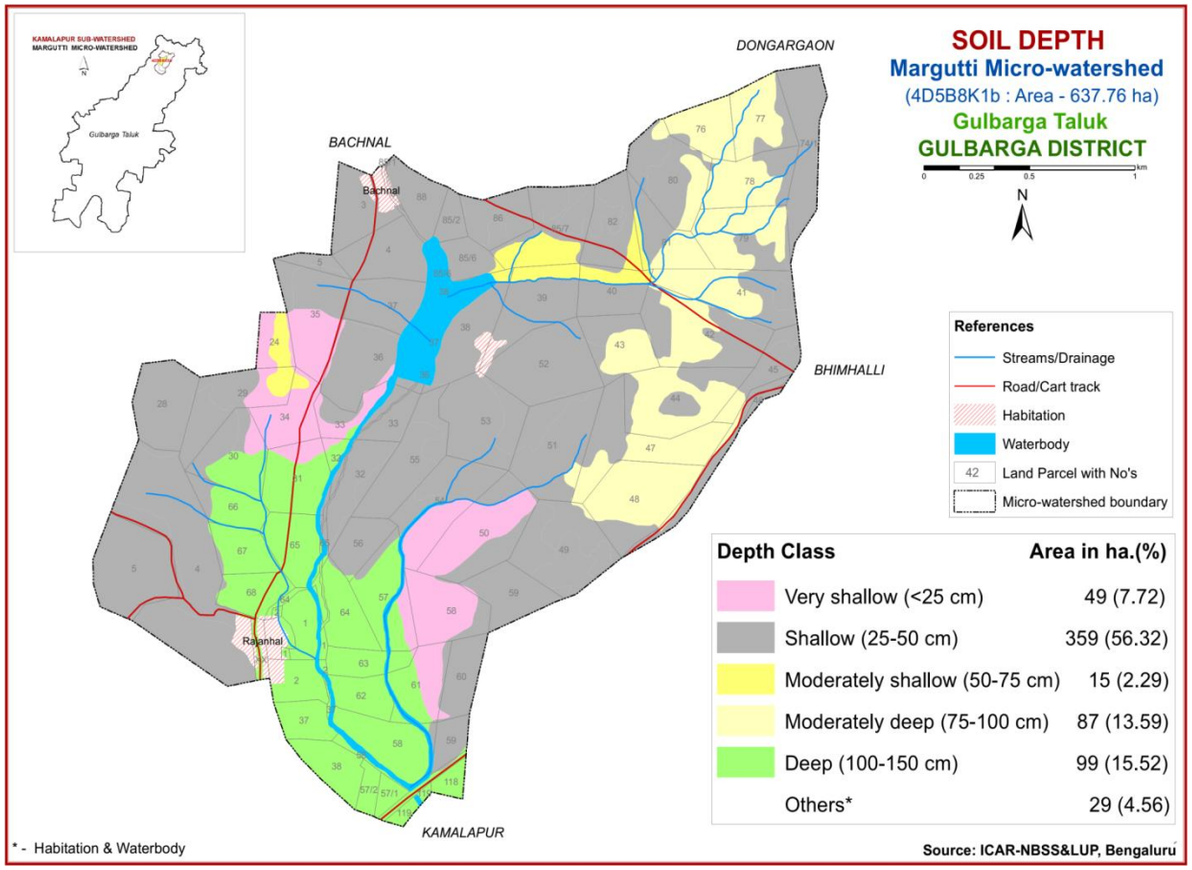
Sl.No*	Map unit	Description	Area	Per cent
14	KGImC3g2	Shallow, black gravelly clay soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5% slope, severely eroded, moderately gravelly, 35-60 per cent gravels.	71.60	13.10
15	MANmB2	Very deep, black clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded	7.21	1.32
16	MGTmB1g2	Very shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, slightly eroded, moderately gravelly, 35-60 per cent gravels.	0.96	0.18
17	MGTmB3g1	Very shallow, black gravelly clay soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, severely eroded, slightly gravelly, 15-35 per cent gravels.	6.00	1.10
18	MGTmC2g2	Very shallow, black gravelly clay soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5 % slope, moderately eroded, moderately gravelly, 35-60 per cent gravels.	5.98	1.09
19	MGTmD3g2	Very shallow, black gravelly clay soils developed from weathered basalt on moderately sloping uplands; clay surface on 3-5 % slope, severely eroded, moderately gravelly, 35-60 per cent gravels.	56.28	10.29
20	MGTmD3g3	Very shallow, black gravelly clay soils developed from weathered basalt on moderately sloping uplands; clay surface on 3-5 % slope, severely eroded, moderately gravelly, >60 per cent gravels.	39.08	7.15
21	MRDmB2g1	Moderately deep, gravelly clay red lateritic soils developed from laterite on very gently sloping uplands, clay surface on 1-3 % slope, moderately eroded, slightly gravelly, 15-35 per cent gravels.	15.59	2.85
22	NHAmC2g2	Shallow, black clayey soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5% slope, slightly gravelly, 35-60 per cent gravels.	10.95	2.00
23	RMNmB1g1	Moderately deep, black clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3% slope, moderately eroded, moderately gravelly, 15-35 per cent gravels.	48.94	8.95
24	RNLmB2	Deep, black clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3 % slope, moderately eroded, slightly gravelly.	63.96	11.70
30	RMNmC2g2	Moderately deep, black clayey soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5% slope, moderately eroded, moderately gravelly, 35-60 per cent gravels.	38.38	5.97
31	RMNmC3g2	Moderately deep, black clayey soils developed from weathered basalt on gently sloping uplands; clay surface on 3-5% slope, severely eroded, moderately gravelly, 35-60 per cent gravels.	4.20	0.65
32	RMNmD3g2	Moderately deep, black clayey soils developed from weathered basalt on moderately sloping uplands; clay surface on 3-5% slope, severely eroded, moderately gravelly, 35-60 per cent gravels.	36.80	5.73
33	RNLmB1	Deep, black clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3 % slope, slightly eroded	29.26	4.55
34	RNLmB2g1	Deep, black clayey soils developed from weathered basalt on very gently sloping uplands; clay surface on 1-3 % slope, moderately eroded, slightly gravelly, 15-35 per cent gravels.	2.23	0.35

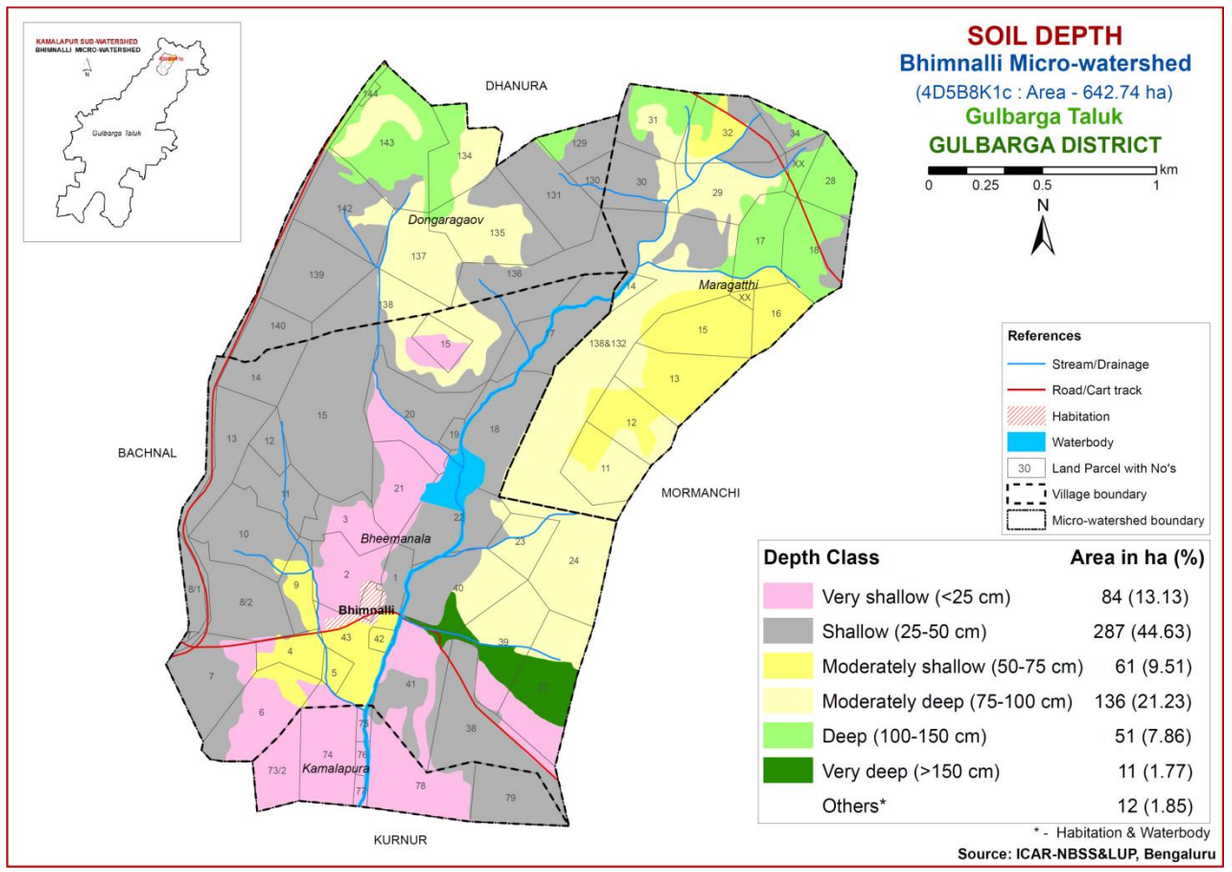
*Soil map unit numbers are continuous for the taluk, not the micro-watershed

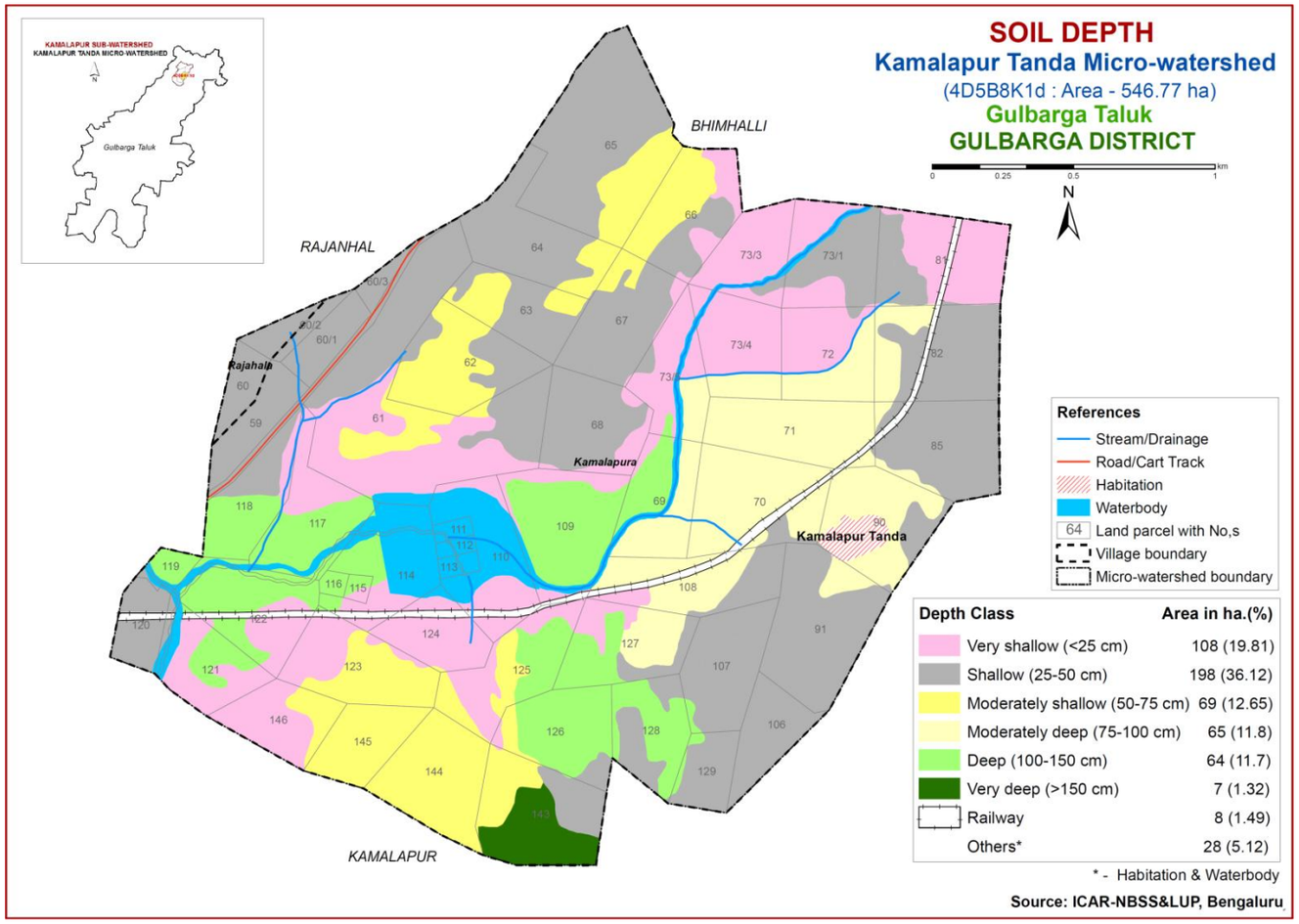

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
LAND CAPABILITY
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
Bachnal
BHIMHALLI
Rajanhal
KAMALAPUR
Key
II-Good cultivable land
III-Moderately good cultivable land
IV-Marginally suitable for cultivation
VI - Not suitable for cultivation (grazing/forestry)
Limitations
e- erosion limitation
s- soil limitation
(depth, gravelliness, texture, salinity/alkalinity)
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Micro-watershed boundary
Classes Area in ha.(%)
IIs 200 (31.4)
IIIs 187 (29.39)
IIIse 87 (13.71)
IVe 119 (18.64)
VIe 12 (1.86)
VIs 3 (0.45)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

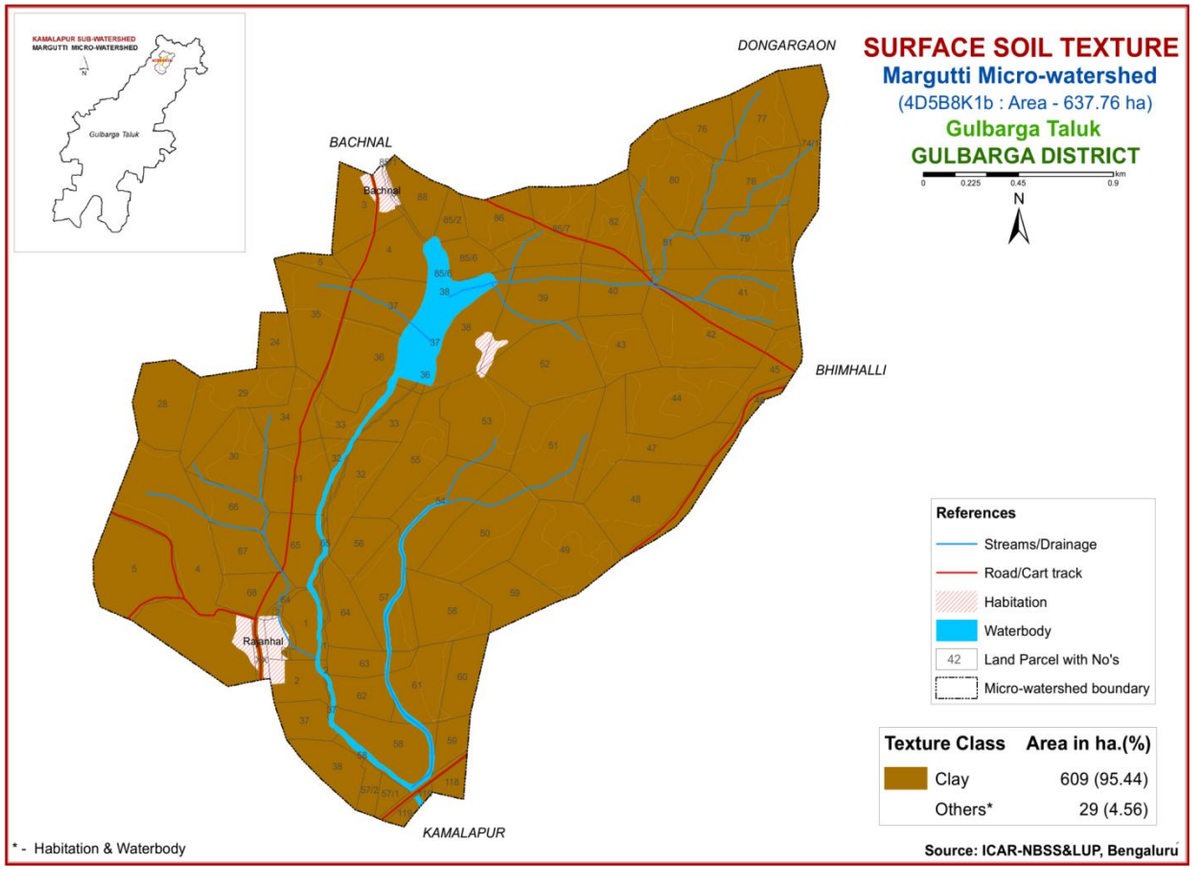

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
LAND CAPABILITY
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
Dongaragaov
Maragatthi
BACHNAL
Bheemanala
Bhimnalli
Kamalapura
MORMANCHI
KURNUR
Key
II-Good cultivable land
III-Moderately good cultivable land
IV-Marginally suitable for cultivation
VI - Not suitable for cultivation (grazing/forestry)
Limitations
e- erosion limitation
s- soil limitation
(depth, gravelliness, texture, salinity/alkalinity)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary
Classes Area in ha.(%)
IIs 165 (25.69)
IIIe 13 (1.98)
IIIs 173 (26.99)
IIIse 228 (35.54)
IVe 0.1 (0.02)
IVse 45 (6.99)
VIe 1 (0.09)
VIse 5 (0.84)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

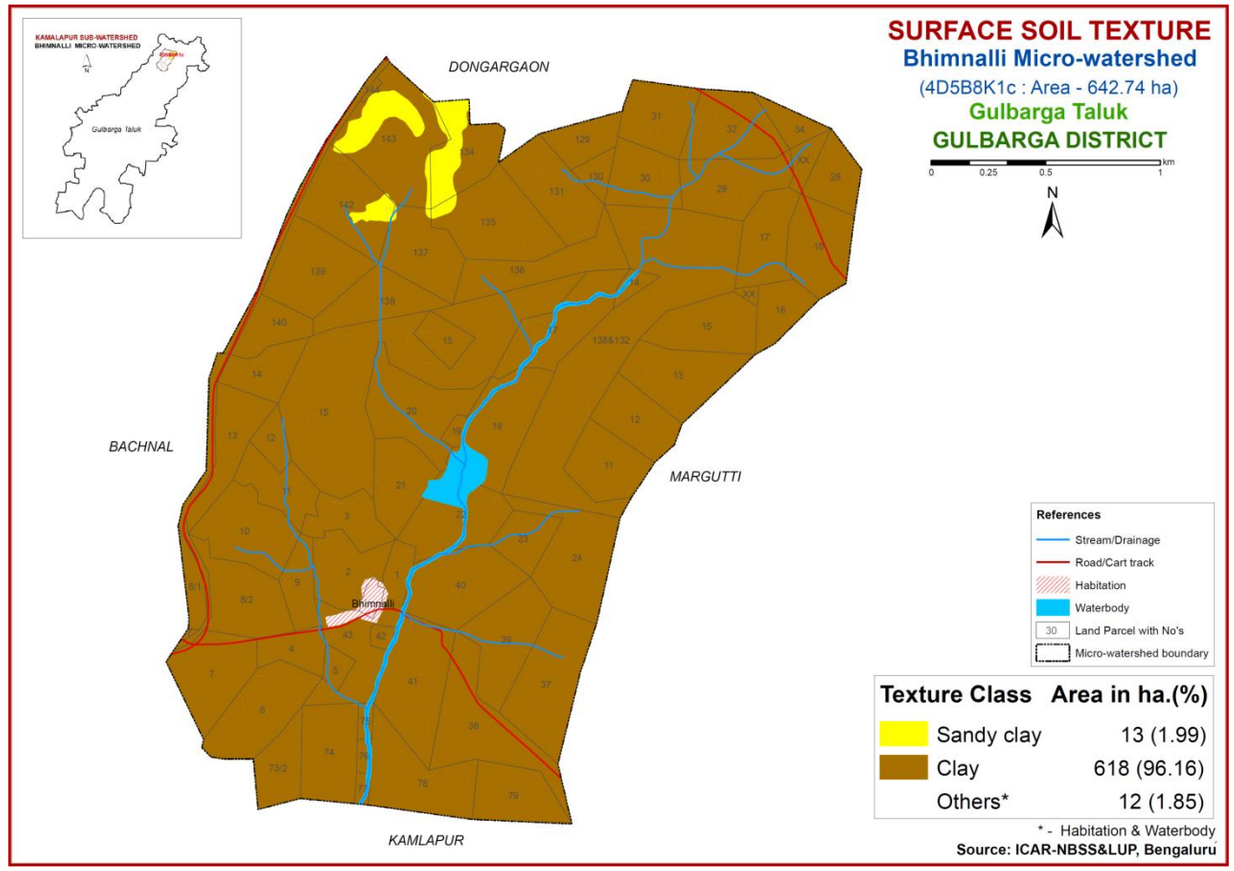

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
LAND CAPABILITY
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.275 0.55 1.1 km
N
BHIMHALLI
RAJANHAL
Rajahala
Kamalapura
Kamalapur Tanda
KAMALAPUR
Key
II-Good cultivable land
III-Moderately good cultivable land
IV-Marginally suitable for cultivation
VII-Marginal land with major limitation suitable for pasture/forestry
Limitations
e- erosion limitation
s- soil limitation
(depth, gravelliness, texture, salinity/alkalinity)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No,s
Village boundary
Micro-watershed boundary
Classes Area in ha.(%)
IIs 170 (31.12)
IIse 8 (1.42)
IIIe 5 (0.97)
IIIs 49 (9.05)
IIIse 86 (15.67)
IVs 19 (3.53)
IVse 57 (10.51)
VIs 72 (13.1)
VIse 44 (8.02)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

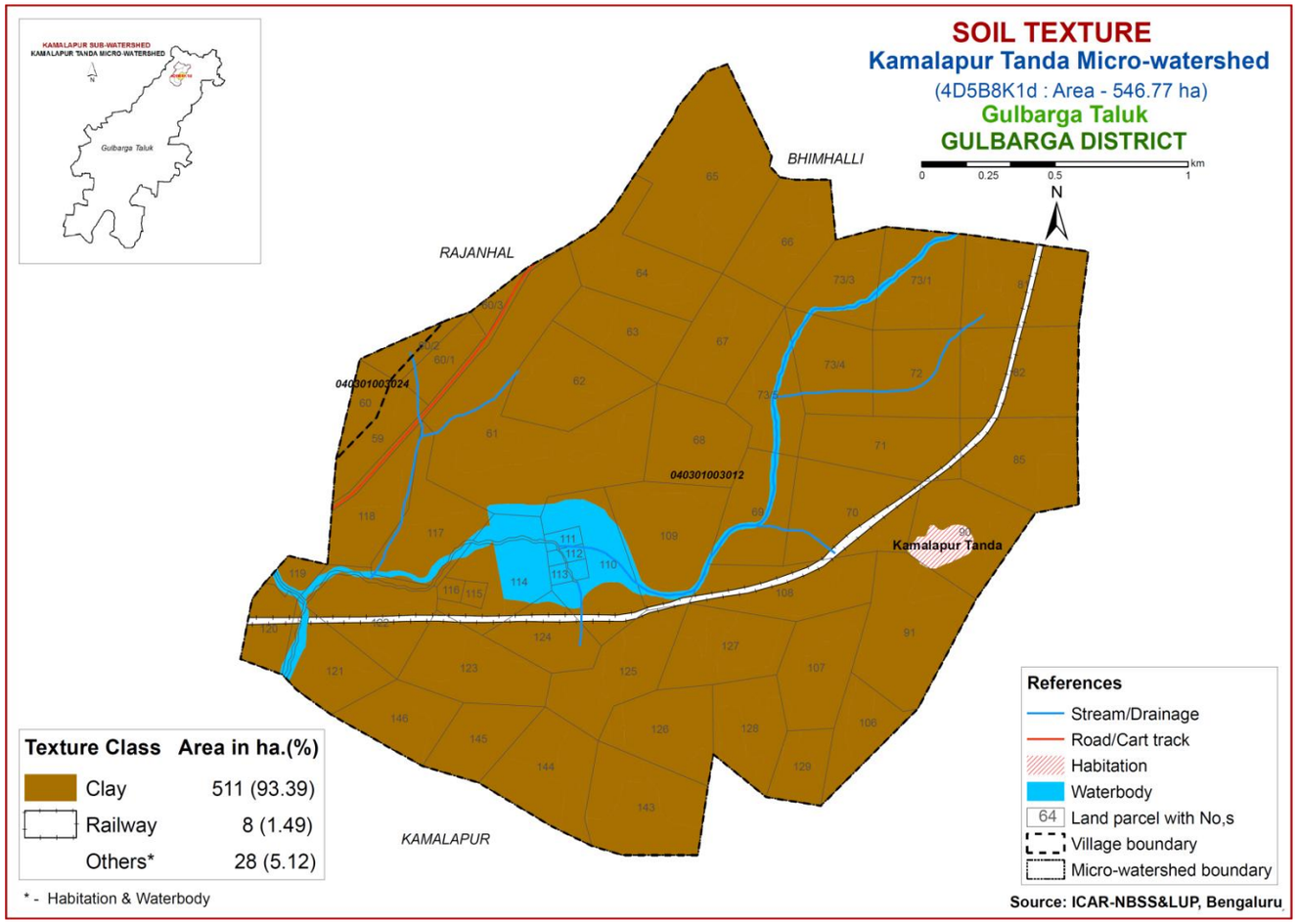

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
SOIL DEPTH
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
Bachnal
BHIMHALLI
Rajanhal
KAMALAPUR
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Micro-watershed boundary
Depth Class
Area in ha.(%)
Very shallow (<25 cm) 49 (7.72)
Shallow (25-50 cm) 359 (56.32)
Moderately shallow (50-75 cm) 15 (2.29)
Moderately deep (75-100 cm) 87 (13.59)
Deep (100-150 cm) 99 (15.52)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

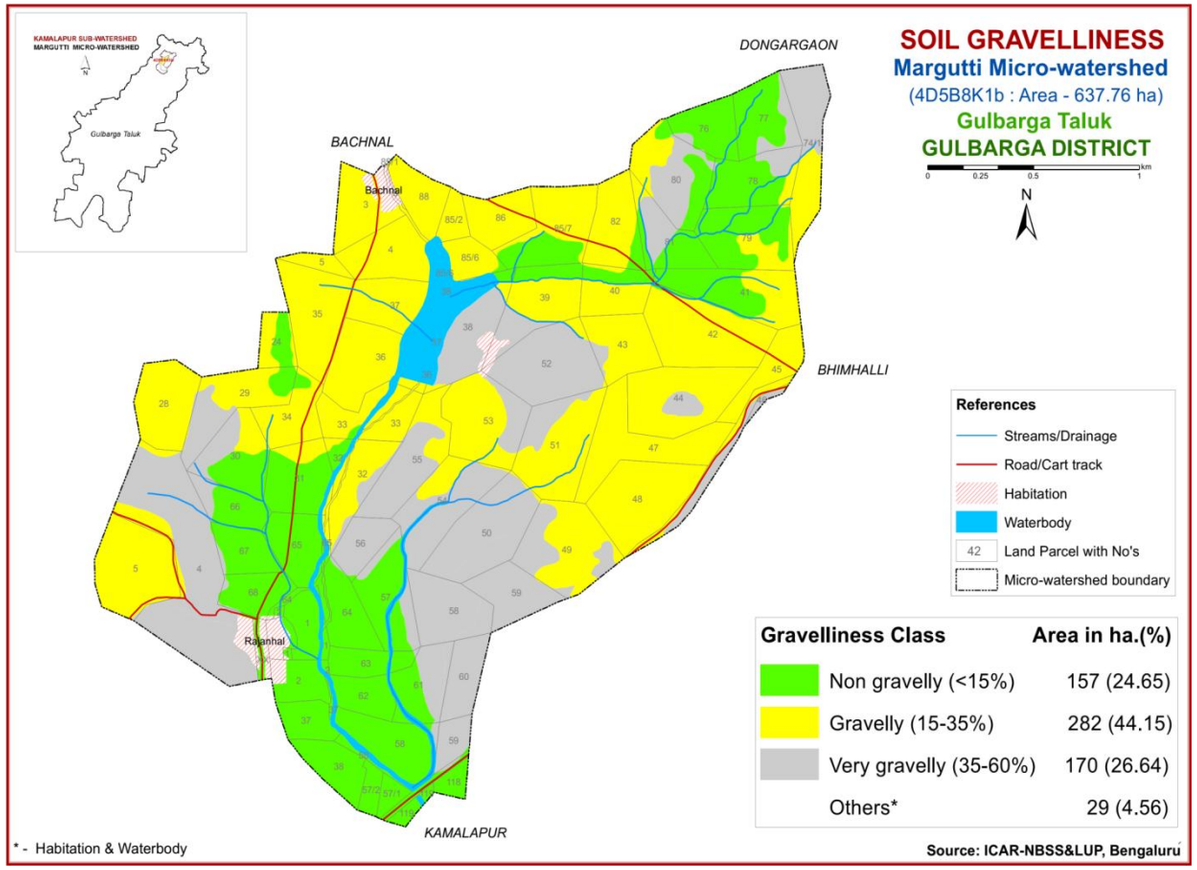

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
SOIL DEPTH
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
Dongaragaov
Maragatthi
BACHNAL
MORMANCHI
Bheemanala
Bhimnalli
Kamalapura
KURNUR
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary
Depth Class
Area in ha (%)
Very shallow (<25 cm) 84 (13.13)
Shallow (25-50 cm) 287 (44.63)
Moderately shallow (50-75 cm) 61 (9.51)
Moderately deep (75-100 cm) 136 (21.23)
Deep (100-150 cm) 51 (7.86)
Very deep (>150 cm) 11 (1.77)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

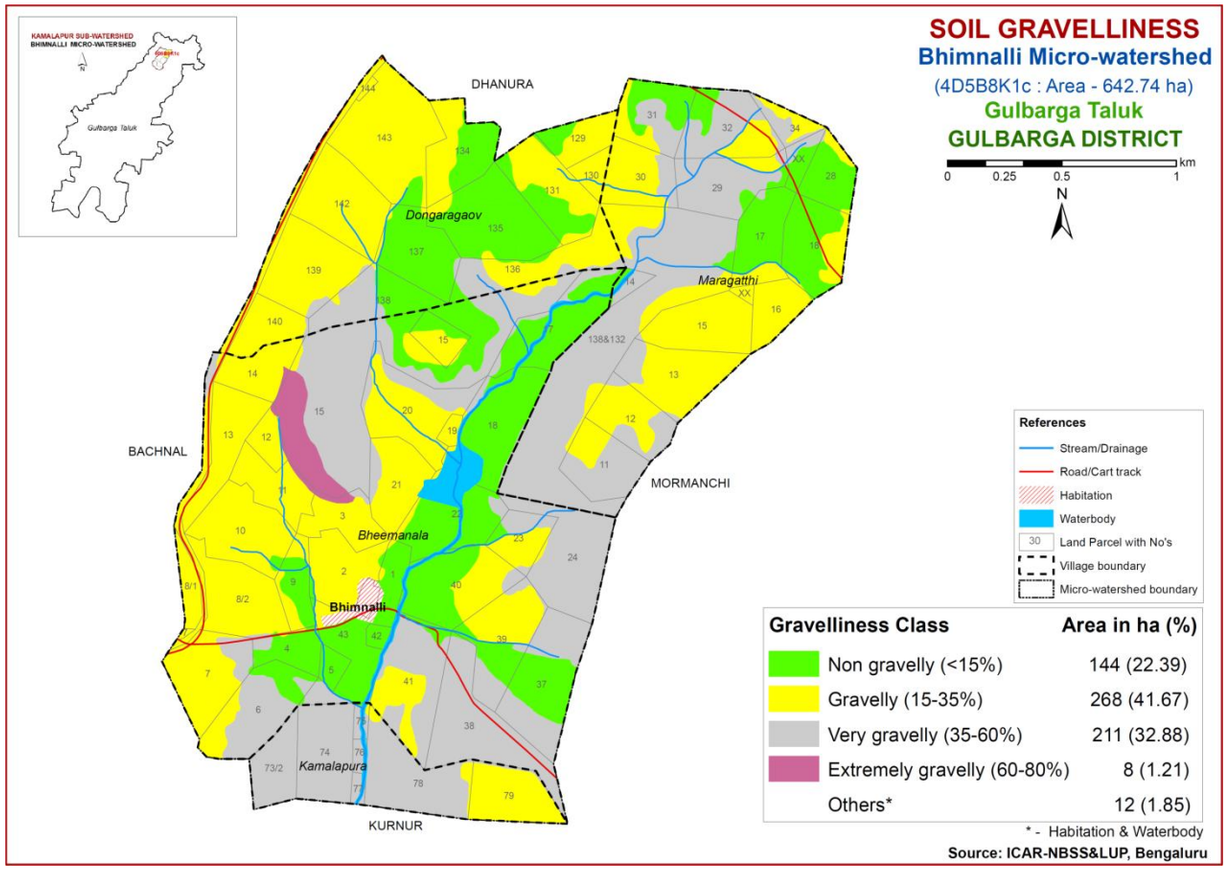

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
SOIL DEPTH
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
Rajahalli
Kamalapura
Kamalapur Tanda
KAMALAPUR
References
Stream/Drainage
Road/Cart Track
Habitation
Waterbody
64 Land parcel with No,s
Village boundary
Micro-watershed boundary
Depth Class
Area in ha.(%)
Very shallow (<25 cm) 108 (19.81)
Shallow (25-50 cm) 198 (36.12)
Moderately shallow (50-75 cm) 69 (12.65)
Moderately deep (75-100 cm) 65 (11.8)
Deep (100-150 cm) 64 (11.7)
Very deep (>150 cm) 7 (1.32)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

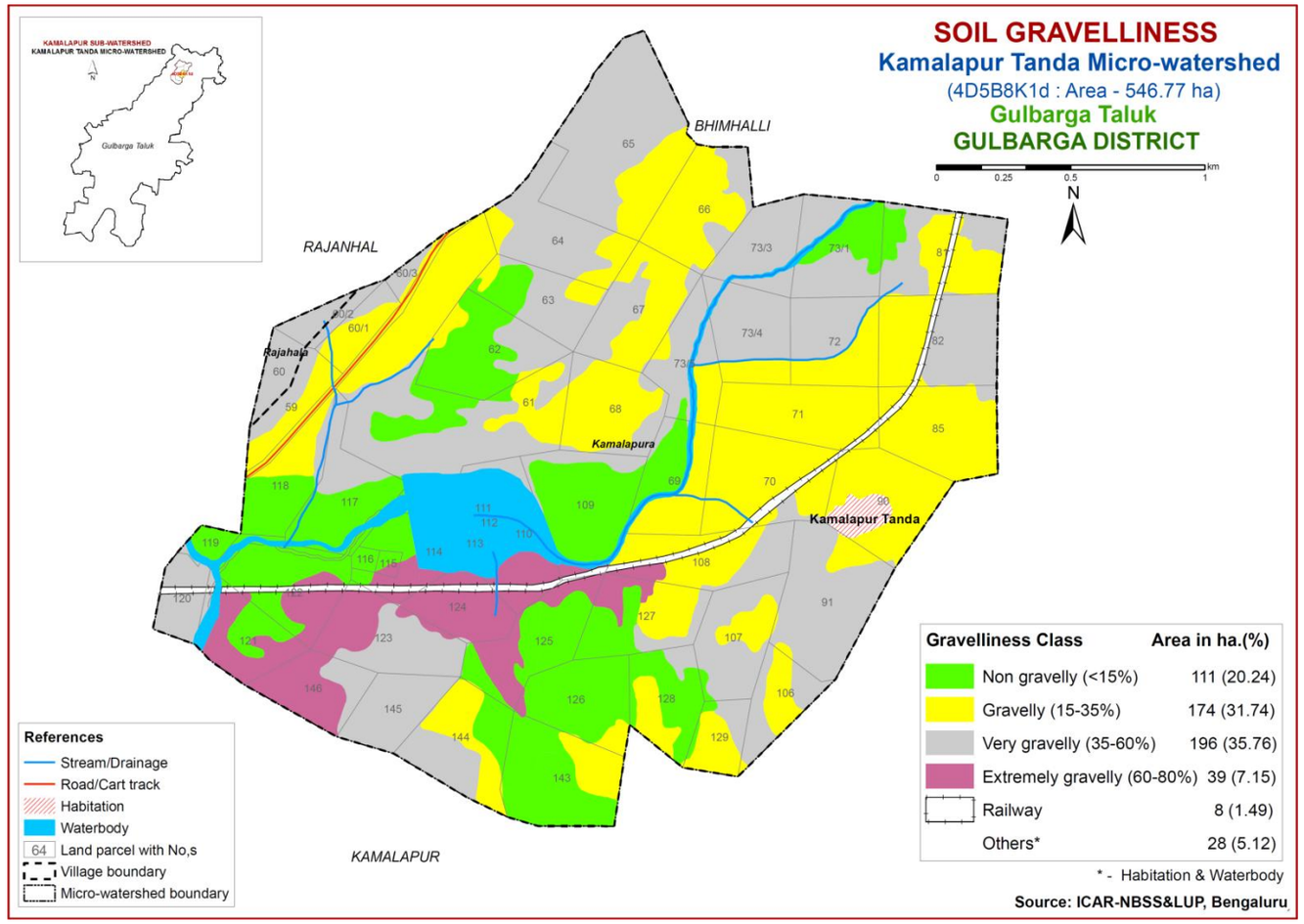

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Rajanhal
SURFACE SOIL TEXTURE
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.225 0.45 0.9 km
N
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Micro-watershed boundary
Texture Class Area in ha.(%)
Clay 609 (95.44)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

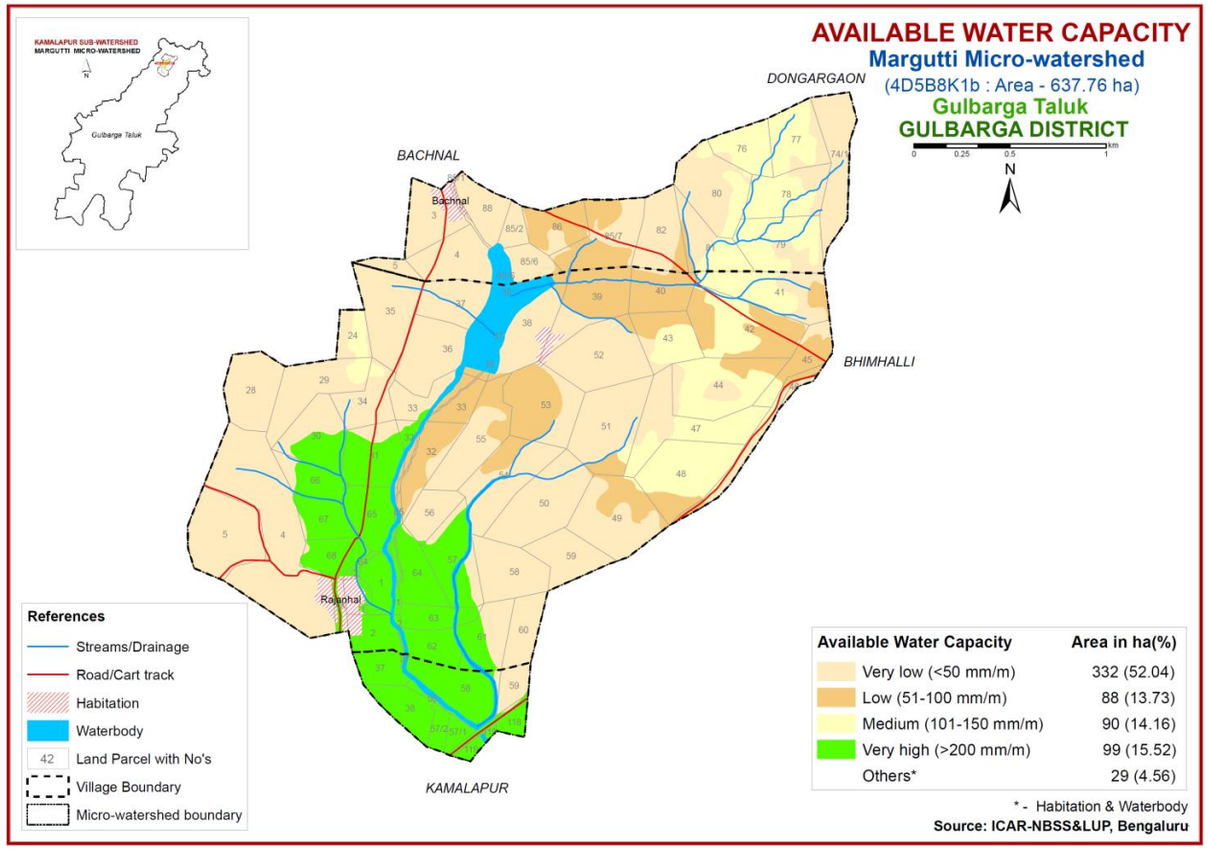

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
DONGARGAON
BACHNAL
MARGUTTI
KAMLAPUR
Bhimnalli
SURFACE SOIL TEXTURE
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Micro-watershed boundary
Texture Class Area in ha.(%)
Sandy clay 13 (1.99)
Clay 618 (96.16)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

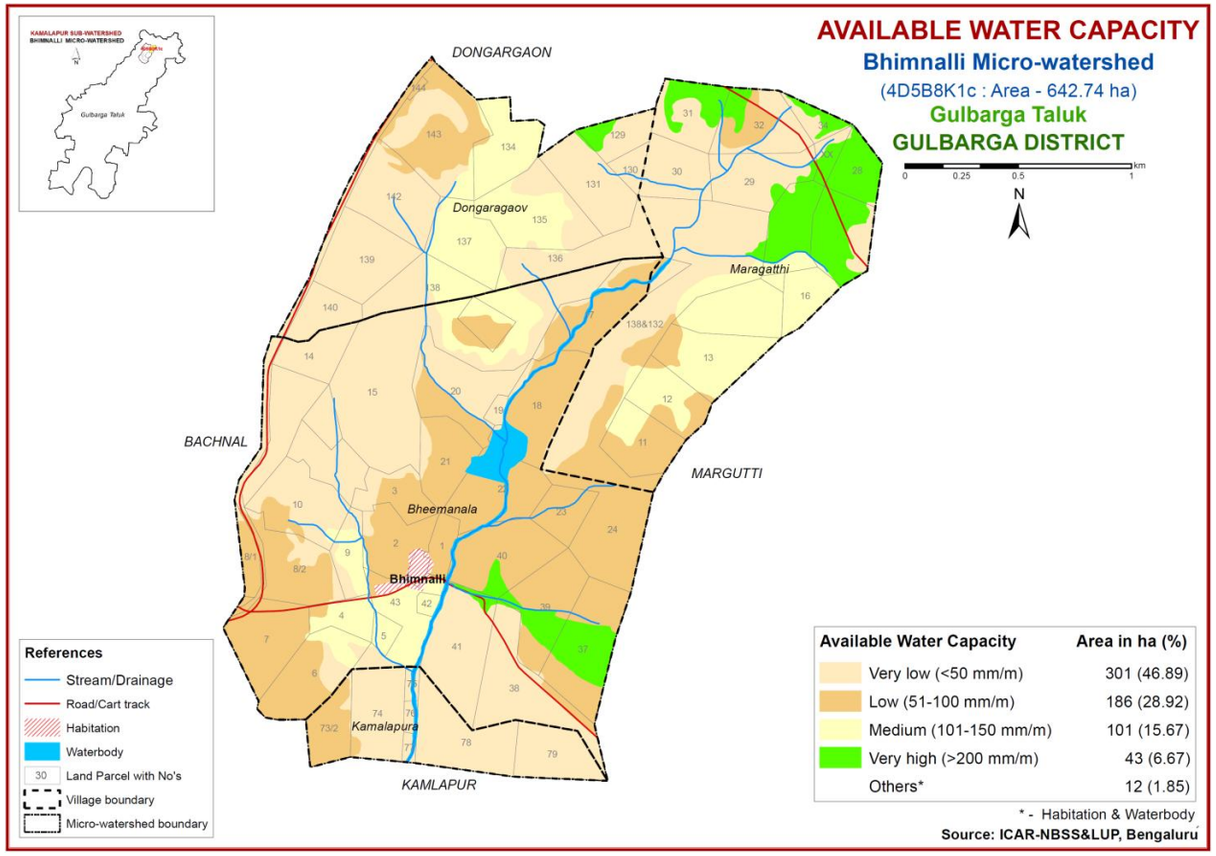

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
BHIMHALLI
RAJANHAL
KAMALAPUR
040301003024
040301003012
Kamalapur Tanda
SOIL TEXTURE
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No,s
Village boundary
Micro-watershed boundary
Texture Class Area in ha.(%)
Clay 511 (93.39)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

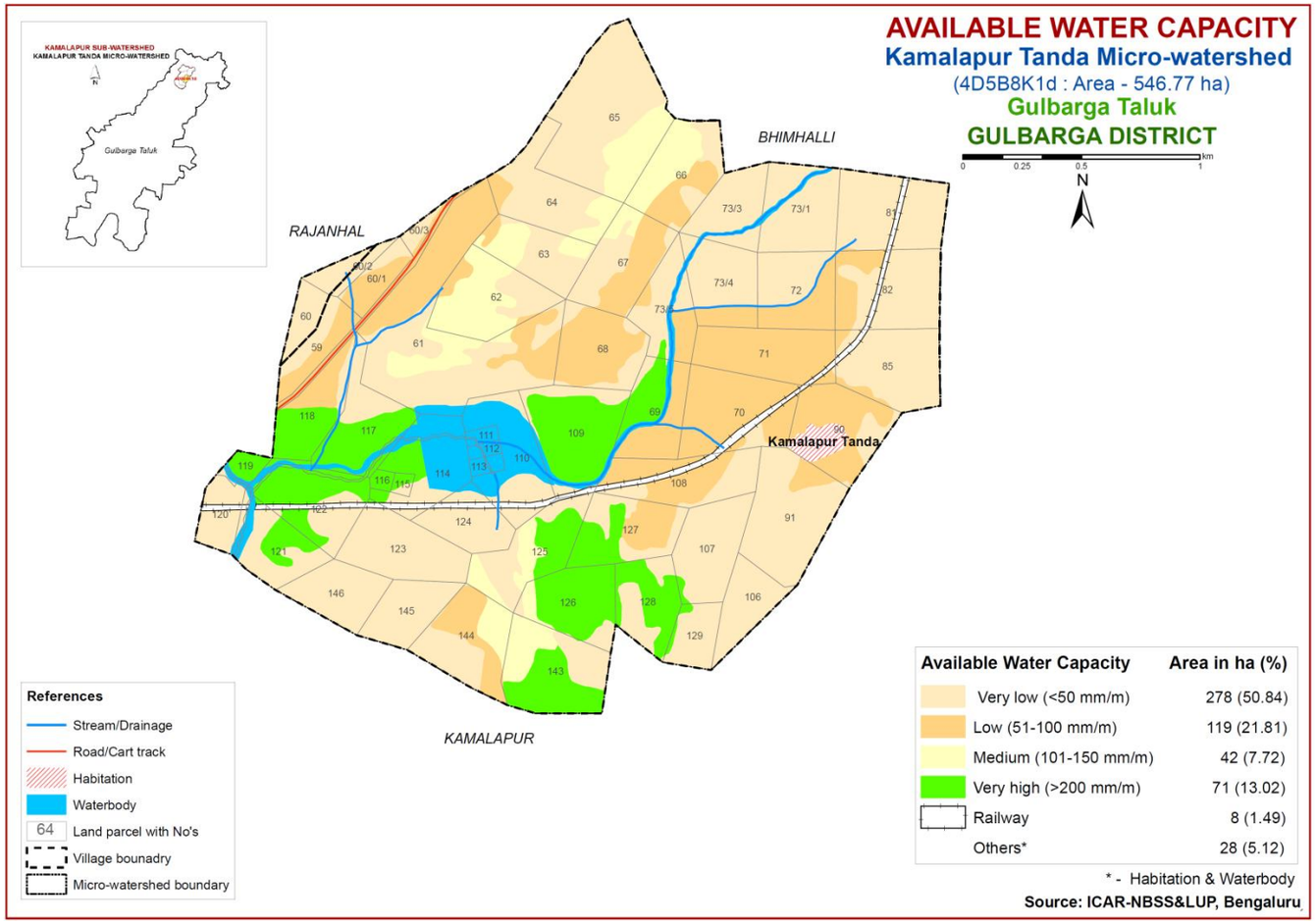

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
SOIL GRAVELLINESS
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
Bachnal
BHIMHALLI
Rajanhal
KAMALAPUR
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Micro-watershed boundary
Gravelliness Class
Area in ha.(%)
Non gravelly (<15%) 157 (24.65)
Gravelly (15-35%) 282 (44.15)
Very gravelly (35-60%) 170 (26.64)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

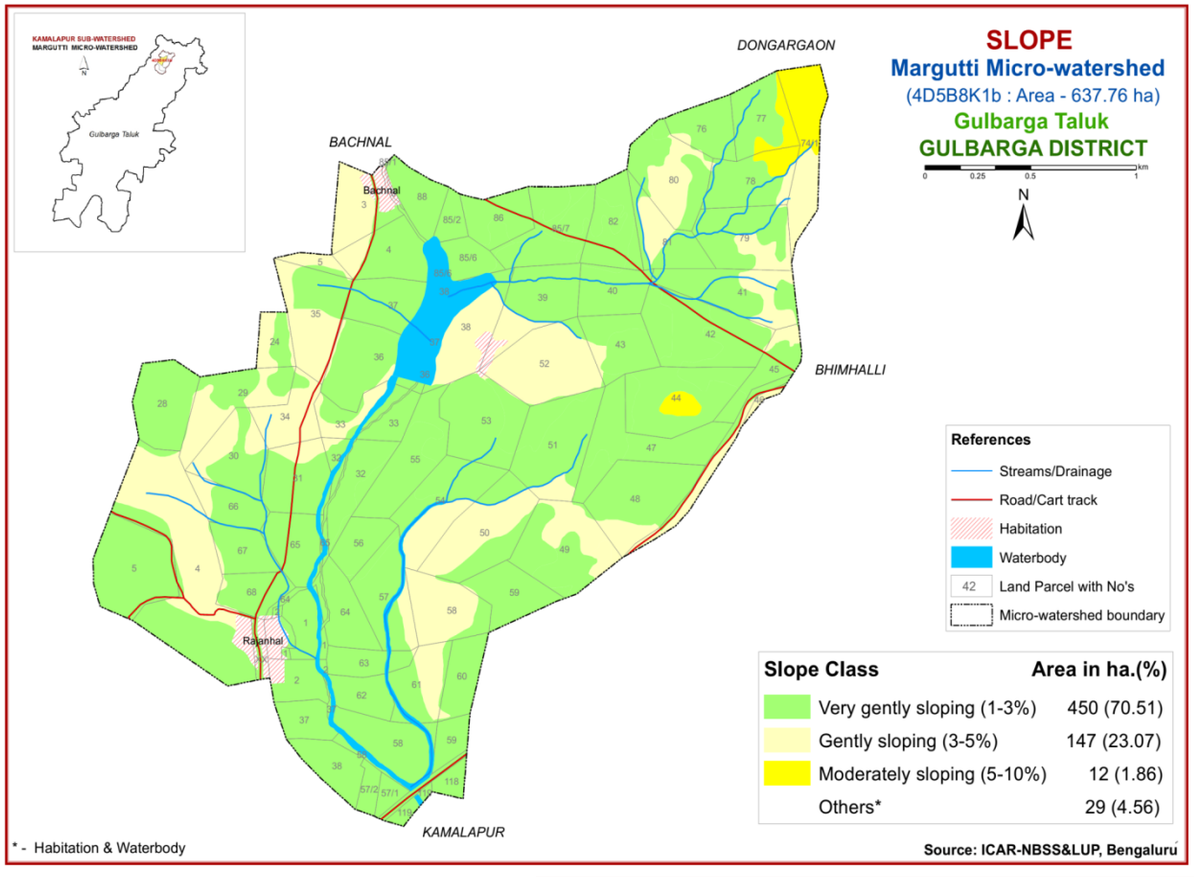

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
SOIL GRAVELLINESS
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
Dongaragaov
Maragatthi
BACHNAL
MORMANCHI
Bheemanala
Bhimnalli
Kamalapura
KURNUR
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary
Gravelliness Class
Area in ha (%)
Non gravelly (<15%) 144 (22.39)
Gravelly (15-35%) 268 (41.67)
Very gravelly (35-60%) 211 (32.88)
Extremely gravelly (60-80%) 8 (1.21)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

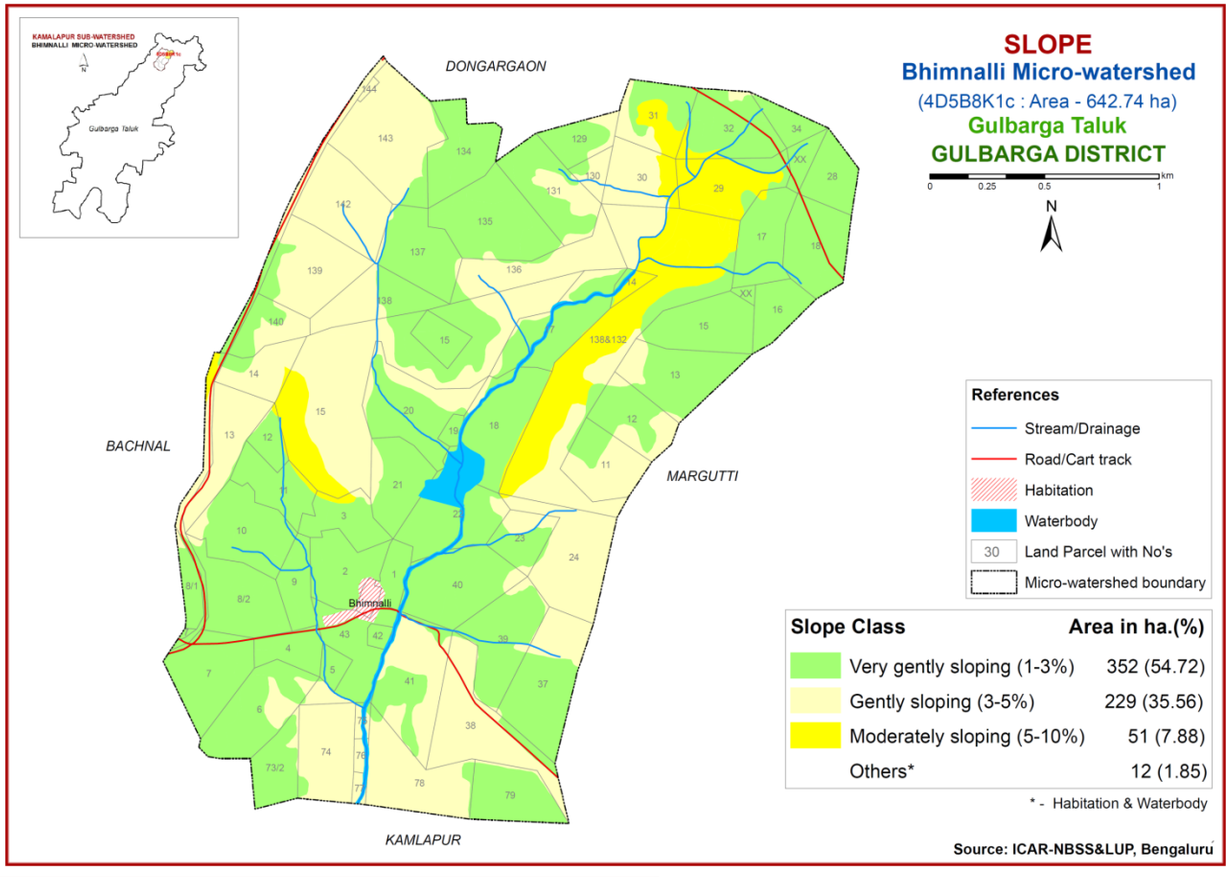

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
SOIL GRAVELLINESS
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
Rajahala
Kamalapura
Kamalapur Tanda
KAMALAPUR
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No,s
Village boundary
Micro-watershed boundary
Gravelliness Class
Area in ha.(%)
Non gravelly (<15%) 111 (20.24)
Gravelly (15-35%) 174 (31.74)
Very gravelly (35-60%) 196 (35.76)
Extremely gravelly (60-80%) 39 (7.15)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

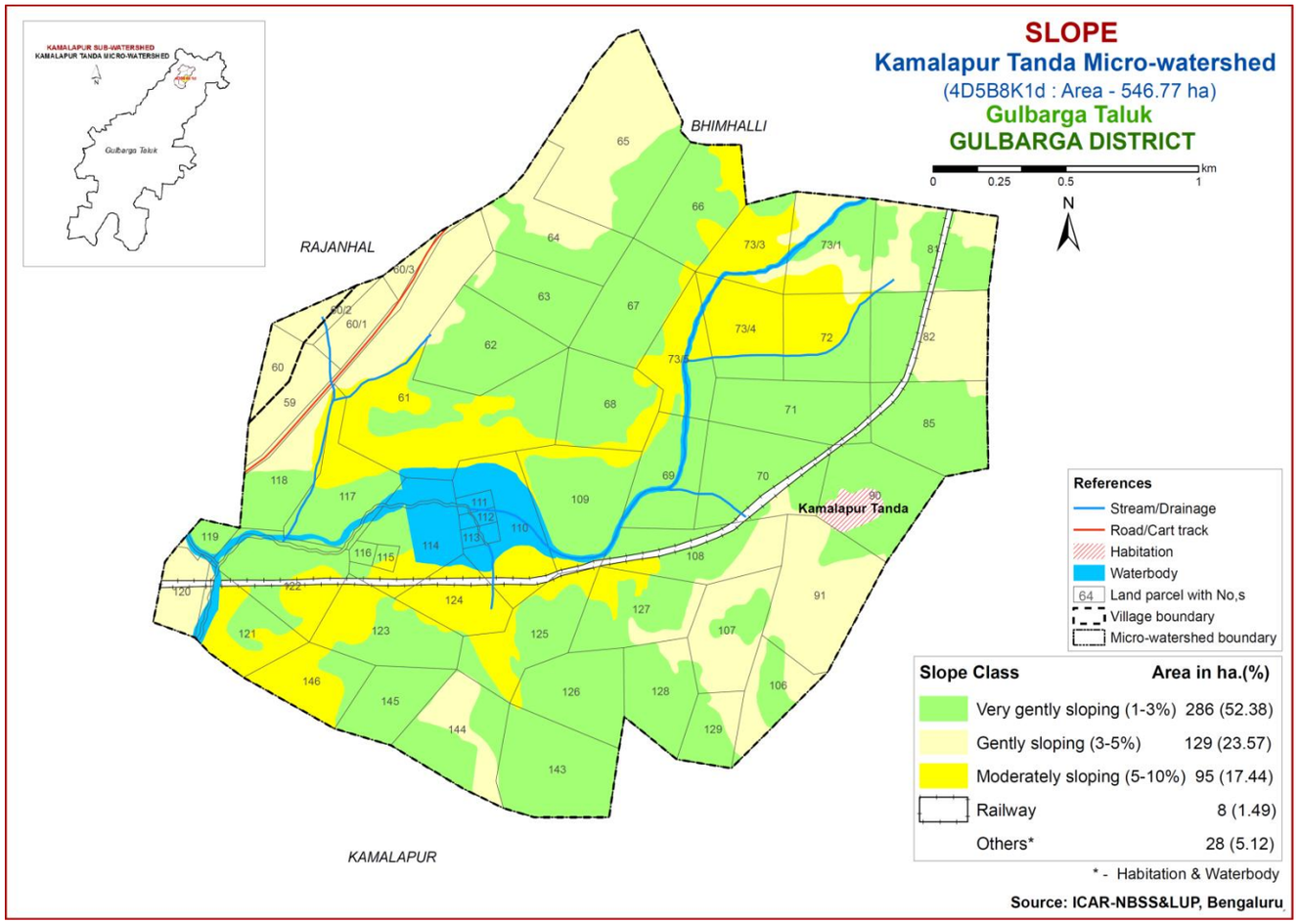

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
AVAILABLE WATER CAPACITY
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Rajanhal
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Village Boundary
Micro-watershed boundary
Available Water Capacity | Area in ha(%)
Very low (<50 mm/m) 332 (52.04)
Low (51-100 mm/m) 88 (13.73)
Medium (101-150 mm/m) 90 (14.16)
Very high (>200 mm/m) 99 (15.52)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

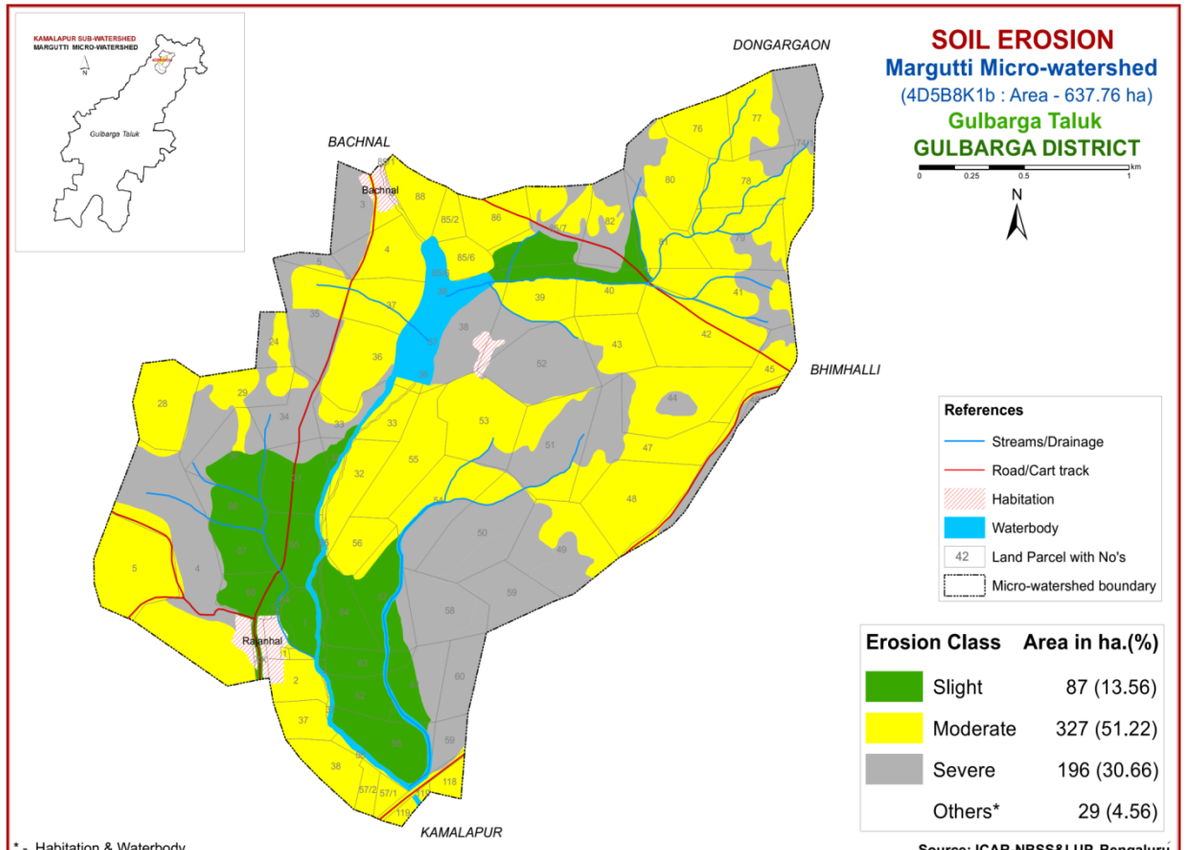

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
AVAILABLE WATER CAPACITY
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
Dongaragaov
Maragatthi
BACHNAL
MARGUTTI
Bheemanala
Bhimnalli
Kamalapura
KAMLAPUR
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Water Capacity | Area in ha (%)
Very low (<50 mm/m) 301 (46.89)
Low (51-100 mm/m) 186 (28.92)
Medium (101-150 mm/m) 101 (15.67)
Very high (>200 mm/m) 43 (6.67)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

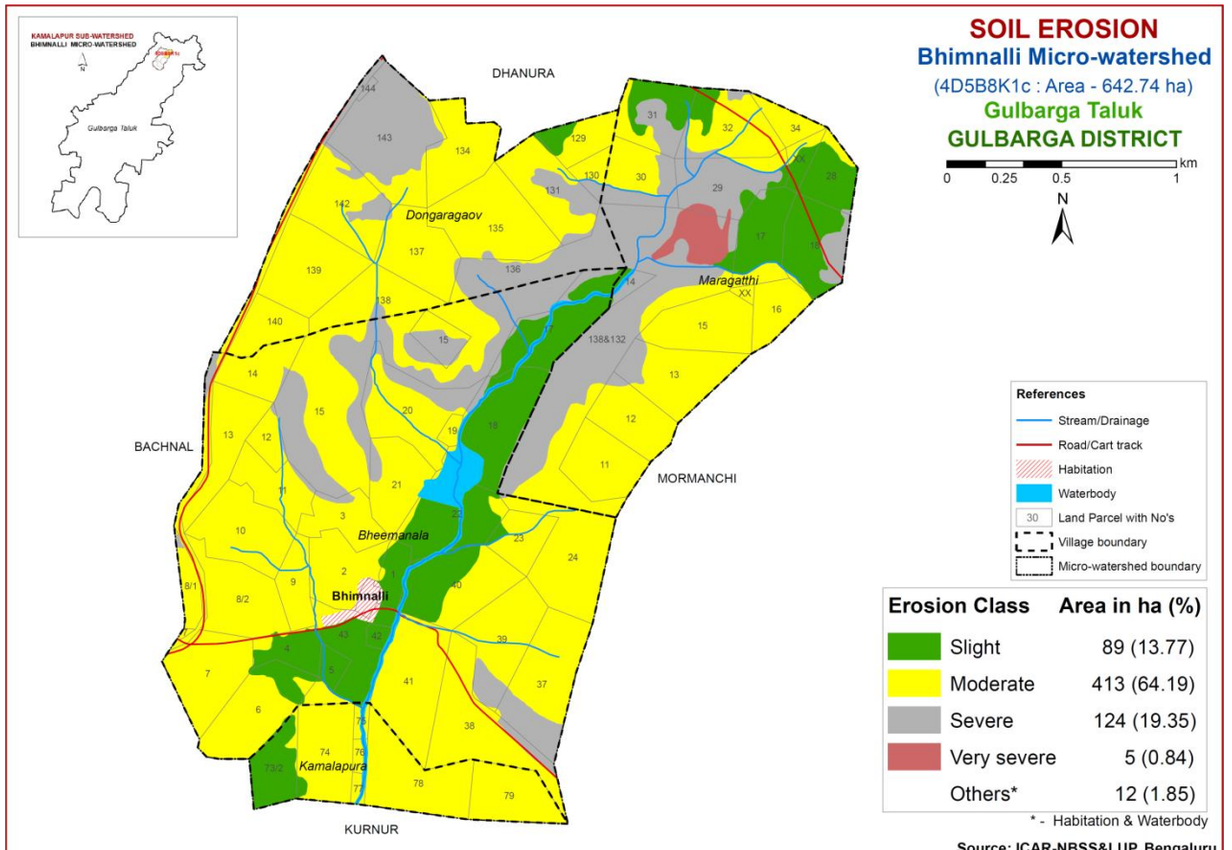

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
AVAILABLE WATER CAPACITY
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
Kamalapur Tanda
KAMALAPUR
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No's
Village bounadry
Micro-watershed boundary
Available Water Capacity | Area in ha (%)
Very low (<50 mm/m) 278 (50.84)
Low (51-100 mm/m) 119 (21.81)
Medium (101-150 mm/m) 42 (7.72)
Very high (>200 mm/m) 71 (13.02)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

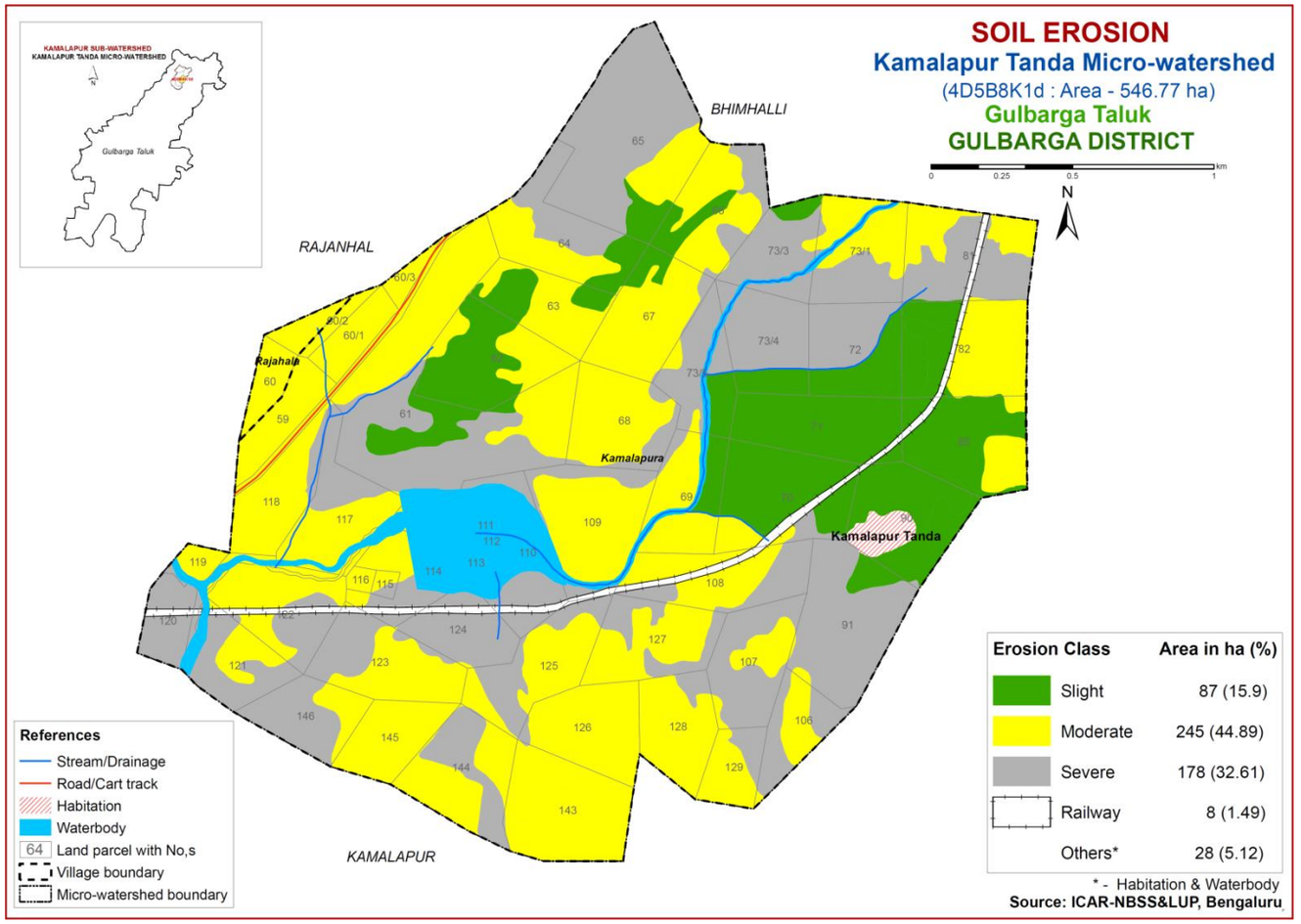

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
SLOPE
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Rajanhal
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Micro-watershed boundary
Slope Class Area in ha.(%)
Very gently sloping (1-3%) 450 (70.51)
Gently sloping (3-5%) 147 (23.07)
Moderately sloping (5-10%) 12 (1.86)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

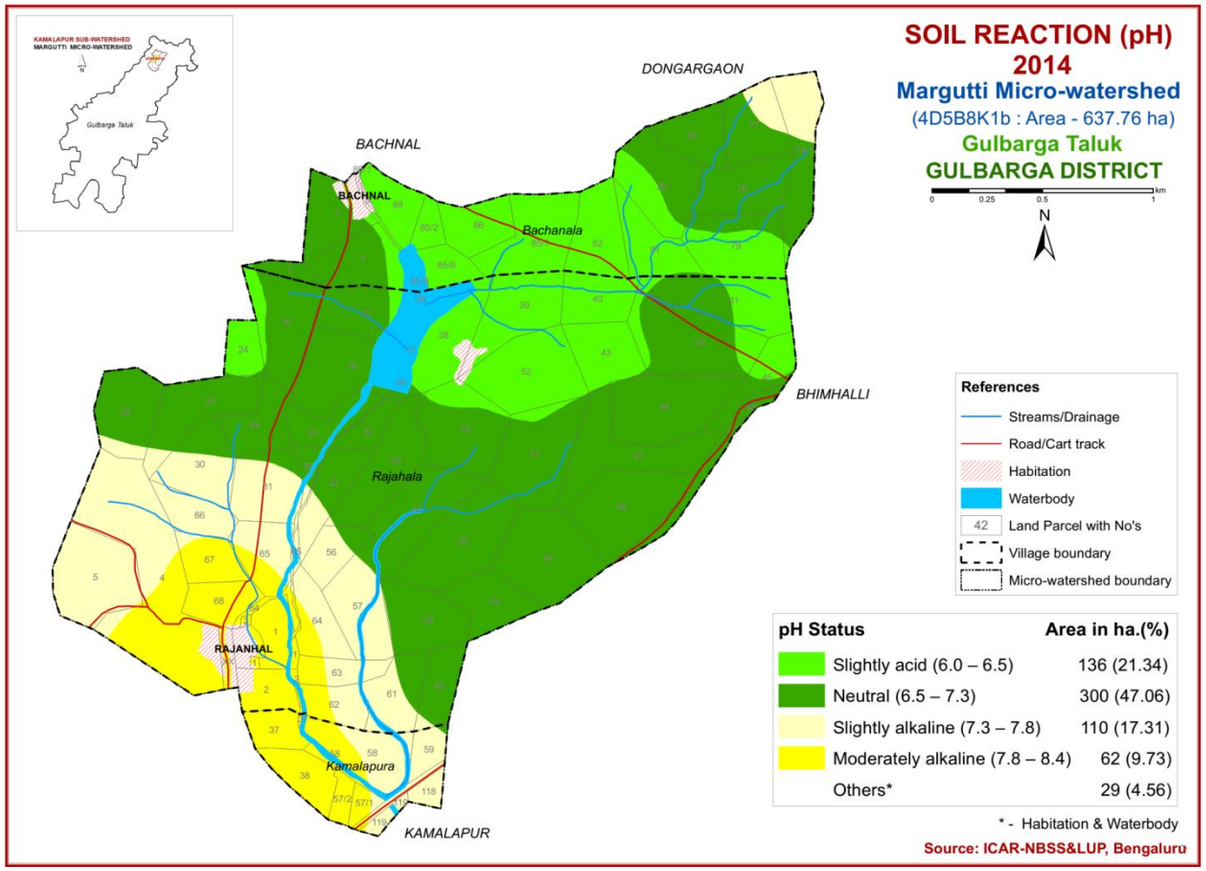

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
SLOPE
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
MARGUTTI
KAMLAPUR
Bhimnalli
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Micro-watershed boundary
Slope Class Area in ha.(%)
Very gently sloping (1-3%) 352 (54.72)
Gently sloping (3-5%) 229 (35.56)
Moderately sloping (5-10%) 51 (7.88)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

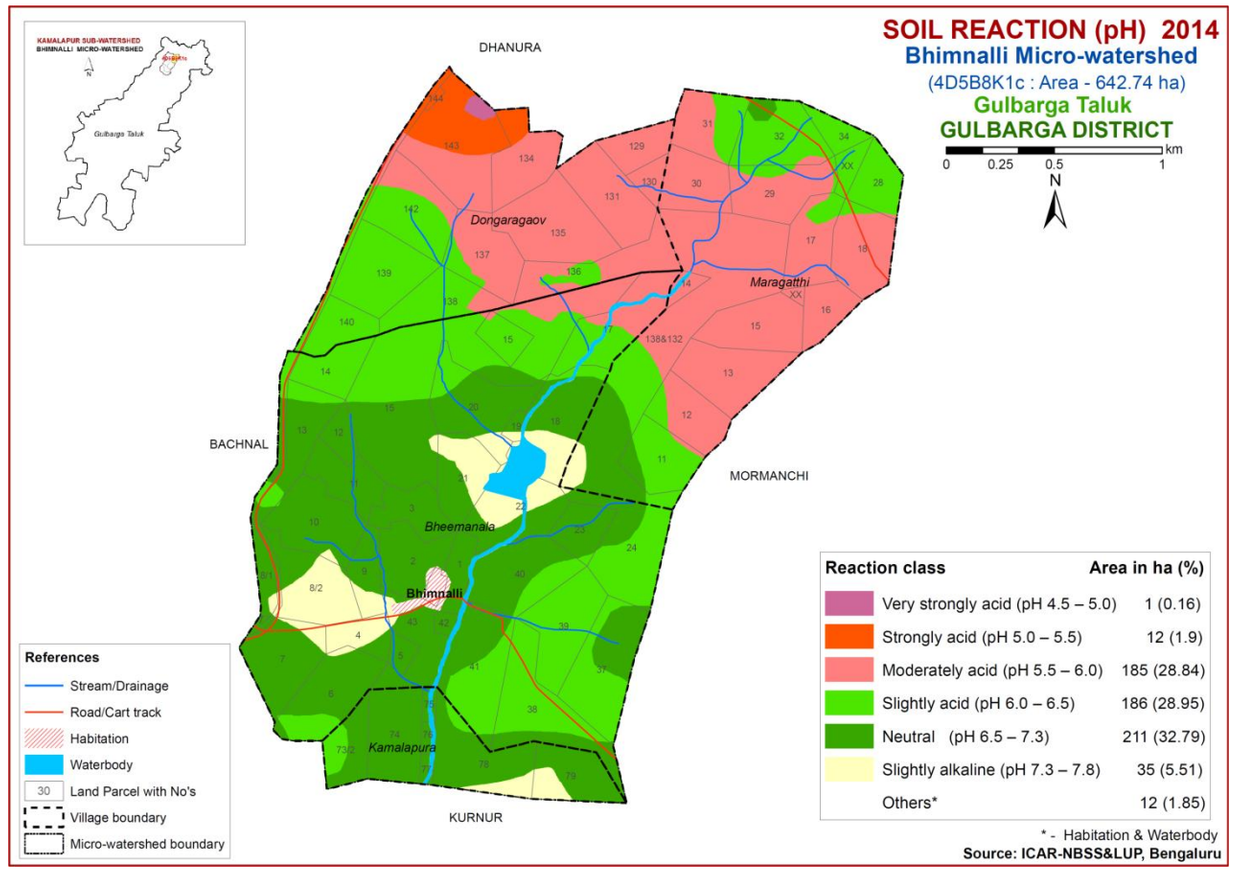

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
SLOPE
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
RAJANHAL
BHIMHALLI
KAMALAPUR
Kamalapur Tanda
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No,s
Village boundary
Micro-watershed boundary
Slope Class Area in ha.(%)
Very gently sloping (1-3%) 286 (52.38)
Gently sloping (3-5%) 129 (23.57)
Moderately sloping (5-10%) 95 (17.44)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

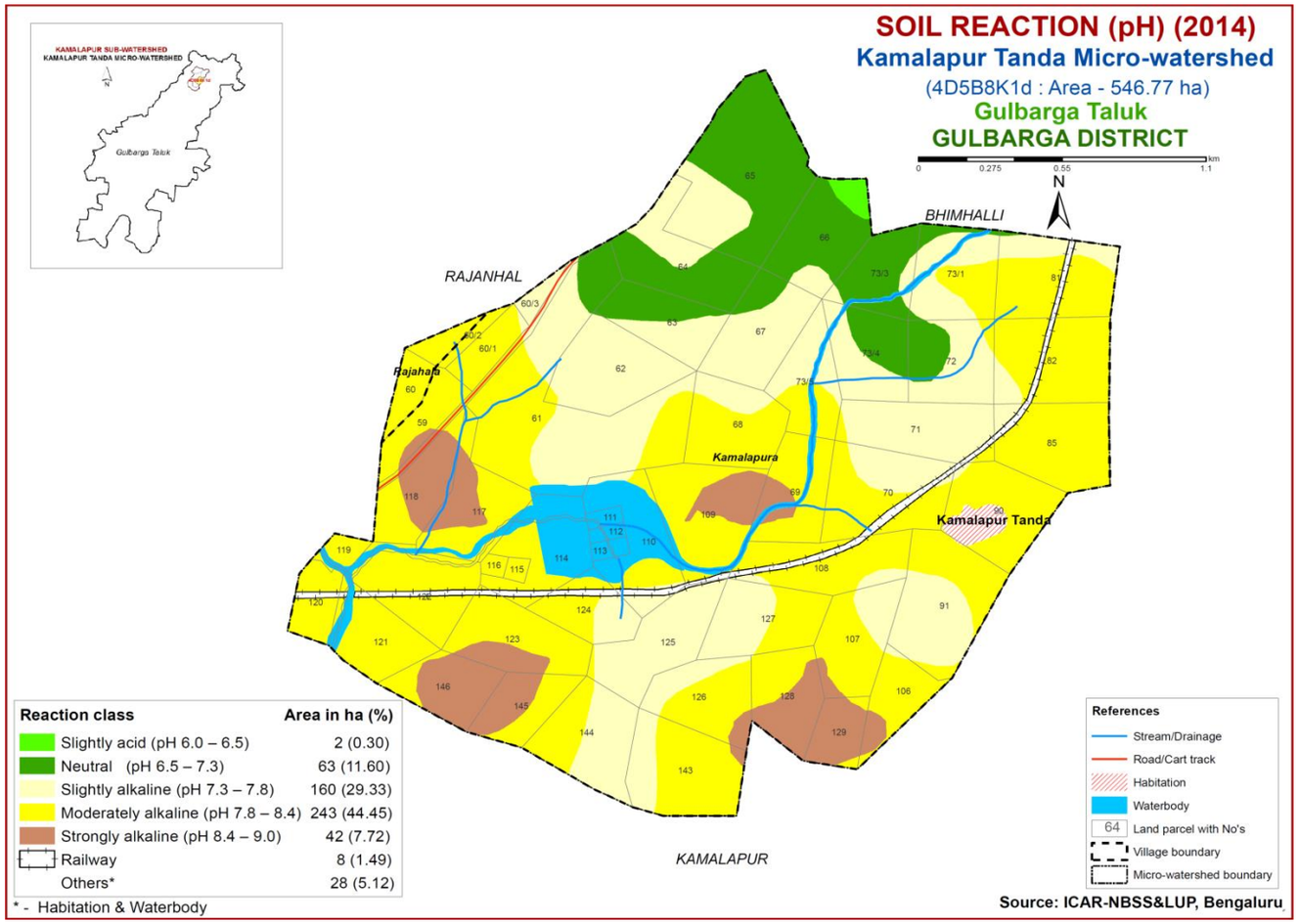

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
SOIL EROSION
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
Bachnal
BHIMHALLI
Rajanhal
KAMALAPUR
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Micro-watershed boundary
Erosion Class Area in ha.(%)
Slight 87 (13.56)
Moderate 327 (51.22)
Severe 196 (30.66)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

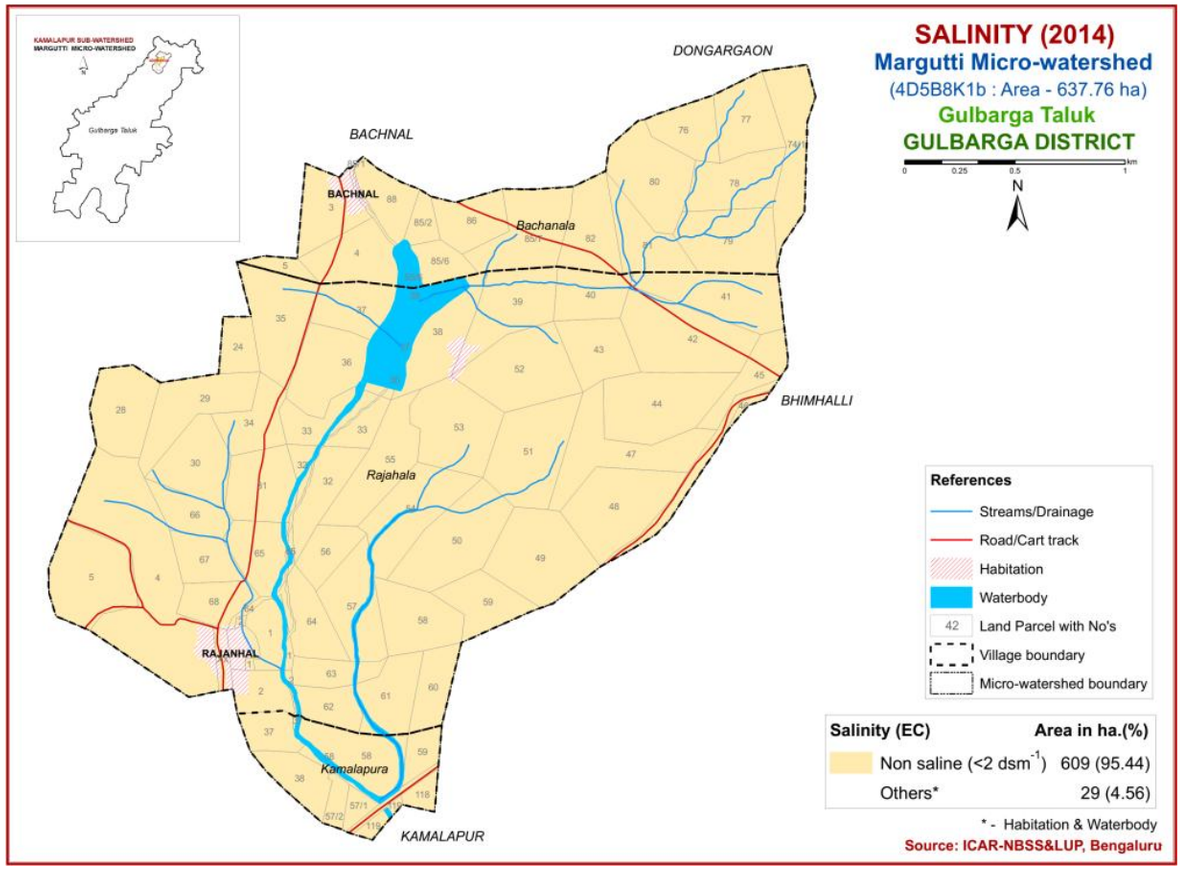

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
SOIL EROSION
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
Dongaragaov
Maragatthi
BACHNAL
MORMANCHI
Bheemanala
Bhimnalli
Kamalapura
KURNUR
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary
Erosion Class Area in ha (%)
Slight 89 (13.77)
Moderate 413 (64.19)
Severe 124 (19.35)
Very severe 5 (0.84)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

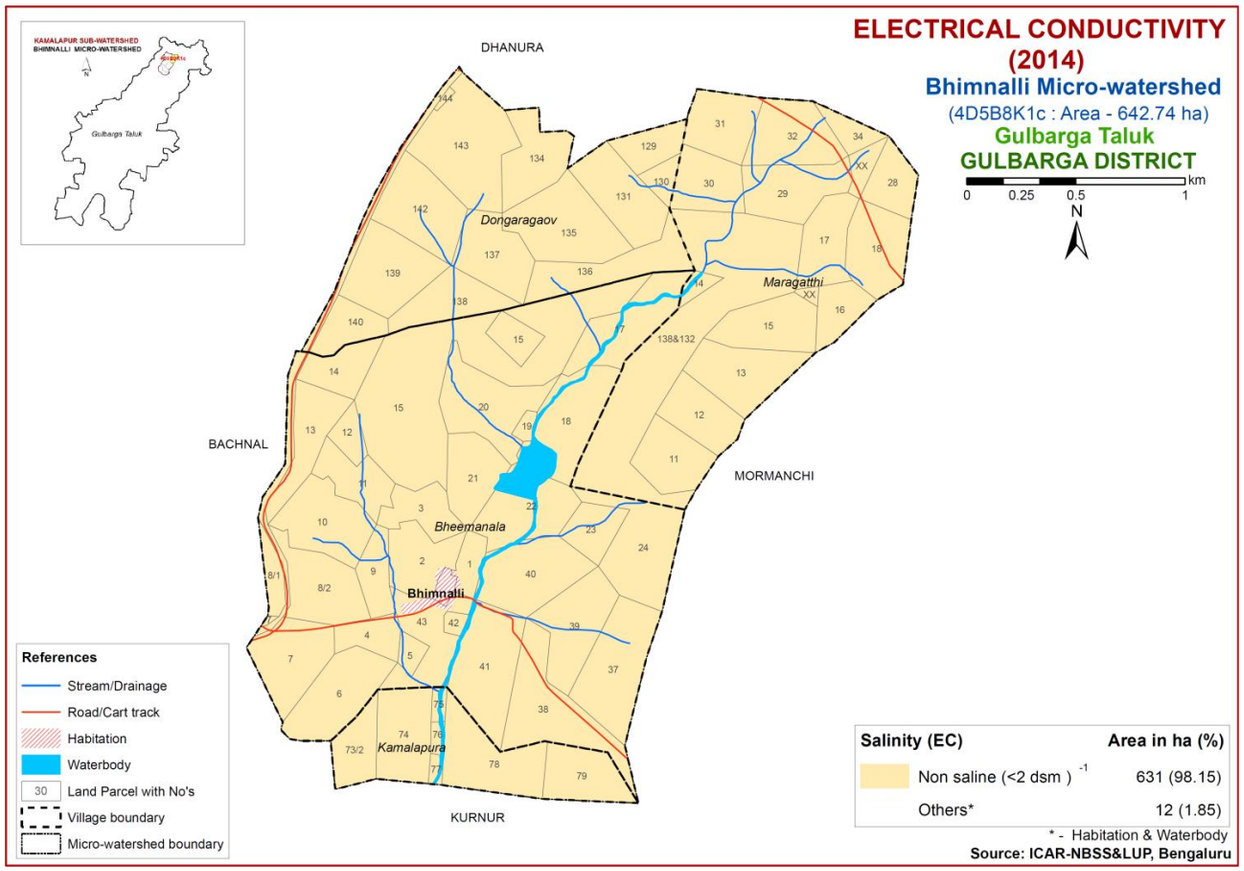

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
SOIL EROSION
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
Rajahalli
Kamalapura
Kamalapur Tanda
KAMALAPUR
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No,s
Village boundary
Micro-watershed boundary
Erosion Class Area in ha (%)
Slight 87 (15.9)
Moderate 245 (44.89)
Severe 178 (32.61)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

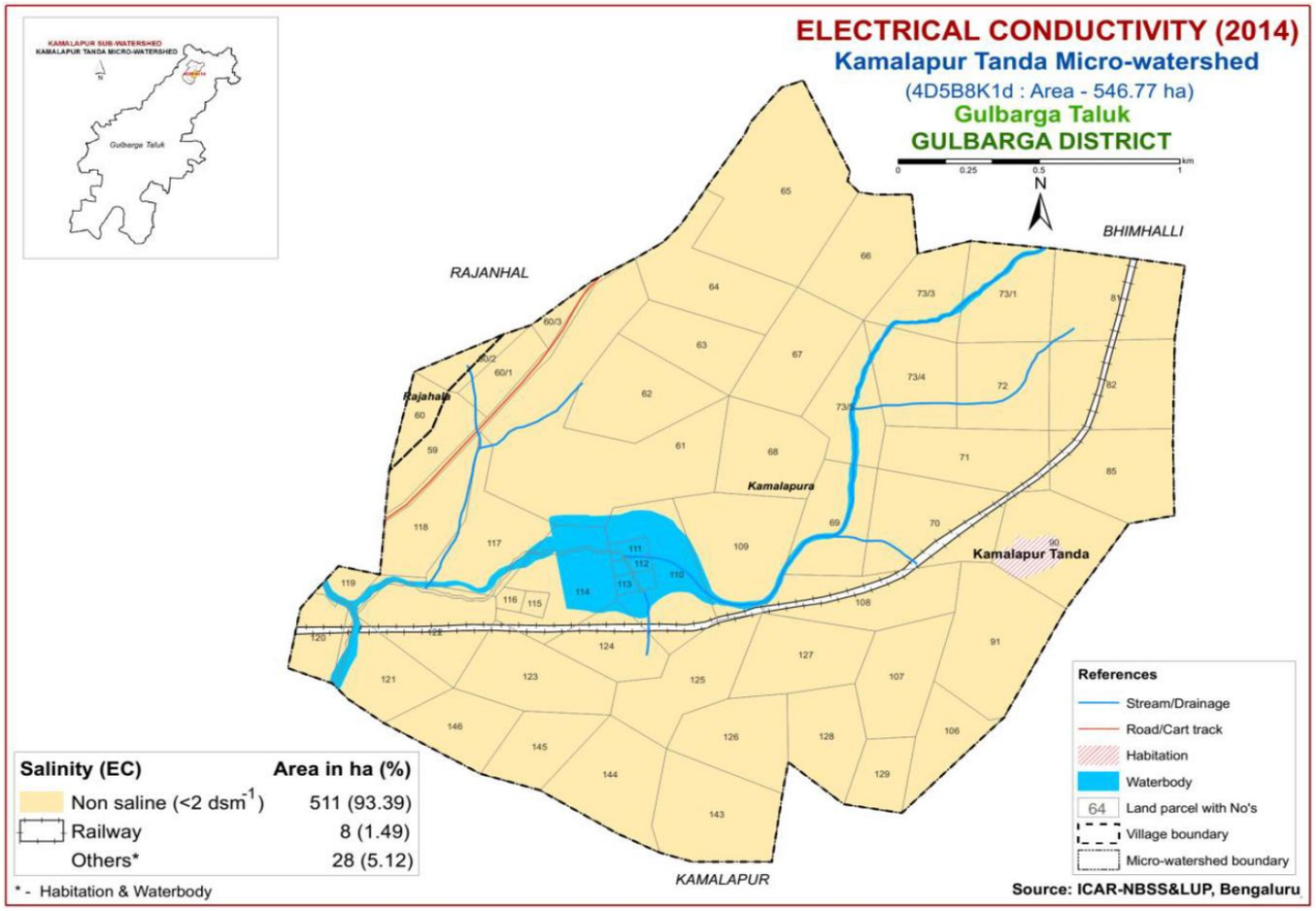

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
SOIL REACTION (pH) 2014
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BACHNAL
BHIMHALLI
Bachanala
Rajahala
RAJANHAL
Kamalapura
KAMALAPUR
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Village boundary
Micro-watershed boundary
pH Status Area in ha.(%)
Slightly acid (6.0 – 6.5) 136 (21.34)
Neutral (6.5 – 7.3) 300 (47.06)
Slightly alkaline (7.3 – 7.8) 110 (17.31)
Moderately alkaline (7.8 – 8.4) 62 (9.73)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

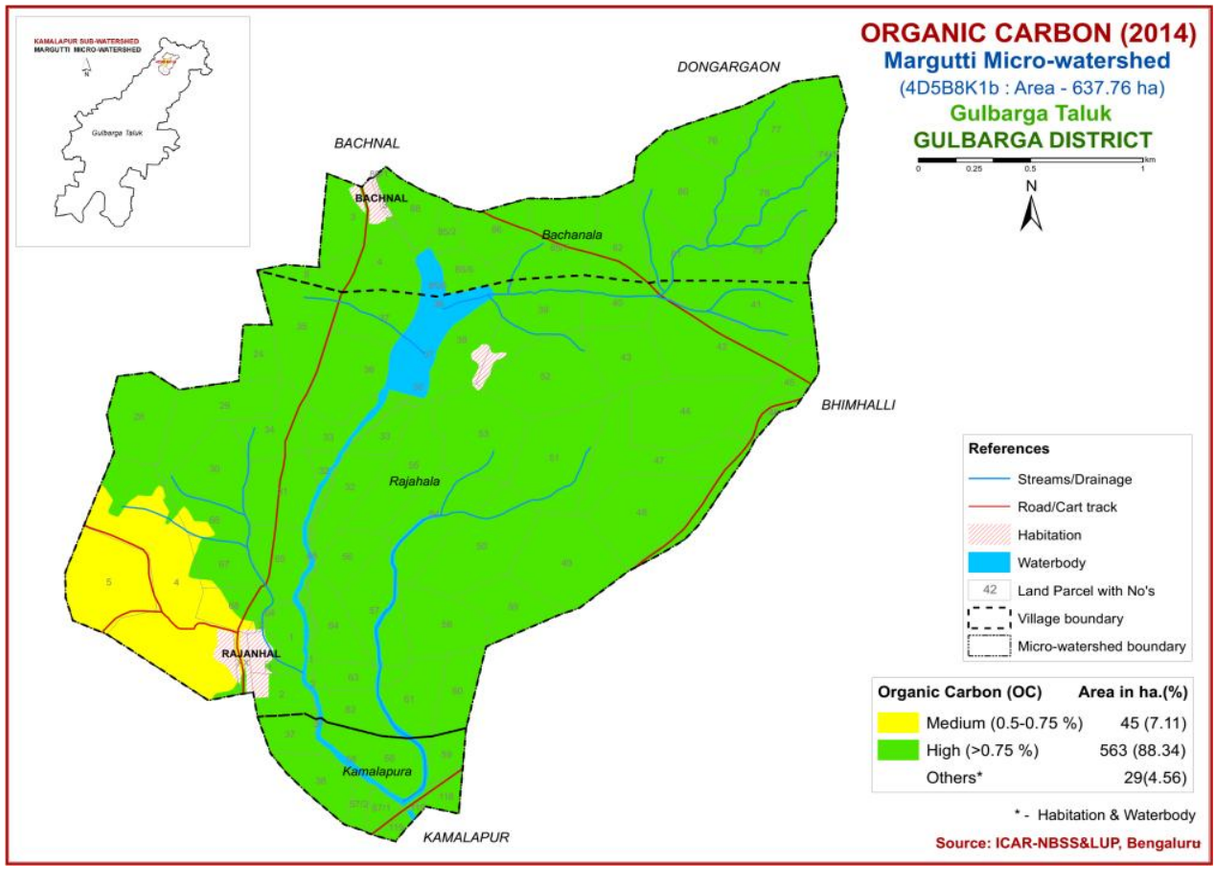

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
SOIL REACTION (pH) 2014
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
Dongaragaov
Maragatthi
BACHNAL
MORMANCHI
Bheemanala
Bhimnalli
Kamalapura
KURNUR
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary
Reaction class Area in ha (%)
Very strongly acid (pH 4.5 – 5.0) 1 (0.16)
Strongly acid (pH 5.0 – 5.5) 12 (1.9)
Moderately acid (pH 5.5 – 6.0) 185 (28.84)
Slightly acid (pH 6.0 – 6.5) 186 (28.95)
Neutral (pH 6.5 – 7.3) 211 (32.79)
Slightly alkaline (pH 7.3 – 7.8) 35 (5.51)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

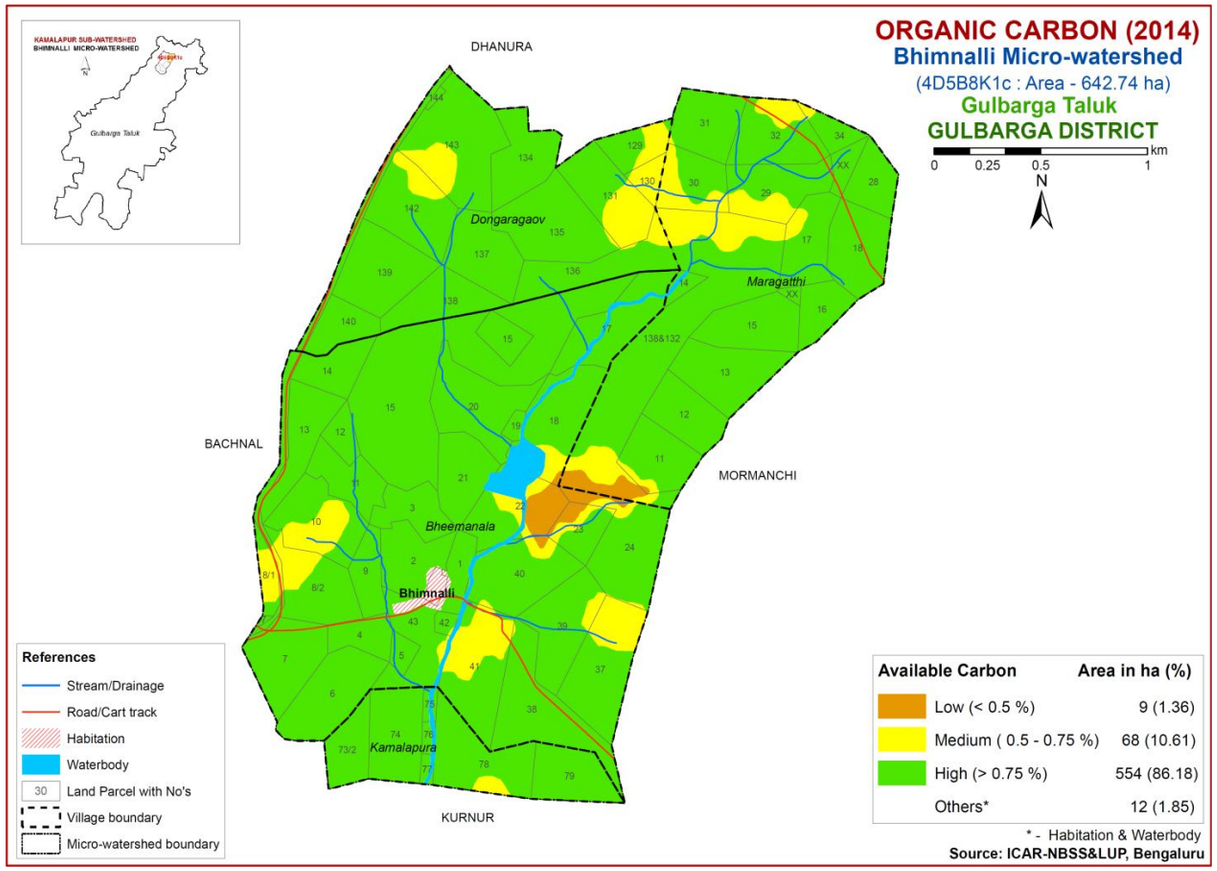

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
SOIL REACTION (pH) (2014)
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.275 0.55 1.1 km
N
BHIMHALLI
RAJANHAL
Rajahala
Kamalapura
Kamalapur Tanda
KAMALAPUR
Reaction class Area in ha (%)
Slightly acid (pH 6.0 – 6.5) 2 (0.30)
Neutral (pH 6.5 – 7.3) 63 (11.60)
Slightly alkaline (pH 7.3 – 7.8) 160 (29.33)
Moderately alkaline (pH 7.8 – 8.4) 243 (44.45)
Strongly alkaline (pH 8.4 – 9.0) 42 (7.72)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

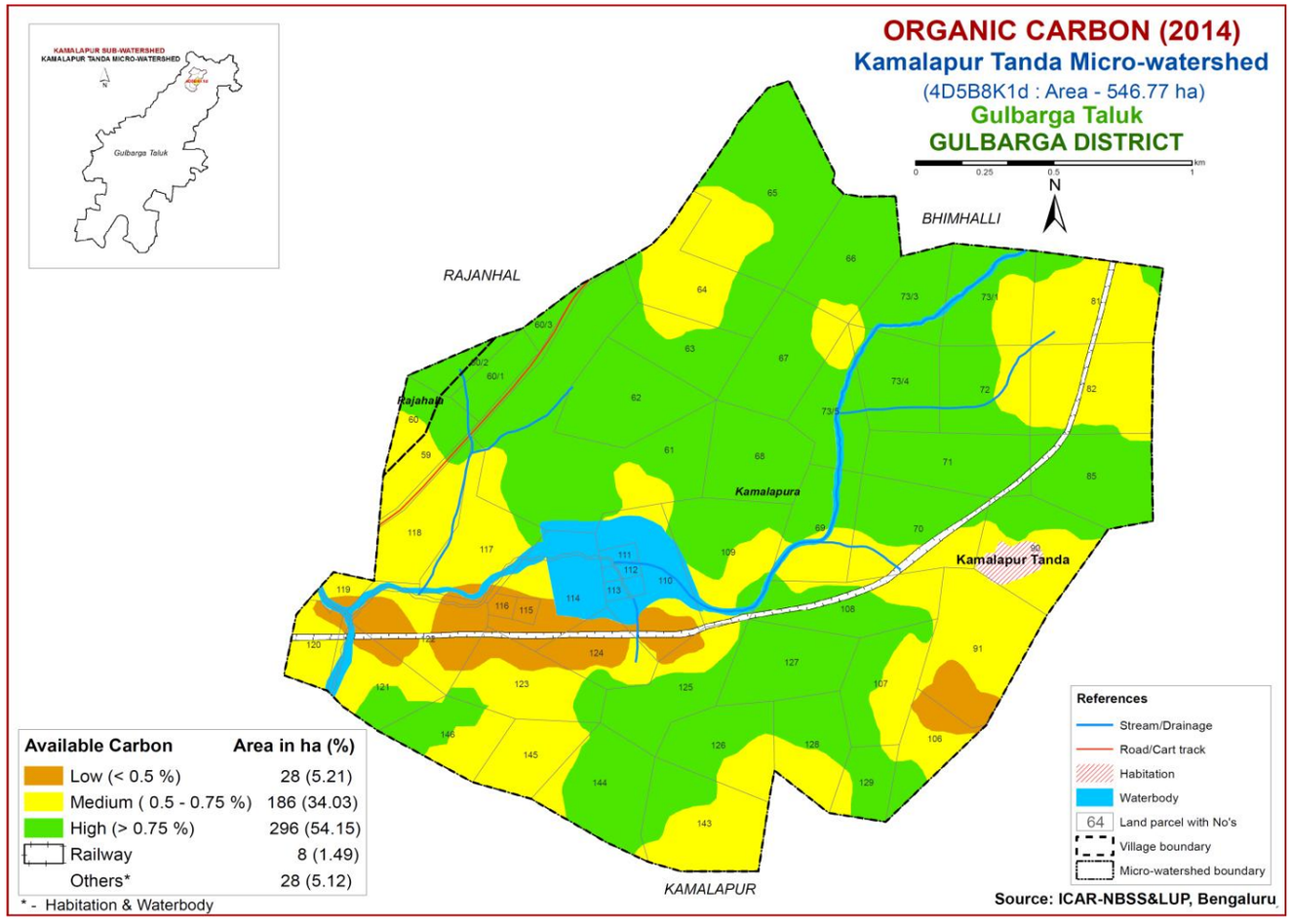

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
SALINITY (2014)
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BHIMHALLI
RAJANHAL
KAMALAPUR
Bachanala
Rajahala
Kamalapura
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Village boundary
Micro-watershed boundary
Salinity (EC) Area in ha.(%)
Non saline (<2 dsm-1) 609 (95.44)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

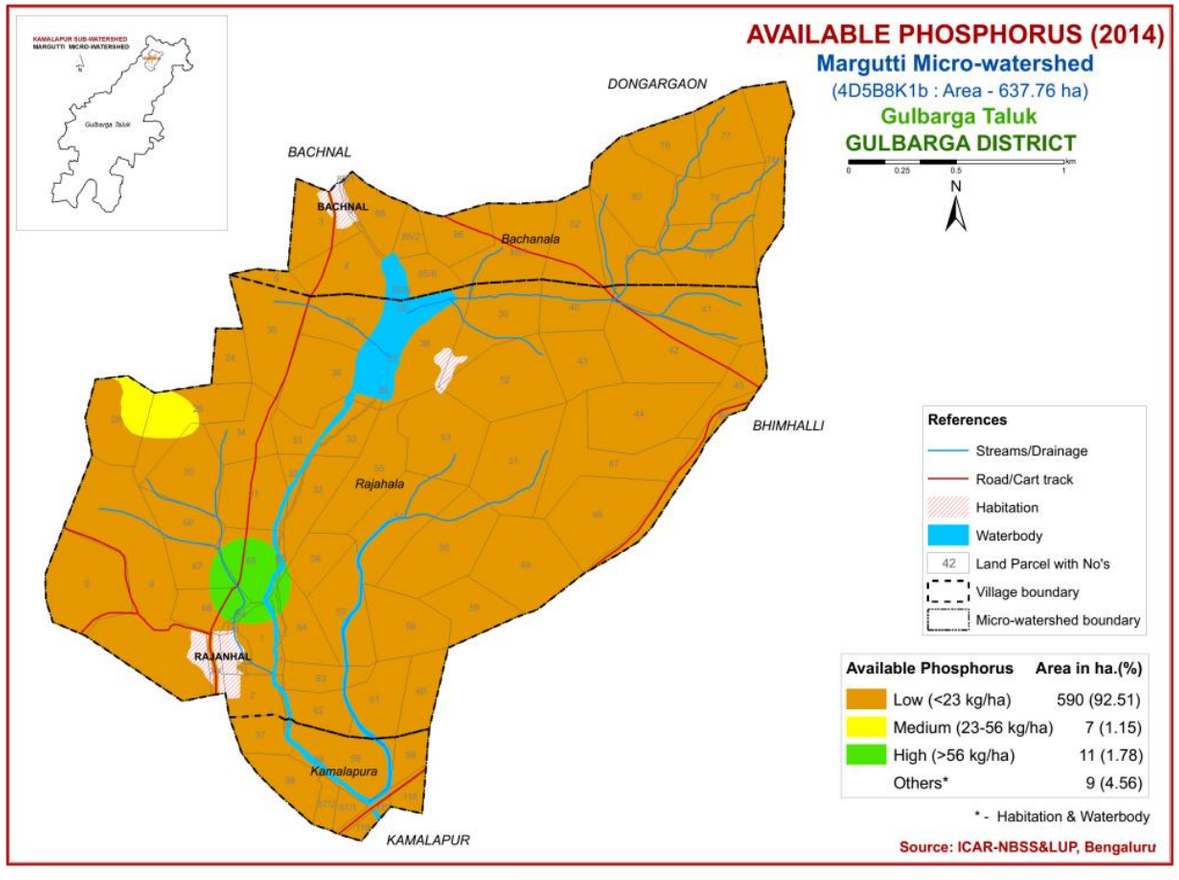

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
ELECTRICAL CONDUCTIVITY (2014)
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary
Salinity (EC) Area in ha (%)
Non saline (<2 dsm) -1 631 (98.15)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

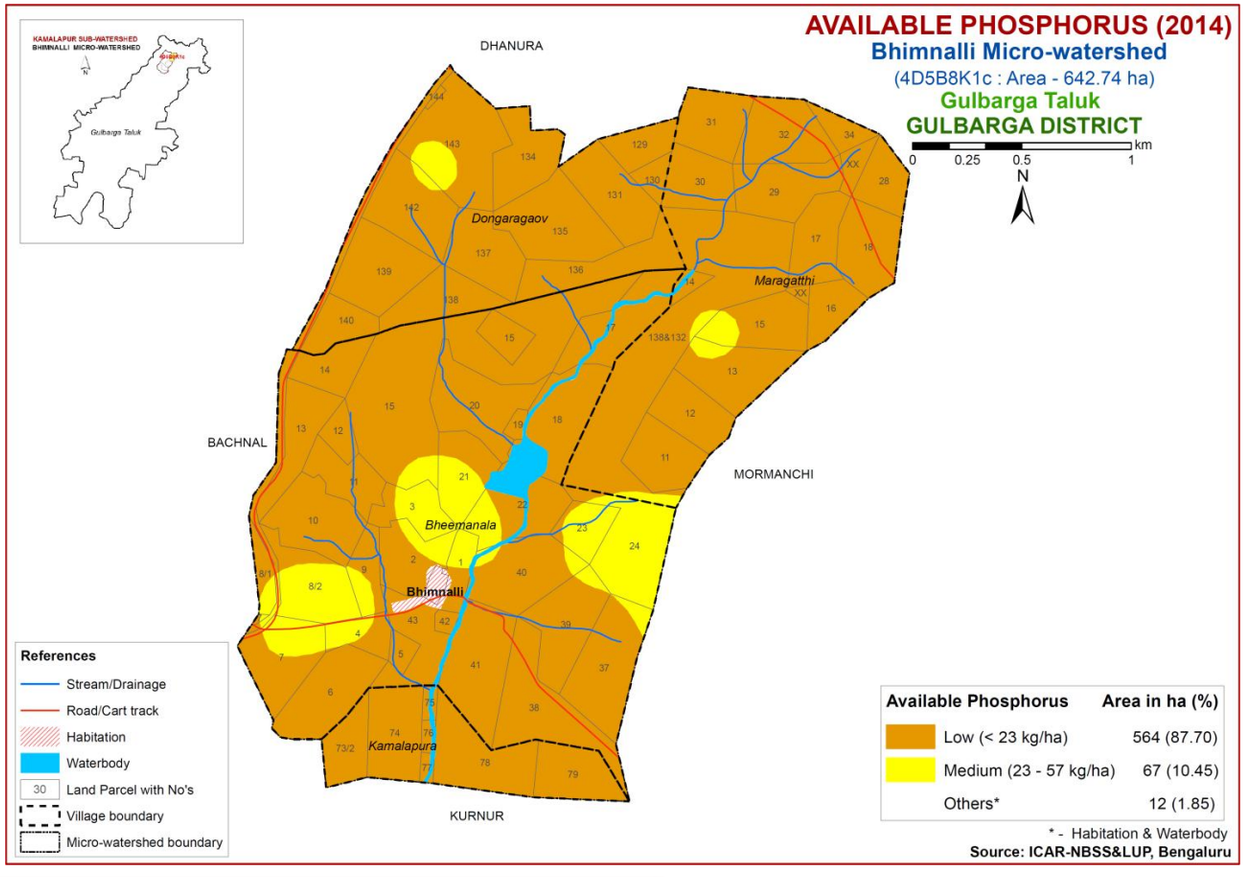

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
ELECTRICAL CONDUCTIVITY (2014)
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
RAJANHAL
BHIMHALLI
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No's
Village boundary
Micro-watershed boundary
Salinity (EC) Area in ha (%)
Non saline (<2 dsm-1) 511 (93.39)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

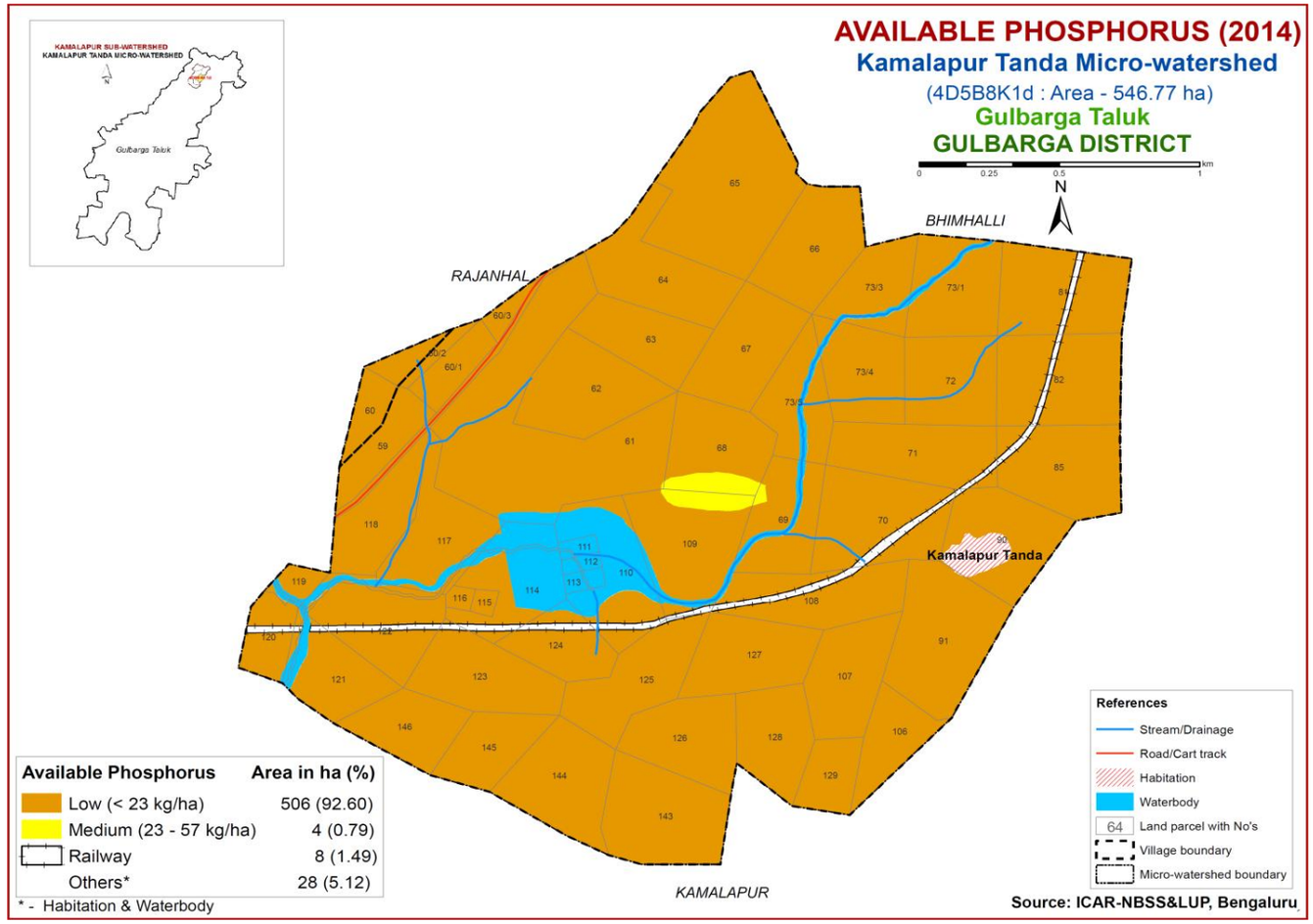

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
ORGANIC CARBON (2014)
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BHIMHALLI
RAJANHAL
KAMALAPUR
Bachanala
Rajahala
Kamalapura
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Village boundary
Micro-watershed boundary
Organic Carbon (OC) Area in ha.(%)
Medium (0.5-0.75 %) 45 (7.11)
High (>0.75 %) 563 (88.34)
Others* 29(4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

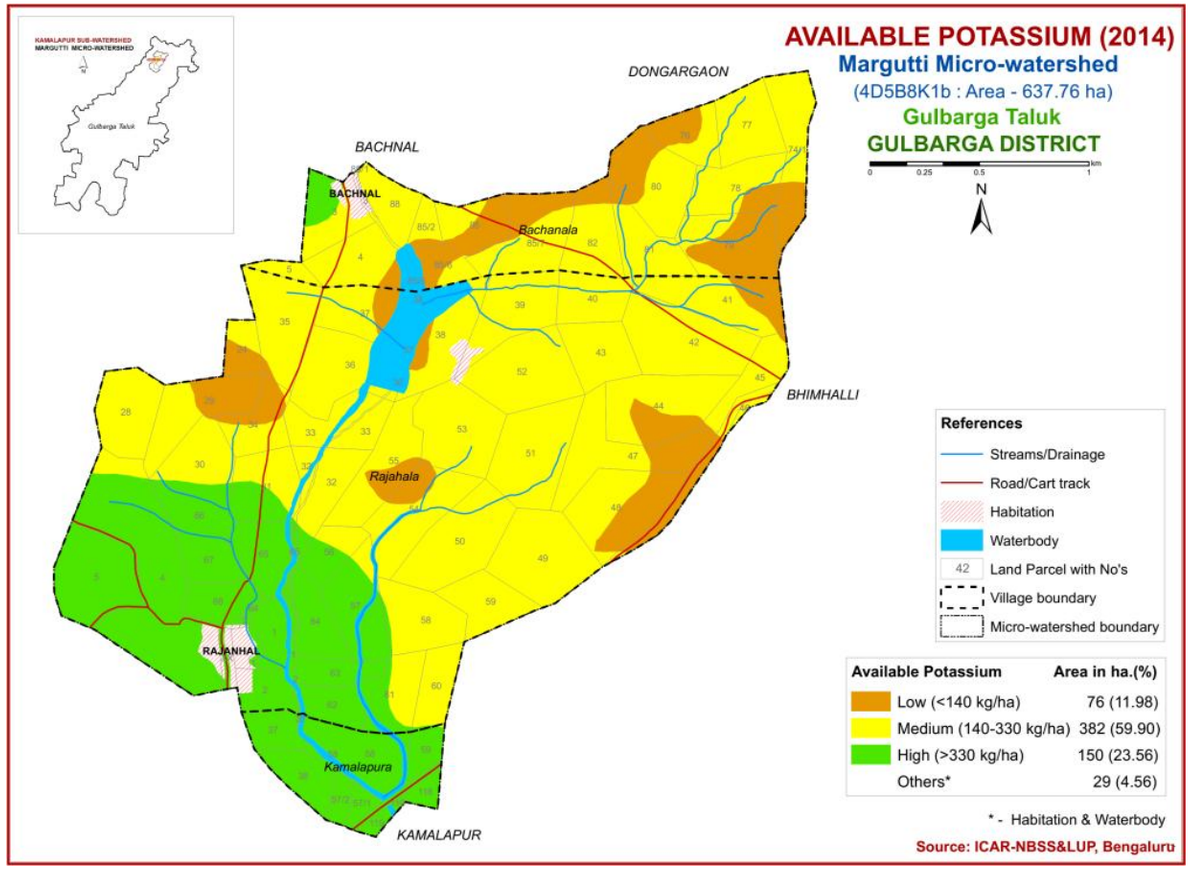

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
ORGANIC CARBON (2014)
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Carbon Area in ha (%)
Low (< 0.5 %) 9 (1.36)
Medium (0.5 - 0.75 %) 68 (10.61)
High (> 0.75 %) 554 (86.18)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

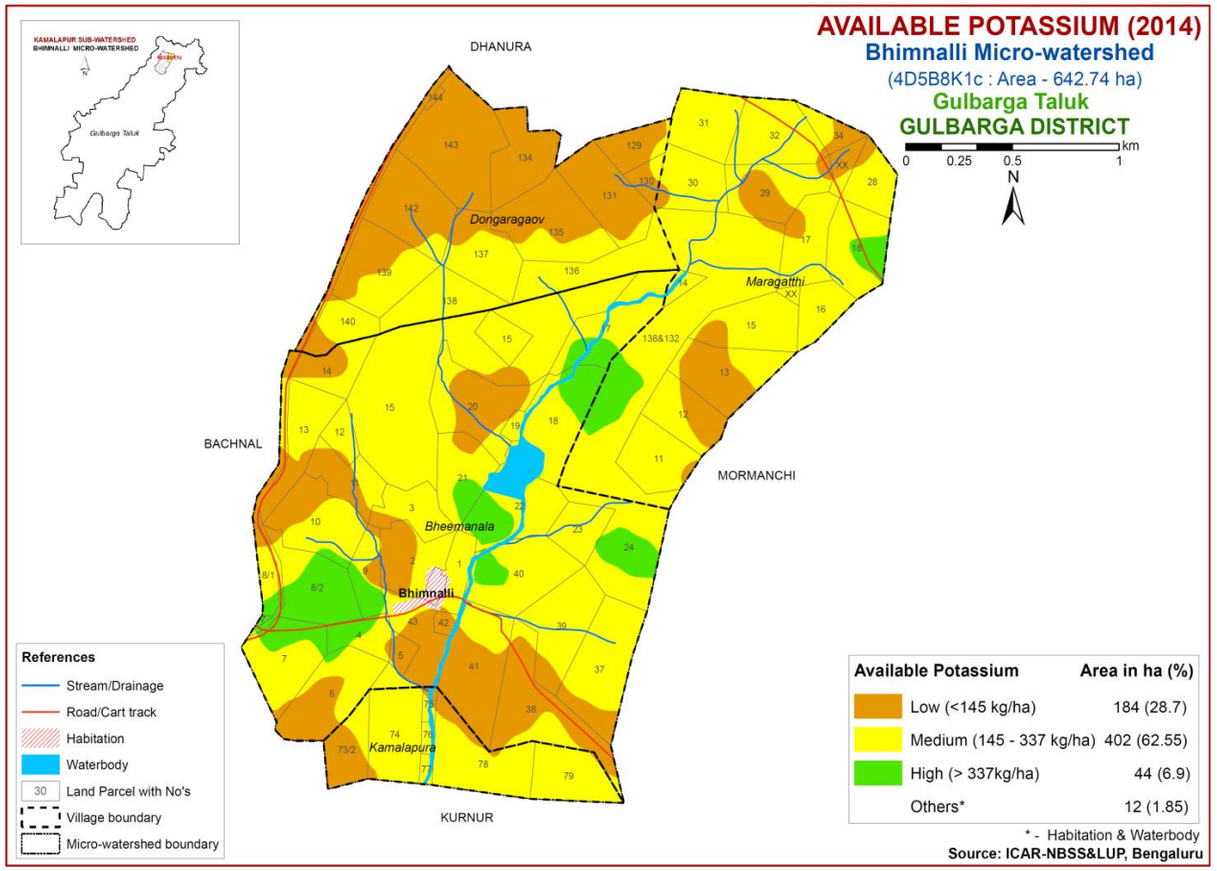

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
ORGANIC CARBON (2014)
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
Available Carbon Area in ha (%)
Low (< 0.5 %) 28 (5.21)
Medium (0.5 - 0.75 %) 186 (34.03)
High (> 0.75 %) 296 (54.15)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

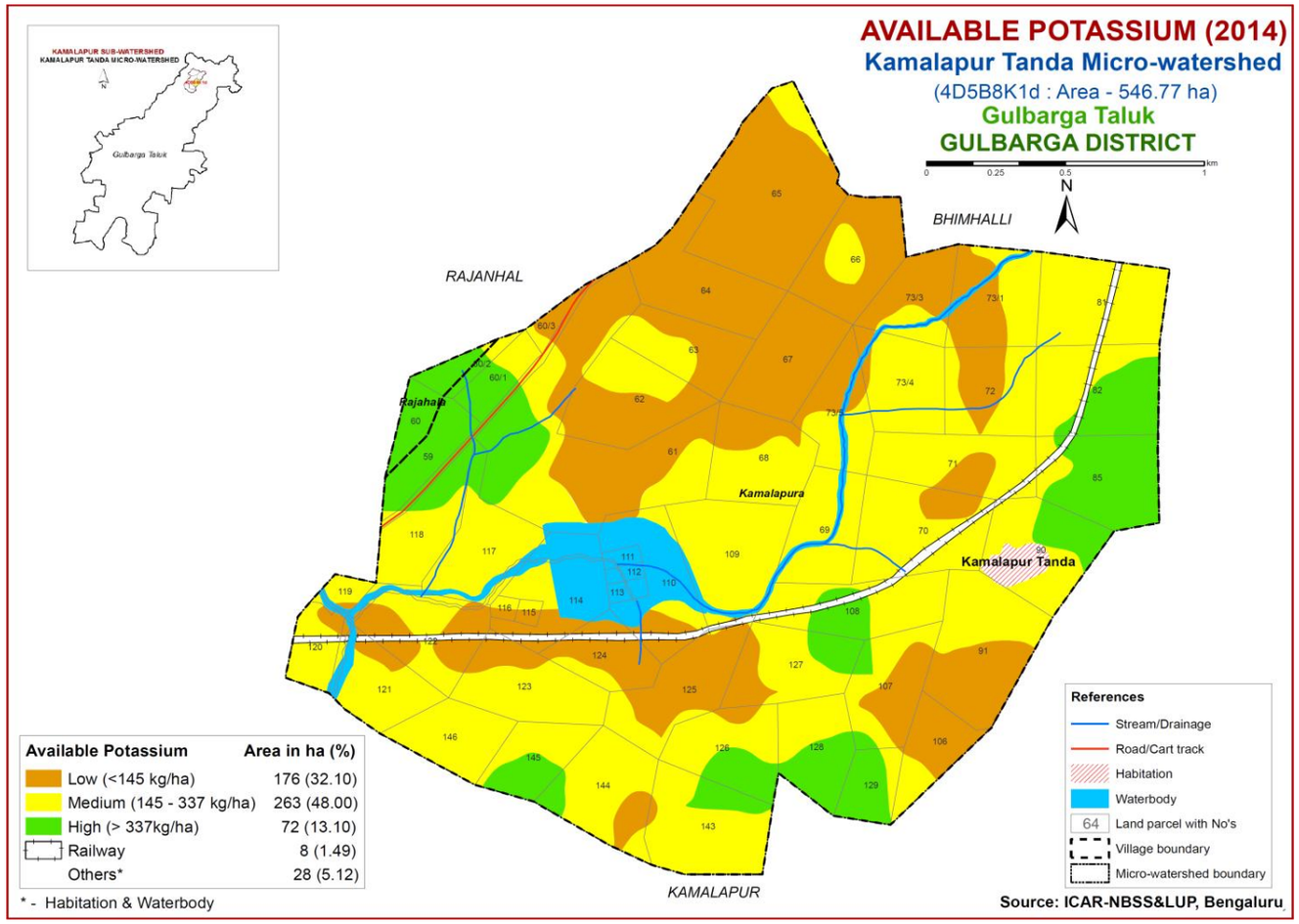

AVAILABLE PHOSPHORUS (2014)
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
DONGARGAON
BACHNAL
BHIMHALLI
RAJANHAL
KAMALAPUR
Bachanala
Rajahala
Kamalapura
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Phosphorus | Area in ha.(%)
Low (<23 kg/ha) | 590 (92.51)
Medium (23-56 kg/ha) | 7 (1.15)
High (>56 kg/ha) | 11 (1.78)
Others* | 9 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

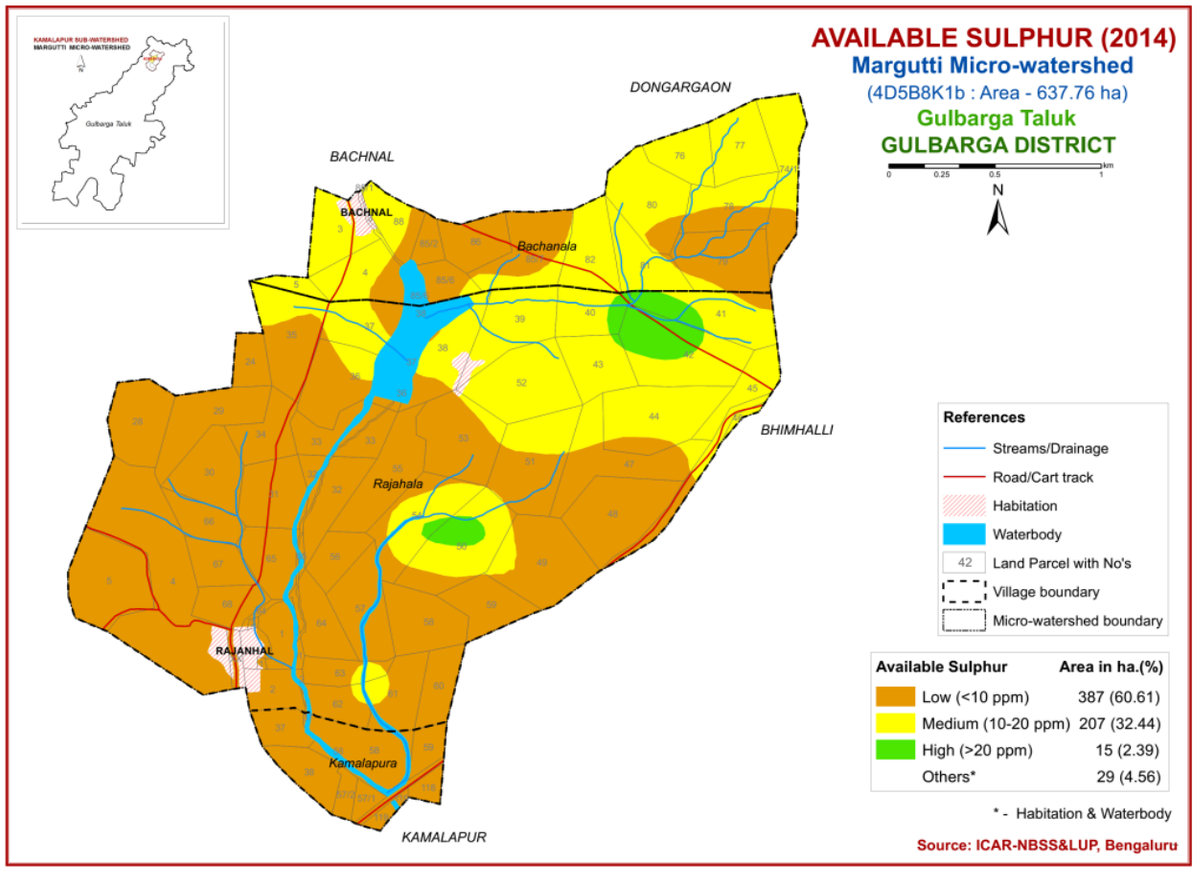

AVAILABLE PHOSPHORUS (2014)
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Phosphorus | Area in ha (%)
Low (< 23 kg/ha) | 564 (87.70)
Medium (23 - 57 kg/ha) | 67 (10.45)
Others* | 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

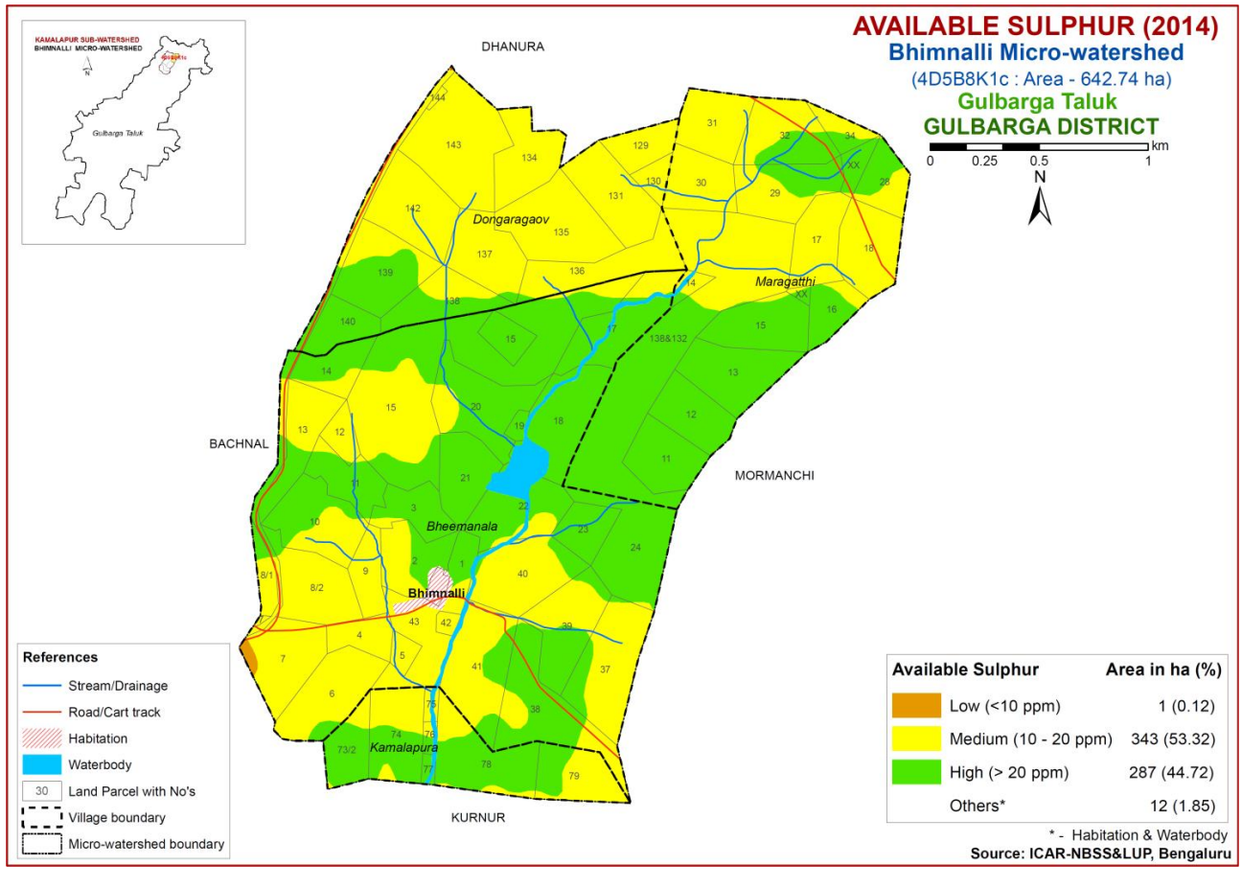

AVAILABLE PHOSPHORUS (2014)
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
RAJANHAL
BHIMHALLI
KAMALAPUR
Kamalapur Tanda
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Available Phosphorus | Area in ha (%)
Low (< 23 kg/ha) | 506 (92.60)
Medium (23 - 57 kg/ha) | 4 (0.79)
Railway | 8 (1.49)
Others* | 28 (5.12)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

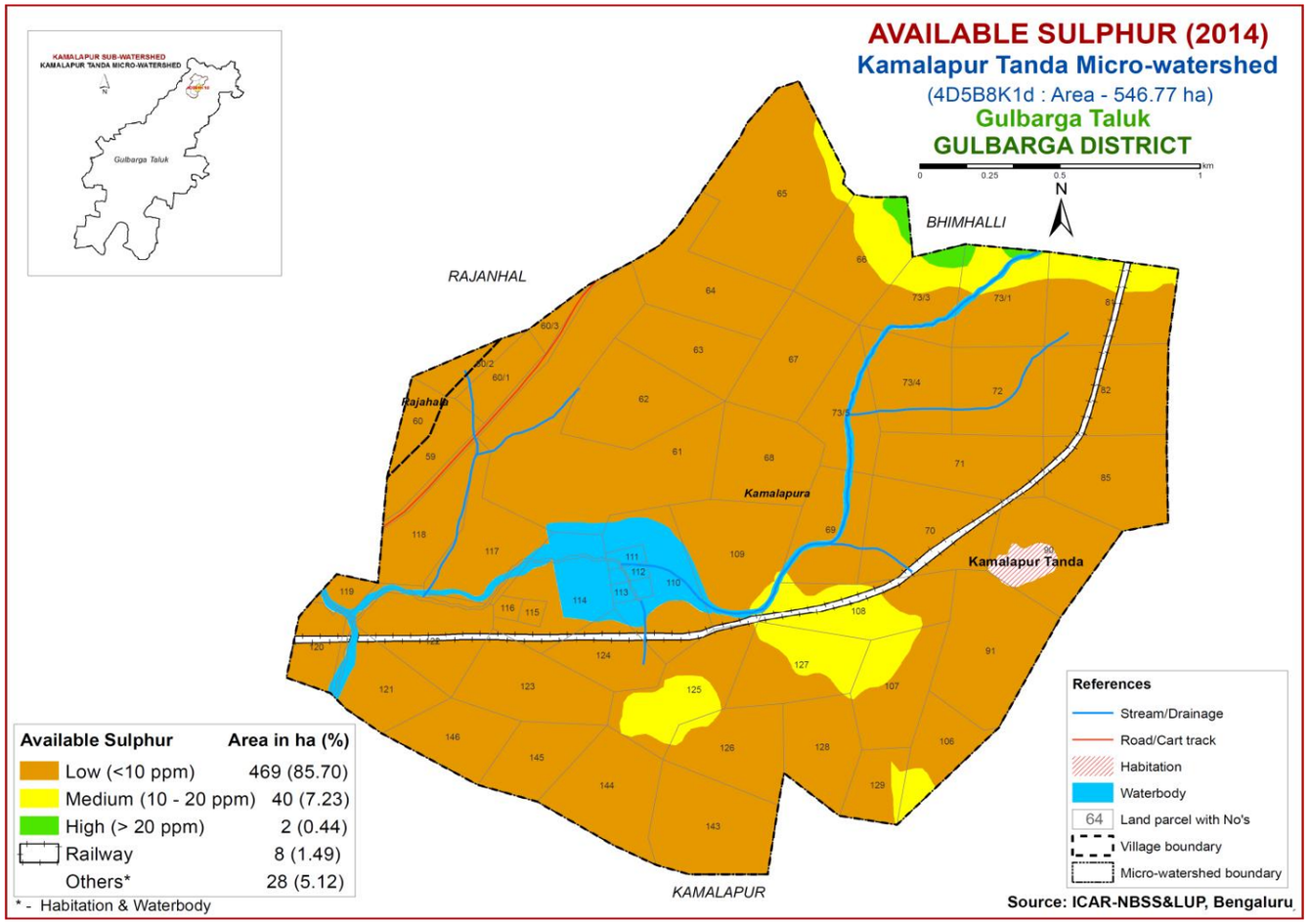

AVAILABLE POTASSIUM (2014)
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
DONGARGAON
BACHNAL
BHIMHALLI
RAJANHAL
KAMALAPUR
Bachanala
Rajahala
Kamalapura
0 0.25 0.5 1 km
N
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Potassium Area in ha.(%)
Low (<140 kg/ha) 76 (11.98)
Medium (140-330 kg/ha) 382 (59.90)
High (>330 kg/ha) 150 (23.56)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

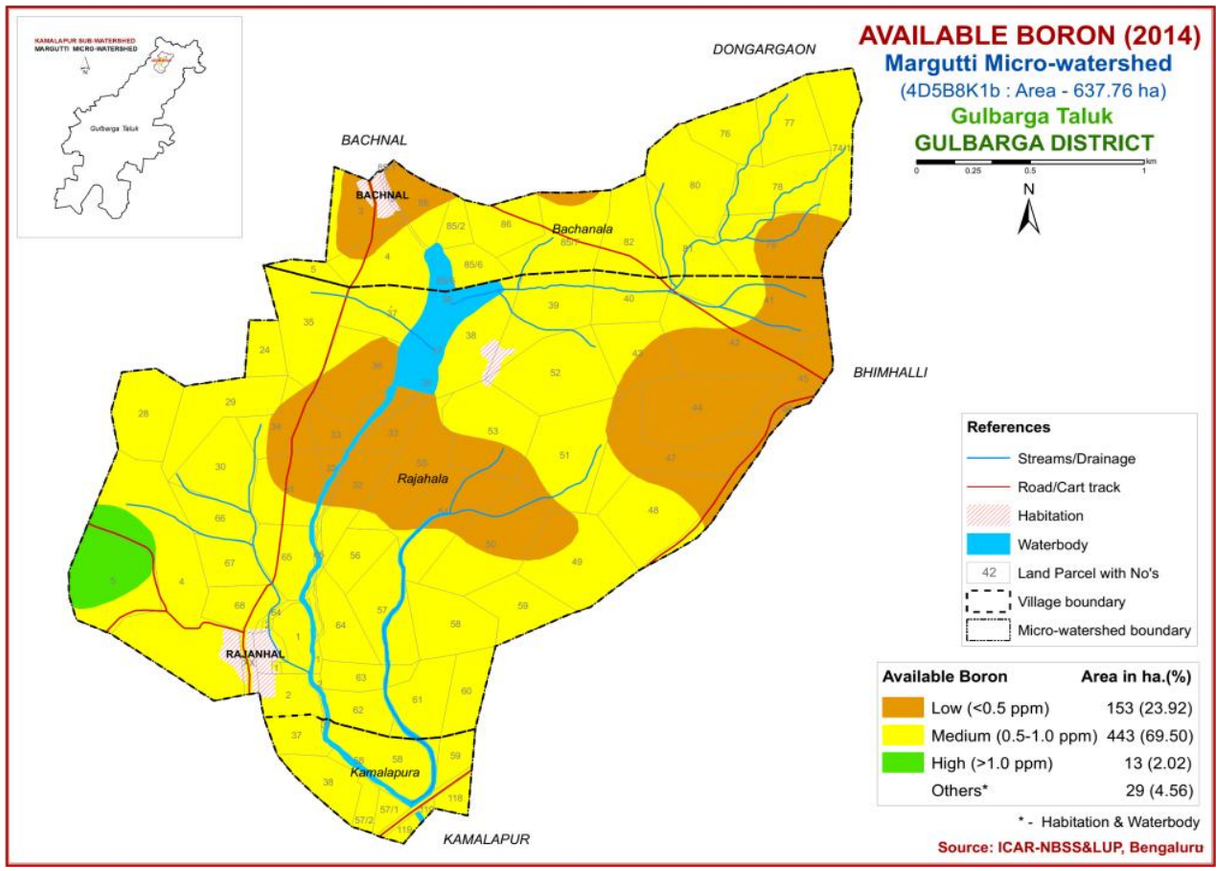

AVAILABLE POTASSIUM (2014)
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
0 0.25 0.5 1 km
N
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Potassium Area in ha (%)
Low (<145 kg/ha) 184 (28.7)
Medium (145 - 337 kg/ha) 402 (62.55)
High (> 337kg/ha) 44 (6.9)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

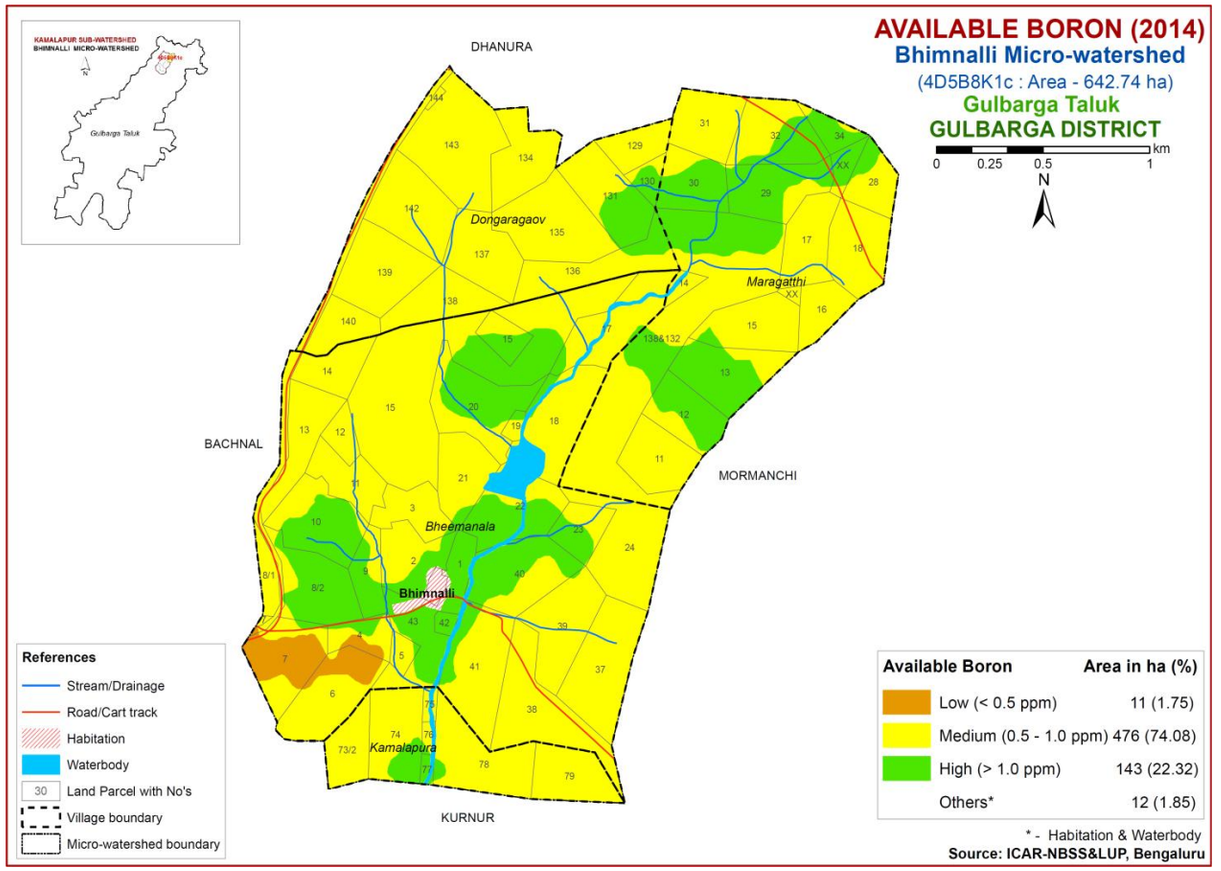

AVAILABLE POTASSIUM (2014)
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
BHIMHALLI
RAJANHAL
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
0 0.25 0.5 1 km
N
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Potassium Area in ha (%)
Low (<145 kg/ha) 176 (32.10)
Medium (145 - 337 kg/ha) 263 (48.00)
High (> 337kg/ha) 72 (13.10)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

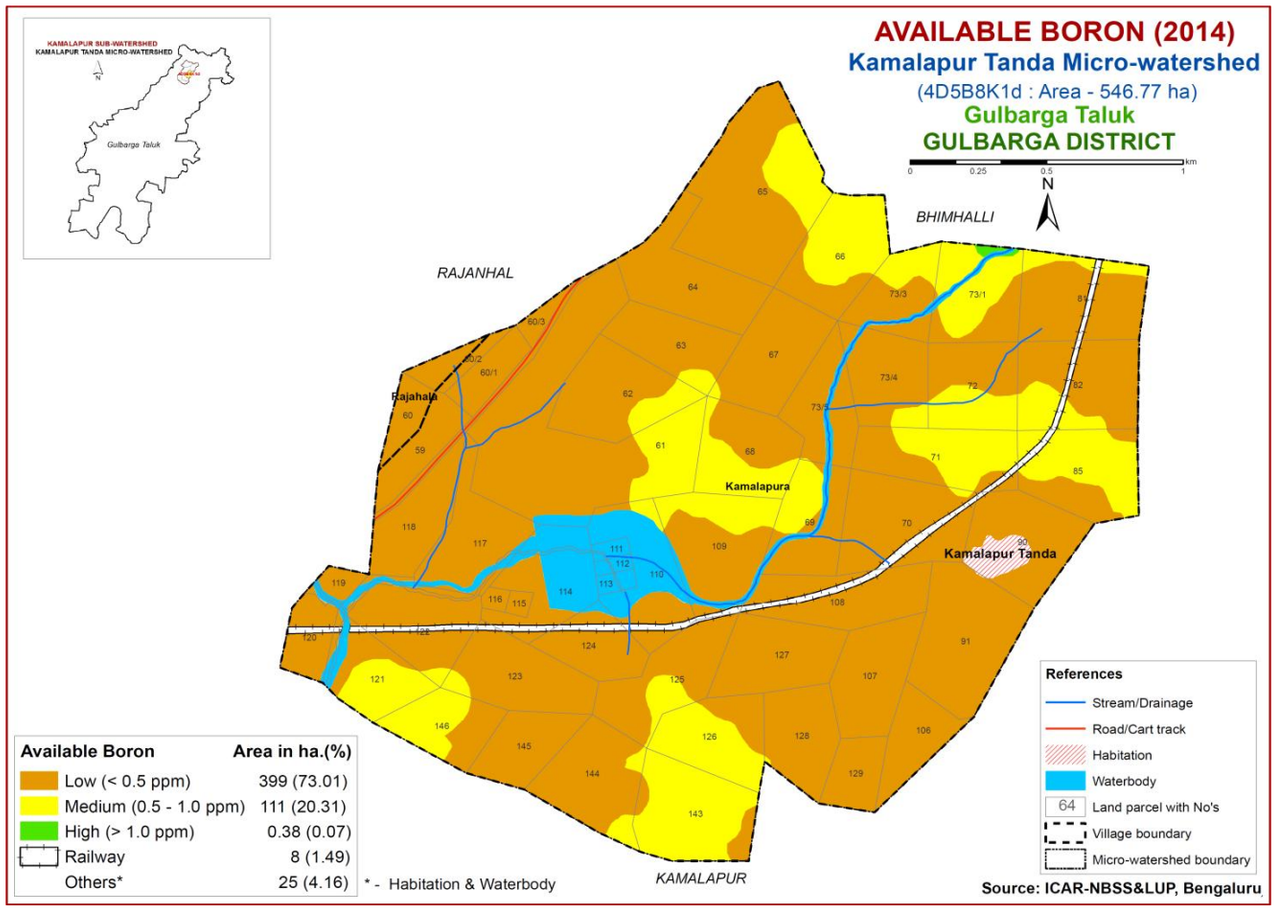

AVAILABLE SULPHUR (2014)
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
DONGARGAON
BACHNAL
BHIMHALLI
RAJANHAL
KAMALAPUR
Bachanala
Rajahala
Kamalapura
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Sulphur | Area in ha.(%)
Low (<10 ppm) 387 (60.61)
Medium (10-20 ppm) 207 (32.44)
High (>20 ppm) 15 (2.39)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

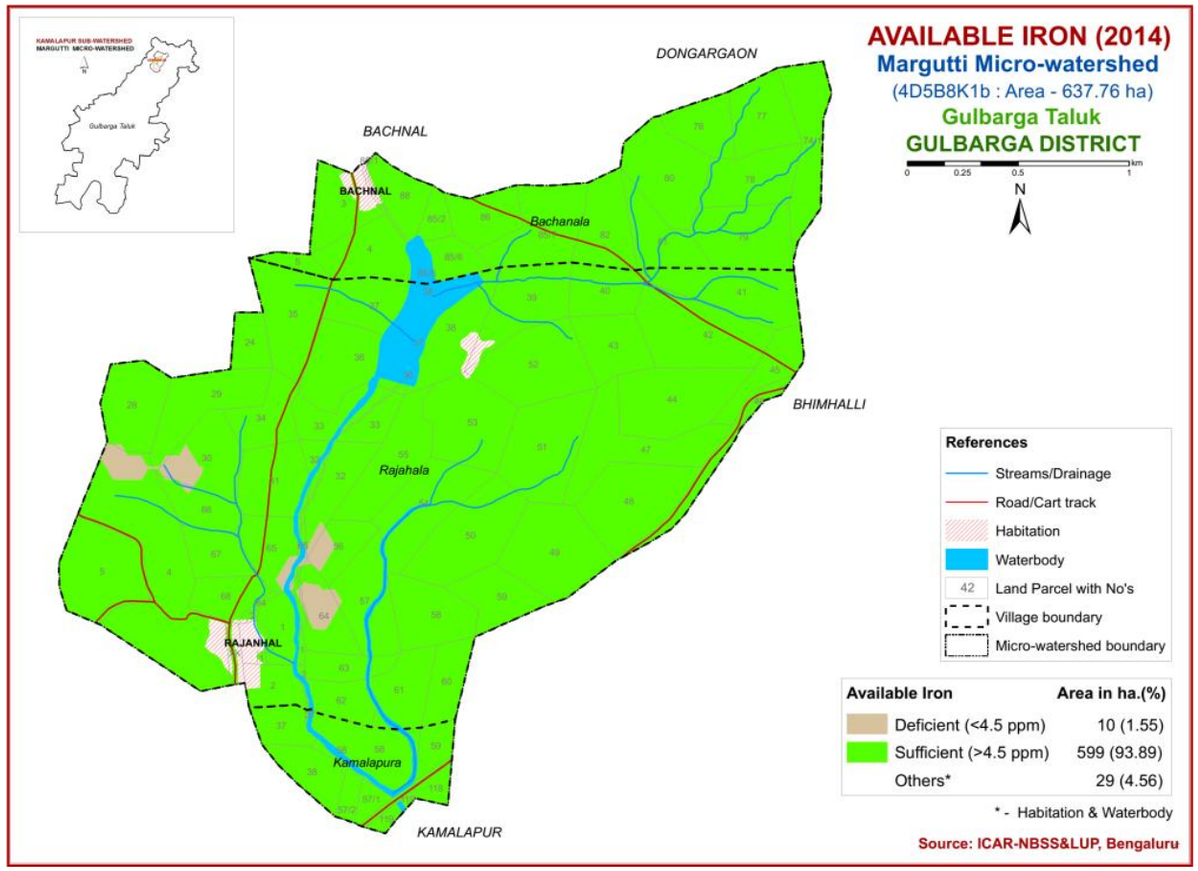

AVAILABLE SULPHUR (2014)
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Sulphur | Area in ha (%)
Low (<10 ppm) 1 (0.12)
Medium (10 - 20 ppm) 343 (53.32)
High (> 20 ppm) 287 (44.72)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

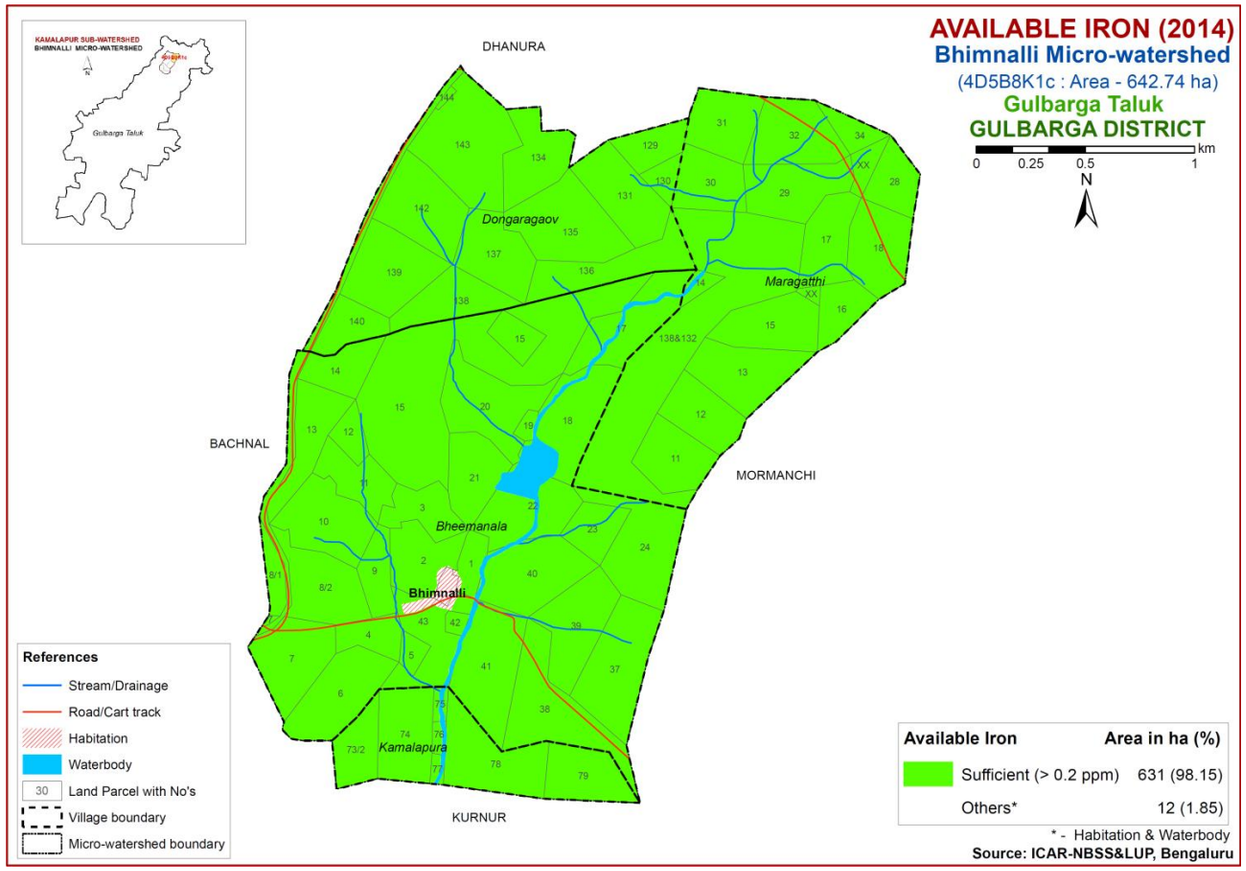

AVAILABLE SULPHUR (2014)
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
RAJANHAL
BHIMHALLI
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Sulphur | Area in ha (%)
Low (<10 ppm) 469 (85.70)
Medium (10 - 20 ppm) 40 (7.23)
High (> 20 ppm) 2 (0.44)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

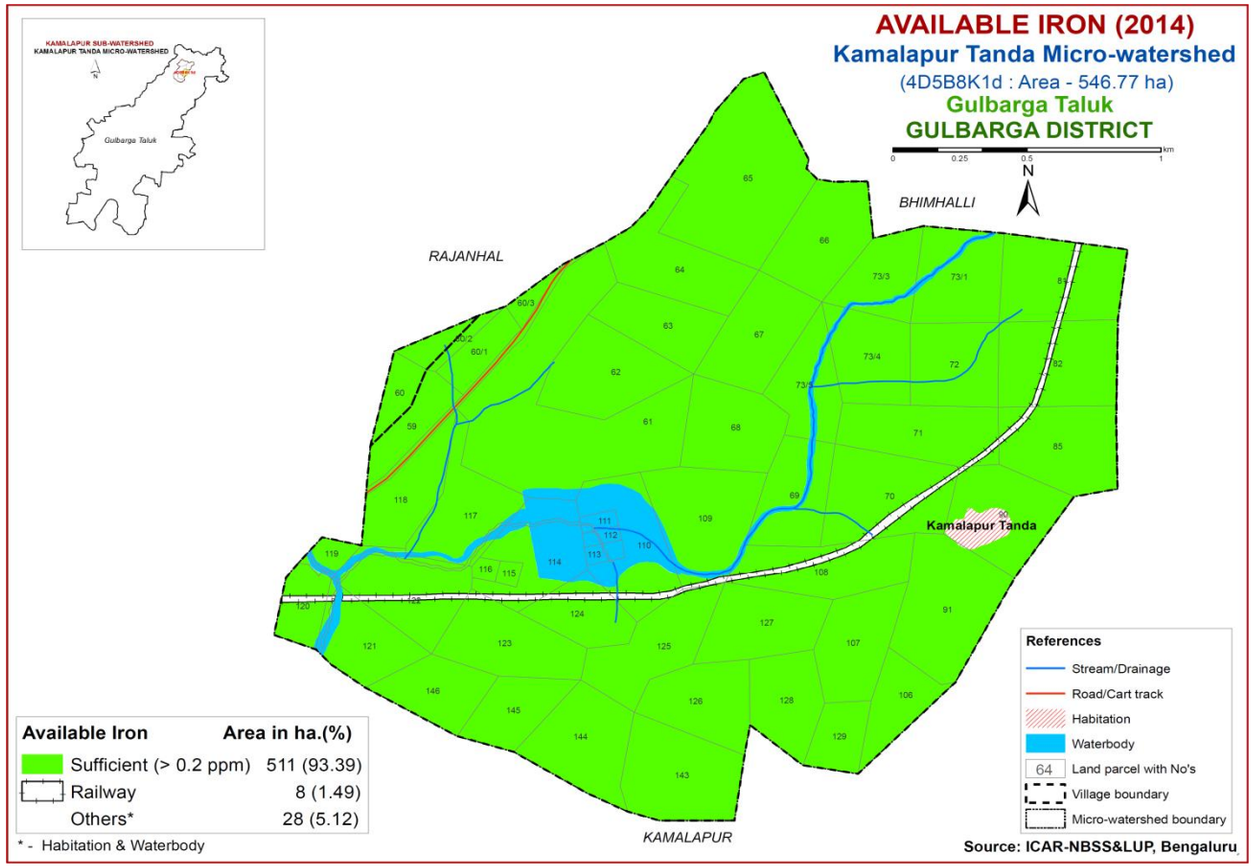

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
AVAILABLE BORON (2014)
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BHIMHALLI
RAJANHAL
KAMALAPUR
Bachanala
Rajahala
Kamalapura
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Boron Area in ha.(%)
Low (<0.5 ppm) 153 (23.92)
Medium (0.5-1.0 ppm) 443 (69.50)
High (>1.0 ppm) 13 (2.02)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

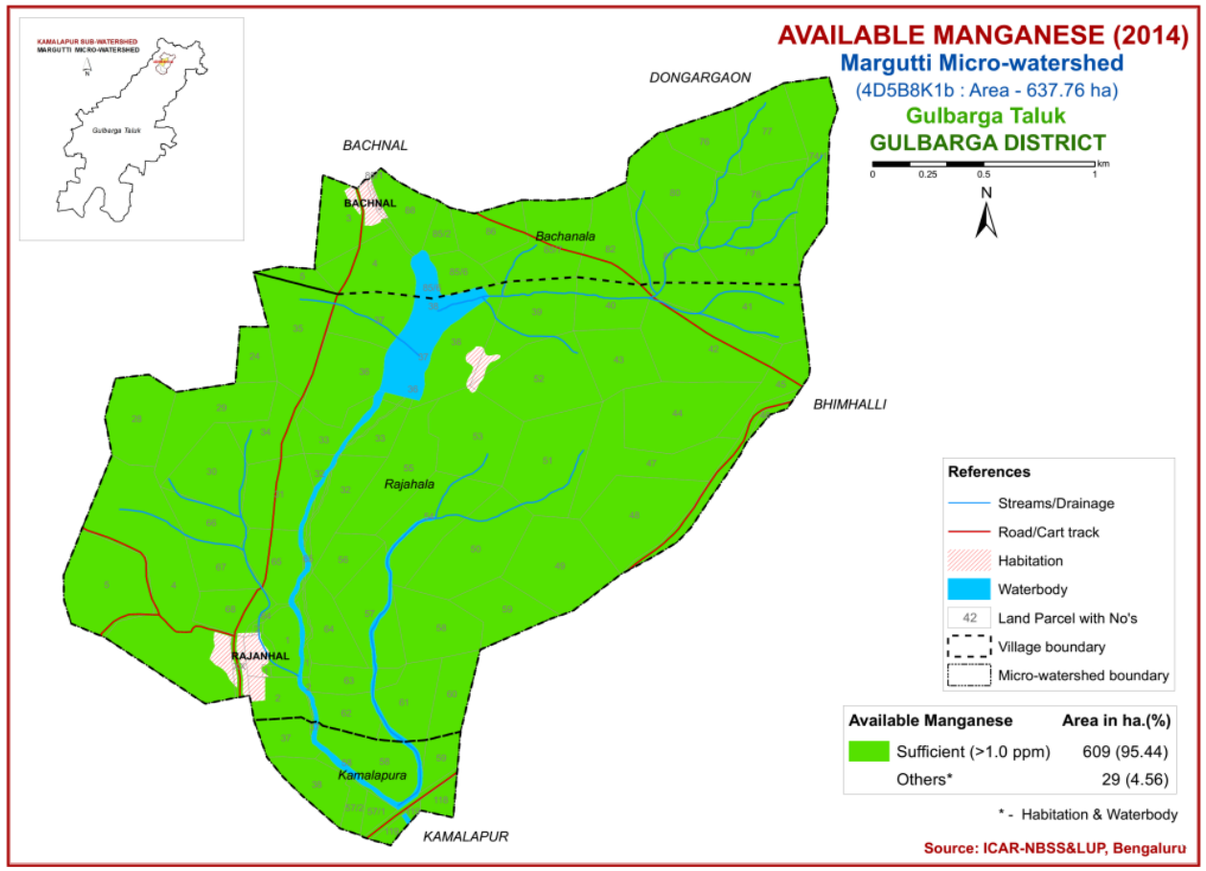

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
AVAILABLE BORON (2014)
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Boron Area in ha (%)
Low (< 0.5 ppm) 11 (1.75)
Medium (0.5 - 1.0 ppm) 476 (74.08)
High (> 1.0 ppm) 143 (22.32)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

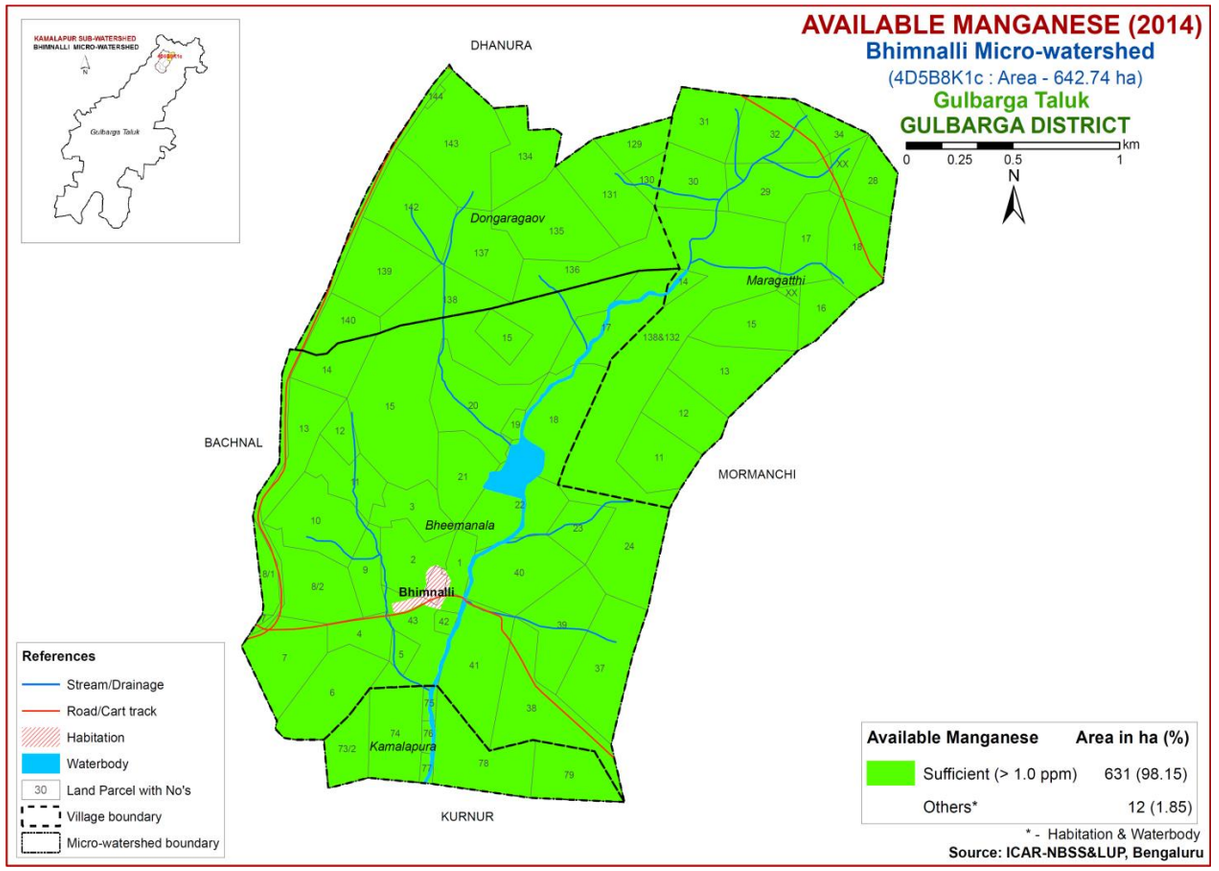

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
AVAILABLE BORON (2014)
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Boron Area in ha.(%)
Low (< 0.5 ppm) 399 (73.01)
Medium (0.5 - 1.0 ppm) 111 (20.31)
High (> 1.0 ppm) 0.38 (0.07)
Railway 8 (1.49)
Others* 25 (4.16)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

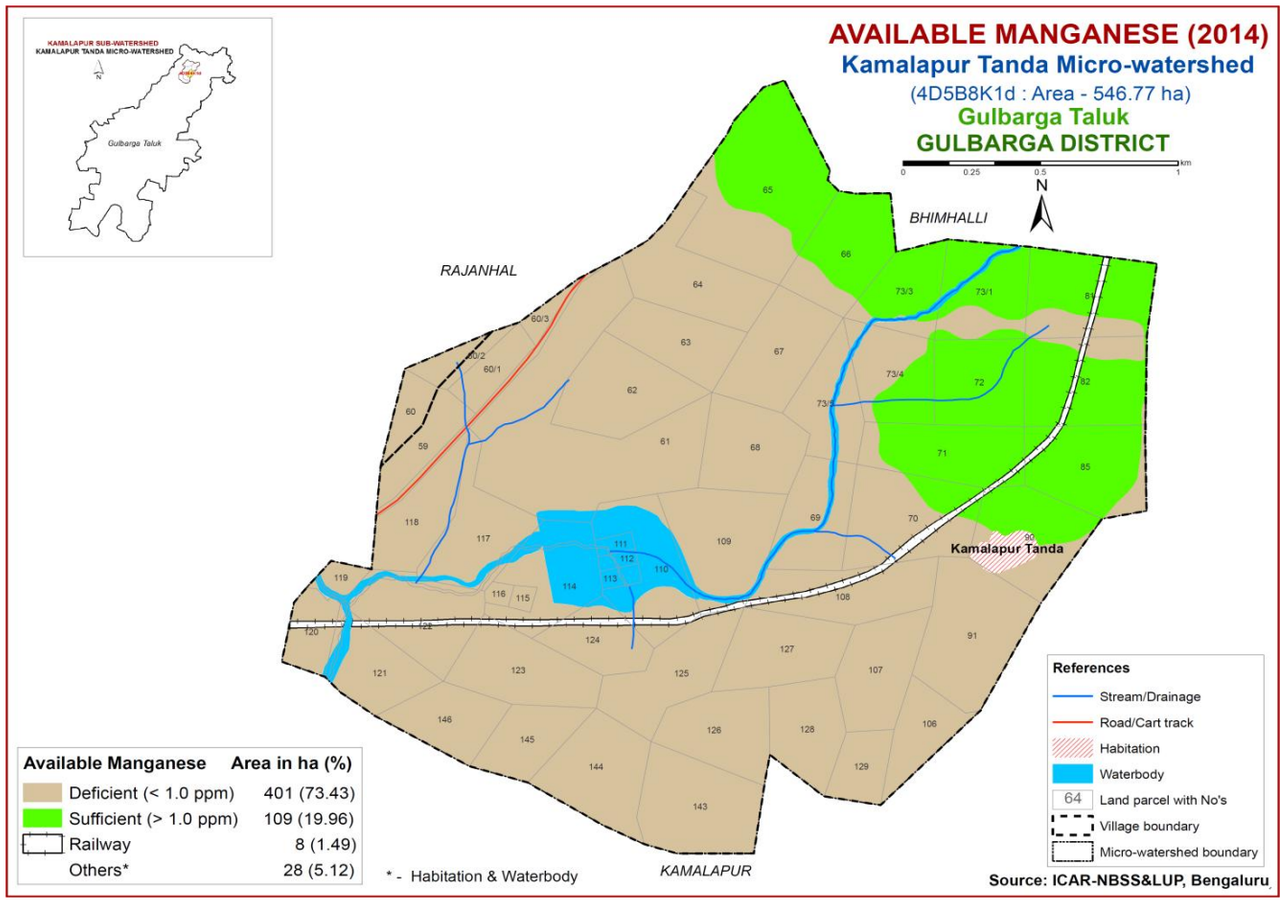

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
AVAILABLE IRON (2014)
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BACHNAL
Bachanala
BHIMHALLI
Rajahala
RAJANHAL
Kamalapura
KAMALAPUR
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Iron Area in ha.(%)
Deficient (<4.5 ppm) 10 (1.55)
Sufficient (>4.5 ppm) 599 (93.89)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

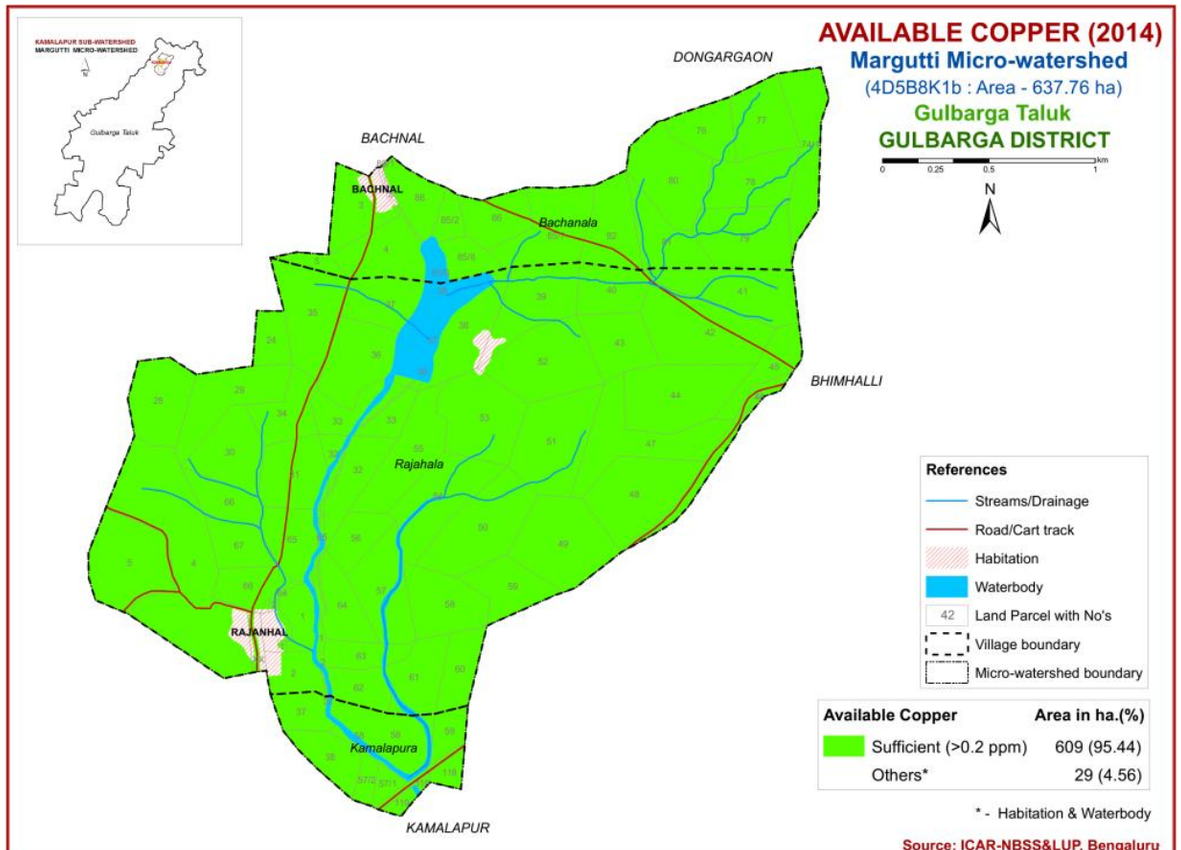

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
AVAILABLE IRON (2014)
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
Dongaragaov
Maragatthi
BACHNAL
MORMANCHI
Bheemanala
Bhimnalli
Kamalapura
KURNUR
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Iron Area in ha (%)
Sufficient (> 0.2 ppm) 631 (98.15)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

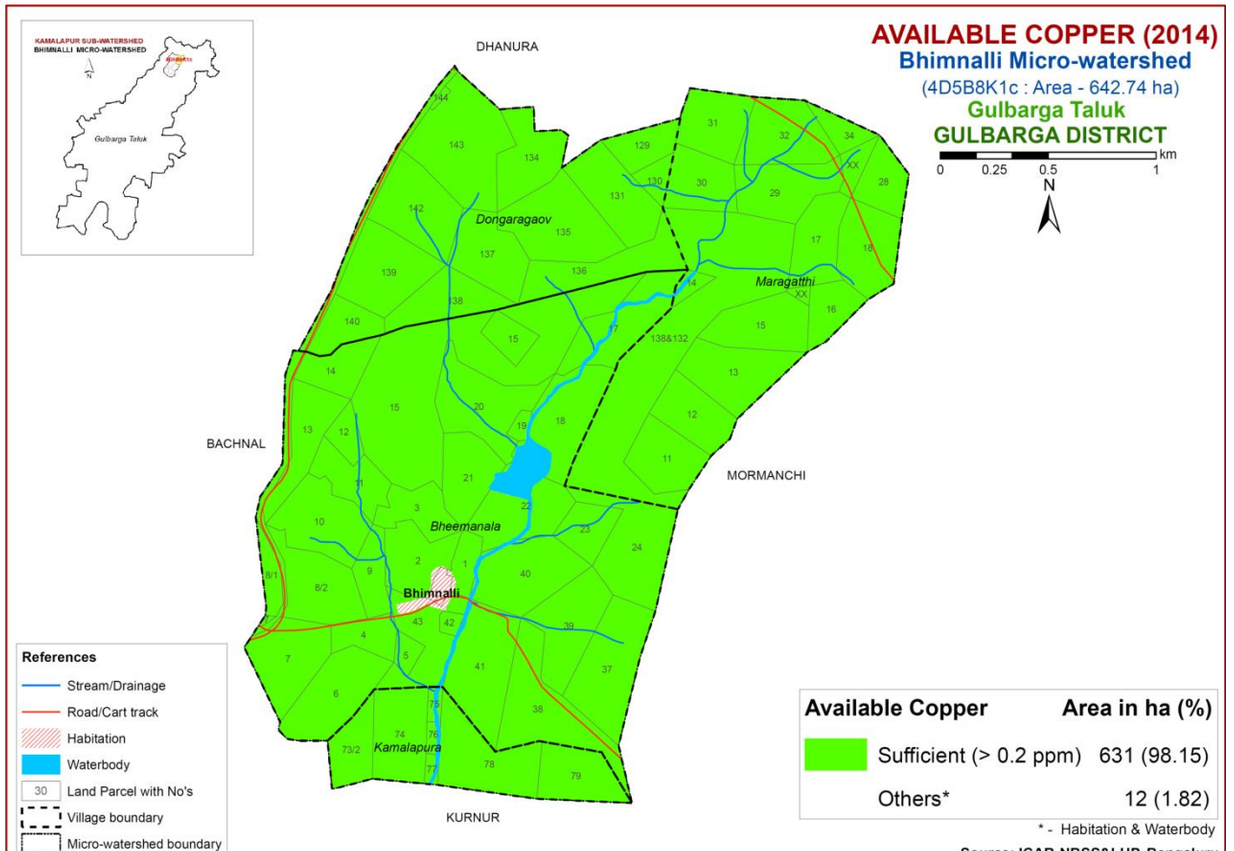

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
AVAILABLE IRON (2014)
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
Kamalapur Tanda
KAMALAPUR
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Iron Area in ha.(%)
Sufficient (> 0.2 ppm) 511 (93.39)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

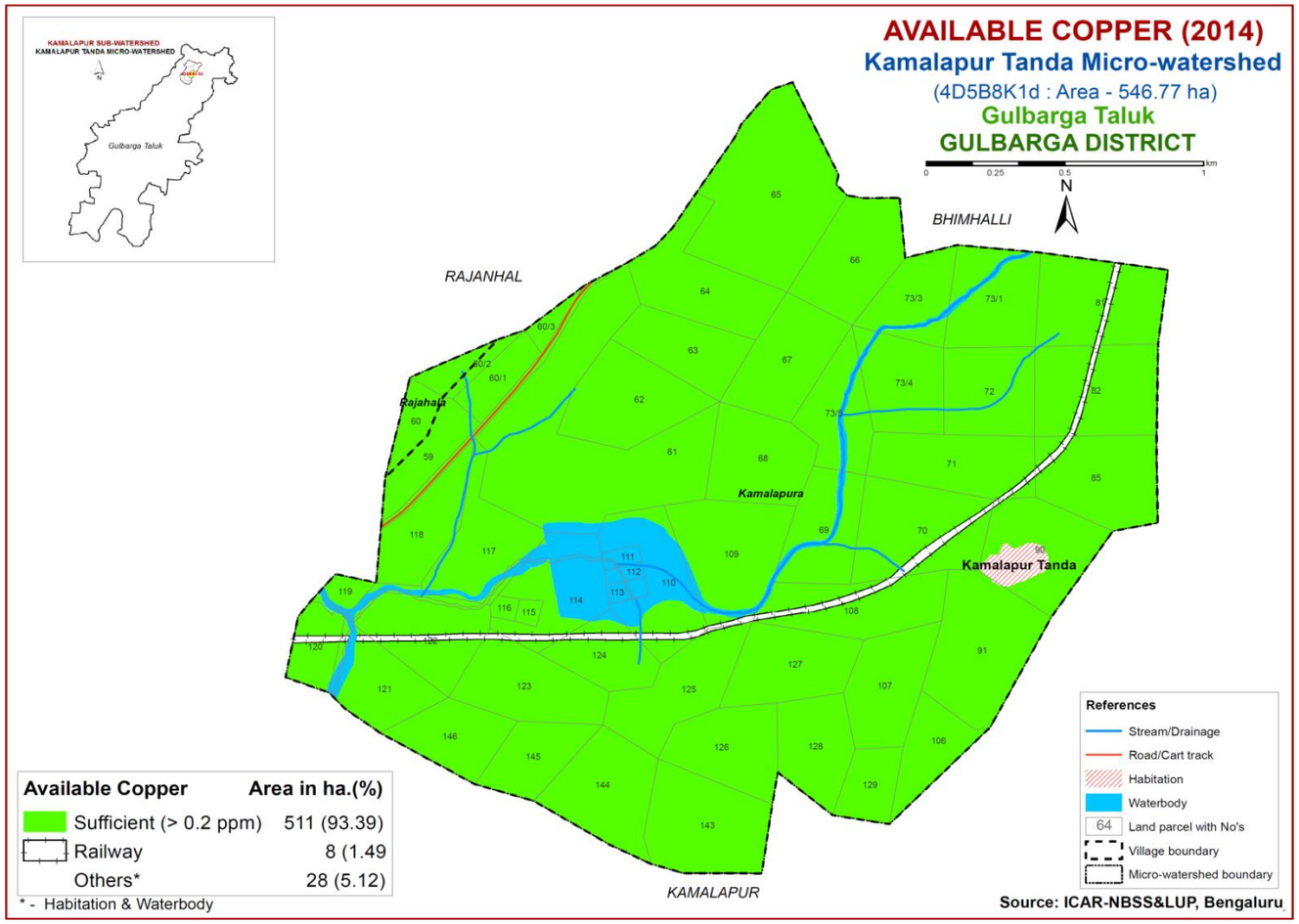

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
AVAILABLE MANGANESE (2014)
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BACHNAL
Bachanala
BHIMHALLI
Rajahala
RAJANHAL
Kamalapura
KAMALAPUR
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Manganese Area in ha.(%)
Sufficient (>1.0 ppm) 609 (95.44)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

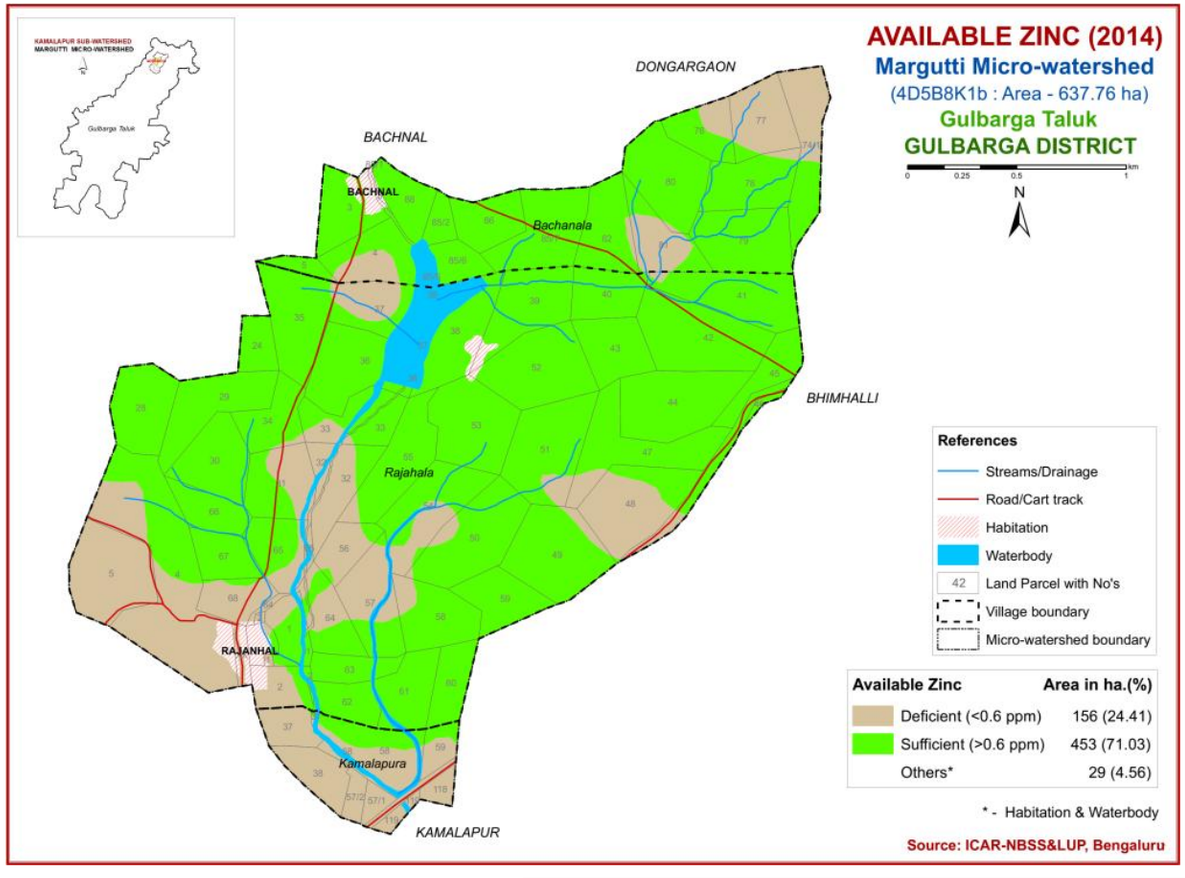

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
AVAILABLE MANGANESE (2014)
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
Dongaragaov
Maragatthi
BACHNAL
MORMANCHI
Bheemanala
Bhimnalli
Kamalapura
KURNUR
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Manganese Area in ha (%)
Sufficient (> 1.0 ppm) 631 (98.15)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

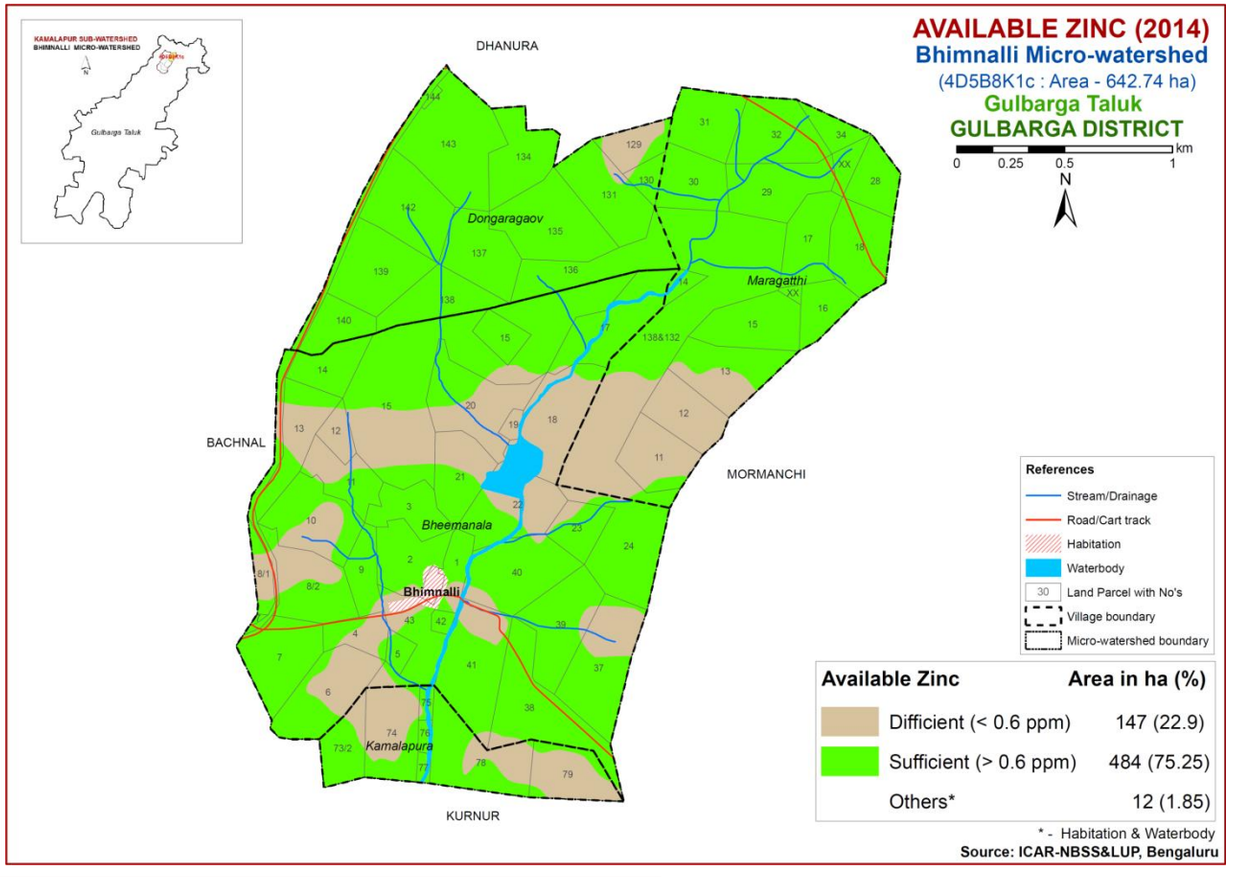

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
AVAILABLE MANGANESE (2014)
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
Kamalapur Tanda
KAMALAPUR
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Manganese Area in ha (%)
Deficient (< 1.0 ppm) 401 (73.43)
Sufficient (> 1.0 ppm) 109 (19.96)
Railway 8 (1.49)
Others* 28 (5.12)
Source: ICAR-NBSS&LUP, Bengaluru

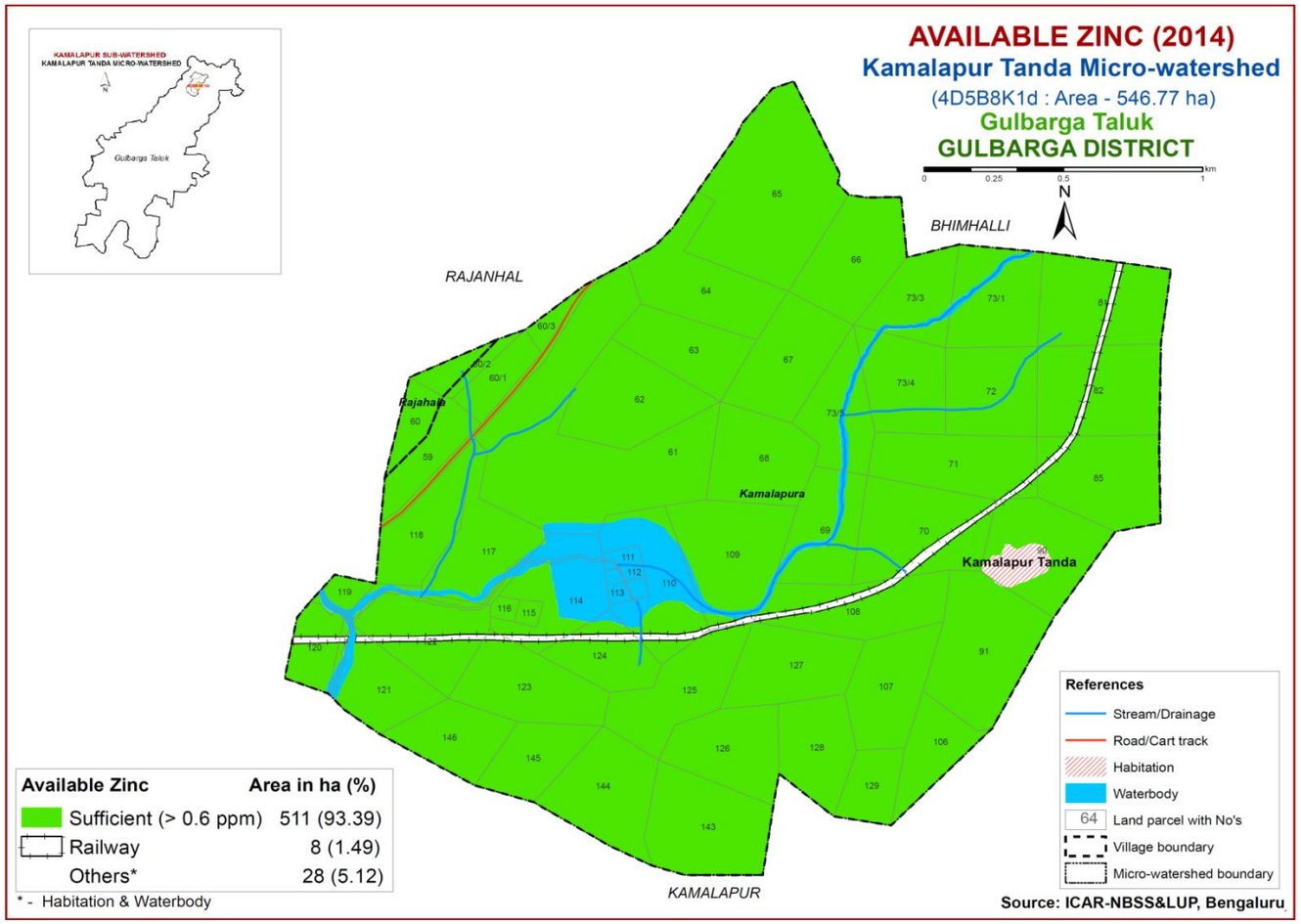

AVAILABLE COPPER (2014)
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
DONGARGAON
BACHNAL
BHIMHALLI
RAJANHAL
KAMALAPUR
Bachanala
Rajahala
Kamalapura
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Copper
Area in ha.(%)
Sufficient (>0.2 ppm) 609 (95.44)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

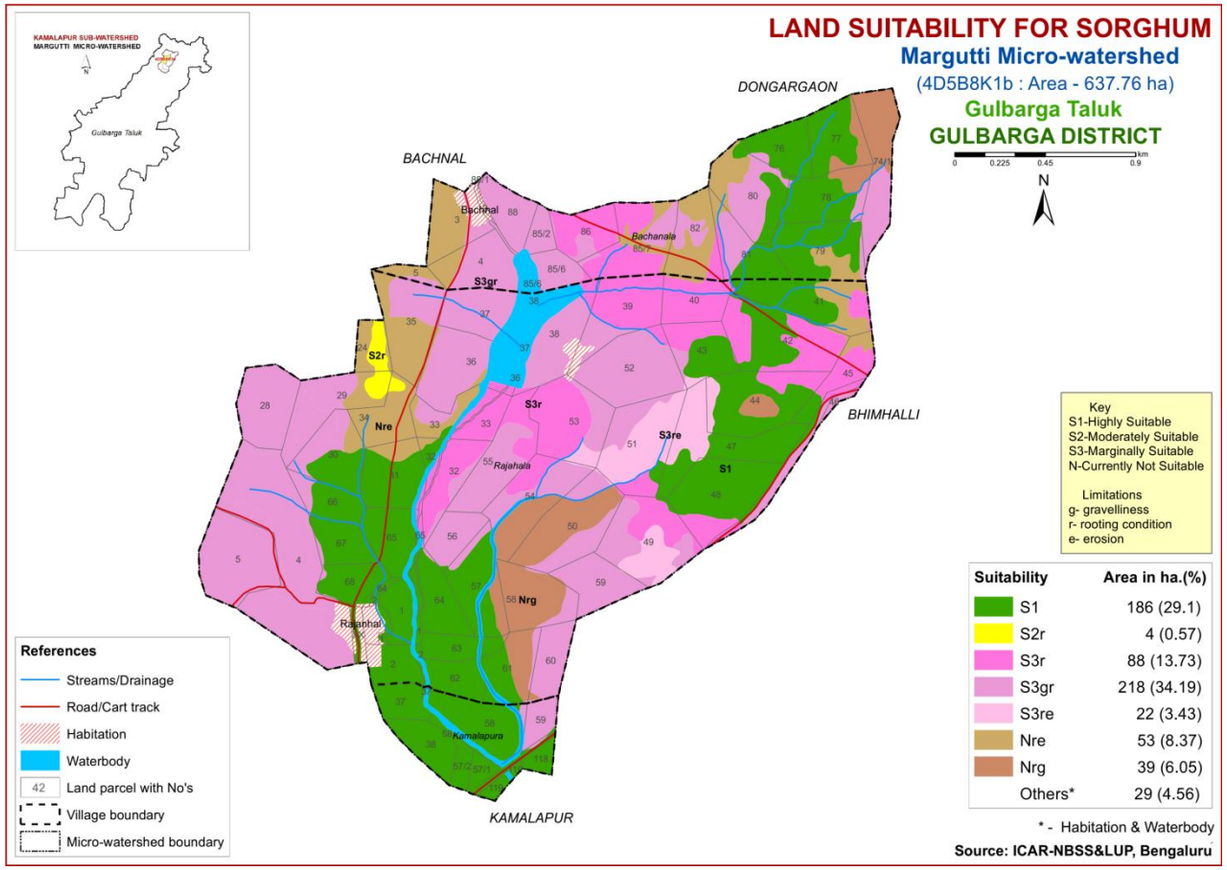

AVAILABLE COPPER (2014)
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Copper
Area in ha (%)
Sufficient (> 0.2 ppm) 631 (98.15)
Others* 12 (1.82)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

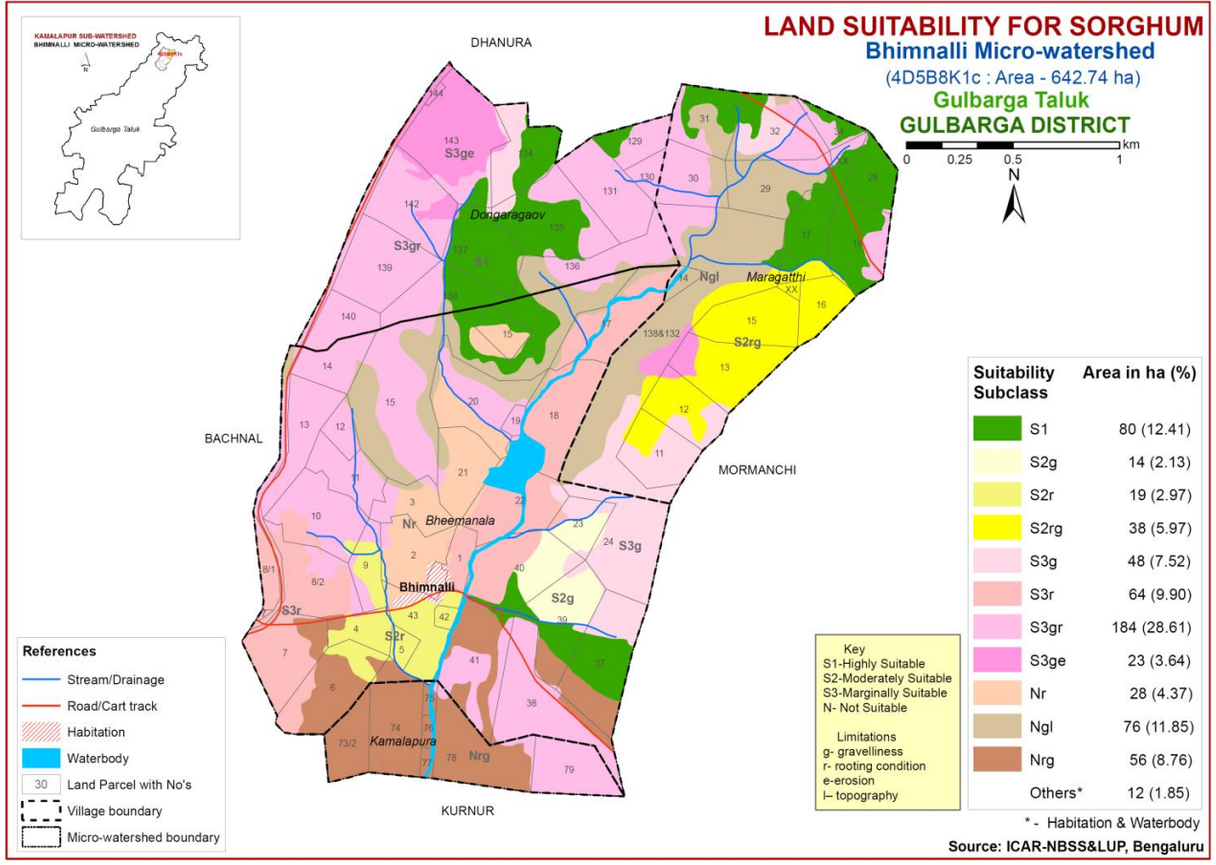

AVAILABLE COPPER (2014)
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
RAJANHAL
BHIMHALLI
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
Available Copper
Area in ha.(%)
Sufficient (> 0.2 ppm) 511 (93.39)
Railway 8 (1.49
Others* 28 (5.12)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

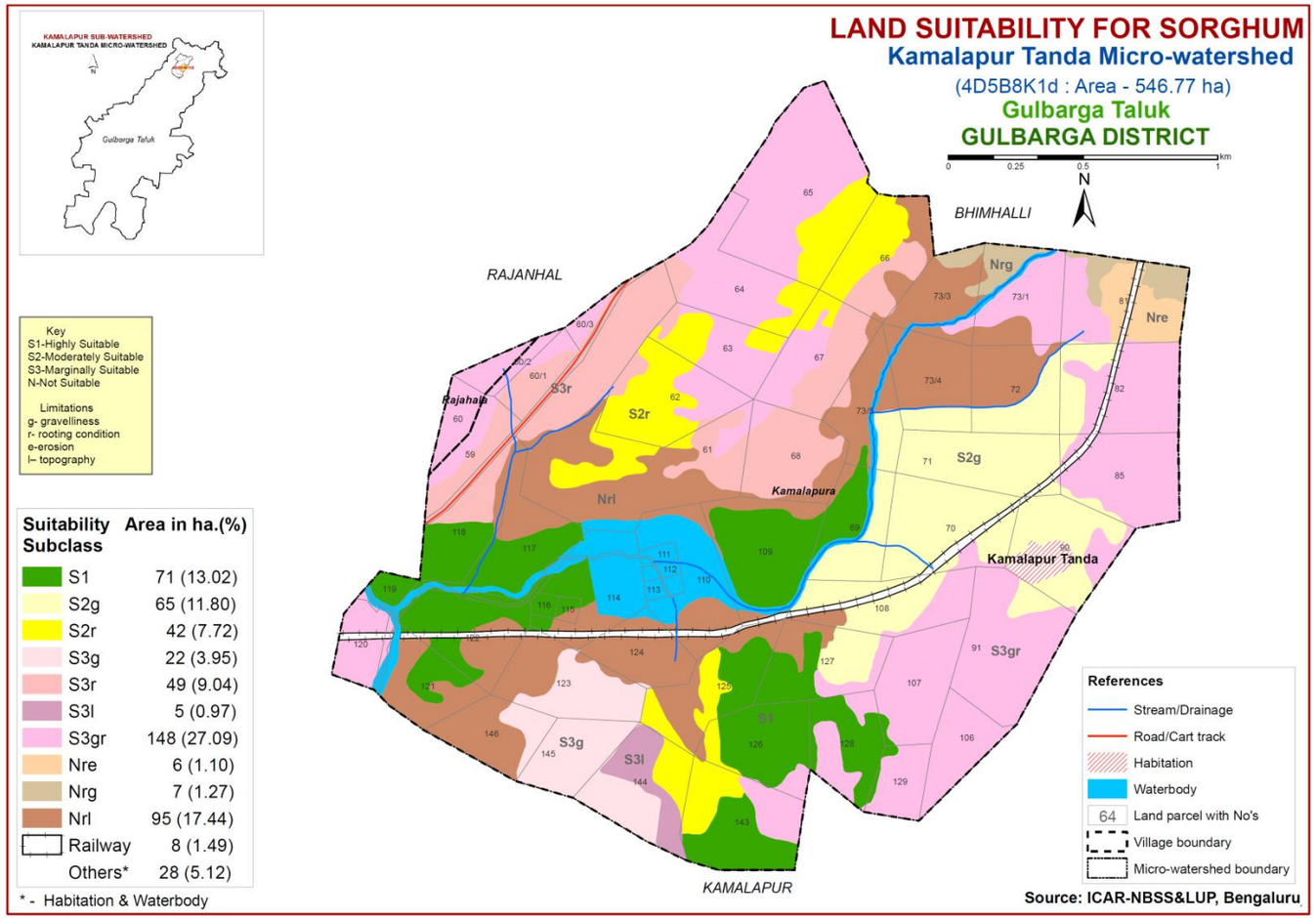

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
AVAILABLE ZINC (2014)
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
RAJANHAL
Bachanala
Rajahala
Kamalapura
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Zinc
Area in ha.(%)
Deficient (<0.6 ppm) 156 (24.41)
Sufficient (>0.6 ppm) 453 (71.03)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

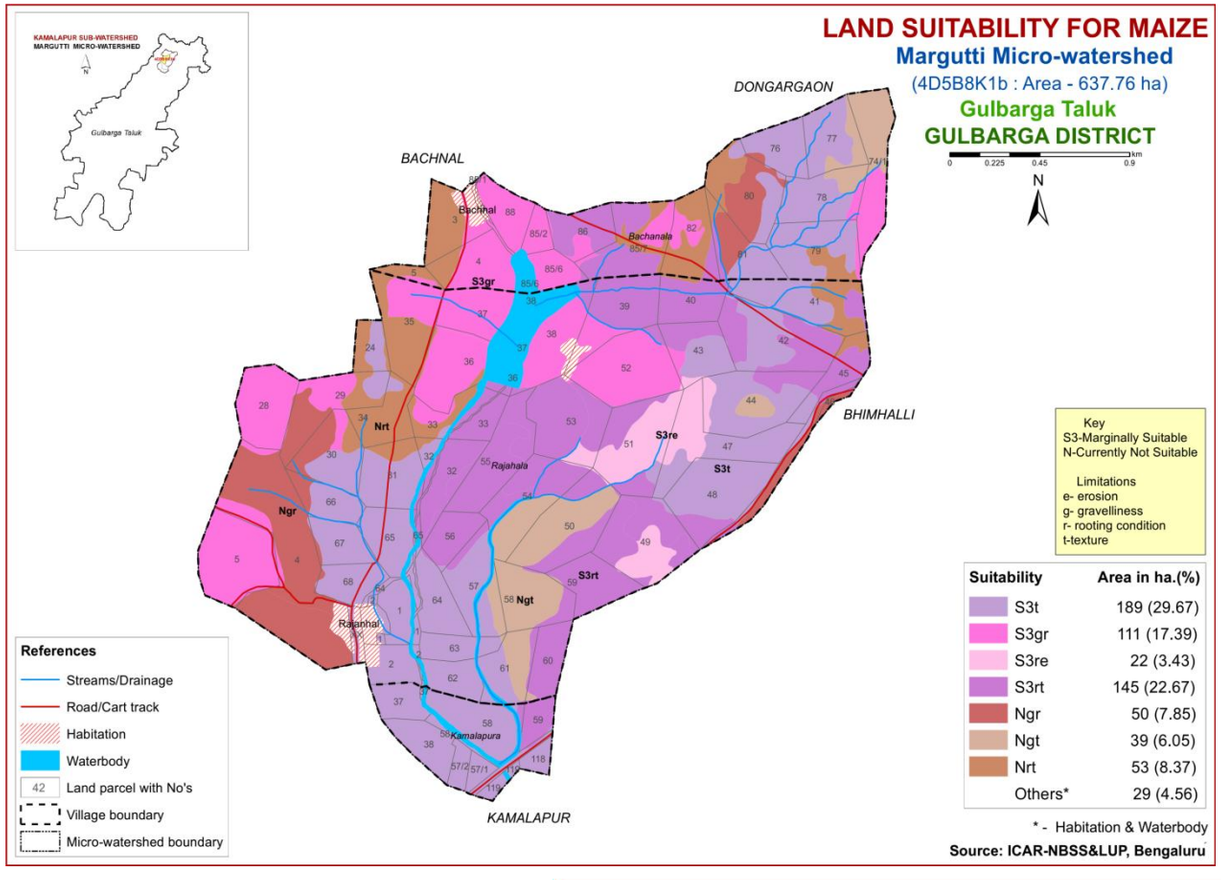

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
AVAILABLE ZINC (2014)
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary
Available Zinc
Area in ha (%)
Difficient (< 0.6 ppm) 147 (22.9)
Sufficient (> 0.6 ppm) 484 (75.25)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

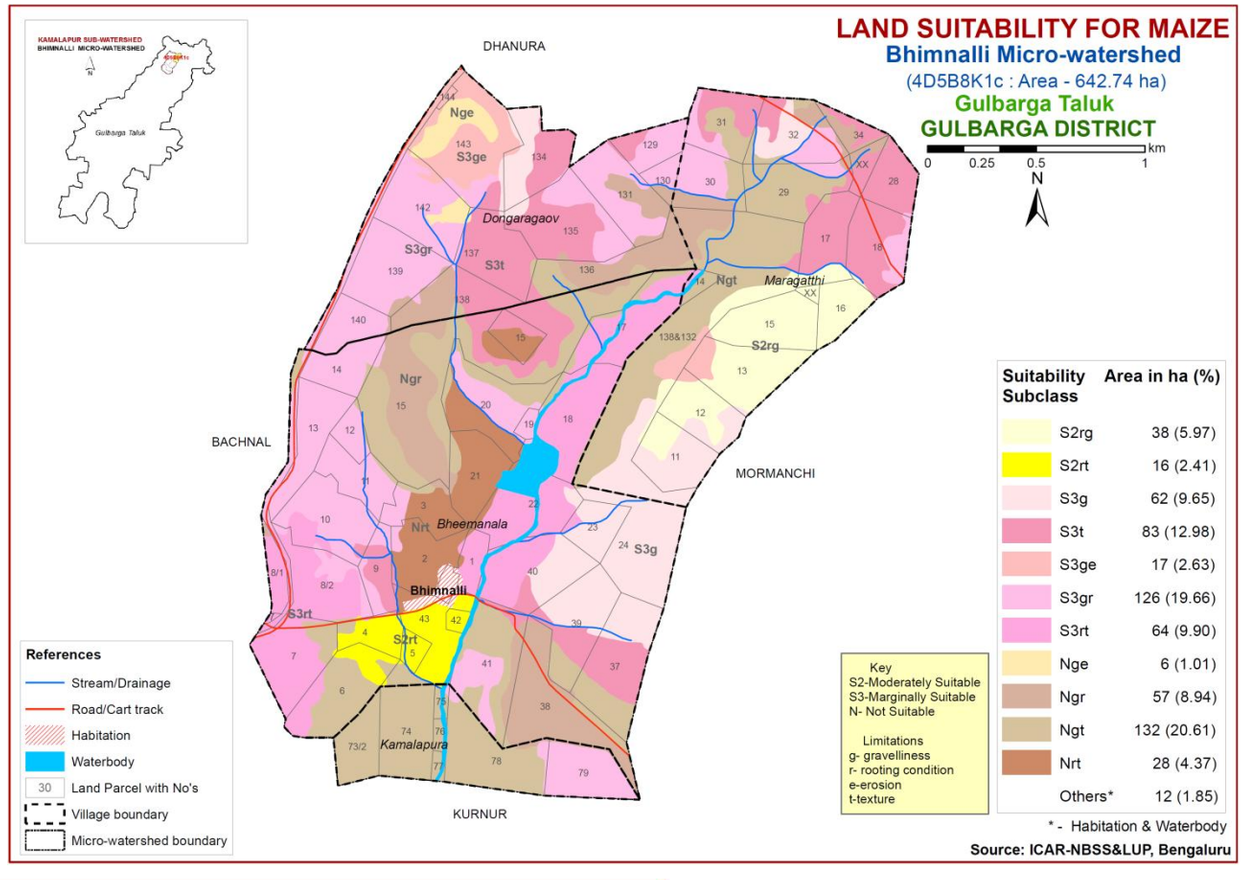

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
AVAILABLE ZINC (2014)
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Zinc
Area in ha (%)
Sufficient (> 0.6 ppm) 511 (93.39)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

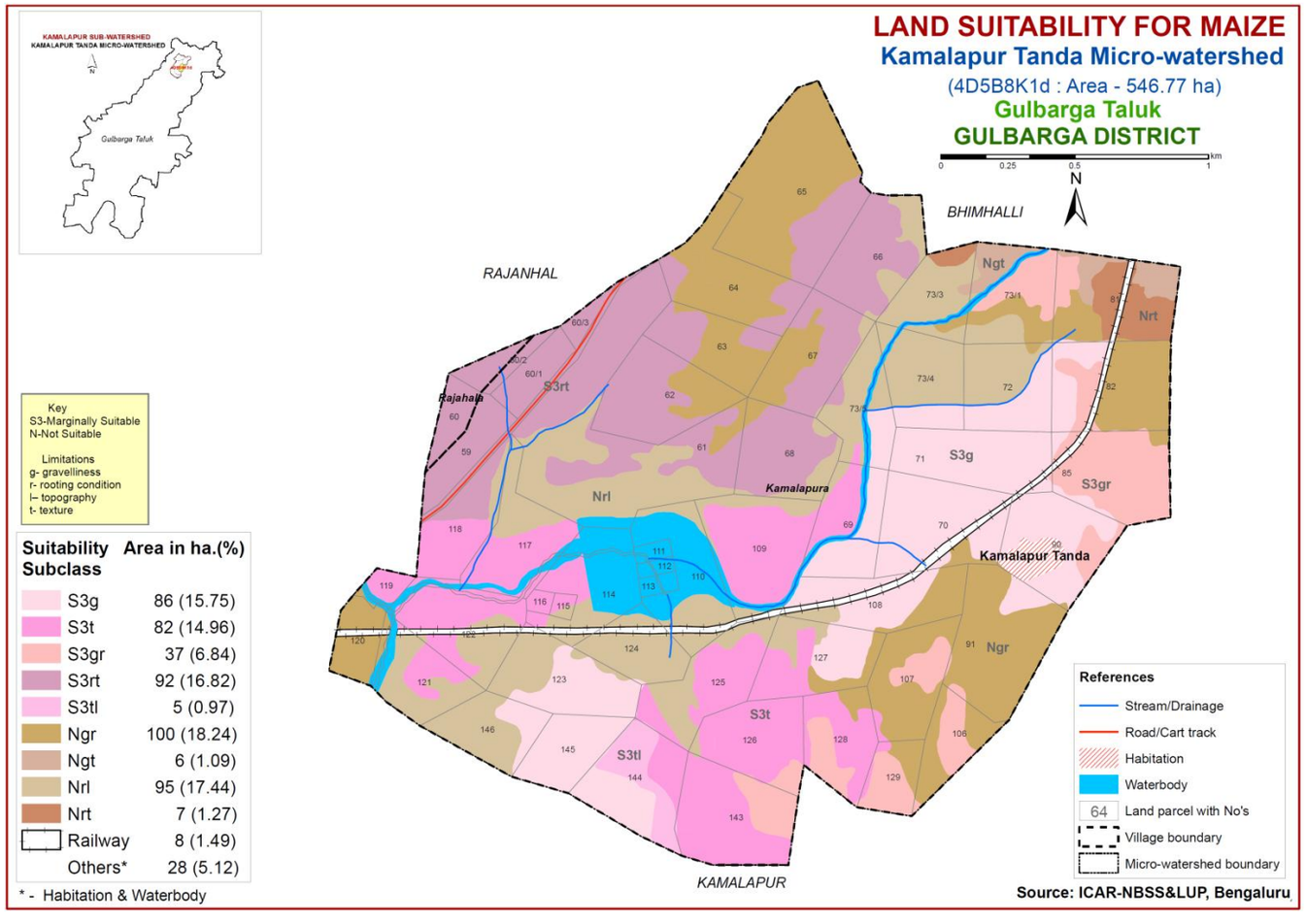

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR SORGHUM
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.225 0.45 0.9 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Bachanala
Rajahala
Kamalapura
S3gr
S2r
S3r
S3re
Nre
Nrg
S1
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N-Currently Not Suitable
Limitations
g- gravelliness
r- rooting condition
e- erosion
Suitability
Area in ha.(%)
S1 186 (29.1)
S2r 4 (0.57)
S3r 88 (13.73)
S3gr 218 (34.19)
S3re 22 (3.43)
Nre 53 (8.37)
Nrg 39 (6.05)
Others* 29 (4.56)
* - Habitation & Waterbody
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

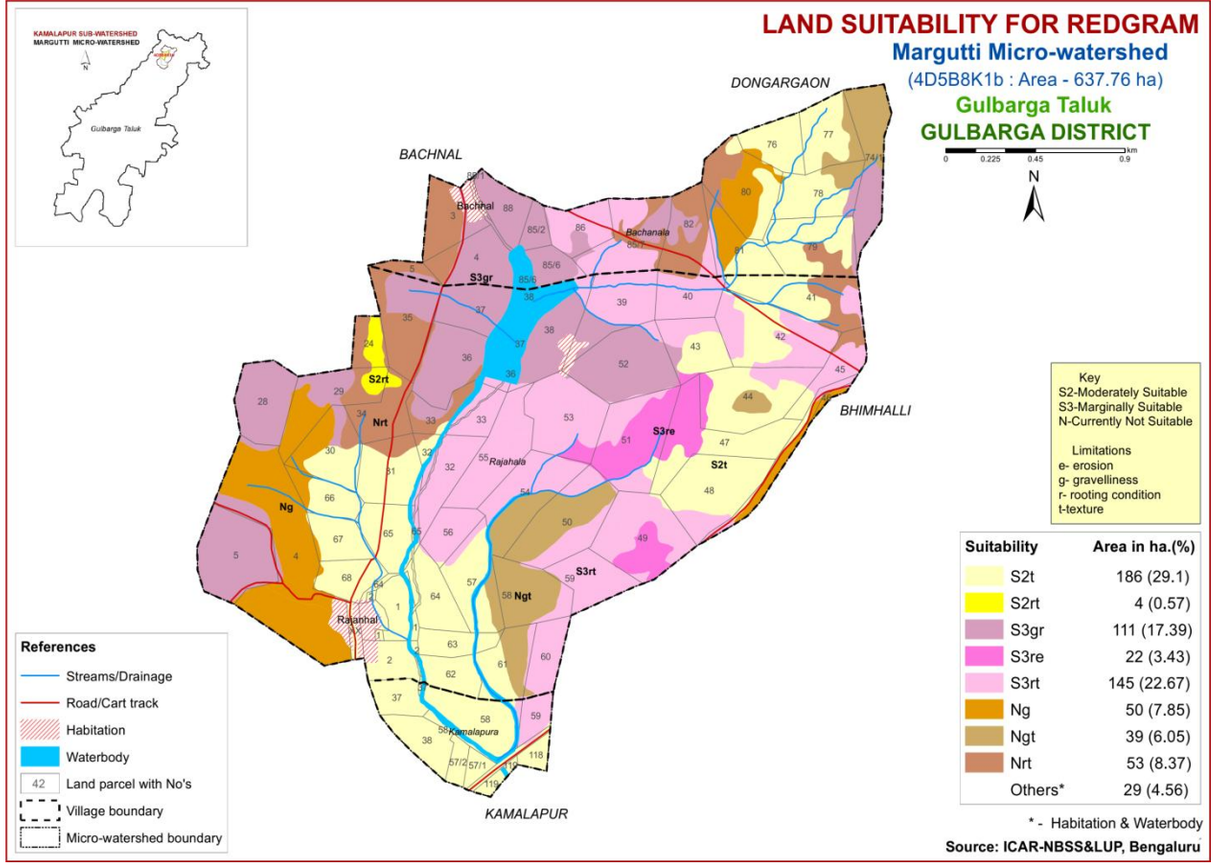

BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR SORGHUM
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
S3gr
S3ge
S2rg
S3g
S2g
S3r
S2r
Nr
Ngl
Nrg
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
g- gravelliness
r- rooting condition
e-erosion
I– topography
Suitability Subclass
Area in ha (%)
S1 80 (12.41)
S2g 14 (2.13)
S2r 19 (2.97)
S2rg 38 (5.97)
S3g 48 (7.52)
S3r 64 (9.90)
S3gr 184 (28.61)
S3ge 23 (3.64)
Nr 28 (4.37)
Ngl 76 (11.85)
Nrg 56 (8.76)
Others* 12 (1.85)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

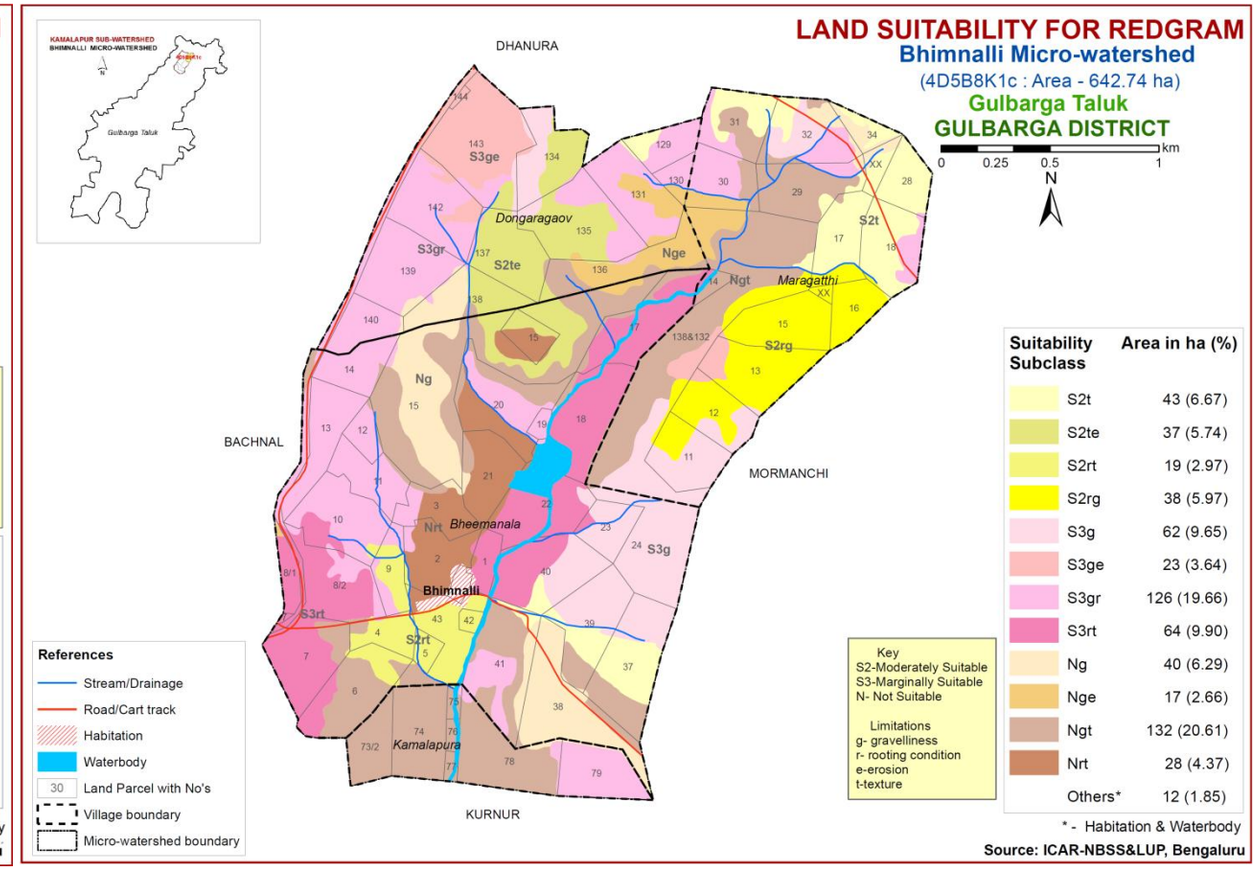

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR SORGHUM
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
S3r
S2r
Nrl
S2g
S3gr
S3g
S3l
Nre
Nrg
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N-Not Suitable
Limitations
g- gravelliness
r- rooting condition
e-erosion
I– topography
Suitability Subclass
Area in ha.(%)
S1 71 (13.02)
S2g 65 (11.80)
S2r 42 (7.72)
S3g 22 (3.95)
S3r 49 (9.04)
S3l 5 (0.97)
S3gr 148 (27.09)
Nre 6 (1.10)
Nrg 7 (1.27)
Nrl 95 (17.44)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

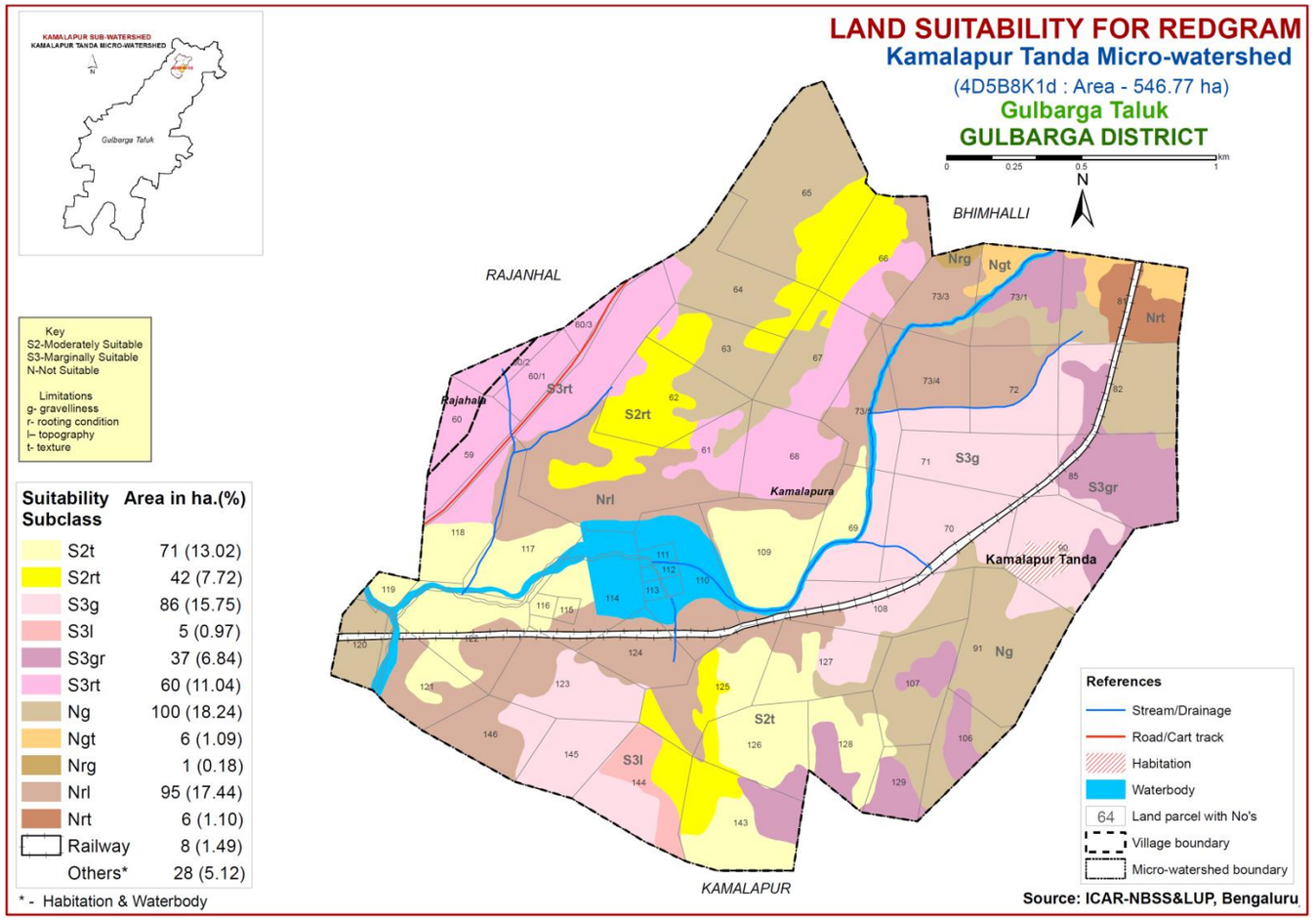

LAND SUITABILITY FOR MAIZE
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
0 0.225 0.45 0.9 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Bachanala
Rajahala
Rajahal
Kamalapura
S3gr
S3re
S3t
S3rt
Ngr
Ngt
Nrt
Key
S3-Marginally Suitable
N-Currently Not Suitable
Limitations
e- erosion
g- gravelliness
r- rooting condition
t-texture
Suitability | Area in ha.(%)
S3t 189 (29.67)
S3gr 111 (17.39)
S3re 22 (3.43)
S3rt 145 (22.67)
Ngr 50 (7.85)
Ngt 39 (6.05)
Nrt 53 (8.37)
Others* 29 (4.56)
* - Habitation & Waterbody
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

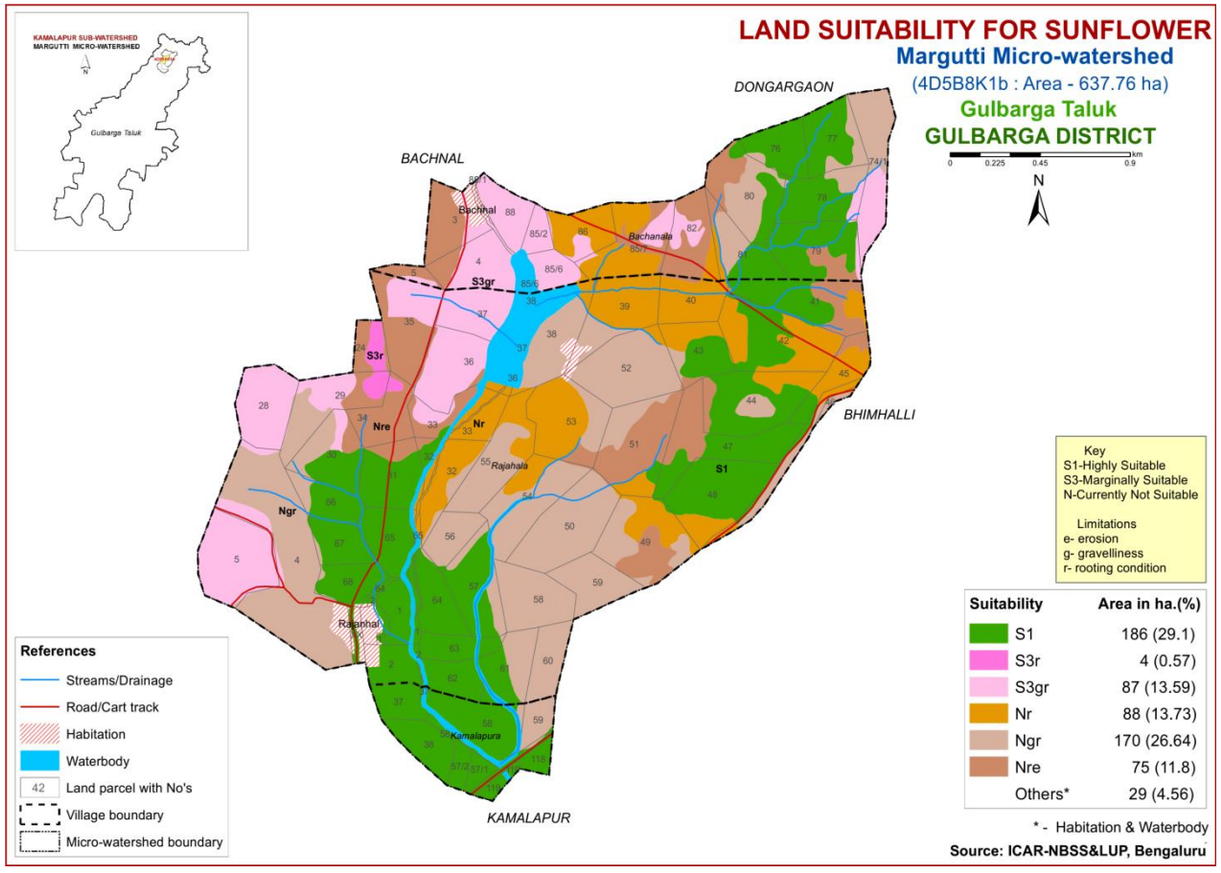

LAND SUITABILITY FOR MAIZE
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
0 0.25 0.5 1 km
N
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
Nge
S3ge
S3gr
S3t
Ngt
Ngr
Nrt
S2rg
S3g
S3rt
S2rt
Key
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
g- gravelliness
r- rooting condition
e-erosion
t-texture
Suitability Subclass | Area in ha (%)
S2rg 38 (5.97)
S2rt 16 (2.41)
S3g 62 (9.65)
S3t 83 (12.98)
S3ge 17 (2.63)
S3gr 126 (19.66)
S3rt 64 (9.90)
Nge 6 (1.01)
Ngr 57 (8.94)
Ngt 132 (20.61)
Nrt 28 (4.37)
Others* 12 (1.85)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

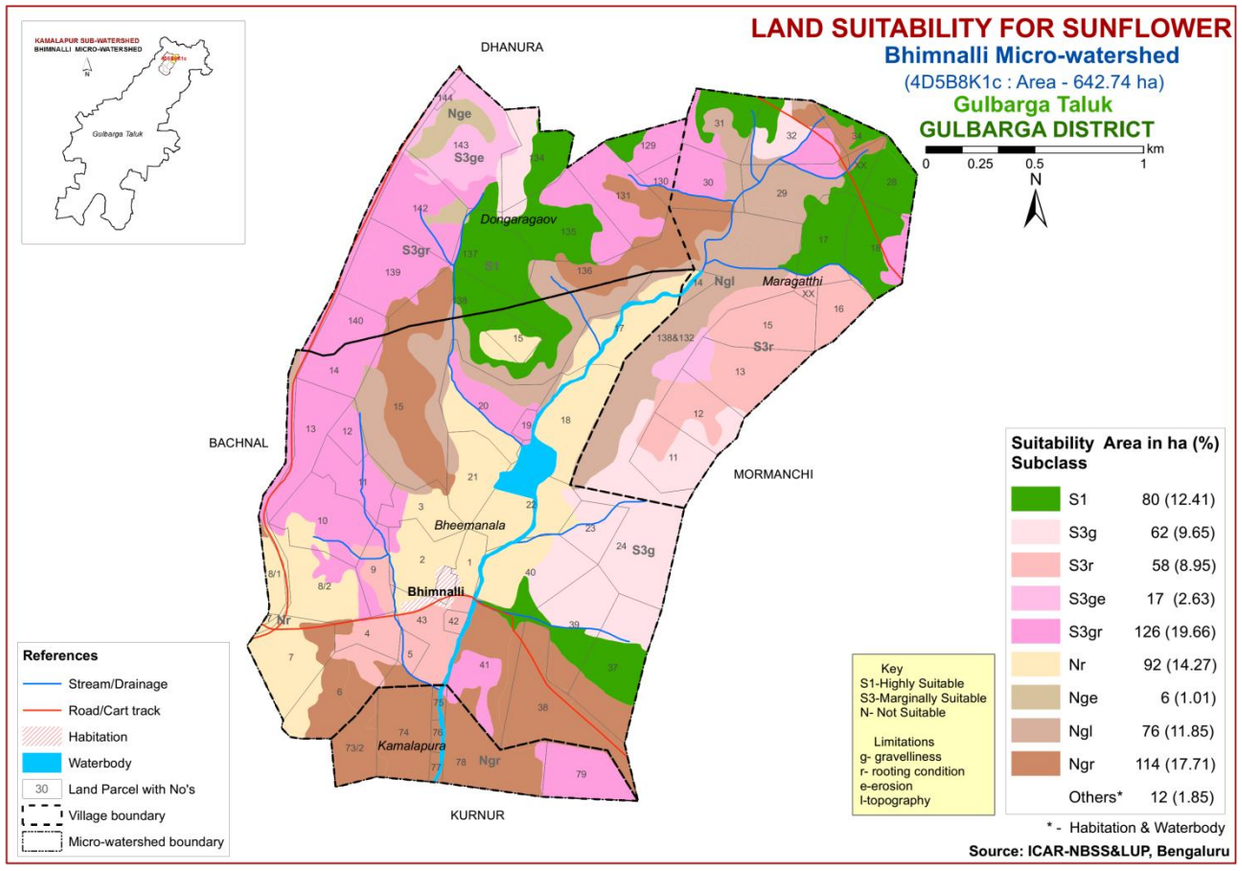

LAND SUITABILITY FOR MAIZE
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
0 0.25 0.5 1 km
N
RAJANHAL
BHIMHALLI
KAMALAPUR
Rajahalh
Kamalapura
Kamalapur Tanda
S3rt
Nrl
S3t
S3tl
S3g
S3gr
Ngr
Ngt
Nrt
Key
S3-Marginally Suitable
N-Not Suitable
Limitations
g- gravelliness
r- rooting condition
l– topography
t- texture
Suitability Subclass | Area in ha.(%)
S3g 86 (15.75)
S3t 82 (14.96)
S3gr 37 (6.84)
S3rt 92 (16.82)
S3tl 5 (0.97)
Ngr 100 (18.24)
Ngt 6 (1.09)
Nrl 95 (17.44)
Nrt 7 (1.27)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

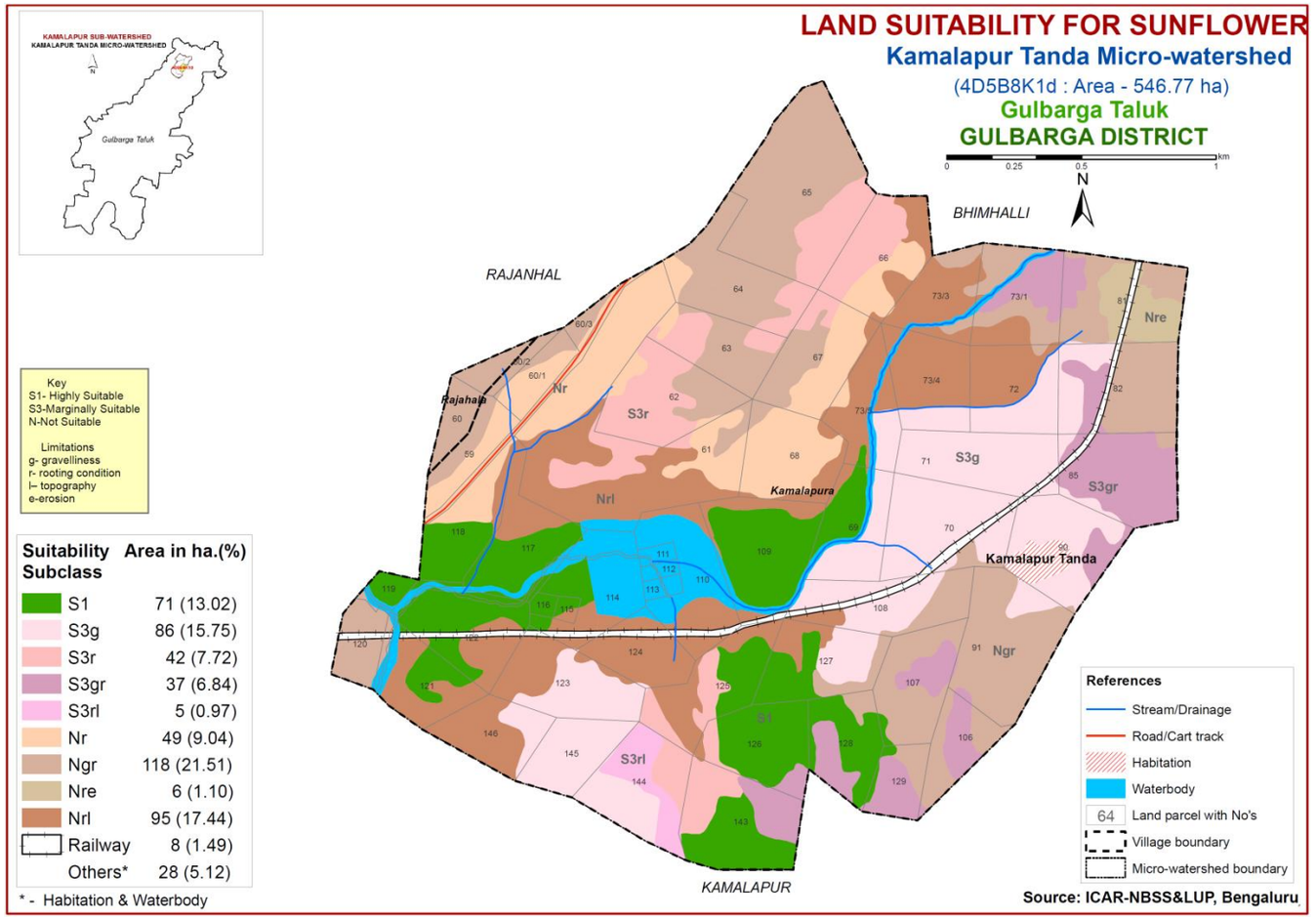

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR REDGRAM
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.225 0.45 0.9 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachhal
Bachanala
Rajahala
Rajanhal
Kamalapura
S3gr
S2rt
Nrt
S3re
S2t
Ng
S3rt
Ngt
Key
S2-Moderately Suitable
S3-Marginally Suitable
N-Currently Not Suitable
Limitations
e- erosion
g- gravelliness
r- rooting condition
t-texture
Suitability | Area in ha.(%)
S2t 186 (29.1)
S2rt 4 (0.57)
S3gr 111 (17.39)
S3re 22 (3.43)
S3rt 145 (22.67)
Ng 50 (7.85)
Ngt 39 (6.05)
Nrt 53 (8.37)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary

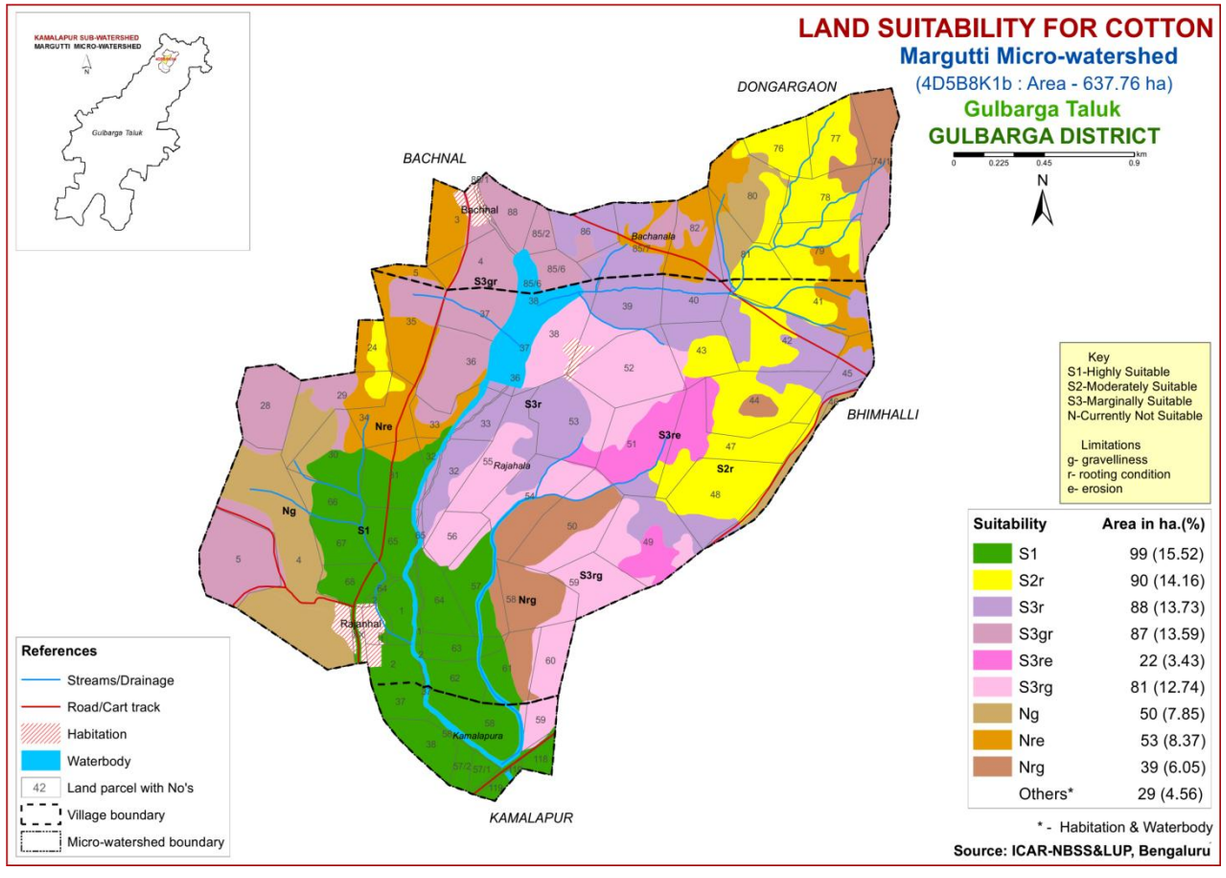

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR REDGRAM
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
S3ge
S3gr
S2te
Nge
Ngt
S2t
S2rg
Ng
Nrt
S3g
S3rt
S2rt
Key
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
g- gravelliness
r- rooting condition
e-erosion
t-texture
Suitability Subclass | Area in ha (%)
S2t 43 (6.67)
S2te 37 (5.74)
S2rt 19 (2.97)
S2rg 38 (5.97)
S3g 62 (9.65)
S3ge 23 (3.64)
S3gr 126 (19.66)
S3rt 64 (9.90)
Ng 40 (6.29)
Nge 17 (2.66)
Ngt 132 (20.61)
Nrt 28 (4.37)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary

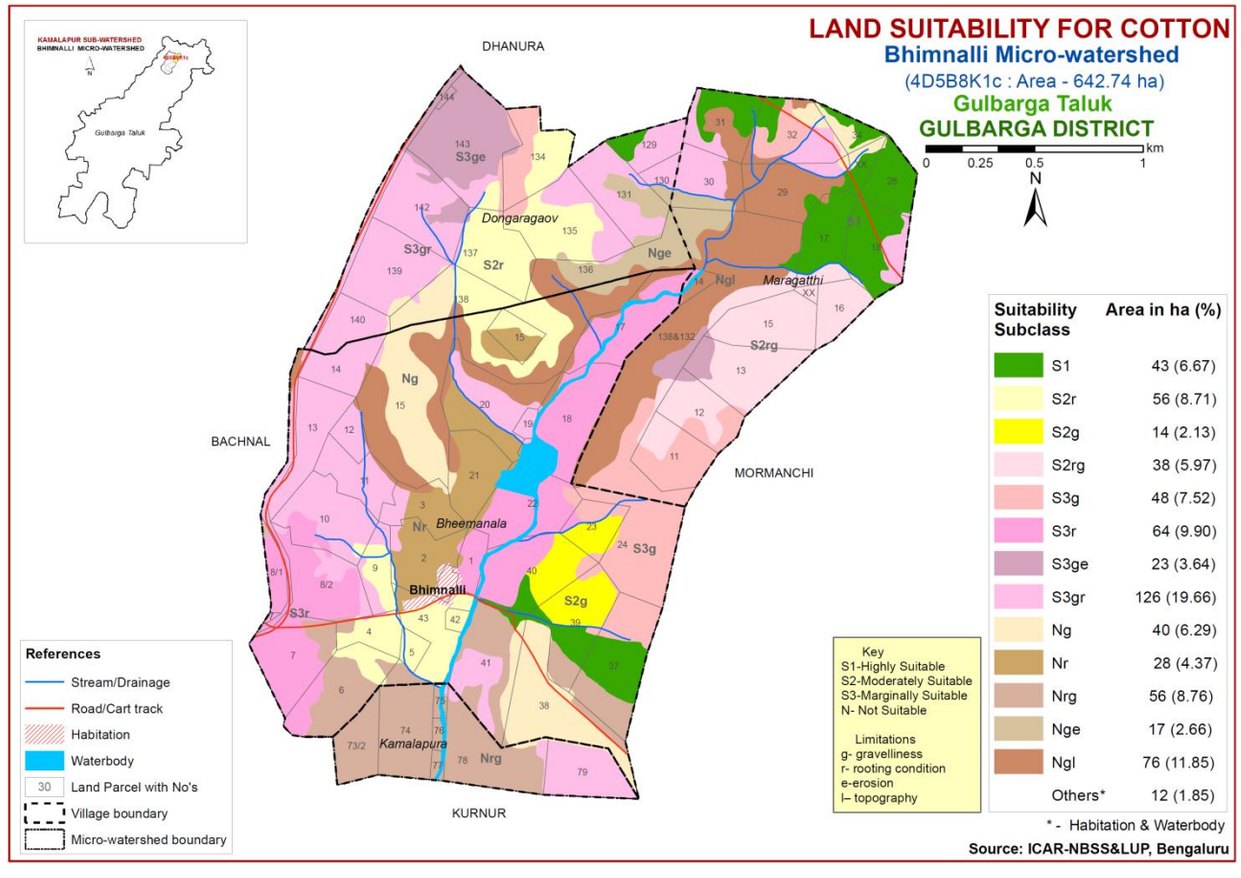

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR REDGRAM
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
S3rt
S2rt
Nrl
S3g
S3gr
Nrg
Ngt
Nrt
S2t
S3l
Ng
Key
S2-Moderately Suitable
S3-Marginally Suitable
N-Not Suitable
Limitations
g- gravelliness
r- rooting condition
l– topography
t- texture
Suitability Subclass | Area in ha.(%)
S2t 71 (13.02)
S2rt 42 (7.72)
S3g 86 (15.75)
S3l 5 (0.97)
S3gr 37 (6.84)
S3rt 60 (11.04)
Ng 100 (18.24)
Ngt 6 (1.09)
Nrg 1 (0.18)
Nrl 95 (17.44)
Nrt 6 (1.10)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary

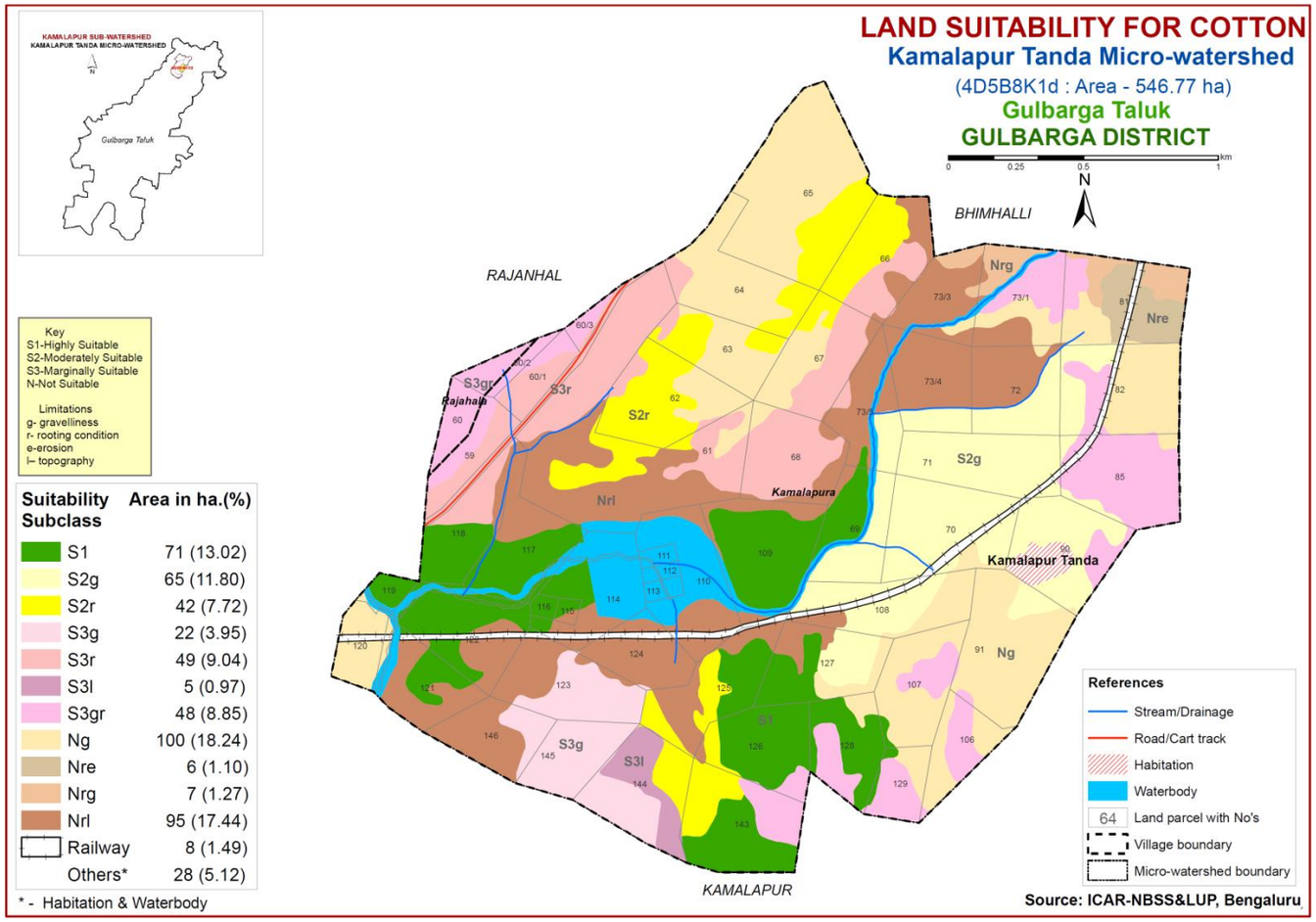

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR SUNFLOWER
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.225 0.45 0.9 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachhal
Bachanala
Rajahala
Rajahal
Kamalapura
S3r
S3gr
Nr
Nre
Ngr
S1
Key
S1-Highly Suitable
S3-Marginally Suitable
N-Currently Not Suitable
Limitations
e- erosion
g- gravelliness
r- rooting condition
Suitability Area in ha.(%)
S1 186 (29.1)
S3r 4 (0.57)
S3gr 87 (13.59)
Nr 88 (13.73)
Ngr 170 (26.64)
Nre 75 (11.8)
Others* 29 (4.56)
* - Habitation & Waterbody
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

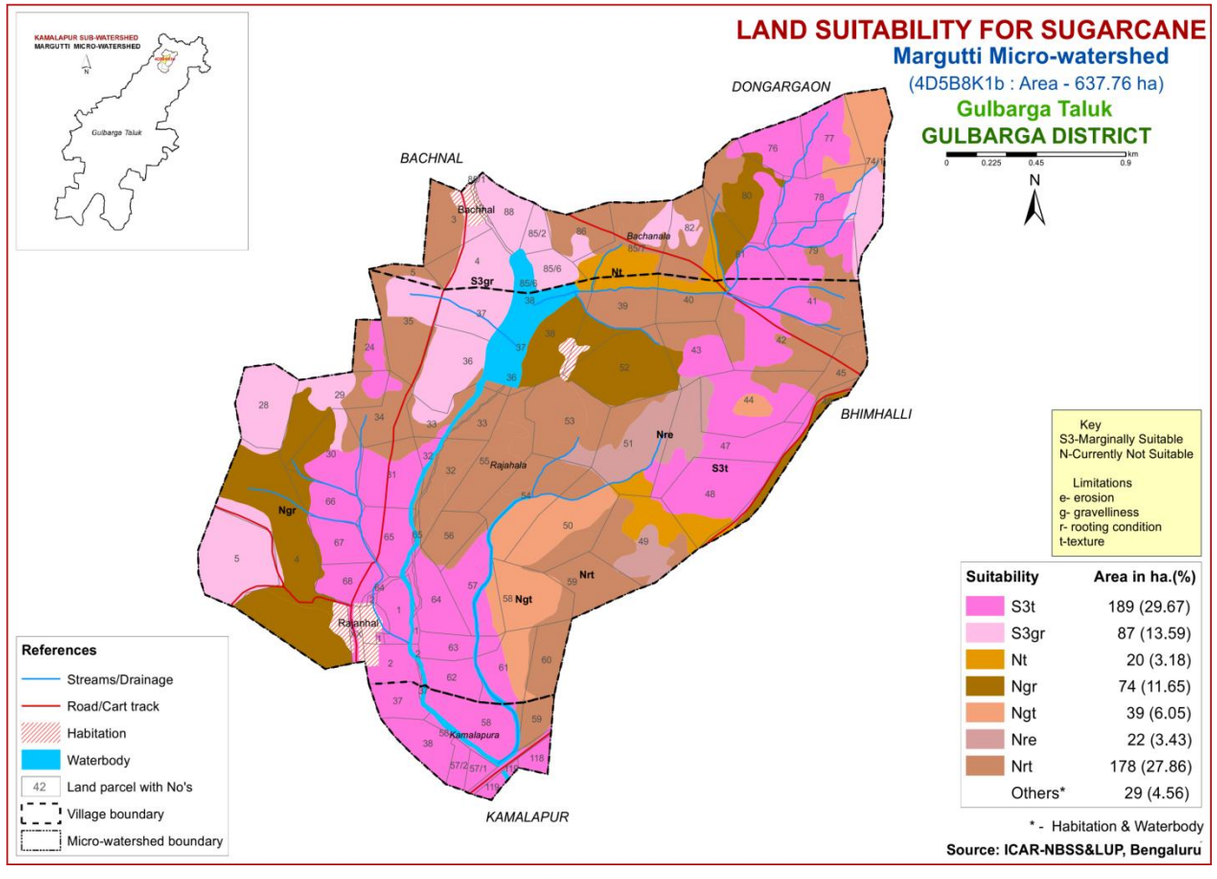

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR SUNFLOWER
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
Nge
S3ge
S3gr
Ngl
S3r
S3g
Ngr
Key
S1-Highly Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
g- gravelliness
r- rooting condition
e-erosion
l-topography
Suitability Area in ha (%)
Subclass
S1 80 (12.41)
S3g 62 (9.65)
S3r 58 (8.95)
S3ge 17 (2.63)
S3gr 126 (19.66)
Nr 92 (14.27)
Nge 6 (1.01)
Ngl 76 (11.85)
Ngr 114 (17.71)
Others* 12 (1.85)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

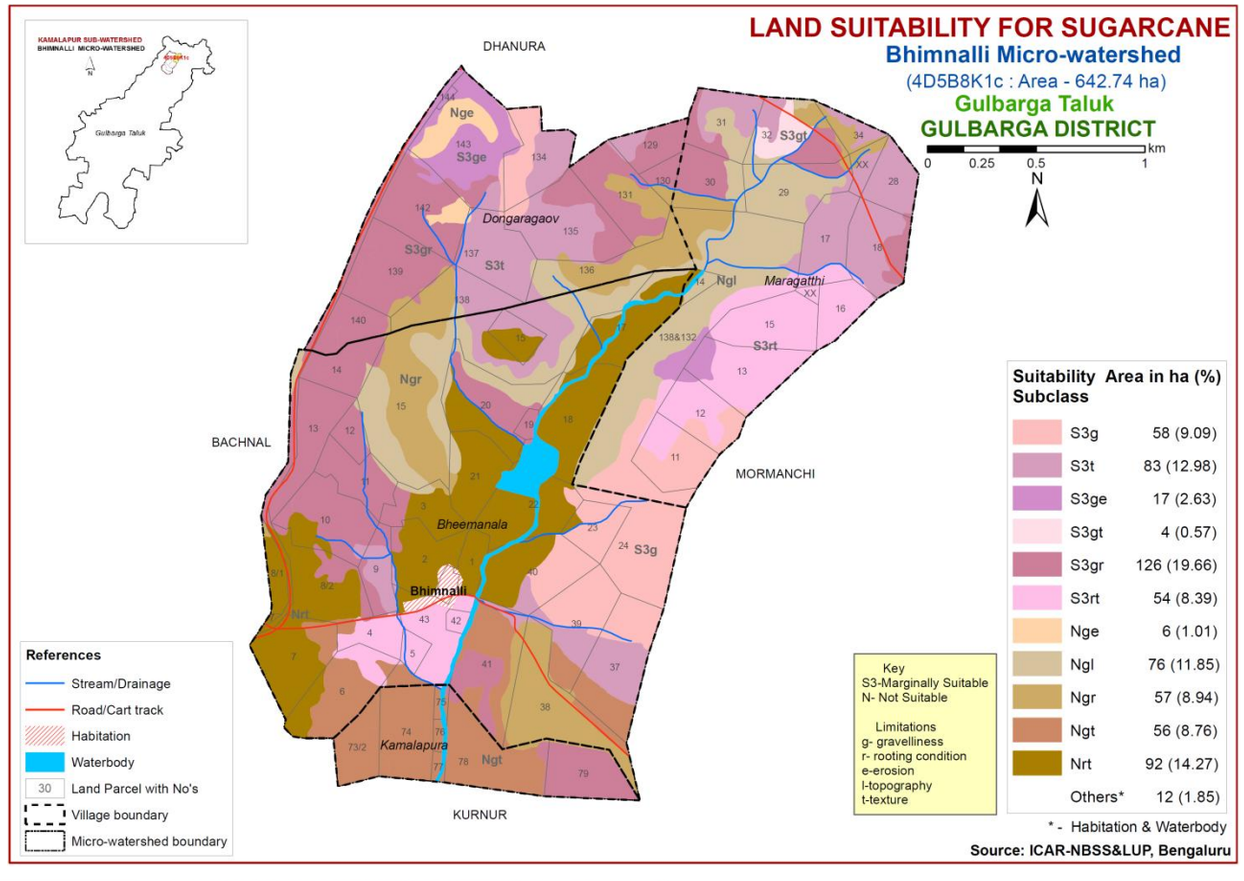

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR SUNFLOWER
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
Nr
S3r
Nrl
S3g
S3gr
Nre
Ngr
S3rl
Key
S1- Highly Suitable
S3-Marginally Suitable
N-Not Suitable
Limitations
g- gravelliness
r- rooting condition
l– topography
e-erosion
Suitability Area in ha.(%)
Subclass
S1 71 (13.02)
S3g 86 (15.75)
S3r 42 (7.72)
S3gr 37 (6.84)
S3rl 5 (0.97)
Nr 49 (9.04)
Ngr 118 (21.51)
Nre 6 (1.10)
Nrl 95 (17.44)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

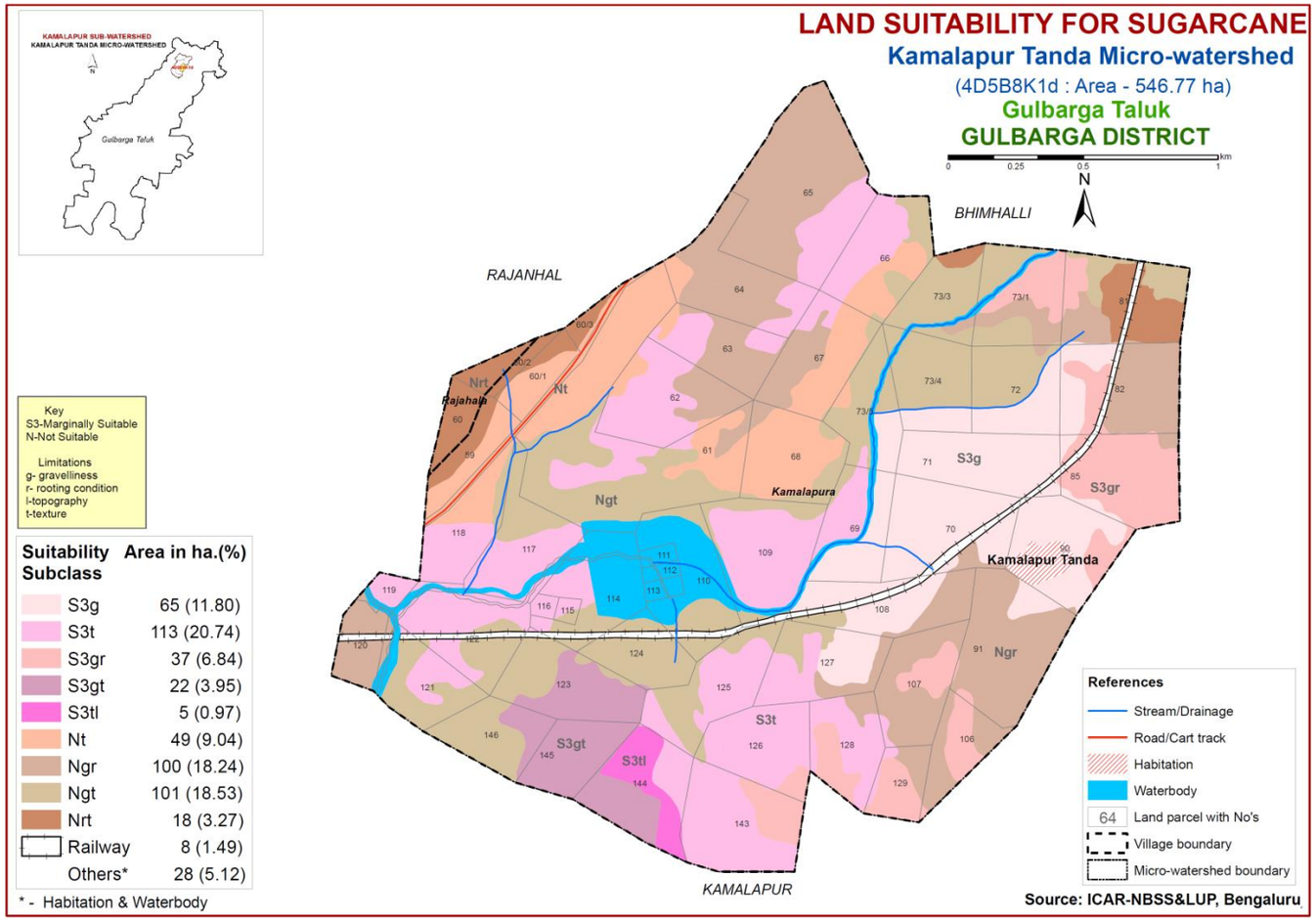

LAND SUITABILITY FOR COTTON
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachanala
Rajahala
Kamalapura
S3gr
S3r
S3re
S2r
S3rg
Nre
Nrg
Ng
S1
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N-Currently Not Suitable
Limitations
g- gravelliness
r- rooting condition
e- erosion
Suitability | Area in ha.(%)
S1 99 (15.52)
S2r 90 (14.16)
S3r 88 (13.73)
S3gr 87 (13.59)
S3re 22 (3.43)
S3rg 81 (12.74)
Ng 50 (7.85)
Nre 53 (8.37)
Nrg 39 (6.05)
Others* 29 (4.56)
* - Habitation & Waterbody
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

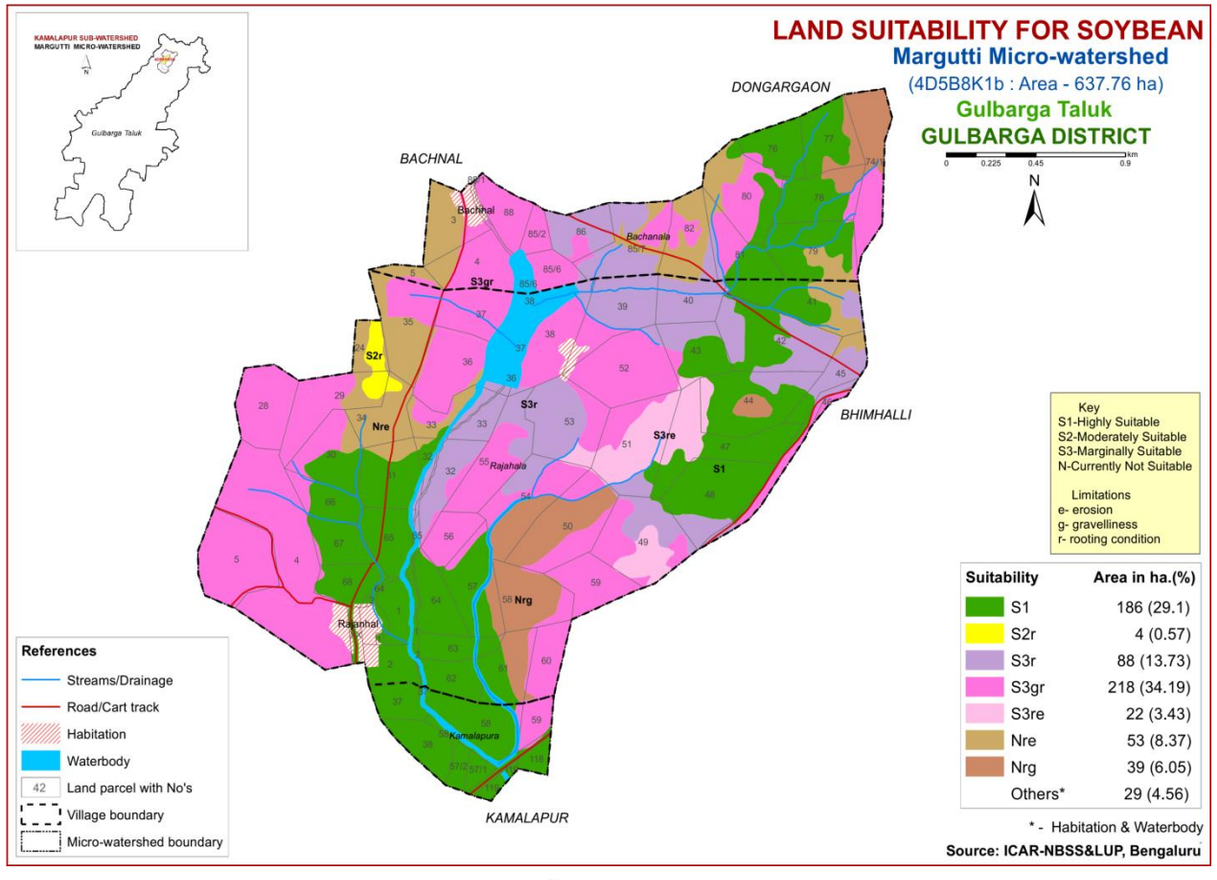

LAND SUITABILITY FOR COTTON
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
S3ge
S3gr
S2r
Nge
Ngl
S2rg
Ng
Nr
S3g
S3r
S2g
Nrg
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
g- gravelliness
r- rooting condition
e-erosion
l– topography
Suitability Subclass | Area in ha (%)
S1 43 (6.67)
S2r 56 (8.71)
S2g 14 (2.13)
S2rg 38 (5.97)
S3g 48 (7.52)
S3r 64 (9.90)
S3ge 23 (3.64)
S3gr 126 (19.66)
Ng 40 (6.29)
Nr 28 (4.37)
Nrg 56 (8.76)
Nge 17 (2.66)
Ngl 76 (11.85)
Others* 12 (1.85)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

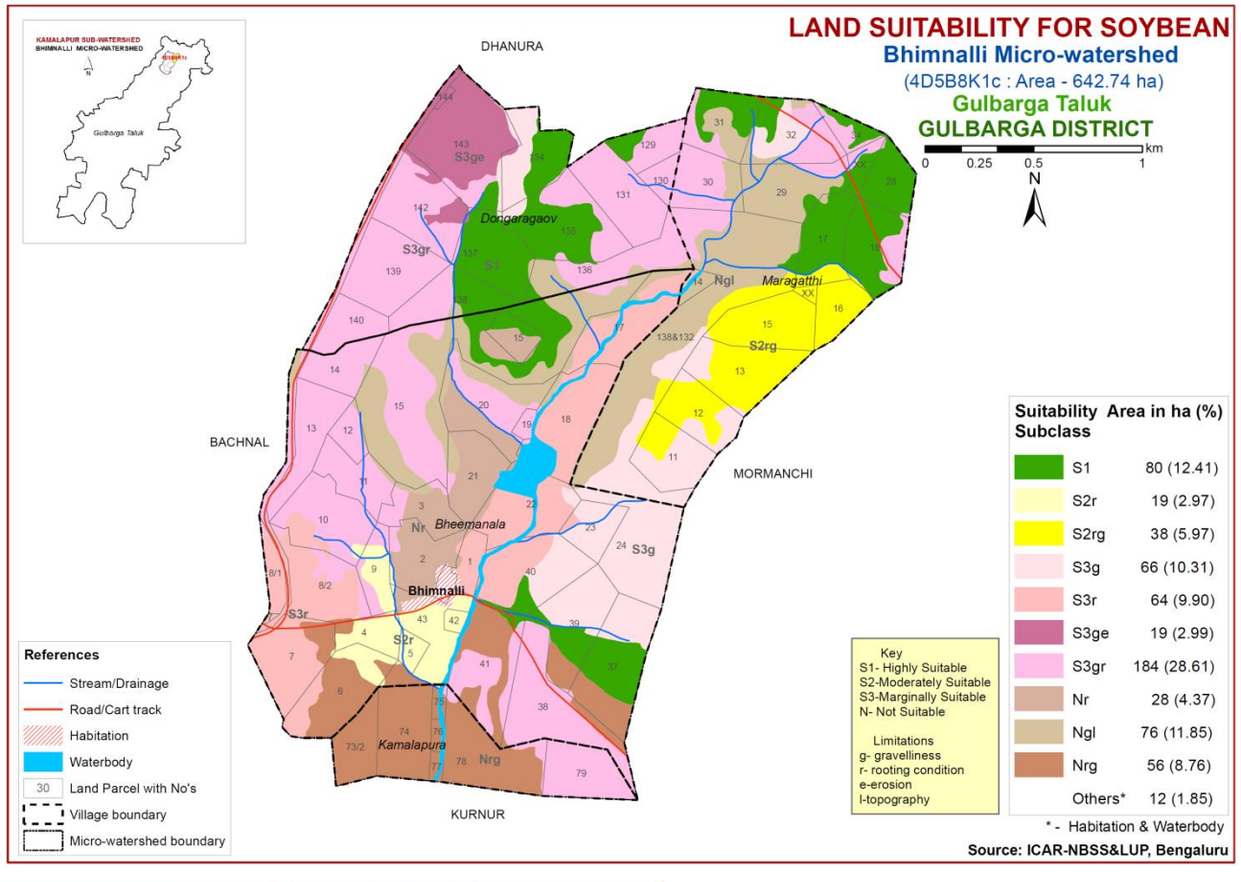

LAND SUITABILITY FOR COTTON
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
RAJANHAL
BHIMHALLI
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
S3gr
S3r
S2r
Nrl
S2g
Nre
Nrg
Ng
S3g
S3l
S1
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N-Not Suitable
Limitations
g- gravelliness
r- rooting condition
e-erosion
l– topography
Suitability Subclass | Area in ha.(%)
S1 71 (13.02)
S2g 65 (11.80)
S2r 42 (7.72)
S3g 22 (3.95)
S3r 49 (9.04)
S3l 5 (0.97)
S3gr 48 (8.85)
Ng 100 (18.24)
Nre 6 (1.10)
Nrg 7 (1.27)
Nrl 95 (17.44)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

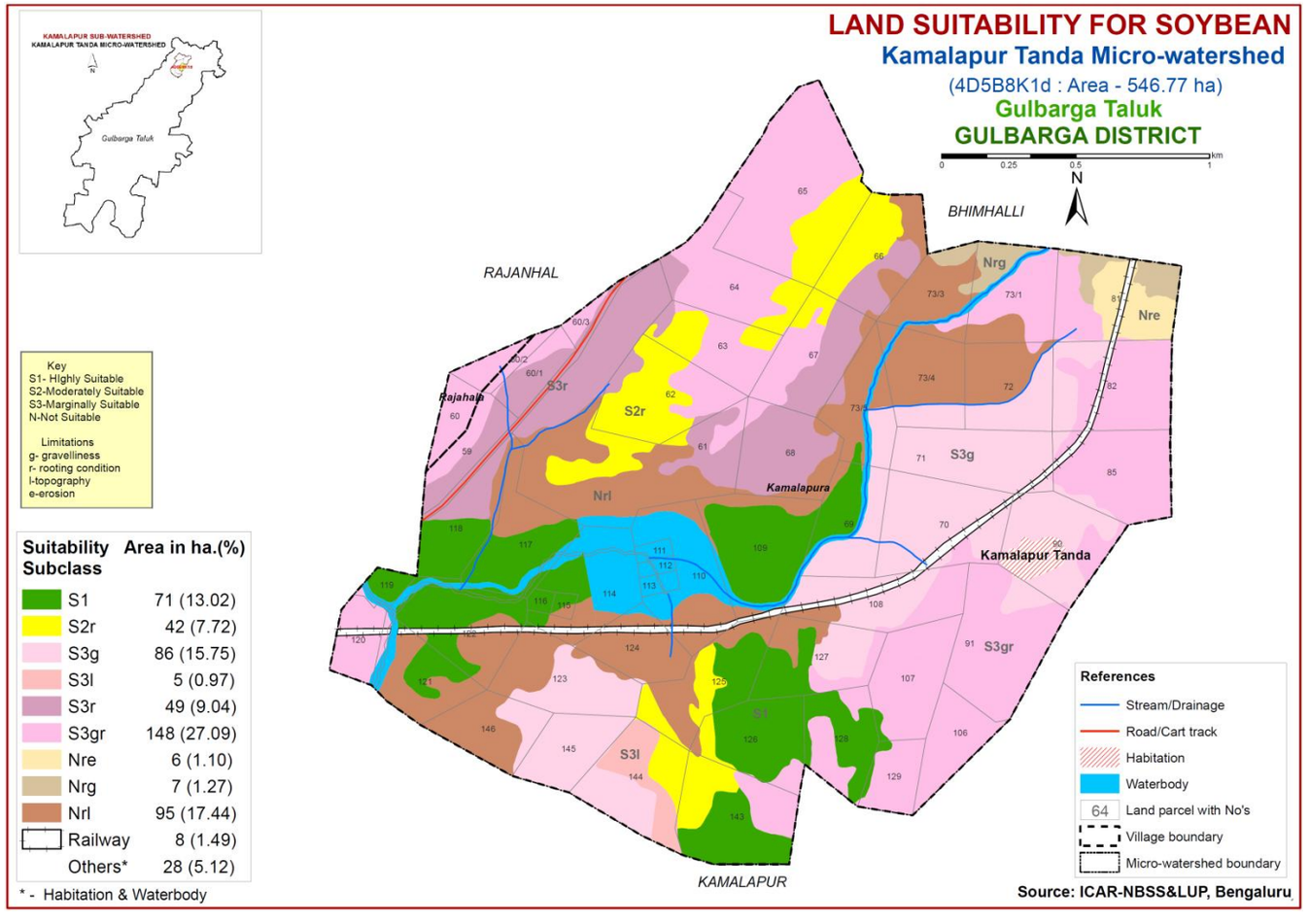

LAND SUITABILITY FOR SUGARCANE
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
0 0.225 0.45 0.9 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Bachanala
Rajahala
Rajanhal
Kamalapura
S3gr
Nt
Nre
S3t
Ngr
Nrt
Ngt
Key
S3-Marginally Suitable
N-Currently Not Suitable
Limitations
e- erosion
g- gravelliness
r- rooting condition
t-texture
Suitability Area in ha.(%)
S3t 189 (29.67)
S3gr 87 (13.59)
Nt 20 (3.18)
Ngr 74 (11.65)
Ngt 39 (6.05)
Nre 22 (3.43)
Nrt 178 (27.86)
Others* 29 (4.56)
* - Habitation & Waterbody
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

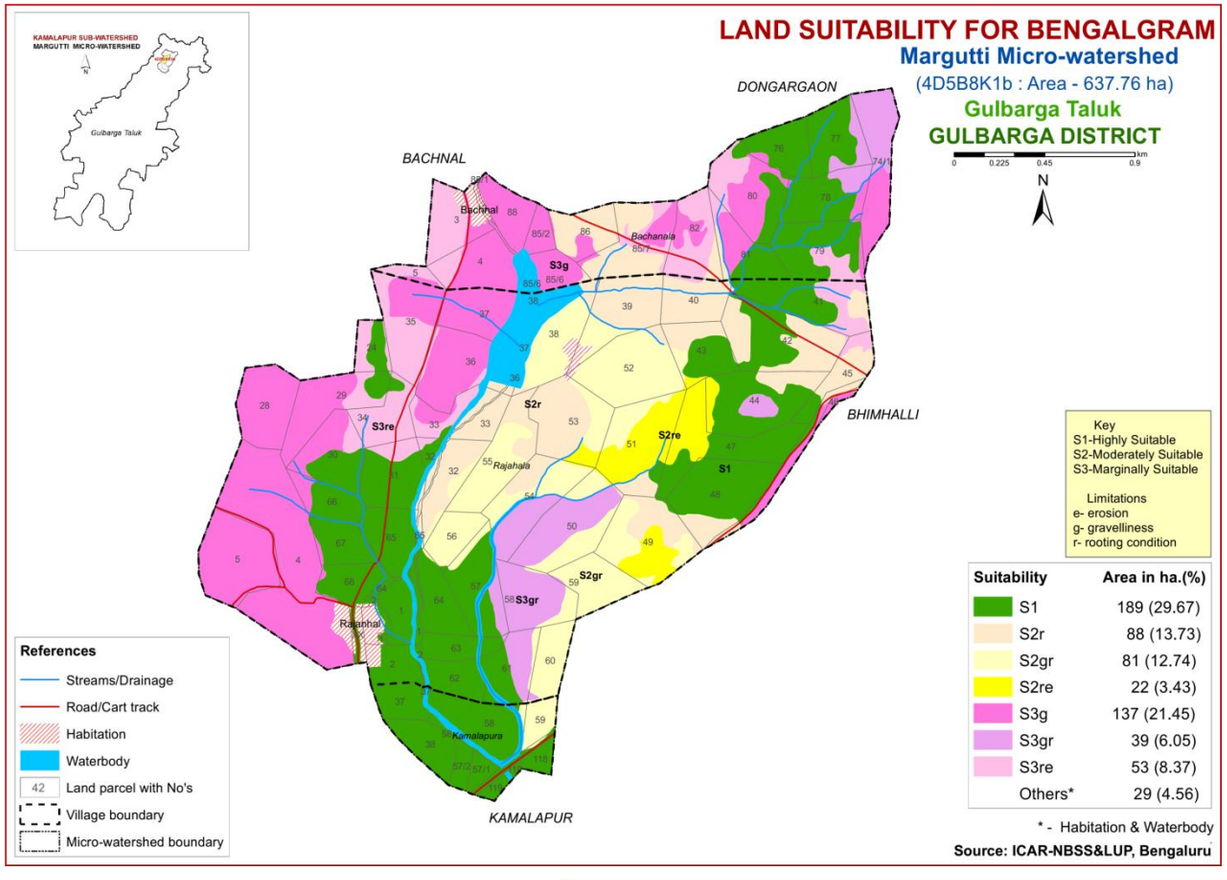

LAND SUITABILITY FOR SUGARCANE
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
0 0.25 0.5 1 km
N
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
Nge
S3ge
S3gt
S3gr
S3t
Ngl
S3rt
Ngr
S3g
Nrt
Ngt
Key
S3-Marginally Suitable
N- Not Suitable
Limitations
g- gravelliness
r- rooting condition
e-erosion
l-topography
t-texture
Suitability Area in ha (%)
Subclass
S3g 58 (9.09)
S3t 83 (12.98)
S3ge 17 (2.63)
S3gt 4 (0.57)
S3gr 126 (19.66)
S3rt 54 (8.39)
Nge 6 (1.01)
Ngl 76 (11.85)
Ngr 57 (8.94)
Ngt 56 (8.76)
Nrt 92 (14.27)
Others* 12 (1.85)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

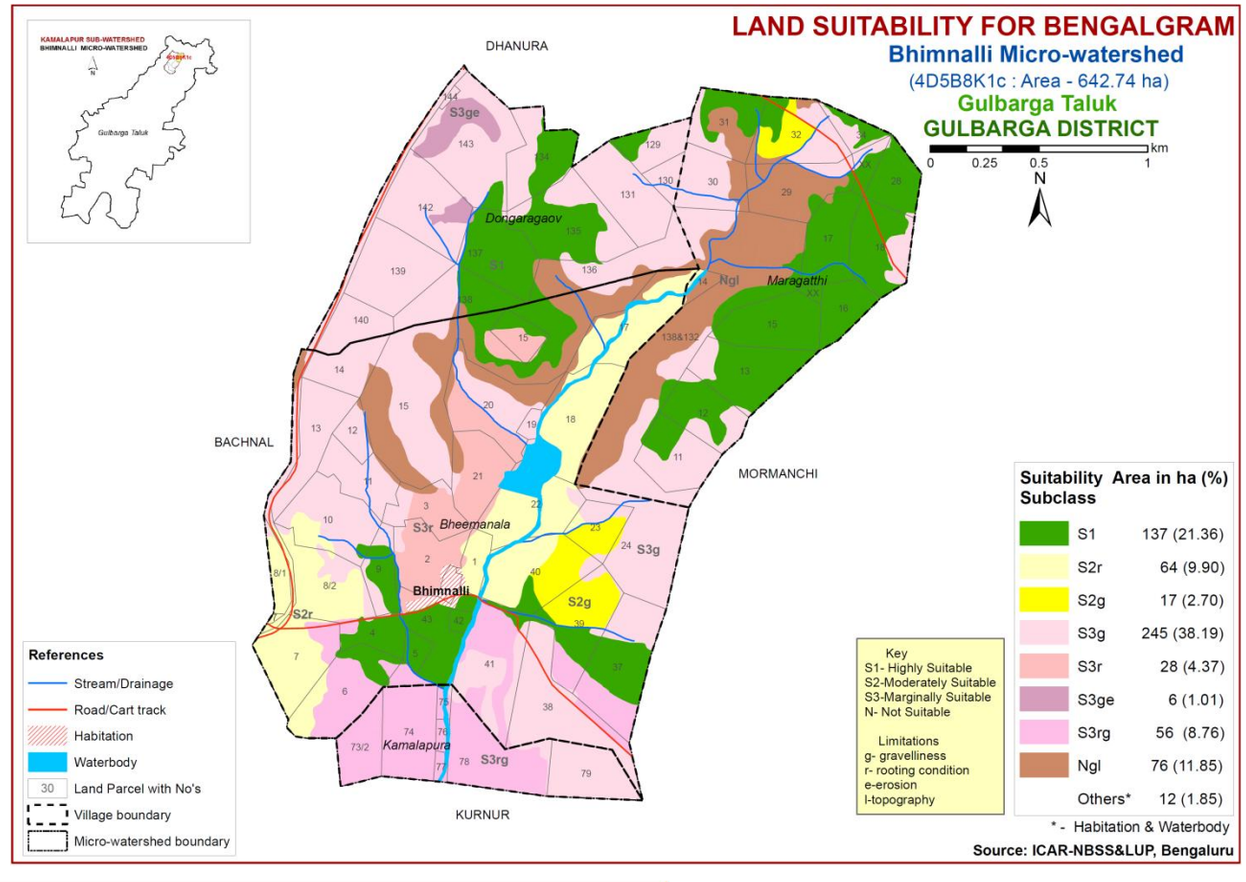

LAND SUITABILITY FOR SUGARCANE
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
KAMALAPUR
Kamalapura Tanda
Rajahala
Kamalapura
Nrt
Nt
Ngt
S3g
S3gr
S3t
S3gt
S3tl
Ngr
Key
S3-Marginally Suitable
N-Not Suitable
Limitations
g- gravelliness
r- rooting condition
l-topography
t-texture
Suitability Area in ha.(%)
Subclass
S3g 65 (11.80)
S3t 113 (20.74)
S3gr 37 (6.84)
S3gt 22 (3.95)
S3tl 5 (0.97)
Nt 49 (9.04)
Ngr 100 (18.24)
Ngt 101 (18.53)
Nrt 18 (3.27)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

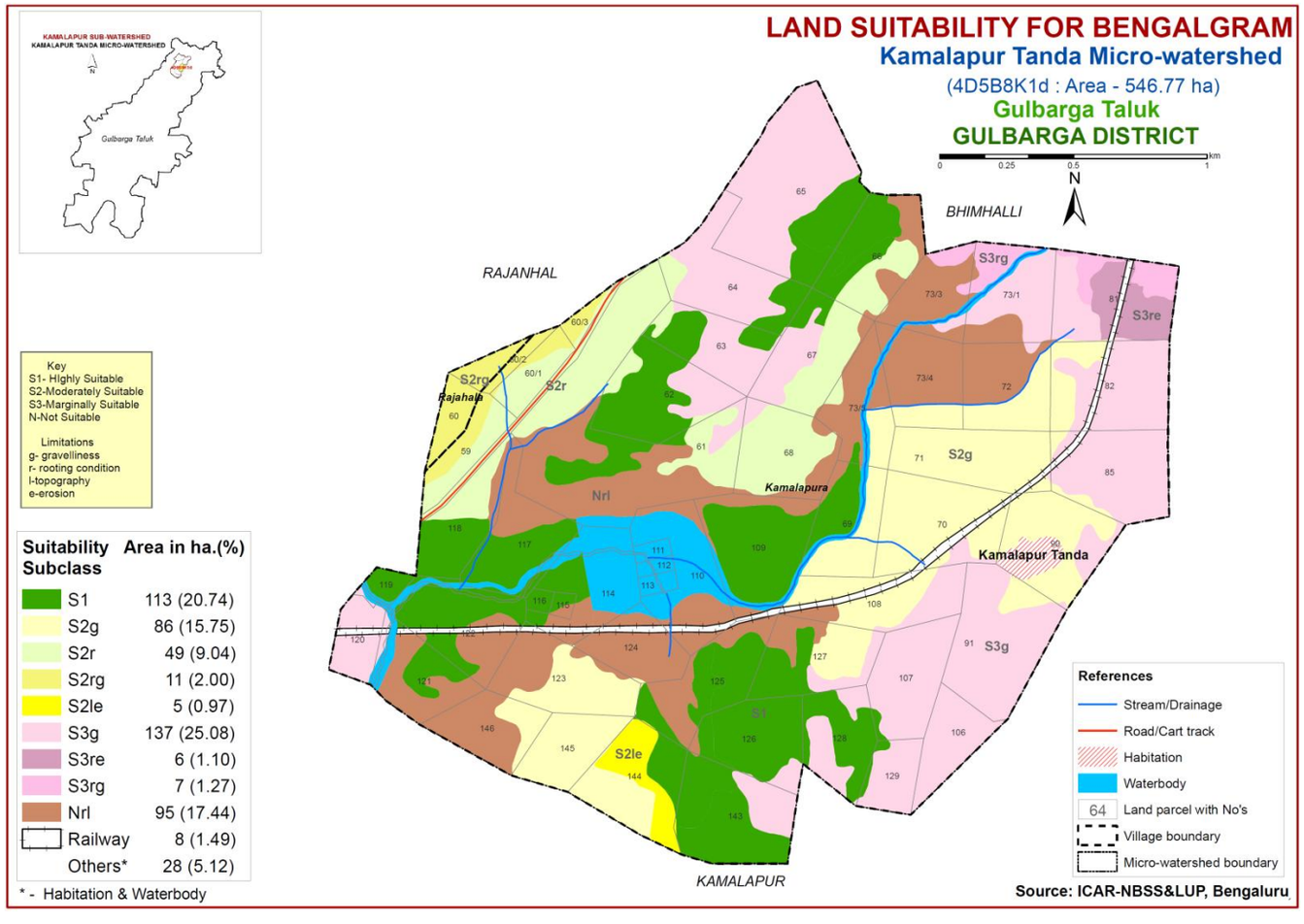

LAND SUITABILITY FOR SOYBEAN
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Bachanala
Rajahala
Rajanhal
Kamalapura
S3gr
S2r
S3r
S3re
Nre
Nrg
S1
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N-Currently Not Suitable
Limitations
e- erosion
g- gravelliness
r- rooting condition
Suitability
Area in ha.(%)
S1 186 (29.1)
S2r 4 (0.57)
S3r 88 (13.73)
S3gr 218 (34.19)
S3re 22 (3.43)
Nre 53 (8.37)
Nrg 39 (6.05)
Others* 29 (4.56)
* - Habitation & Waterbody
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

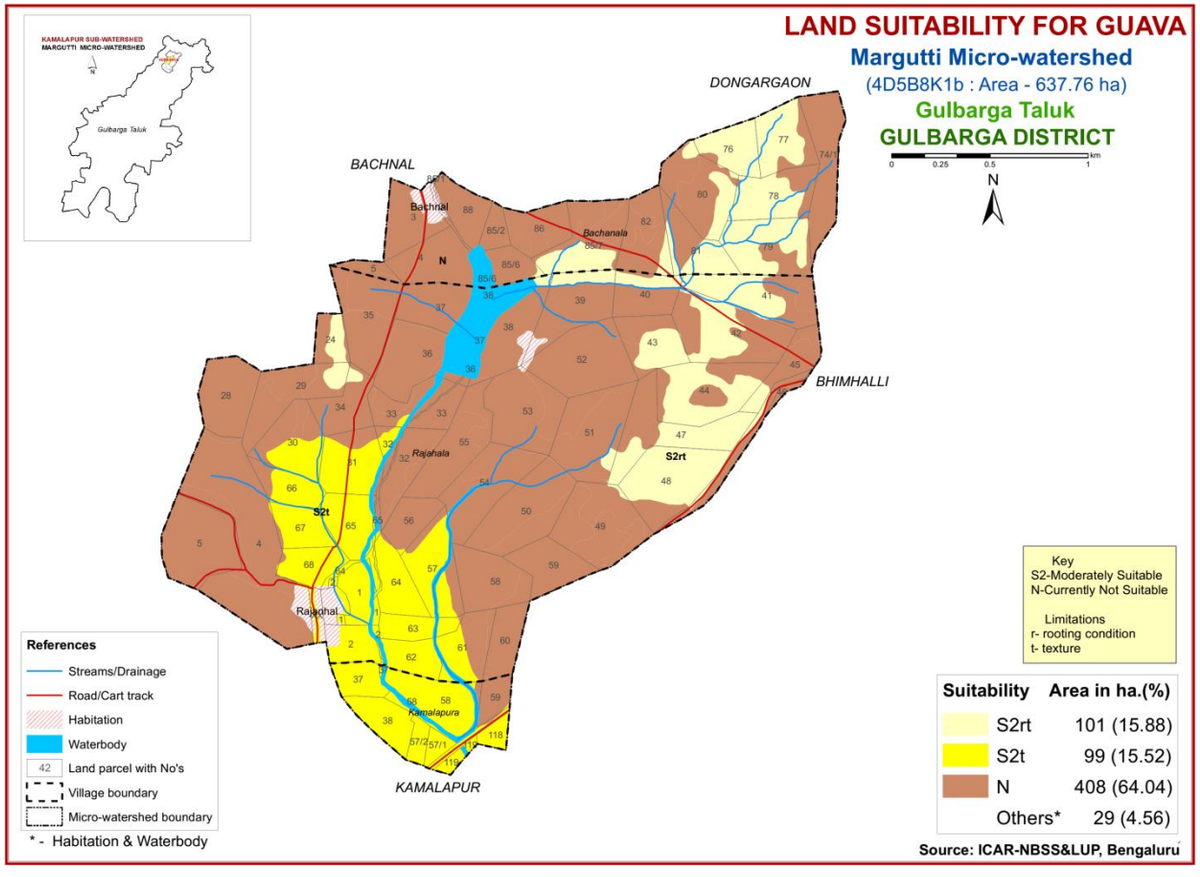

LAND SUITABILITY FOR SOYBEAN
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
S3ge
S3gr
S2rg
S3g
S3r
S2r
Ngl
Nr
Nrg
Key
S1- Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
g- gravelliness
r- rooting condition
e-erosion
l-topography
Suitability Subclass
Area in ha (%)
S1 80 (12.41)
S2r 19 (2.97)
S2rg 38 (5.97)
S3g 66 (10.31)
S3r 64 (9.90)
S3ge 19 (2.99)
S3gr 184 (28.61)
Nr 28 (4.37)
Ngl 76 (11.85)
Nrg 56 (8.76)
Others* 12 (1.85)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

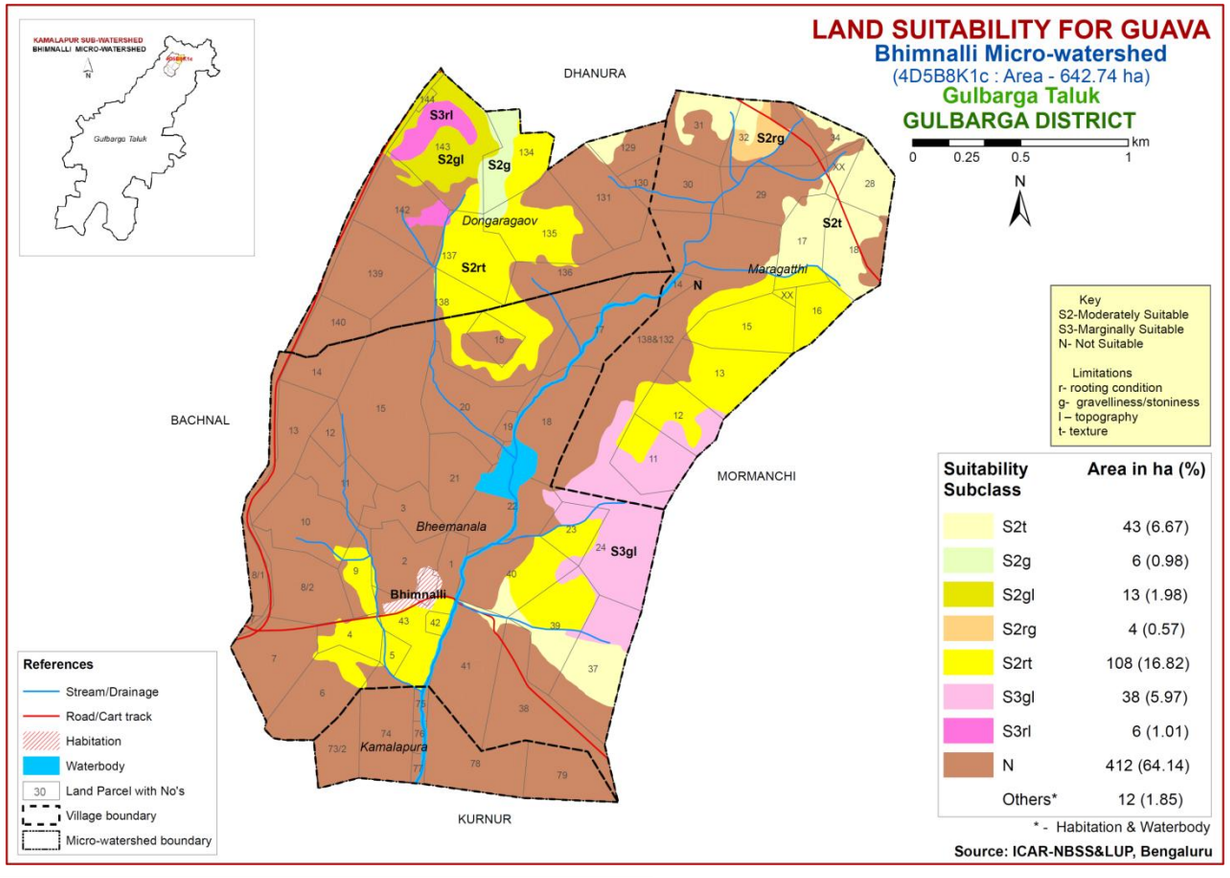

LAND SUITABILITY FOR SOYBEAN
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
RAJANHAL
BHIMHALLI
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
S3r
S2r
Nrl
S3g
S3gr
S3l
Nre
Nrg
Key
S1- HIghly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N-Not Suitable
Limitations
g- gravelliness
r- rooting condition
l-topography
e-erosion
Suitability Subclass
Area in ha.(%)
S1 71 (13.02)
S2r 42 (7.72)
S3g 86 (15.75)
S3l 5 (0.97)
S3r 49 (9.04)
S3gr 148 (27.09)
Nre 6 (1.10)
Nrg 7 (1.27)
Nrl 95 (17.44)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

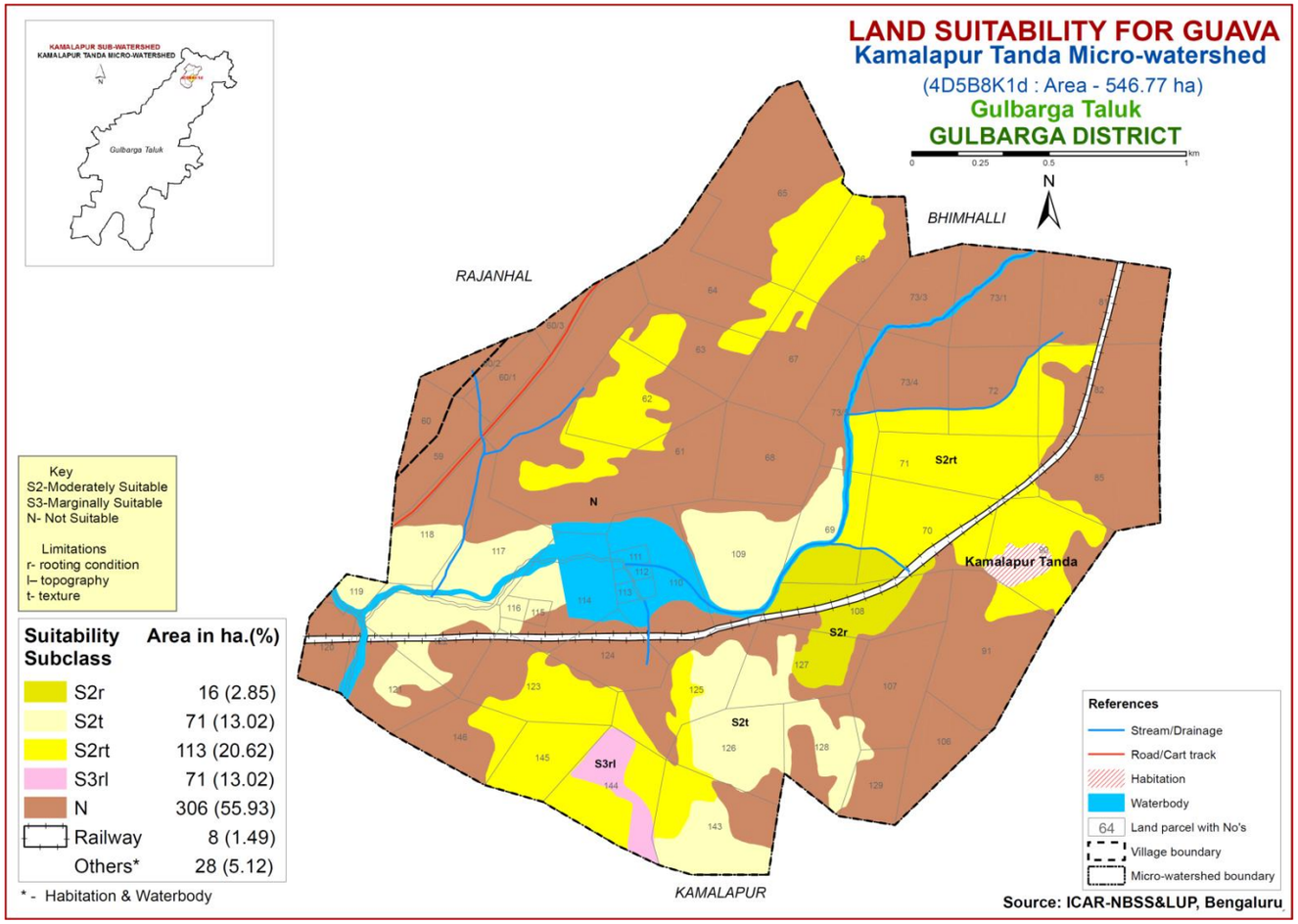

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR BENGALGRAM
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.225 0.45 0.9 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Bachanala
Rajahala
Kamalapura
Rajanhal
S1
S2r
S2re
S2gr
S3g
S3gr
S3re
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
Limitations
e- erosion
g- gravelliness
r- rooting condition
Suitability | Area in ha.(%)
S1 189 (29.67)
S2r 88 (13.73)
S2gr 81 (12.74)
S2re 22 (3.43)
S3g 137 (21.45)
S3gr 39 (6.05)
S3re 53 (8.37)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land parcel with No's
Village boundary
Micro-watershed boundary

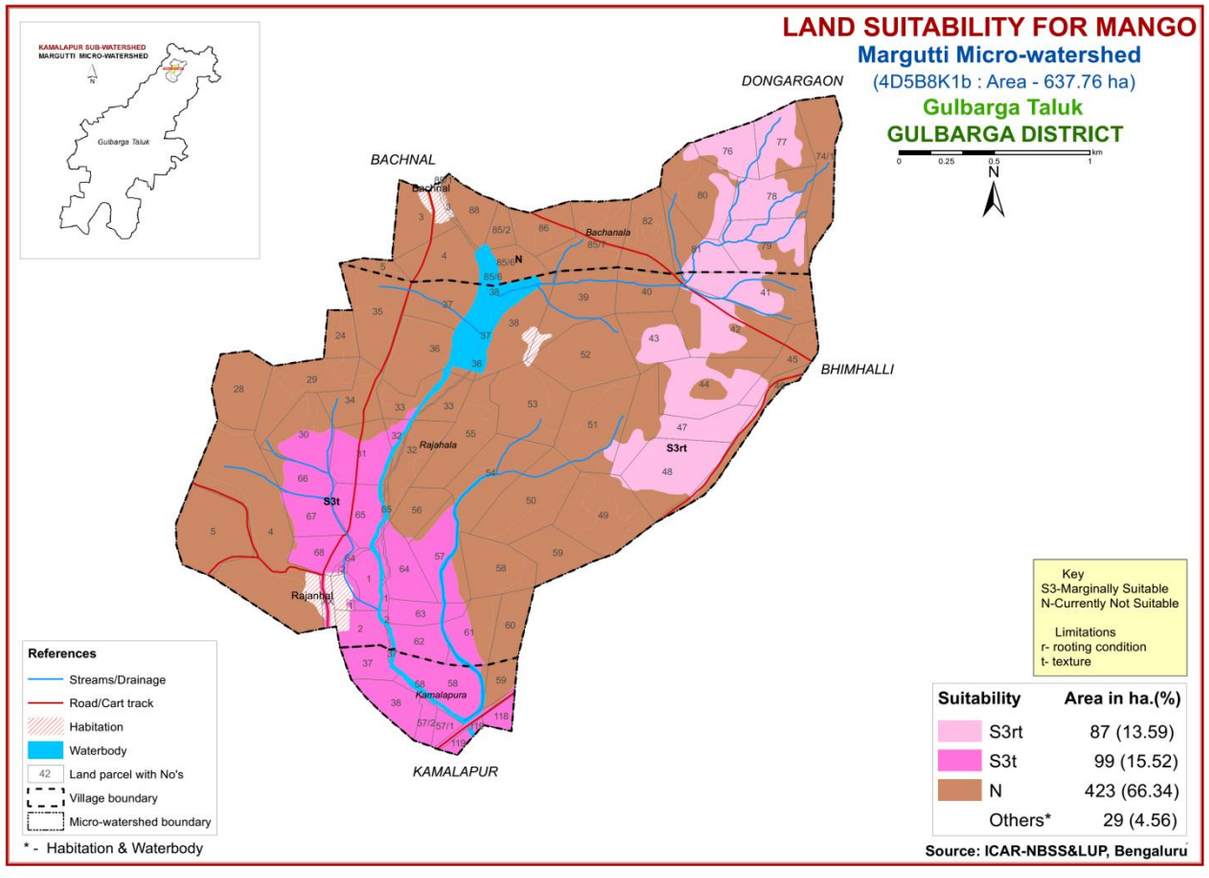

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR BENGALGRAM
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
S3ge
S3r
S3g
S2r
S2g
S3rg
Ngl
Key
S1- Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
g- gravelliness
r- rooting condition
e-erosion
l-topography
Suitability Subclass | Area in ha (%)
S1 137 (21.36)
S2r 64 (9.90)
S2g 17 (2.70)
S3g 245 (38.19)
S3r 28 (4.37)
S3ge 6 (1.01)
S3rg 56 (8.76)
Ngl 76 (11.85)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary

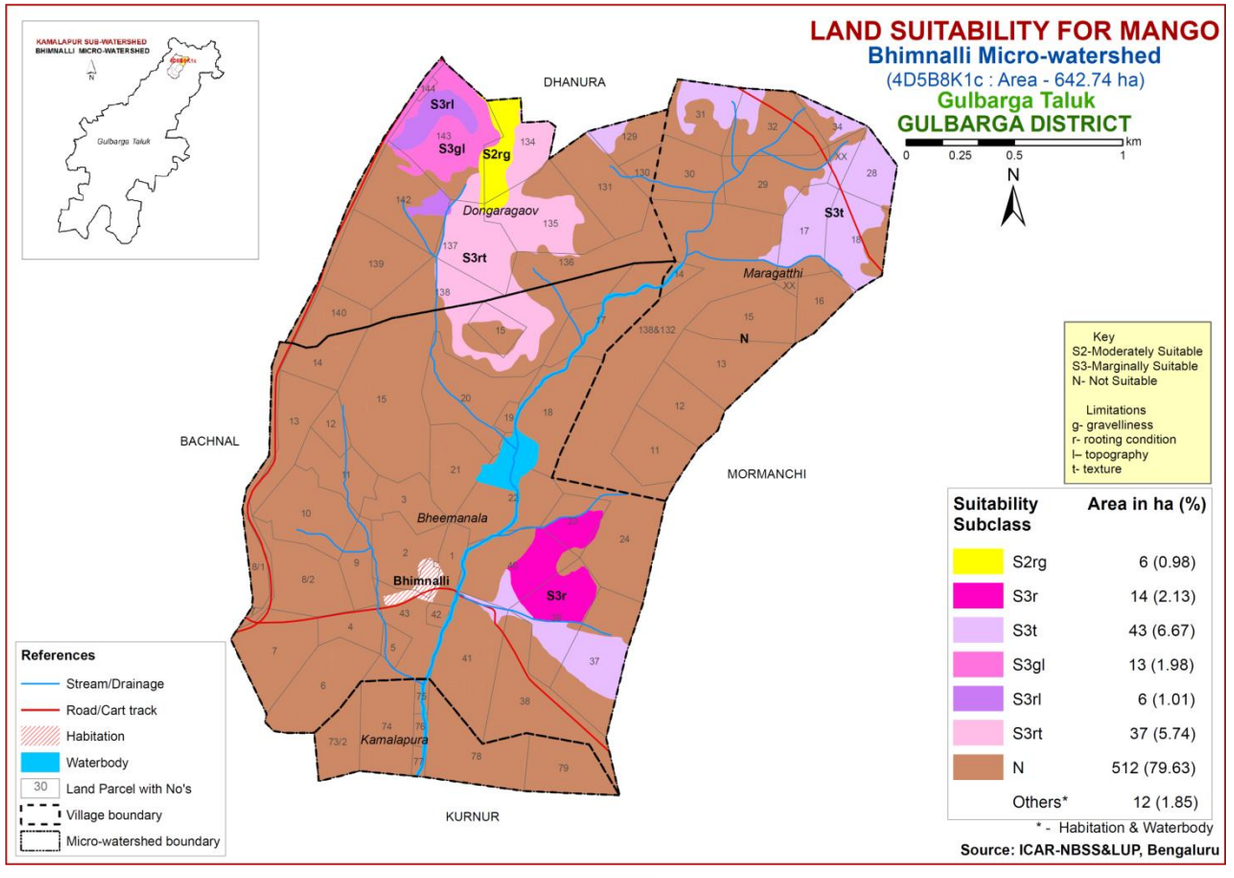

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR BENGALGRAM
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
S3rg
S3re
S2rg
S2r
Nrl
S2g
S3g
S2le
Key
S1- Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N-Not Suitable
Limitations
g- gravelliness
r- rooting condition
l-topography
e-erosion
Suitability Subclass | Area in ha.(%)
S1 113 (20.74)
S2g 86 (15.75)
S2r 49 (9.04)
S2rg 11 (2.00)
S2le 5 (0.97)
S3g 137 (25.08)
S3re 6 (1.10)
S3rg 7 (1.27)
Nrl 95 (17.44)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

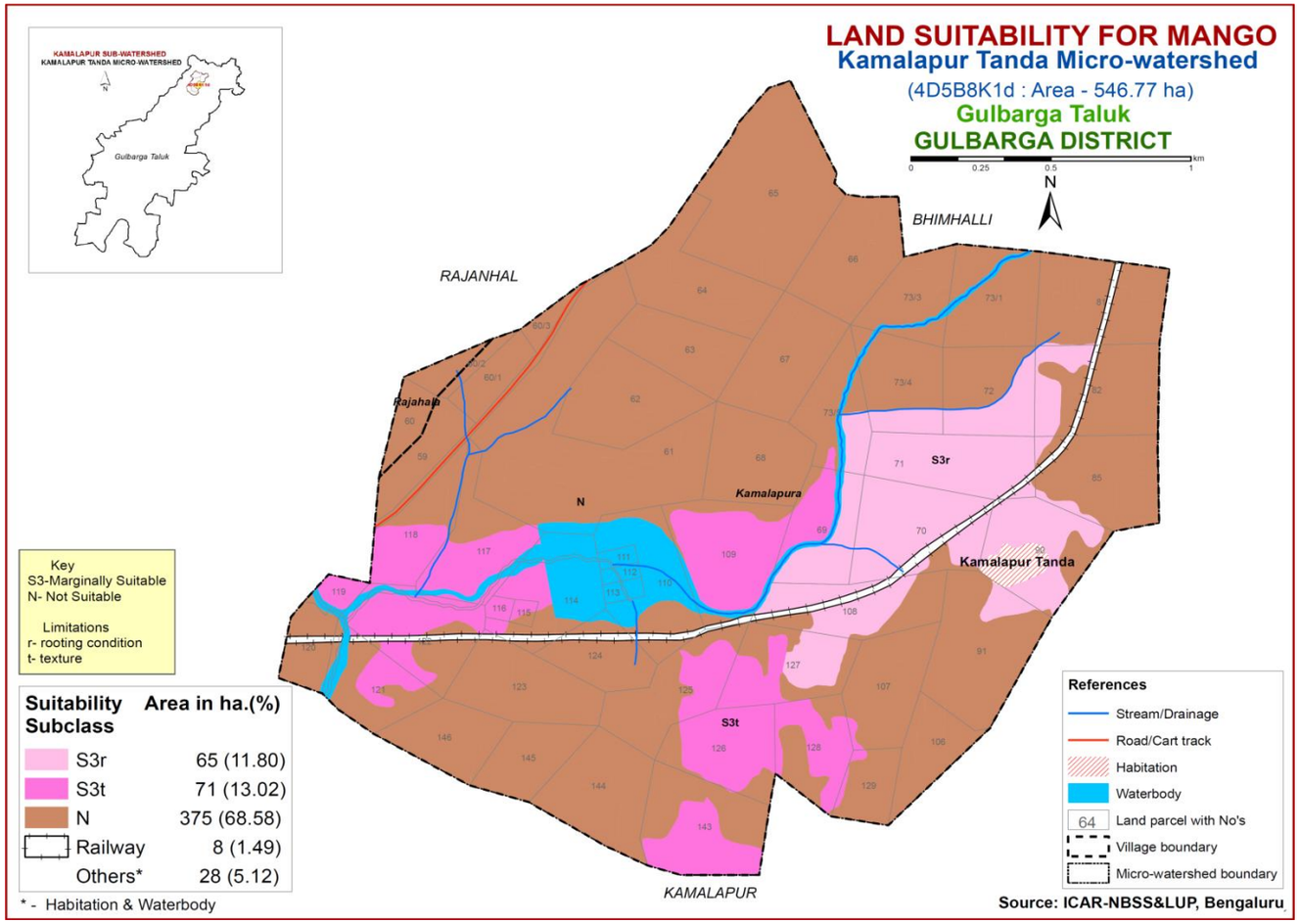

LAND SUITABILITY FOR GUAVA
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Bachanala
Rajahala
Rajaghal
Kamalapura
S2t
S2rt
N
0 0.25 0.5 1 km
Key
S2-Moderately Suitable
N-Currently Not Suitable
Limitations
r- rooting condition
t- texture
Suitability | Area in ha.(%)
S2rt 101 (15.88)
S2t 99 (15.52)
N 408 (64.04)
Others* 29 (4.56)
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

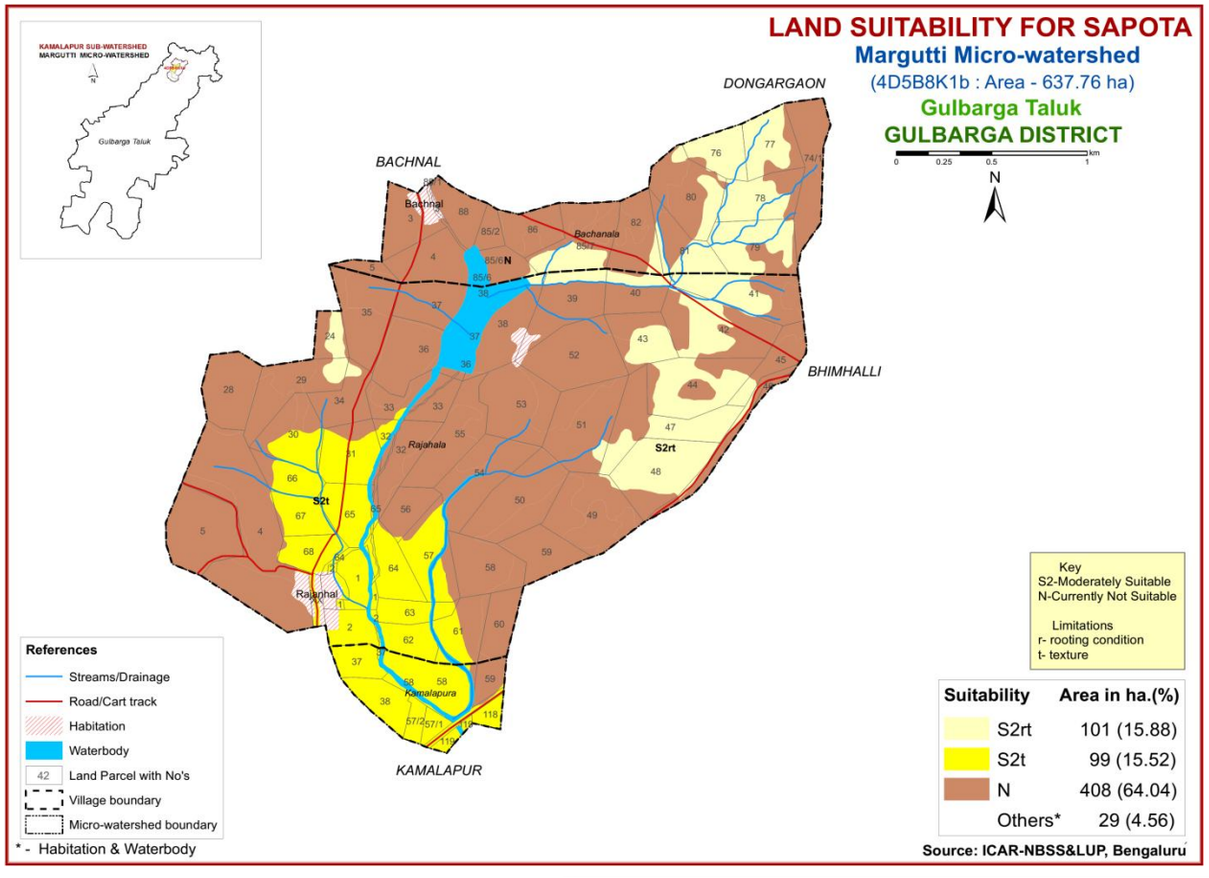

LAND SUITABILITY FOR GUAVA
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
S3rl
S2gl
S2g
S2rg
S2t
S2rt
S3gl
N
0 0.25 0.5 1 km
Key
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
r- rooting condition
g- gravelliness/stoniness
l – topography
t- texture
Suitability Subclass | Area in ha (%)
S2t 43 (6.67)
S2g 6 (0.98)
S2gl 13 (1.98)
S2rg 4 (0.57)
S2rt 108 (16.82)
S3gl 38 (5.97)
S3rl 6 (1.01)
N 412 (64.14)
Others* 12 (1.85)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

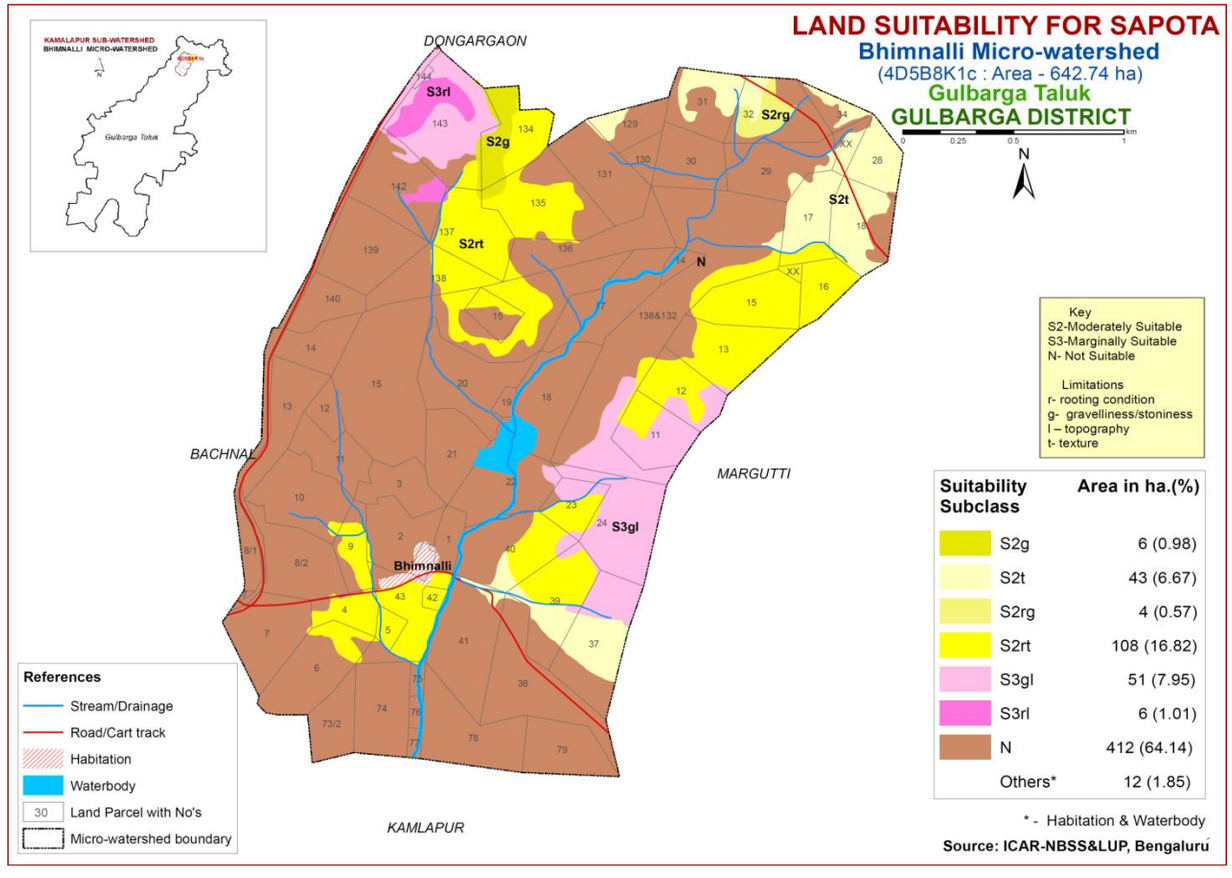

LAND SUITABILITY FOR GUAVA
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
RAJANHAL
BHIMHALLI
KAMALAPUR
Kamalapur Tanda
S2rt
S2r
S2t
S3rl
N
0 0.25 0.5 1 km
Key
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
r- rooting condition
l– topography
t- texture
Suitability Subclass | Area in ha.(%)
S2r 16 (2.85)
S2t 71 (13.02)
S2rt 113 (20.62)
S3rl 71 (13.02)
N 306 (55.93)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

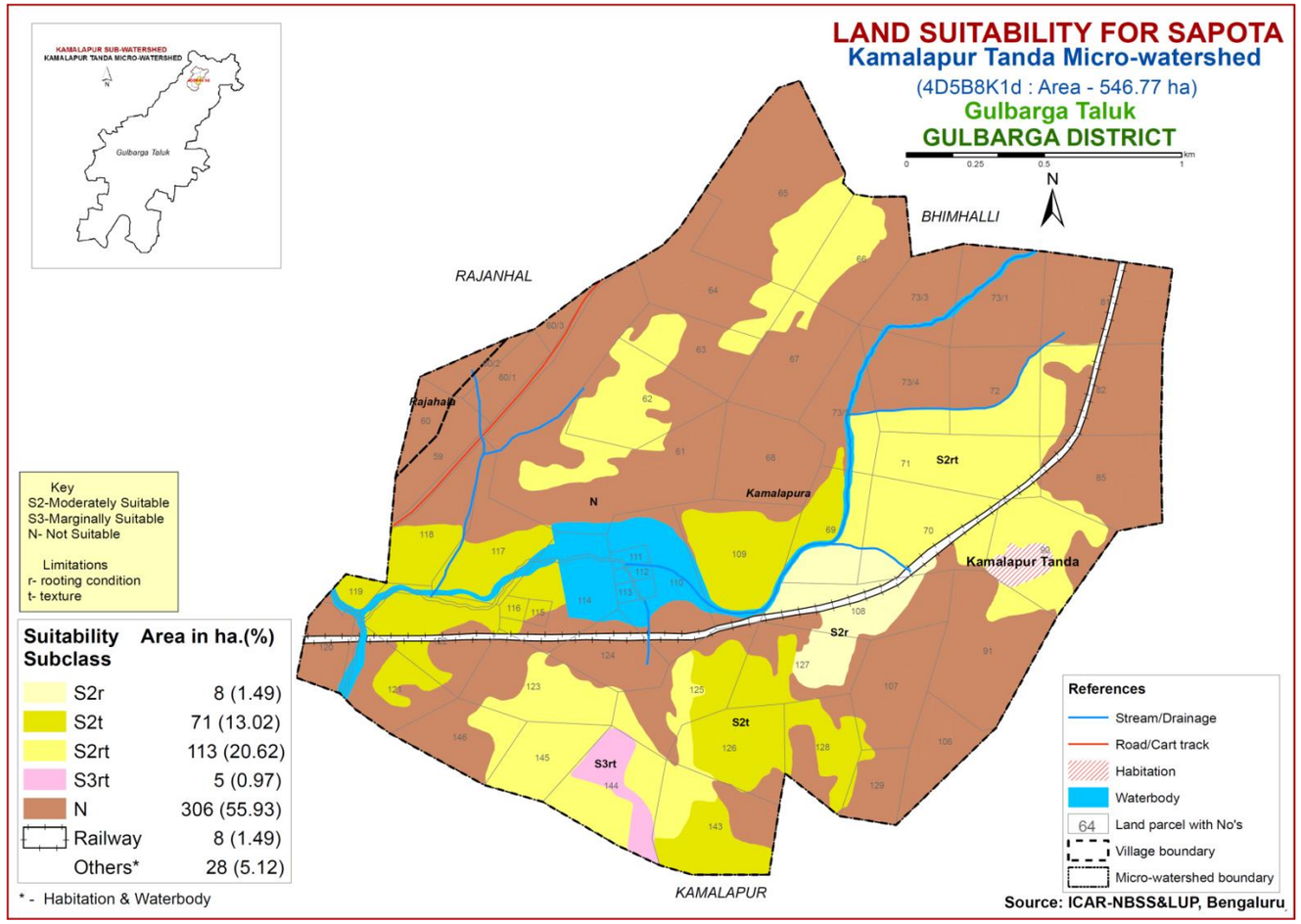

LAND SUITABILITY FOR MANGO
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachanala
Rajahala
Kamalapura
Rajanhal
S3t
S3rt
N
Key
S3-Marginally Suitable
N-Currently Not Suitable
Limitations
r- rooting condition
t- texture
Suitability
Area in ha.(%)
S3rt 87 (13.59)
S3t 99 (15.52)
N 423 (66.34)
Others* 29 (4.56)
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

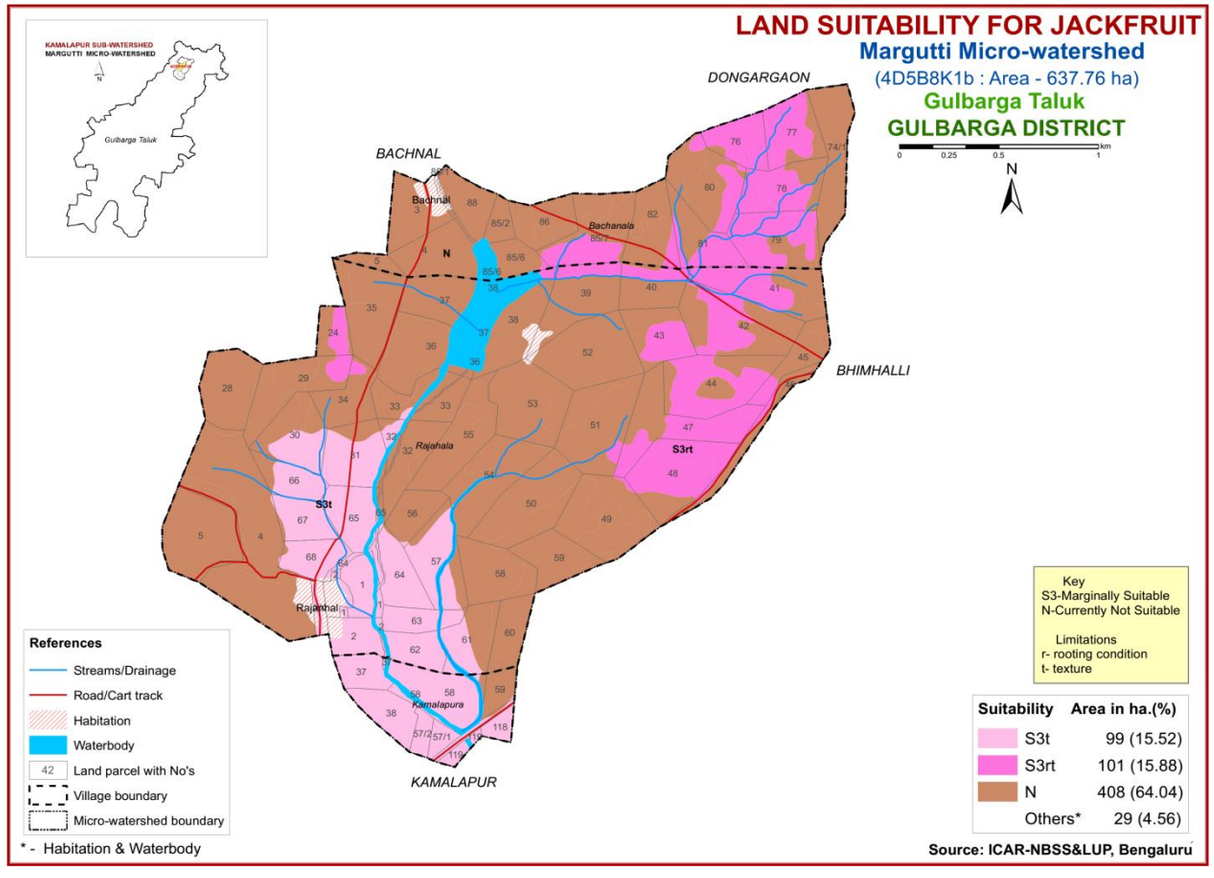

LAND SUITABILITY FOR MANGO
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
S3rl
S3gl
S2rg
S3rt
S3t
S3r
N
Key
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
g- gravelliness
r- rooting condition
l– topography
t- texture
Suitability Subclass
Area in ha (%)
S2rg 6 (0.98)
S3r 14 (2.13)
S3t 43 (6.67)
S3gl 13 (1.98)
S3rl 6 (1.01)
S3rt 37 (5.74)
N 512 (79.63)
Others* 12 (1.85)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

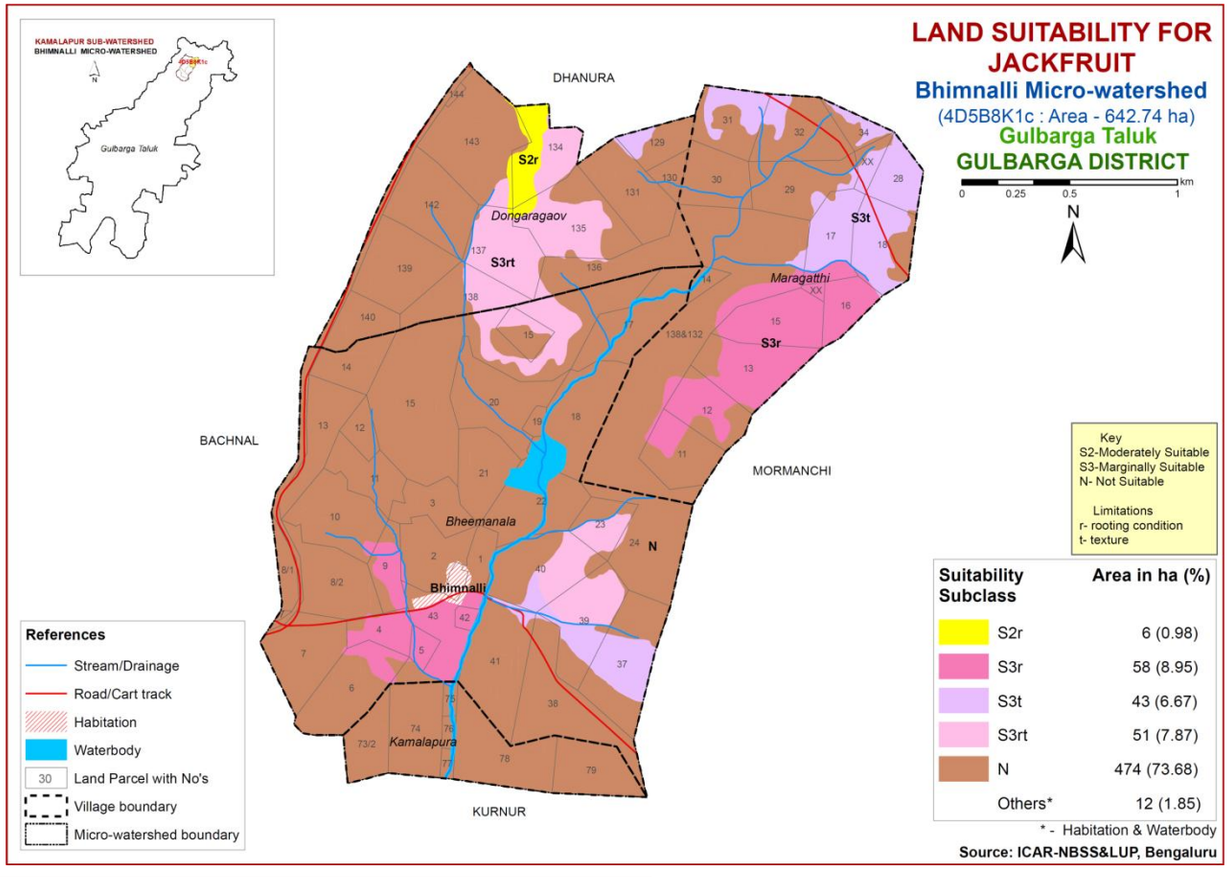

LAND SUITABILITY FOR MANGO
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
BHIMHALLI
RAJANHAL
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
S3r
S3t
N
Key
S3-Marginally Suitable
N- Not Suitable
Limitations
r- rooting condition
t- texture
Suitability Subclass
Area in ha.(%)
S3r 65 (11.80)
S3t 71 (13.02)
N 375 (68.58)
Railway 8 (1.49)
Others* 28 (5.12)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

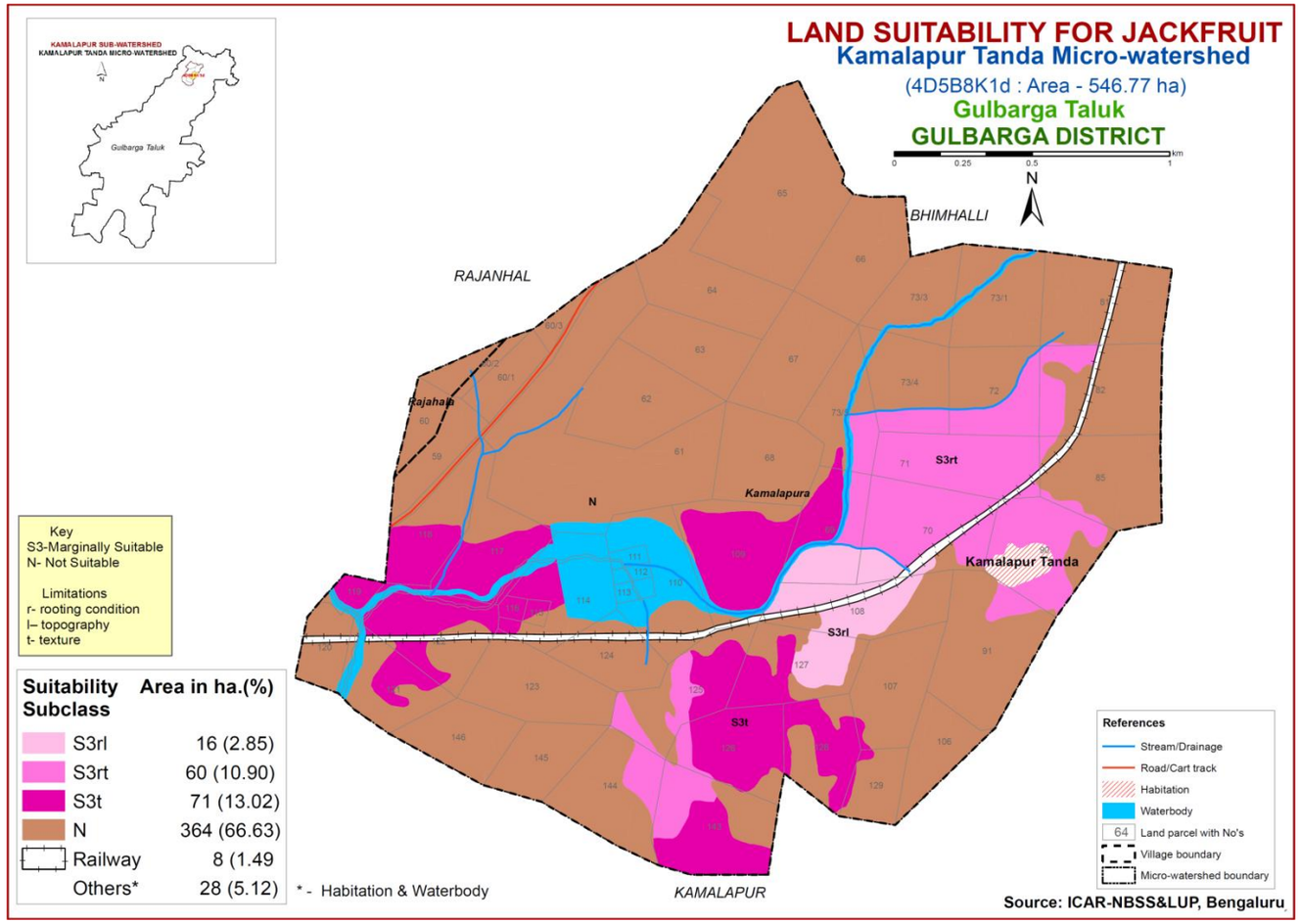

LAND SUITABILITY FOR SAPOTA
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Bachanala
Rajahala
Rajanhal
Kamalapura
S2t
S2rt
N
Key
S2-Moderately Suitable
N-Currently Not Suitable
Limitations
r- rooting condition
t- texture
Suitability
Area in ha.(%)
S2rt 101 (15.88)
S2t 99 (15.52)
N 408 (64.04)
Others* 29 (4.56)
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

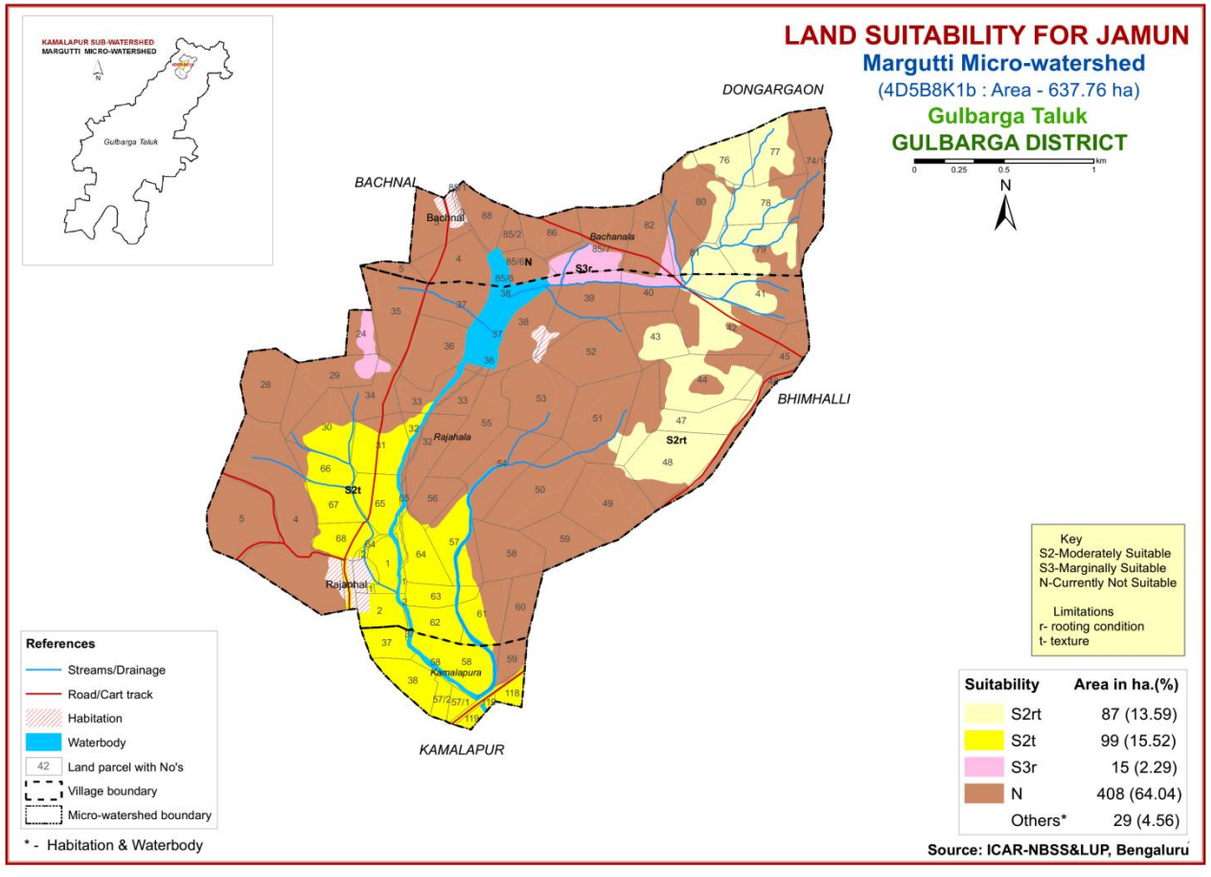

LAND SUITABILITY FOR SAPOTA
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
DONGARGAON
BACHNAL
MARGUTTI
KAMLAPUR
Bhimnalli
S3rl
S2g
S2rg
S2rt
S2t
S3gl
N
Key
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
r- rooting condition
g- gravelliness/stoniness
l – topography
t- texture
Suitability Subclass
Area in ha.(%)
S2g 6 (0.98)
S2t 43 (6.67)
S2rg 4 (0.57)
S2rt 108 (16.82)
S3gl 51 (7.95)
S3rl 6 (1.01)
N 412 (64.14)
Others* 12 (1.85)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

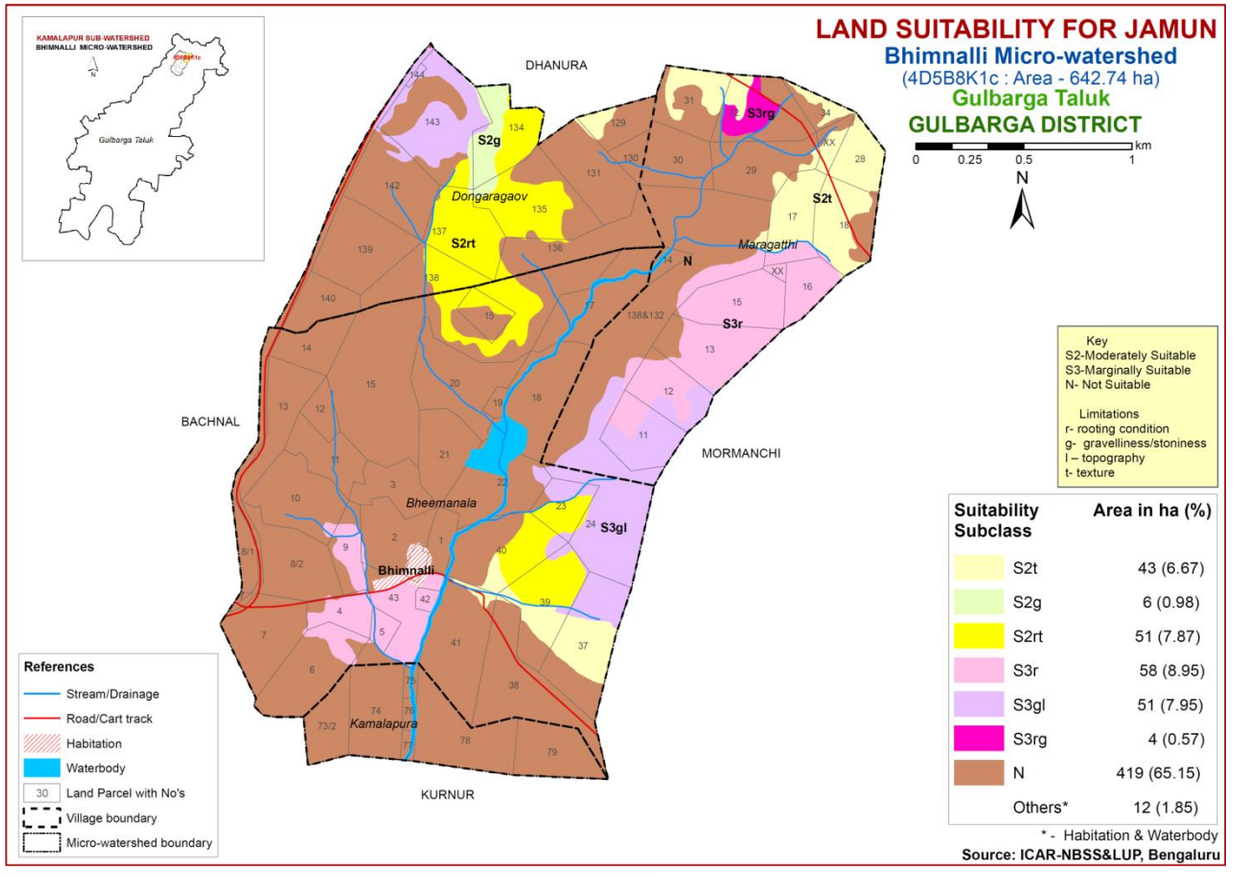

LAND SUITABILITY FOR SAPOTA
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
RAJANHAL
BHIMHALLI
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
N
S2rt
S2r
S2t
S3rt
Key
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
r- rooting condition
t- texture
Suitability Subclass
Area in ha.(%)
S2r 8 (1.49)
S2t 71 (13.02)
S2rt 113 (20.62)
S3rt 5 (0.97)
N 306 (55.93)
Railway 8 (1.49)
Others* 28 (5.12)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

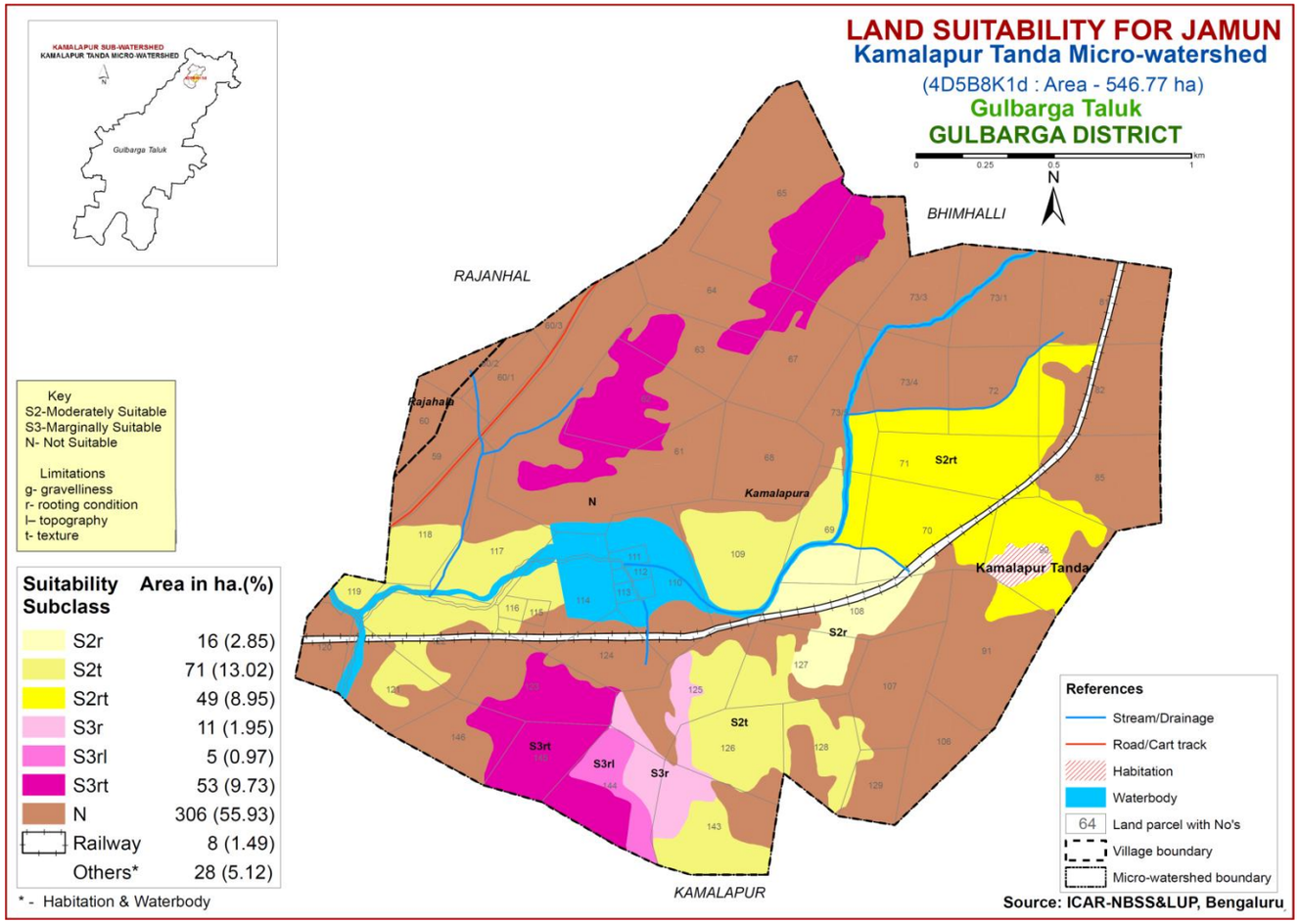

LAND SUITABILITY FOR JACKFRUIT
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Bachanala
Rajahala
Rajanhal
Kamalapura
S3t
S3rt
N
Key
S3-Marginally Suitable
N-Currently Not Suitable
Limitations
r- rooting condition
t- texture
Suitability
Area in ha.(%)
S3t 99 (15.52)
S3rt 101 (15.88)
N 408 (64.04)
Others* 29 (4.56)
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru


LAND SUITABILITY FOR JACKFRUIT
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
S2r
S3rt
S3t
S3r
N
Key
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
r- rooting condition
t- texture
Suitability Subclass
Area in ha (%)
S2r 6 (0.98)
S3r 58 (8.95)
S3t 43 (6.67)
S3rt 51 (7.87)
N 474 (73.68)
Others* 12 (1.85)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru


LAND SUITABILITY FOR JACKFRUIT
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
RAJANHAL
BHIMHALLI
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
S3rt
S3rl
S3t
N
Key
S3-Marginally Suitable
N- Not Suitable
Limitations
r- rooting condition
l– topography
t- texture
Suitability Subclass
Area in ha.(%)
S3rl 16 (2.85)
S3rt 60 (10.90)
S3t 71 (13.02)
N 364 (66.63)
Railway 8 (1.49
Others* 28 (5.12)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru


KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR JAMUN
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachanala
Rajahala
Kamalapura
S2t
S2rt
S3r
Key
S2-Moderately Suitable
S3-Marginally Suitable
N-Currently Not Suitable
Limitations
r- rooting condition
t- texture
Suitability Area in ha.(%)
S2rt 87 (13.59)
S2t 99 (15.52)
S3r 15 (2.29)
N 408 (64.04)
Others* 29 (4.56)
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru


KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR JAMUN
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthl
Bheemanala
Bhimnalli
Kamalapura
S2g
S2rt
S2t
S3r
S3rg
S3gl
Key
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
r- rooting condition
g- gravelliness/stoniness
l – topography
t- texture
Suitability Subclass Area in ha (%)
S2t 43 (6.67)
S2g 6 (0.98)
S2rt 51 (7.87)
S3r 58 (8.95)
S3gl 51 (7.95)
S3rg 4 (0.57)
N 419 (65.15)
Others* 12 (1.85)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru


KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR JAMUN
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
KAMALAPUR
Rajahan
Kamalapura
Kamalapur Tanda
S2rt
S2r
S2t
S3rt
S3rl
S3r
Key
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
g- gravelliness
r- rooting condition
l– topography
t- texture
Suitability Subclass Area in ha.(%)
S2r 16 (2.85)
S2t 71 (13.02)
S2rt 49 (8.95)
S3r 11 (1.95)
S3rl 5 (0.97)
S3rt 53 (9.73)
N 306 (55.93)
Railway 8 (1.49)
Others* 28 (5.12)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

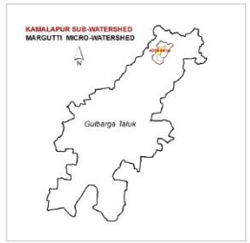
LAND SUITABILITY FOR MUSAMBI

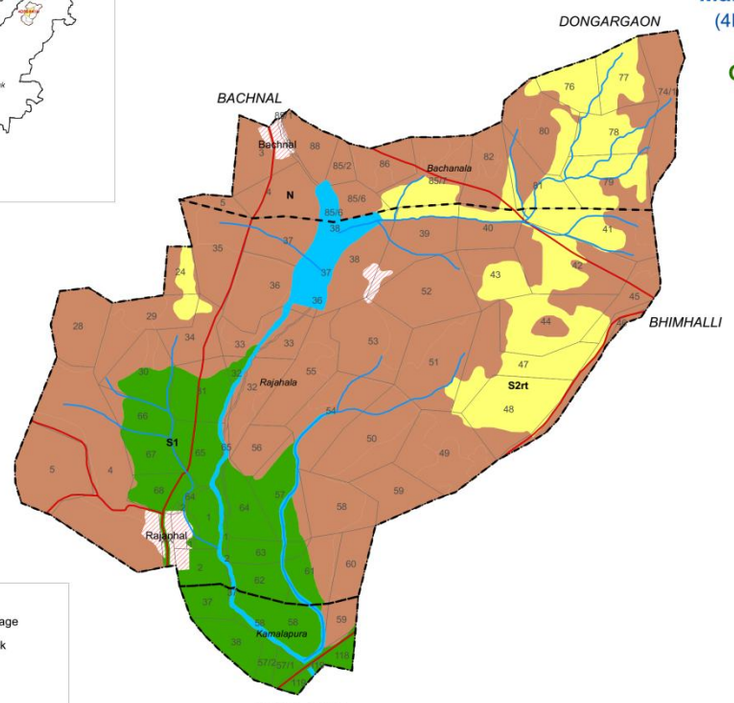
Margutti Micro-watershed

(4D5B8K1b : Area - 637.76 ha)

Gulbarga Taluk

GULBARGA DISTRICT





Key
S1-Highly Suitable
S2-Moderately Suitable
N-Currently Not Suitable

Limitations
r- rooting condition
t- texture

Suitability	Area in ha.(%)
S1	99 (15.52)
S2rt	101 (15.88)
N	408 (64.04)
Others*	29 (4.56)

References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- 42 Land parcel with No's
- Village boundary
- Micro-watershed boundary

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

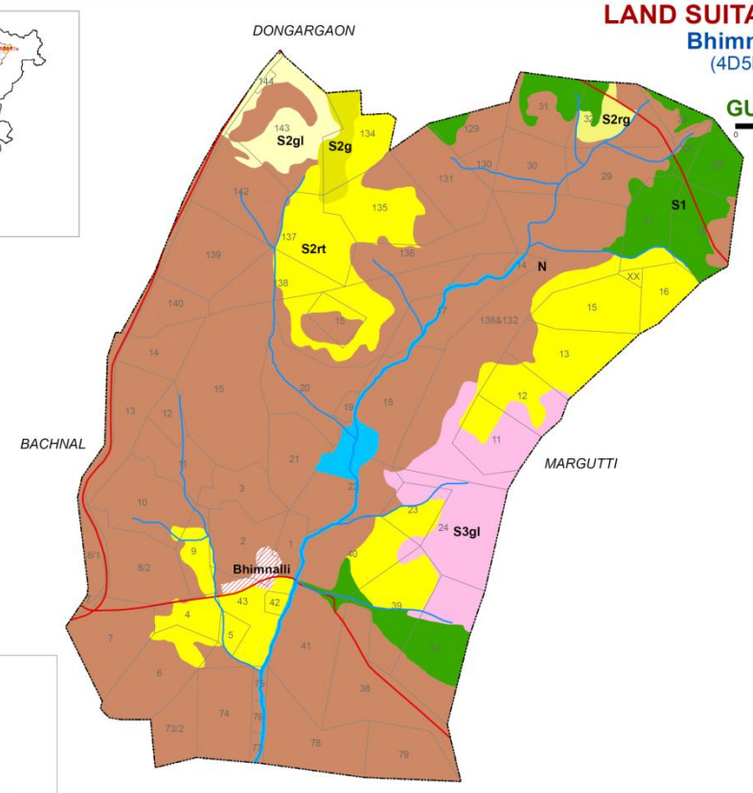
LAND SUITABILITY FOR MUSAMBI

Bhimnalli Micro-watershed

(4D5B8K1c : Area - 642.74 ha)

Gulbarga Taluk

GULBARGA DISTRICT



Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable

Limitations
r- rooting condition
g- gravelliness/stoniness
l – topography
t- texture

Suitability Subclass	Area in ha.(%)
S1	43 (6.67)
S2g	6 (0.98)
S2gl	13 (1.98)
S2rg	4 (0.57)
S2rt	108 (16.82)
S3gl	38 (5.97)
N	419 (65.15)
Others*	12 (1.85)

References
- Stream/Drainage
- Road/Cart track
- Habitation
- Waterbody
- 30 Land Parcel with No's
- Micro-watershed boundary

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

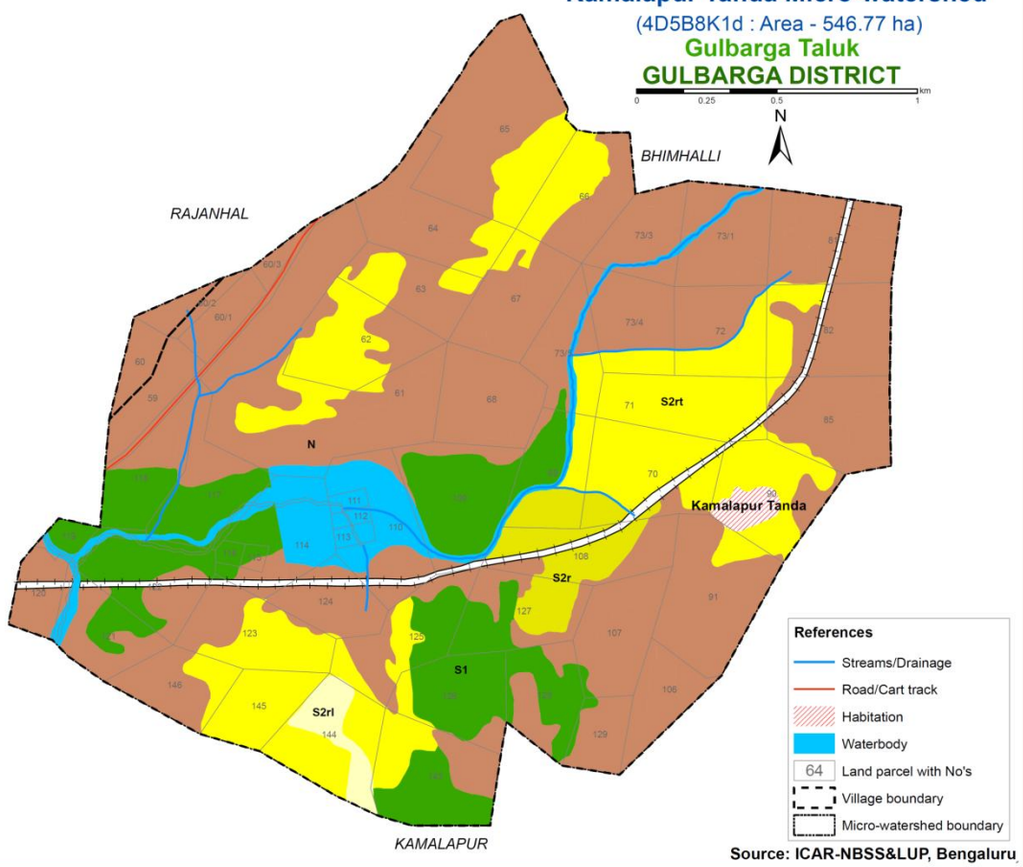
LAND SUITABILITY FOR MUSAMBI

Kamalapur Tanda Micro-watershed

(4D5B8K1d : Area - 546.77 ha)

Gulbarga Taluk

GULBARGA DISTRICT



Key
S1-Highly Suitable
S2-Moderately Suitable
N- Not Suitable

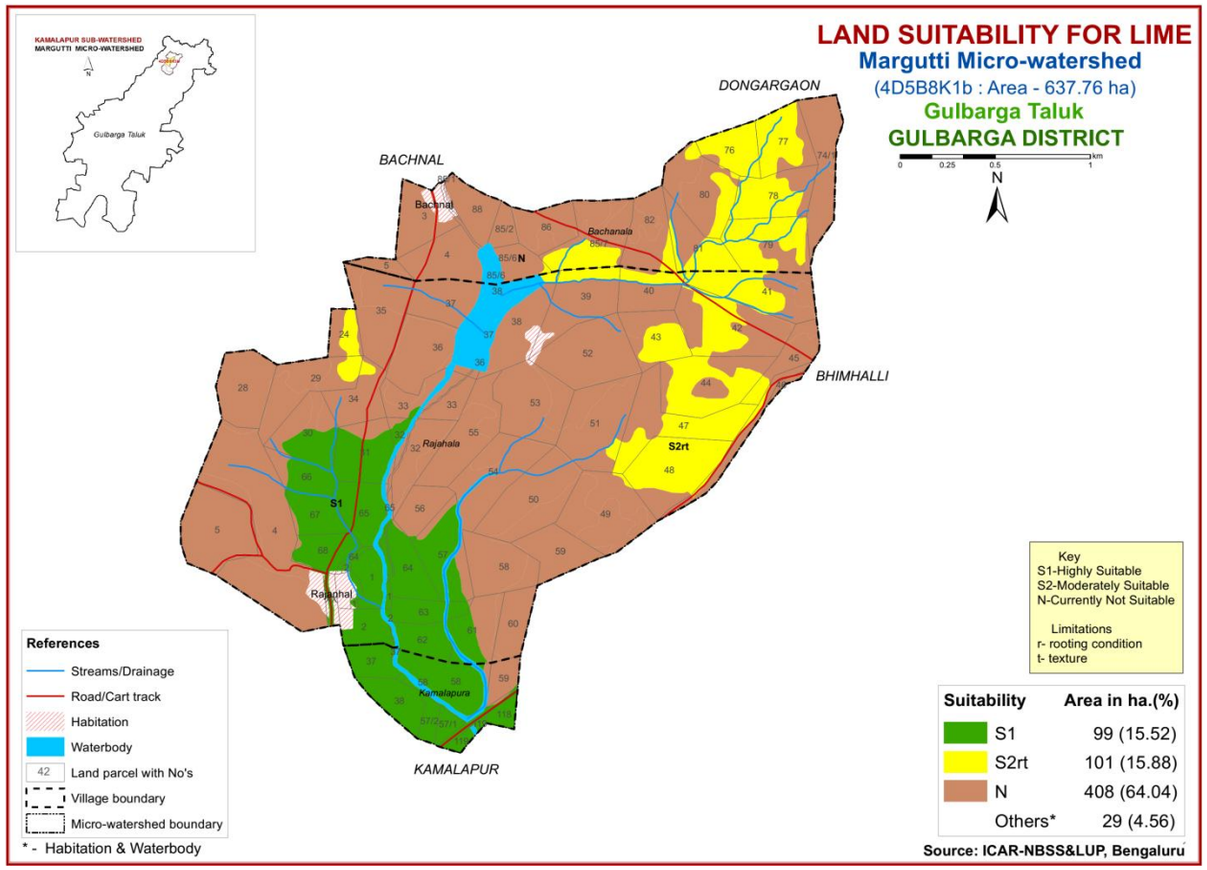
Limitations
r- rooting condition
l– topography
t- texture

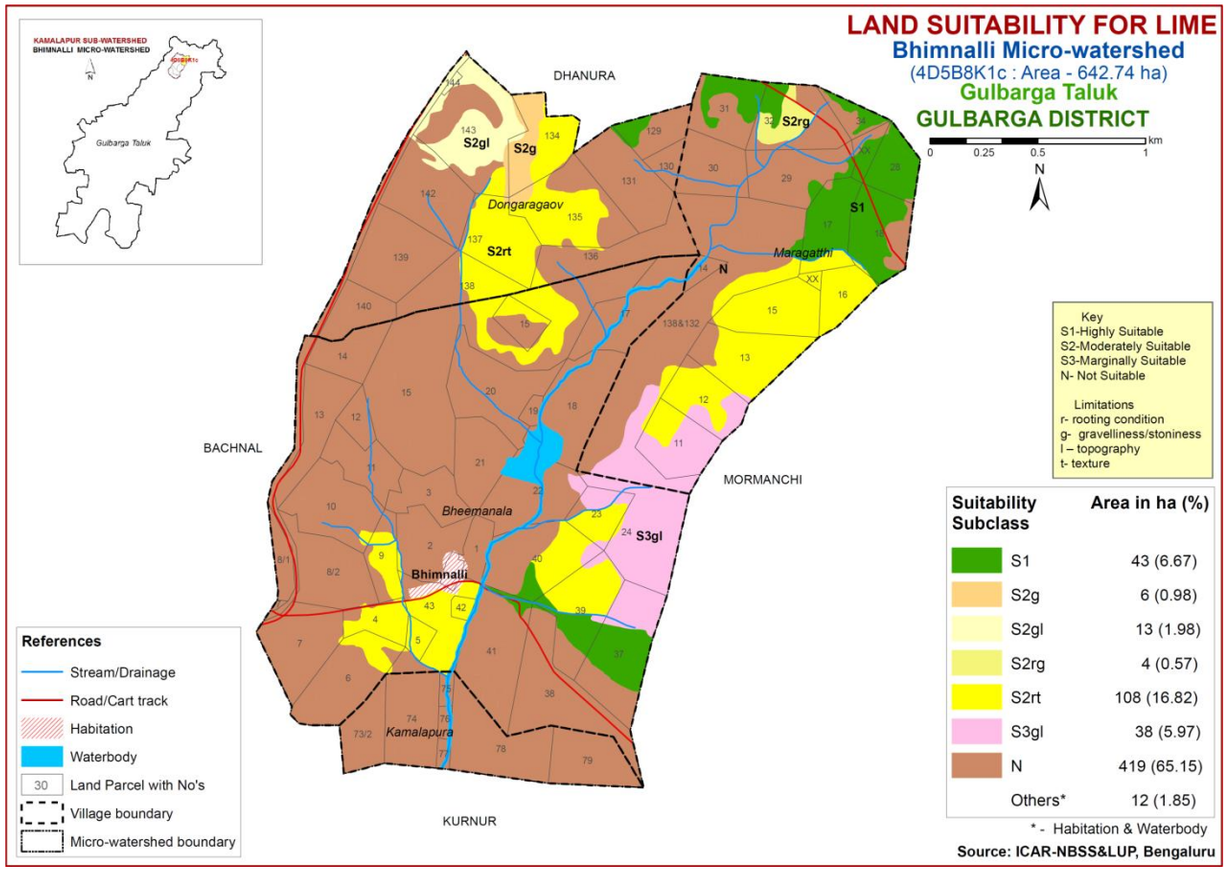
Suitability Subclass	Area in ha.(%)
S1	71 (13.02)
S2r	16 (2.85)
S2rl	5 (0.97)
S2rt	113 (20.62)
N	306 (55.93)
Railway	8 (1.49)
Others*	28 (5.12)

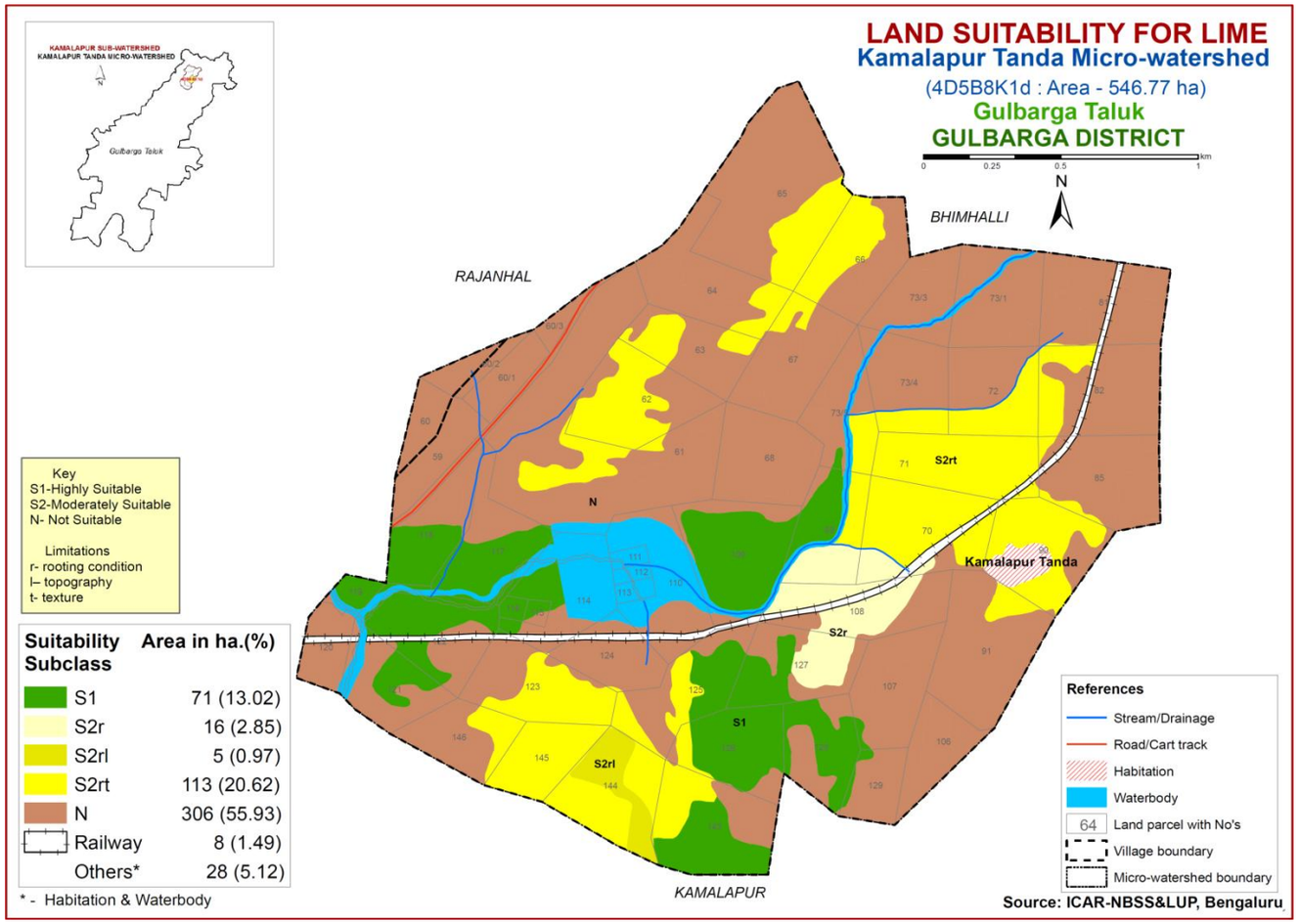
* - Habitation & Waterbody

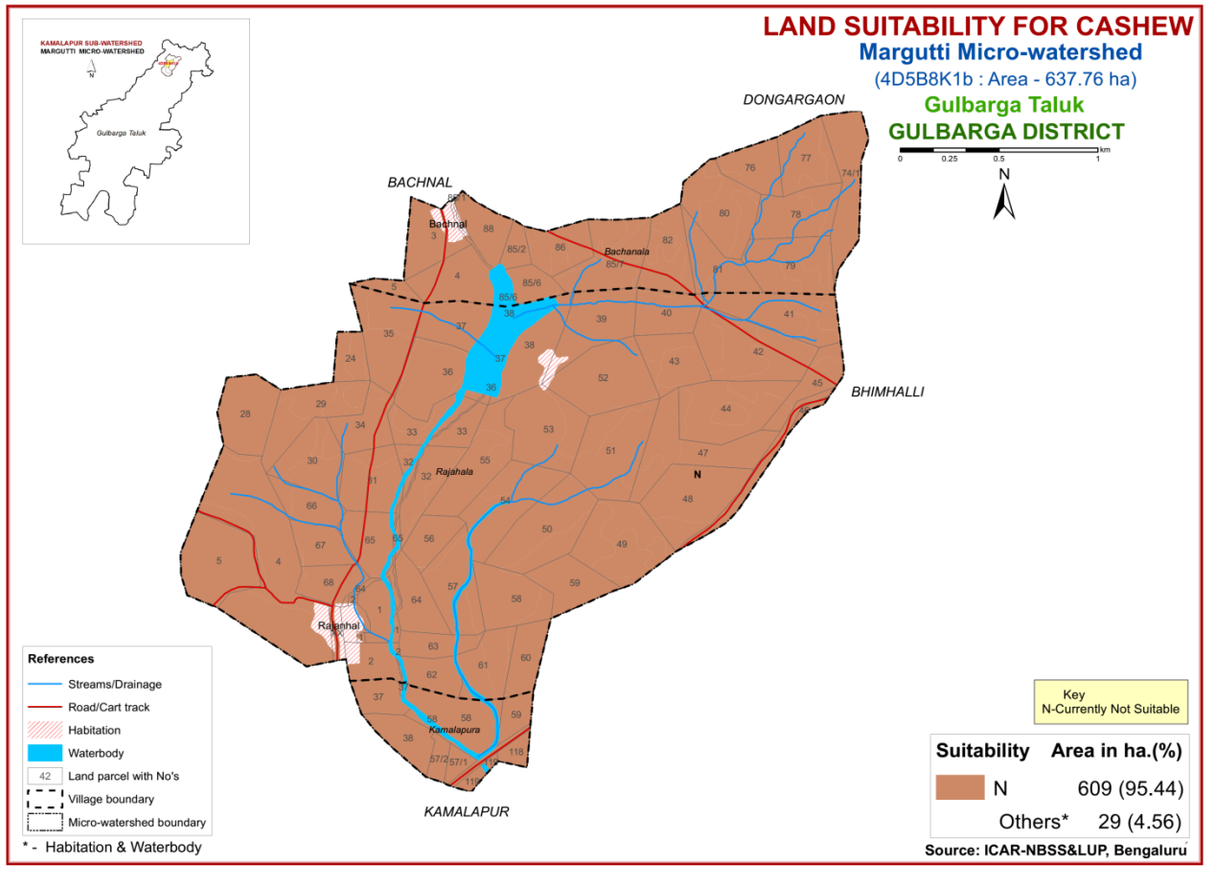
References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- 64 Land parcel with No's
- Village boundary
- Micro-watershed boundary

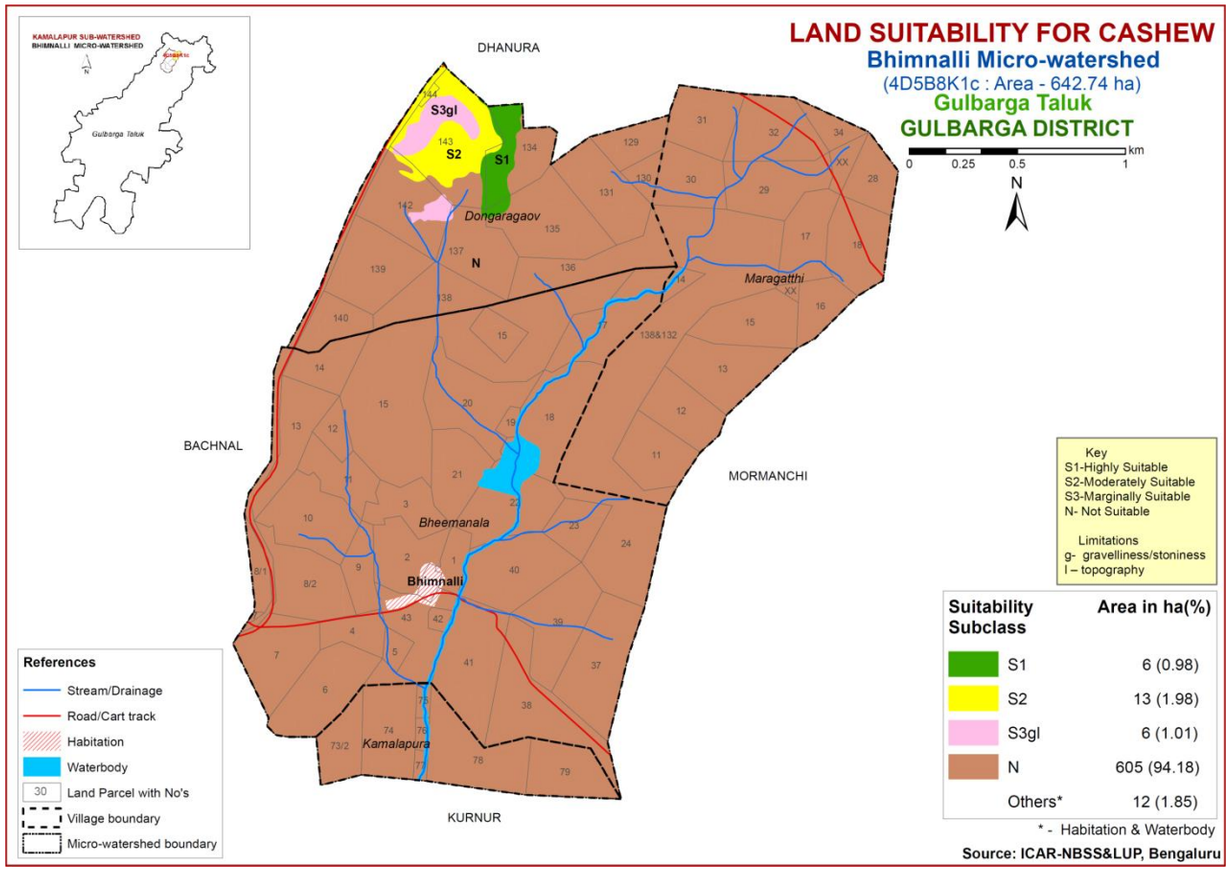
Source: ICAR-NBSS&LUP, Bengaluru

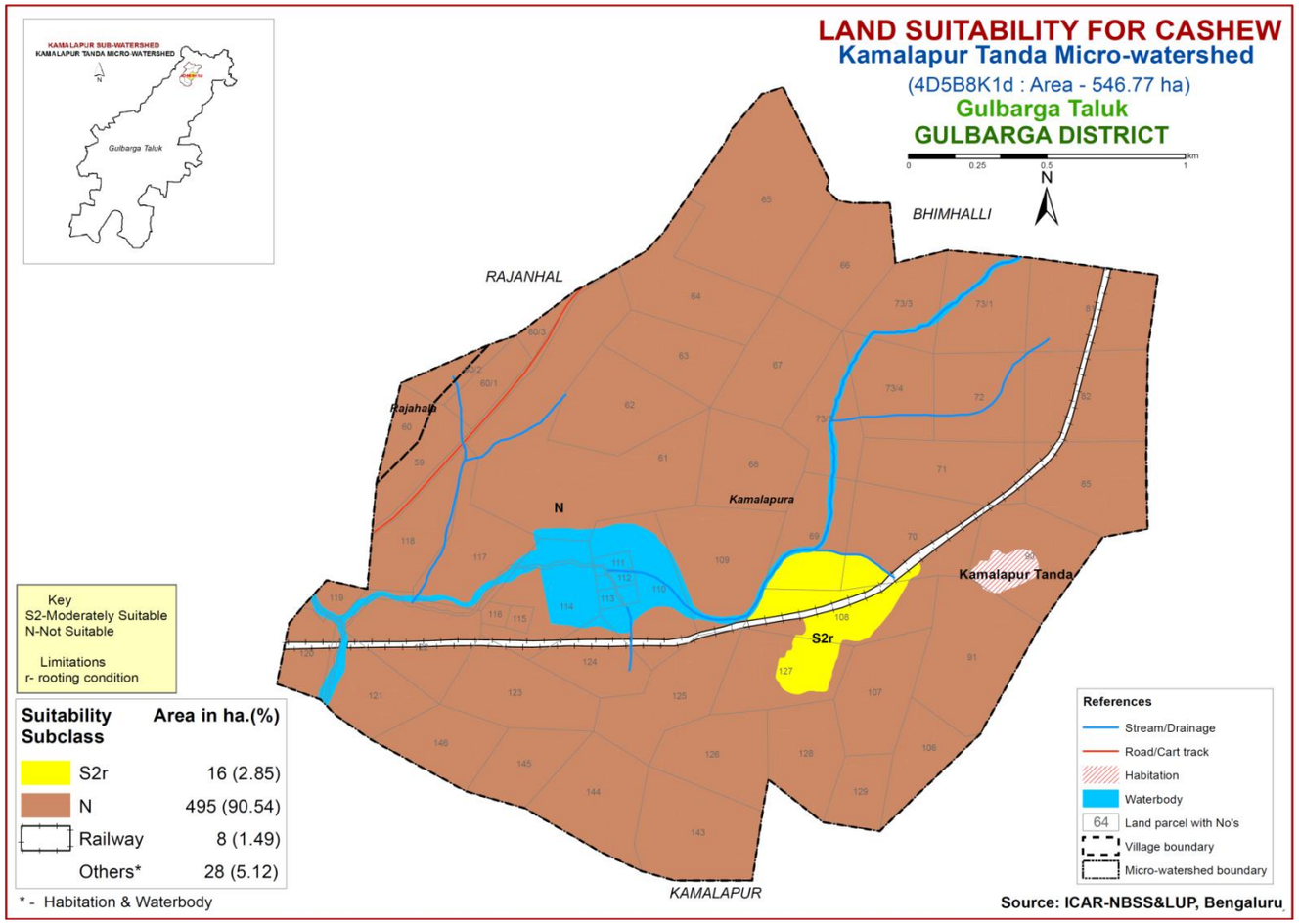

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR LIME
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Bachanala
Rajahala
Rajanhal
Kamalapura
S1
S2rt
N
Key
S1-Highly Suitable
S2-Moderately Suitable
N-Currently Not Suitable
Limitations
r- rooting condition
t- texture
Suitability | Area in ha.(%)
S1 99 (15.52)
S2rt 101 (15.88)
N 408 (64.04)
Others* 29 (4.56)
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

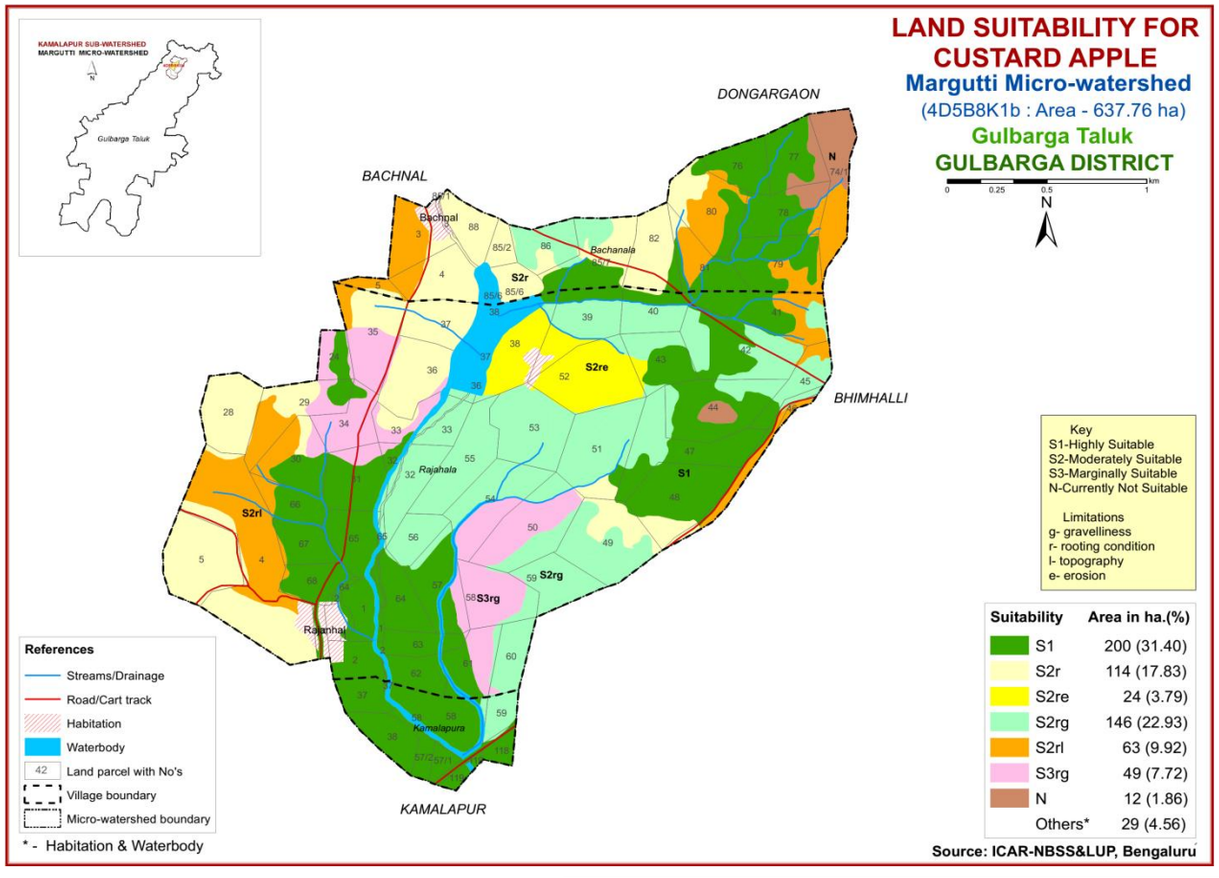

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR LIME
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
S2gl
S2g
S2rg
S1
S2rt
S3gl
N
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
r- rooting condition
g- gravelliness/stoniness
l – topography
t- texture
Suitability Subclass | Area in ha (%)
S1 43 (6.67)
S2g 6 (0.98)
S2gl 13 (1.98)
S2rg 4 (0.57)
S2rt 108 (16.82)
S3gl 38 (5.97)
N 419 (65.15)
Others* 12 (1.85)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

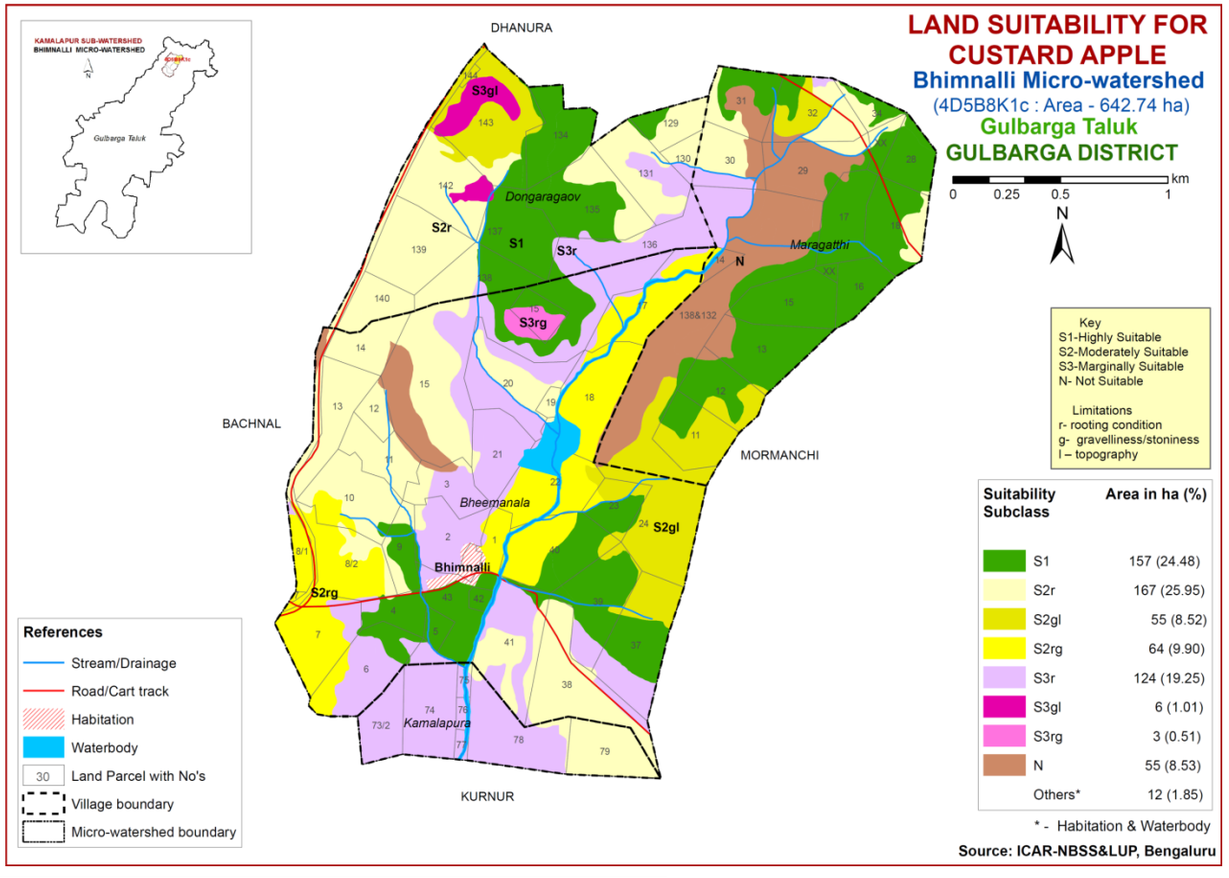

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR LIME
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
KAMALAPUR
Kamalapur Tanda
S2rt
S2r
S1
S2rl
N
Key
S1-Highly Suitable
S2-Moderately Suitable
N- Not Suitable
Limitations
r- rooting condition
l– topography
t- texture
Suitability Subclass | Area in ha.(%)
S1 71 (13.02)
S2r 16 (2.85)
S2rl 5 (0.97)
S2rt 113 (20.62)
N 306 (55.93)
Railway 8 (1.49)
Others* 28 (5.12)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

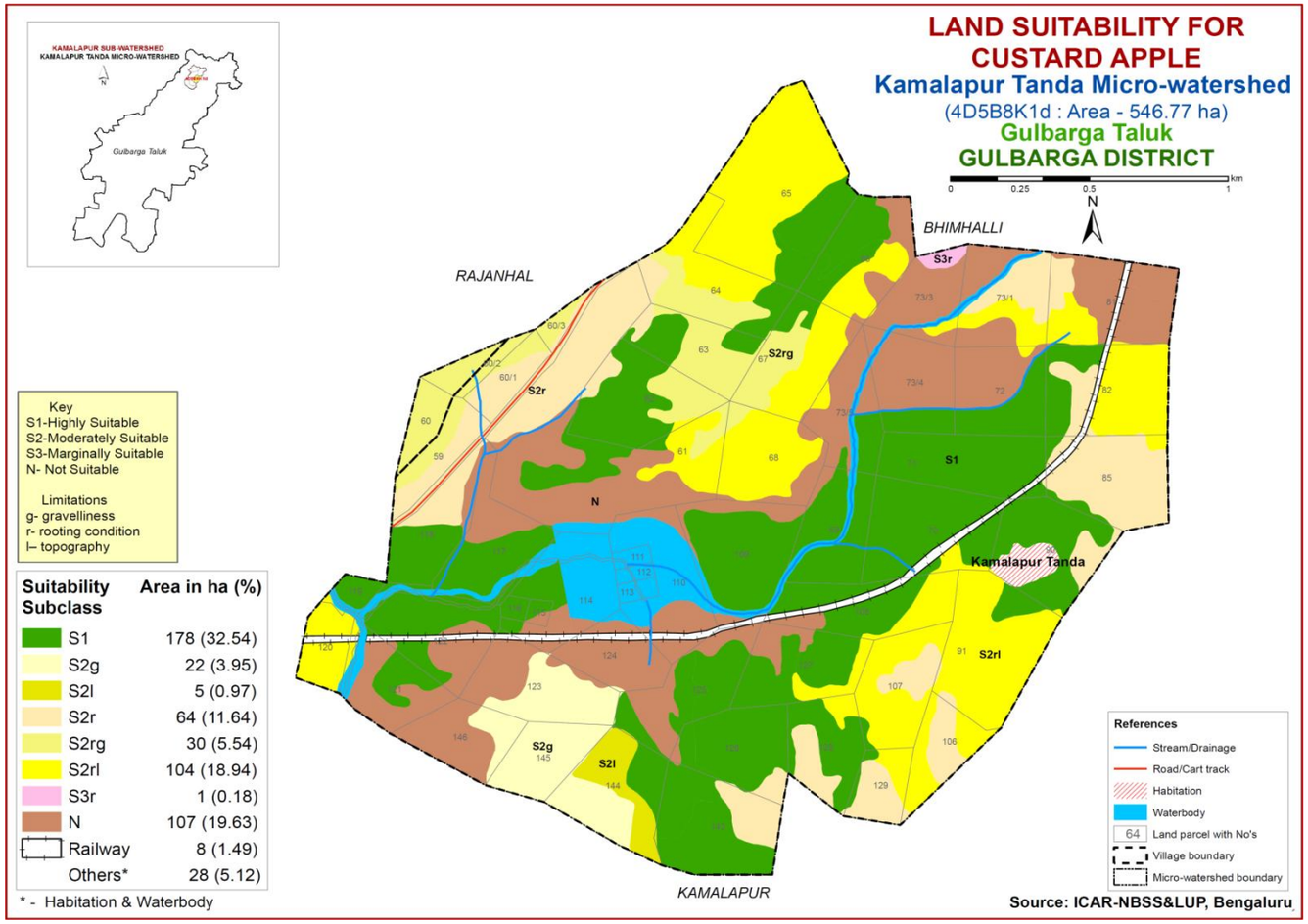

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR CASHEW
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Bachanala
Rajahala
Rajahal
Kamalapura
N
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Key
N-Currently Not Suitable
Suitability Area in ha.(%)
N 609 (95.44)
Others* 29 (4.56)
Source: ICAR-NBSS&LUP, Bengaluru

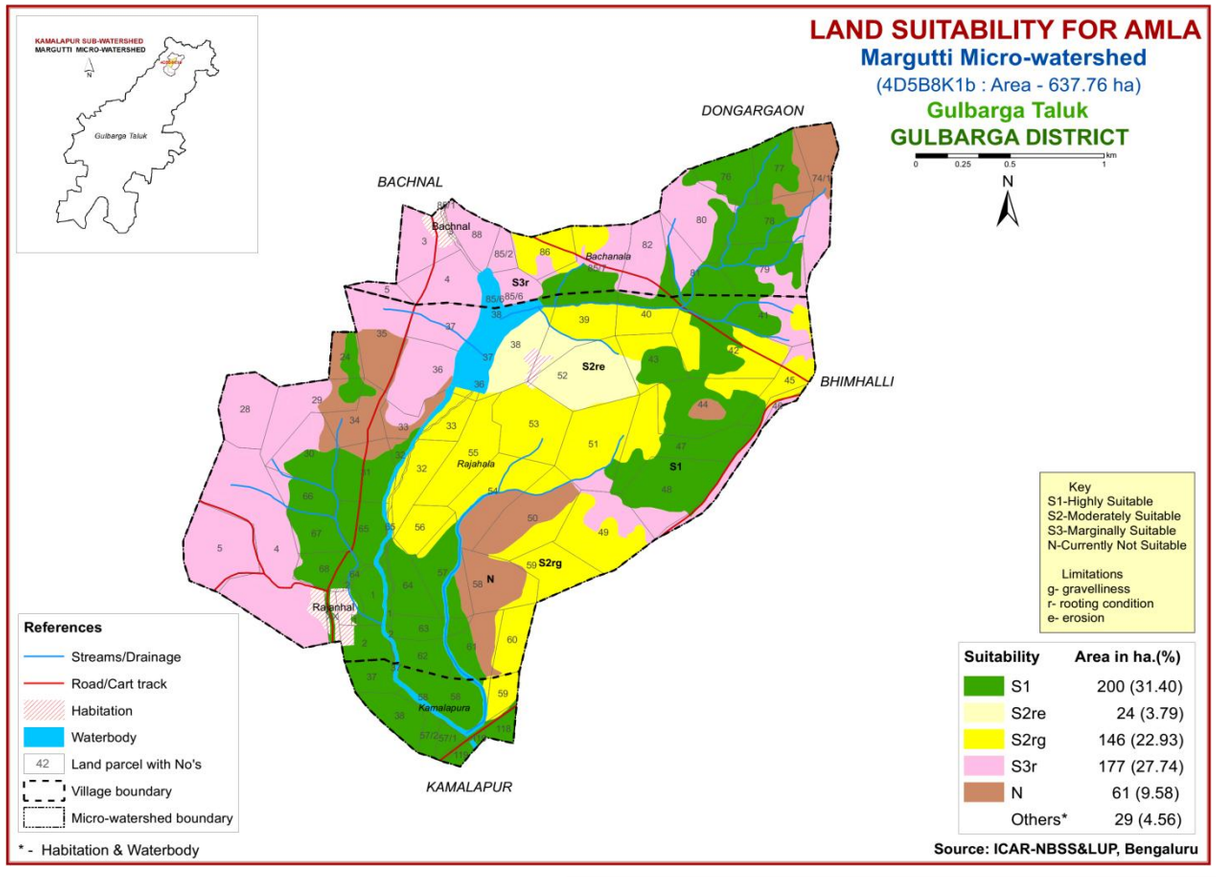

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR CASHEW
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
BACHNAL
MORMANCHI
KURNUR
S3gl
S2
S1
N
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land Parcel with No's
Village boundary
Micro-watershed boundary
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
g- gravelliness/stoniness
l – topography
Suitability Subclass
Area in ha(%)
S1 6 (0.98)
S2 13 (1.98)
S3gl 6 (1.01)
N 605 (94.18)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

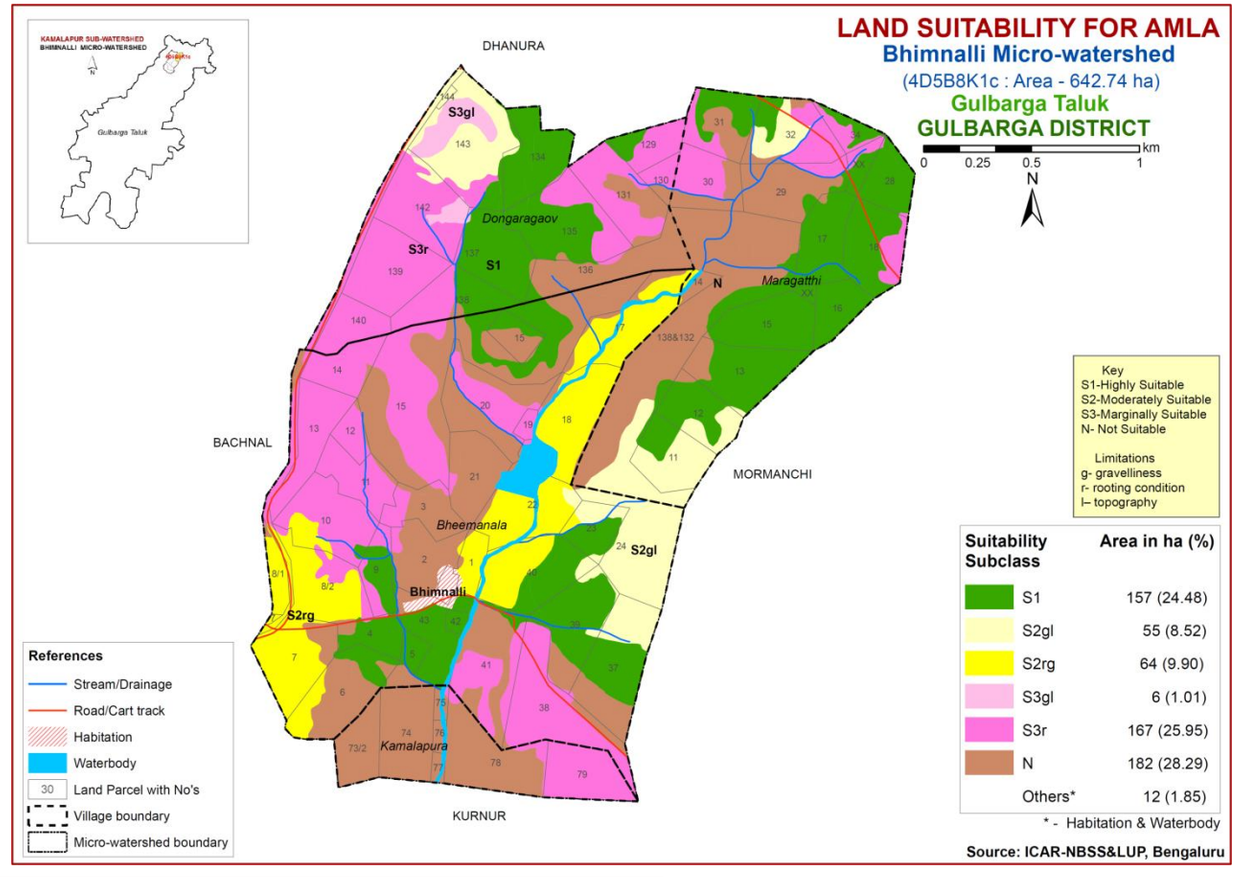

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR CASHEW
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
KAMALAPUR
Rajahala
N
Kamalapura
Kamalapur Tanda
S2r
Key
S2-Moderately Suitable
N-Not Suitable
Limitations
r- rooting condition
Suitability Subclass
Area in ha.(%)
S2r 16 (2.85)
N 495 (90.54)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
64 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru

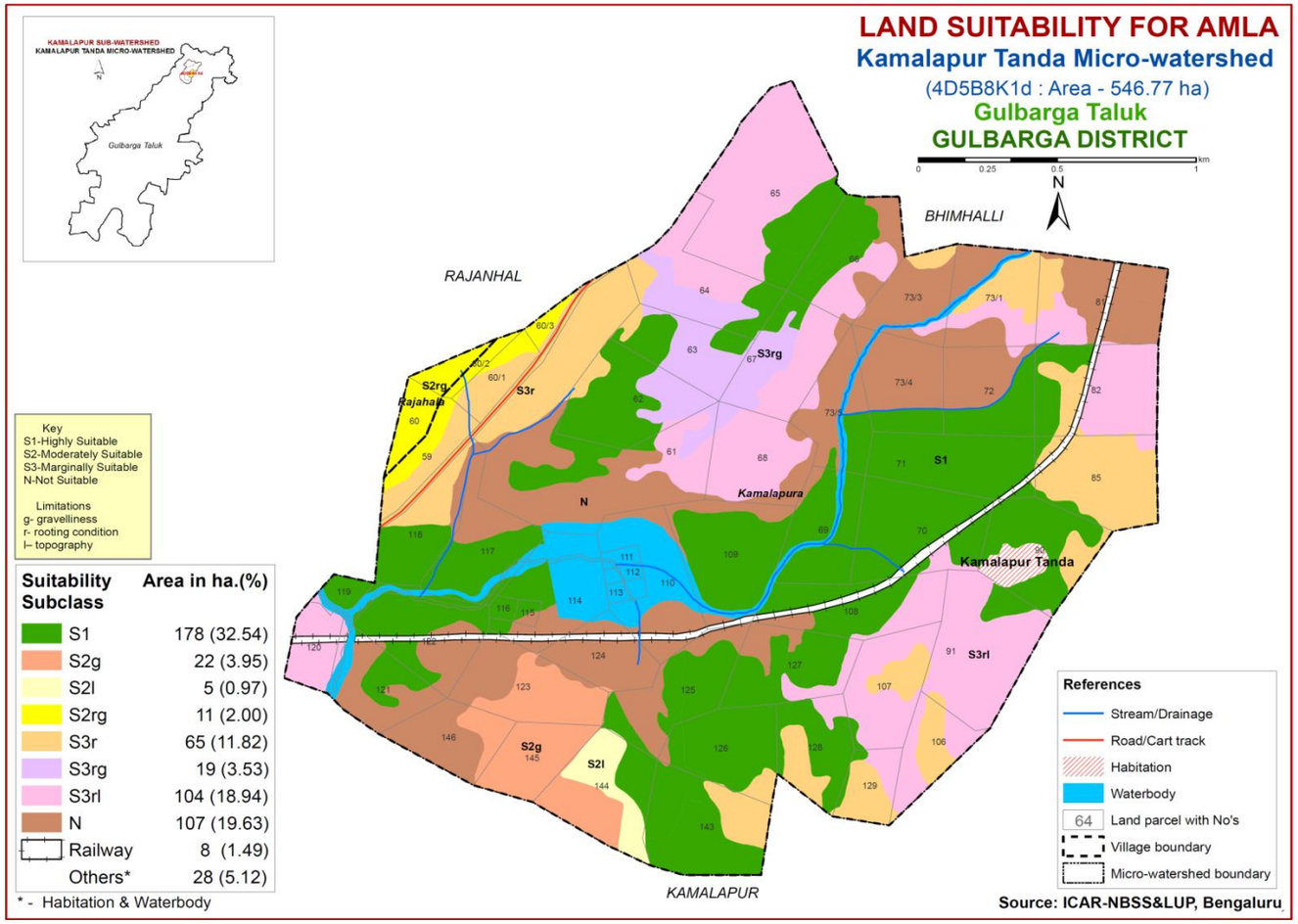

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR
CUSTARD APPLE
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Bachanala
Rajahala
Rajanhal
Kamalapura
S2r
S2re
S2rg
S2rl
S3rg
S1
N
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N-Currently Not Suitable
Limitations
g- gravelliness
r- rooting condition
l- topography
e- erosion
Suitability
Area in ha.(%)
S1 200 (31.40)
S2r 114 (17.83)
S2re 24 (3.79)
S2rg 146 (22.93)
S2rl 63 (9.92)
S3rg 49 (7.72)
N 12 (1.86)
Others* 29 (4.56)
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

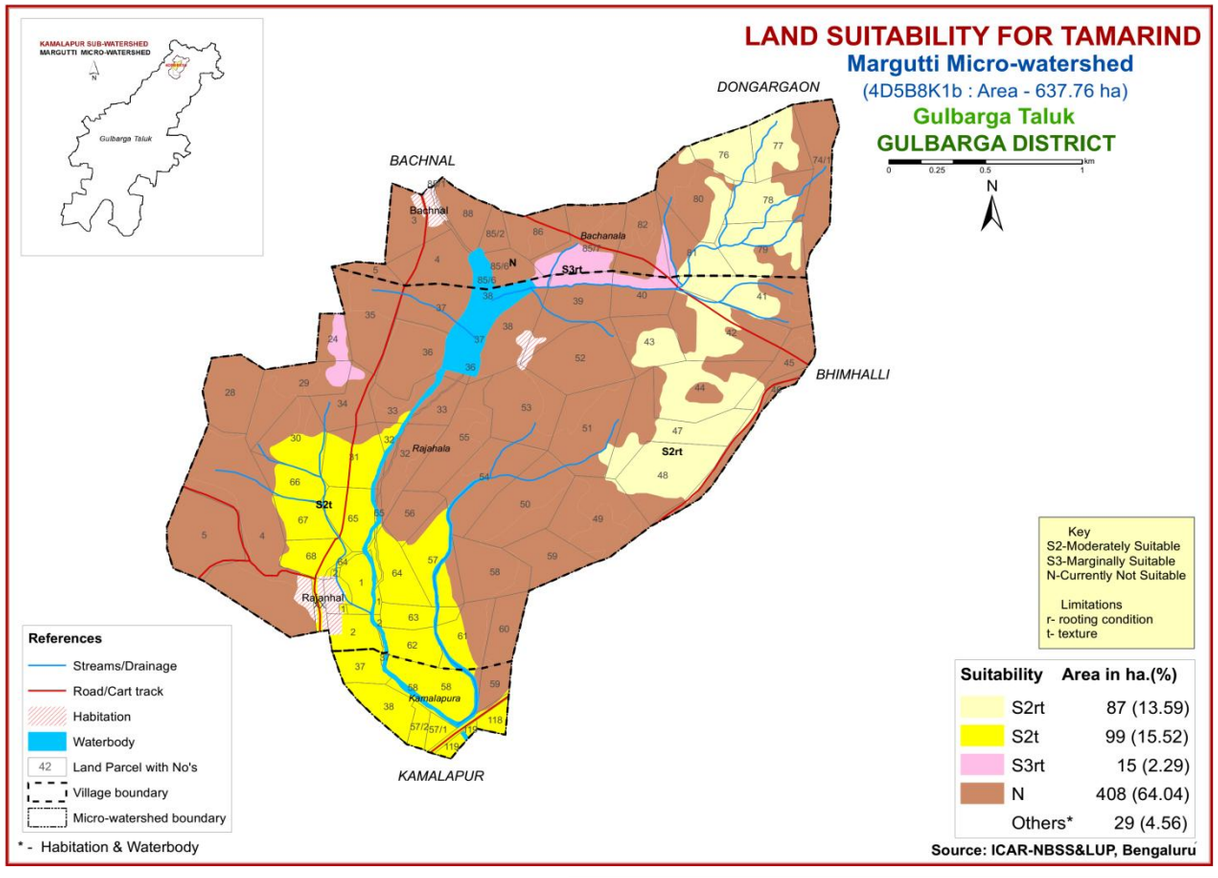

KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR
CUSTARD APPLE
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
S3gl
S2r
S1
S3r
S3rg
S2gl
S2rg
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
r- rooting condition
g- gravelliness/stoniness
l – topography
Suitability Subclass
Area in ha (%)
S1 157 (24.48)
S2r 167 (25.95)
S2gl 55 (8.52)
S2rg 64 (9.90)
S3r 124 (19.25)
S3gl 6 (1.01)
S3rg 3 (0.51)
N 55 (8.53)
Others* 12 (1.85)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

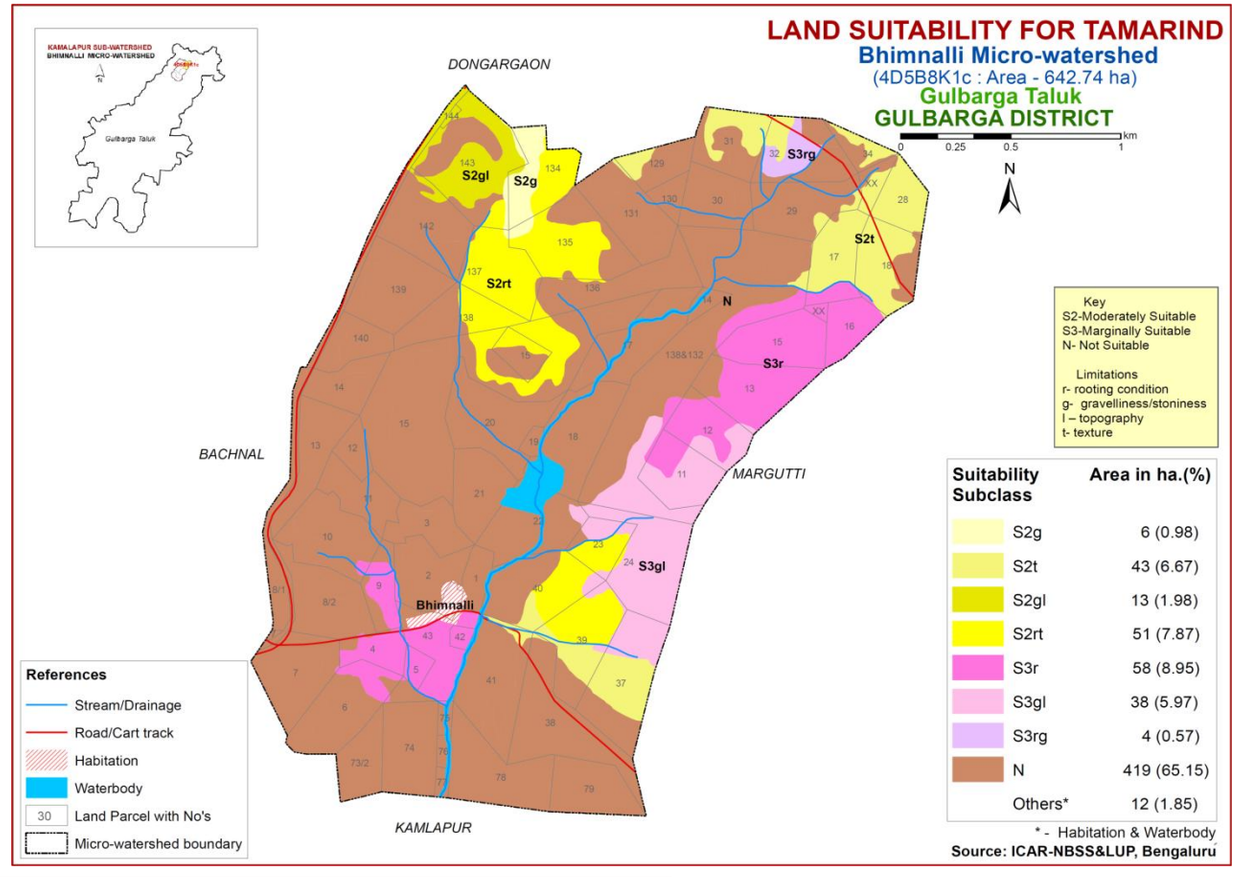

KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR
CUSTARD APPLE
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
RAJANHAL
BHIMHALLI
KAMALAPUR
Kamalapur Tanda
S2r
S2rg
S1
S3r
N
S2rl
S2g
S2l
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
g- gravelliness
r- rooting condition
l– topography
Suitability Subclass
Area in ha (%)
S1 178 (32.54)
S2g 22 (3.95)
S2l 5 (0.97)
S2r 64 (11.64)
S2rg 30 (5.54)
S2rl 104 (18.94)
S3r 1 (0.18)
N 107 (19.63)
Railway 8 (1.49)
Others* 28 (5.12)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

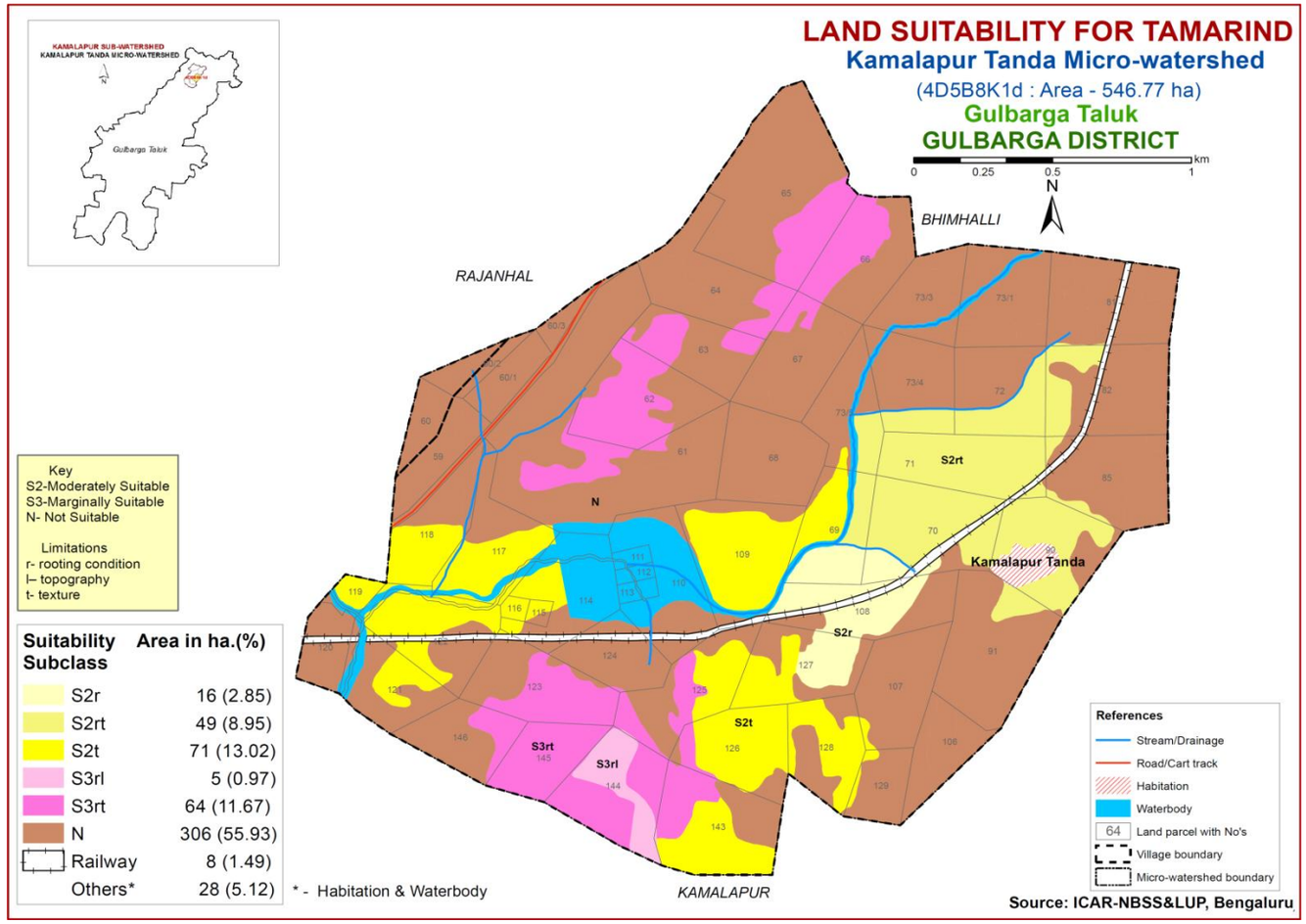

KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR AMLA
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Bachanala
Rajahala
Rajanhal
Kamalapura
S3r
S2re
S1
S2rg
N
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N-Currently Not Suitable
Limitations
g- gravelliness
r- rooting condition
e- erosion
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Suitability
Area in ha.(%)
S1 200 (31.40)
S2re 24 (3.79)
S2rg 146 (22.93)
S3r 177 (27.74)
N 61 (9.58)
Others* 29 (4.56)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru


KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR AMLA
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
S3gl
S3r
S1
S2gl
S2rg
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
g- gravelliness
r- rooting condition
I– topography
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
Suitability Subclass
Area in ha (%)
S1 157 (24.48)
S2gl 55 (8.52)
S2rg 64 (9.90)
S3gl 6 (1.01)
S3r 167 (25.95)
N 182 (28.29)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru


KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR AMLA
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
KAMALAPUR
Rajahala
Kamalapura
Kamalapur Tanda
S2rg
S3r
S3rg
S1
N
S3rl
S2g
S2l
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N-Not Suitable
Limitations
g- gravelliness
r- rooting condition
I– topography
Suitability Subclass
Area in ha.(%)
S1 178 (32.54)
S2g 22 (3.95)
S2l 5 (0.97)
S2rg 11 (2.00)
S3r 65 (11.82)
S3rg 19 (3.53)
S3rl 104 (18.94)
N 107 (19.63)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru


KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR TAMARIND
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Bachanala
Rajahala
Rajanhal
Kamalapura
S3rt
S2rt
S2t
N
Key
S2-Moderately Suitable
S3-Marginally Suitable
N-Currently Not Suitable
Limitations
r- rooting condition
t- texture
Suitability Area in ha.(%)
S2rt 87 (13.59)
S2t 99 (15.52)
S3rt 15 (2.29)
N 408 (64.04)
Others* 29 (4.56)
Source: ICAR-NBSS&LUP, Bengaluru
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Village boundary
Micro-watershed boundary
* - Habitation & Waterbody


KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR TAMARIND
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
MARGUTTI
KAMLAPUR
Bhimnalli
S2gl
S2g
S2t
S2rt
S3rg
S3r
S3gl
N
Key
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
r- rooting condition
g- gravelliness/stoniness
l – topography
t- texture
Suitability Subclass Area in ha.(%)
S2g 6 (0.98)
S2t 43 (6.67)
S2gl 13 (1.98)
S2rt 51 (7.87)
S3r 58 (8.95)
S3gl 38 (5.97)
S3rg 4 (0.57)
N 419 (65.15)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land Parcel with No's
Micro-watershed boundary


KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
LAND SUITABILITY FOR TAMARIND
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
KAMALAPUR
Kamalapur Tanda
S2rt
S2r
S2t
S3rt
S3rl
N
Key
S2-Moderately Suitable
S3-Marginally Suitable
N- Not Suitable
Limitations
r- rooting condition
l– topography
t- texture
Suitability Subclass Area in ha.(%)
S2r 16 (2.85)
S2rt 49 (8.95)
S2t 71 (13.02)
S3rl 5 (0.97)
S3rt 64 (11.67)
N 306 (55.93)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary

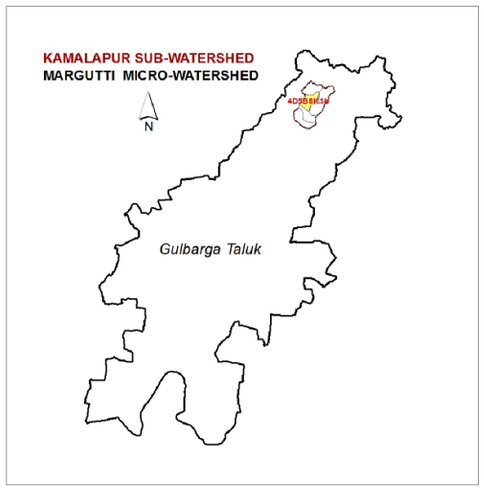
LAND MANAGEMENT UNITS

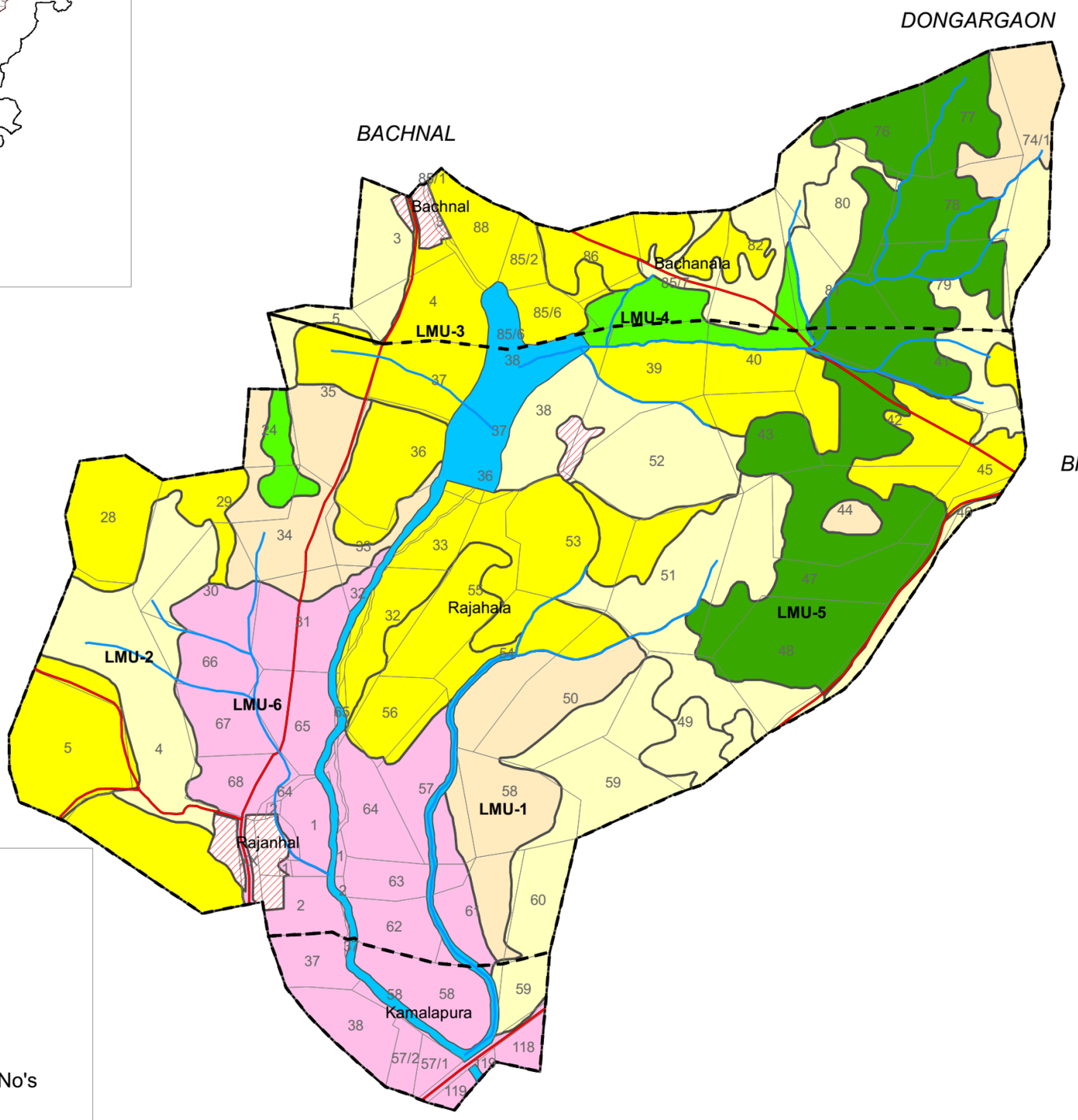
Margutti Micro-watershed

(4D5B8K1b : Area - 637.76 ha)

Gulbarga Taluk

GULBARGA DISTRICT





0 0.25 0.5 1 km

N

References

- Stream/Drainage
- Road/Cart track
- Habitation
- Waterbody
- 42 Land parcel with No's
- Village boundary
- Micro-watershed boundary

* - Habitation & Waterbody

LMU	Area in ha (%)
LMU-1	61 (9.58)
LMU-2	160 (25.07)
LMU-3	187 (29.39)
LMU-4	15 (2.29)
LMU-5	87 (13.59)
LMU-6	99 (15.52)
Others*	29 (4.56)

Source: ICAR-NBSS&LUP, Bengaluru

NOTE: *Proposed Crop Plan for LMU's are given in Table*

Table 4. Proposed Crop Plan for Margutti Micro-watershed (4D5B8K1b), Kalaburagi Taluk and District based on soil-site–crop suitability Assessment

LMU No	Mapping unit	Characters	Crops proposed				Suitable intervention
			Field crops	Forestry Crop/Grasses	Horticulture crops (Rainfed Condition)	Horticulture crops with suitable intervention	
I	14MGTmC3g1 15MGTmC3g2 11KGImD3g2	Very shallow Soil, Depth (<25 cm) Slight to moderately gravelly, severely eroded	-	Silviculture, Neem, Glyricydia, Teak,Agave	-	-	Crescent bunds
II	1BHImC2g1 6KGImB3g1 7KGImC2g1 8KGImC2g2 9KGImC3g1 10KGImC3g2 18 NHAmB3g1 19 NHAmB3g2 20 NHAmC2g2 21 NHAmC3g2	Shallow black soil (25-50 cm) 1-5 % slope, Mod. to severely eroded, slight to mod. Gravelly.	Bajra, Linseed, Green gram, Black gram, Chick pea	Neem, Teak	Custard apple, Charoli, Ber, Amla	Custard apple, Charoli, Ber, Amla	Crescent bunds,
III	4KGImB2g1 5 KGImB2g2 16 NHAmB2g1 17NHAmB2g2	Shallow black soil (25-50 cm) 1-3 % slope, slight . to moderately eroded, slight to mod. Gravelly.	Bajra, Linseed, Green gram, Black gram, Chick pea	Subabhul, Neem, Teak	Custard apple, Charoli, Ber, Amla Vegetable: Ladies finger, Brinjal, Cowpea, Flower: Marigold, Chrysanthemum	Custard apple, Charoli, Ber, Amla Vegetable: Onion, Tomato, Brinjal, Chillies, Bhendi Flower: Marigold, Chrysanthemum	Drip irrigation, suitable soil and water conservations like cultivation on raised beds with mulches and drip

To be continued….

LMU No	Mapping unit	Characters	Crops proposed				Suitable intervention
			Field crops	Forestry Crop/Grasses	Horticulture crops (Rainfed Condition)	Horticulture crops with suitable intervention	
IV	2DSImB1 3DSImB2	Moderately shallow black soil (50-75 cm) 1-3 % slope, moderately eroded.	Sorghum, Cotton, Red Gram, Black gram, Green gram, Soybean, Sesame, Sunflower, Safflower Rabi: Sorghum, Chickpea	Subabhul, Neem, Teak	Custard apple, Charoli, Ber, Amla Vegetable: Ladies finger, Brinjal, Cowpea, Flower: Marigold, Chrysanthemum	Custard apple, Charoli, Ber, Amla, Papaya, Banana, Lime, Citrus Vegetable: Onion, Tomato, Brinjal, Chillies, Bhendi Flower: Marigold, Chrysanthemum	-do- Graded bunds, Strengthening of field bunds
V	12KMPmB2 13KMPmB2g1	Moderately deep black soil (75-100 cm),1-3 % slope, moderately eroded.	Sorghum, Cotton, Red Gram, Black gram, Green gram, Soybean, Sesame, Sunflower, Safflower Rabi: Sorghum, Chickpea	Subabhul, Neem, Teak	Custard apple, Charoli, Ber, Amla Vegetable: Ladies finger, Brinjal, Cowpea, Flower: Marigold, Chrysanthemum	Custard apple, Charoli, Ber, Amla, Papaya, Banana, Lime, Citrus Vegetable: Onion, Tomato, Brinjal, Chillies, Bhendi Flower: Marigold, Chrysanthemum	-do- Graded bunds, Strengthening of field bunds
VI	22RNLmB1 23RNLmB2	Deep to very deep Black soil (100-150 & >150 cm), 1-3 % slope, slight erosion	Sorghum, Cotton, Red Gram Black gram, Green gram, Soybean, Sesame, Sunflower, Safflower, Rabi: Sorghum, Chickpea	-	Vegetable: Ladies finger, Brinjal, Cowpea, coriander Field crops: Sorghum, Cotton, Red Gram, Sunflower, Safflower, Perennial component: Guava, Tamarind, Sapota, Lime, Mosambi Flower: Marigold, Chrysanthemum	Banana, Papaya, Lime. Mosambi, Guava, Tamrind Vegetable: Onion, Tomato, Brinjal, Chillies, Bhendi Flower: Marigold, Chrysanthemum	-do- Graded bunds, Strengthening of field bunds

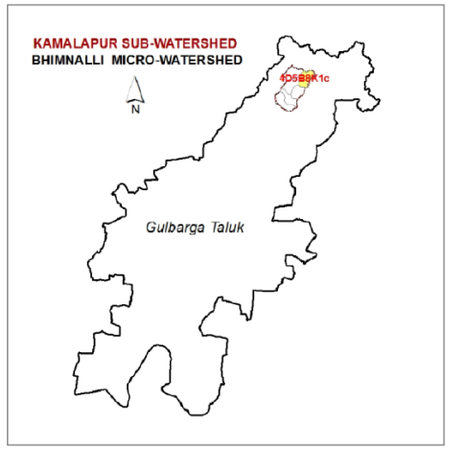
LAND MANAGEMENT UNITS

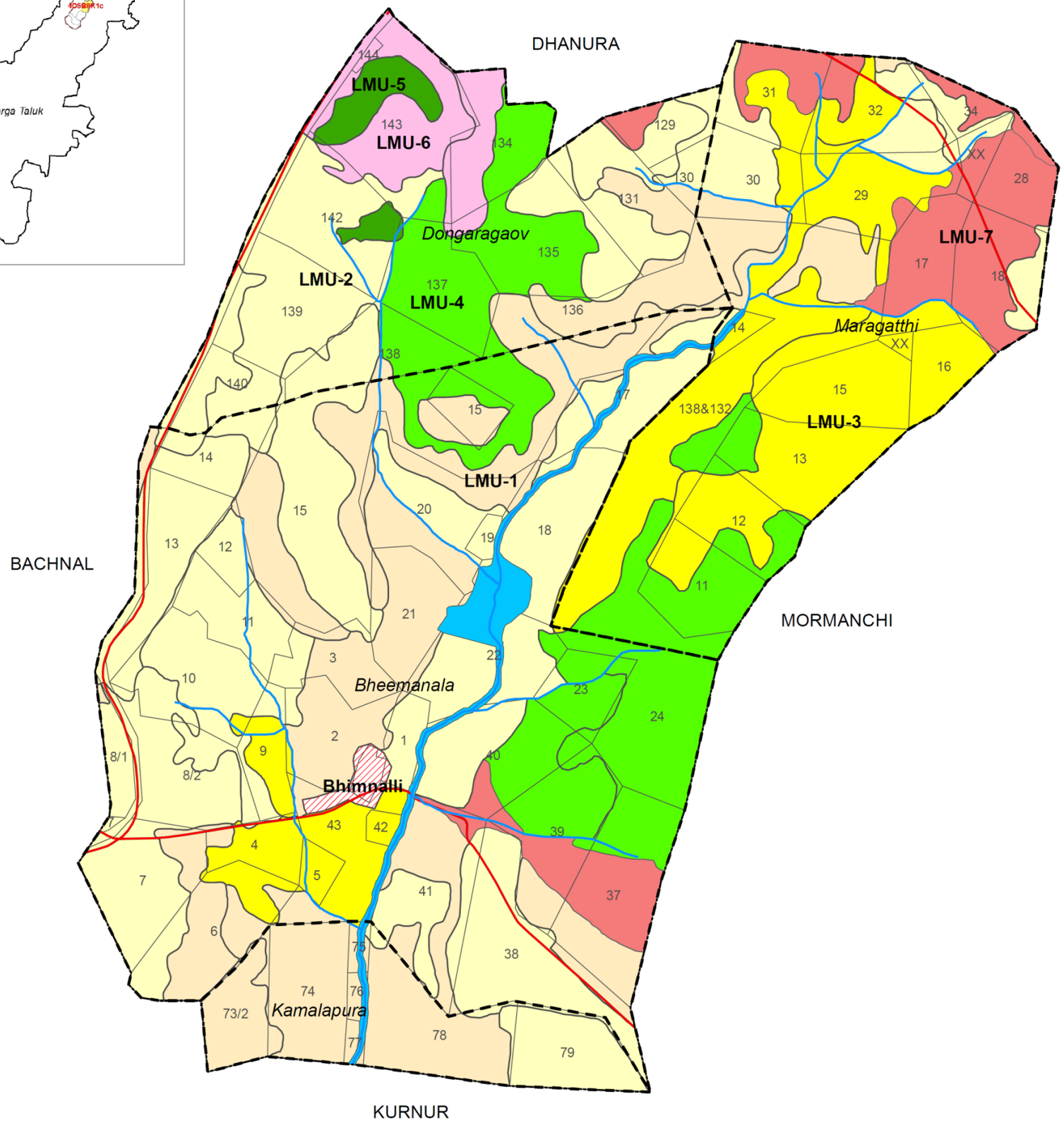
Bhimnalli Micro-watershed

(4D5B8K1c : Area - 642.74 ha)

Gulbarga Taluk

GULBARGA DISTRICT





km
0 0.25 0.5 1

N

References

- Stream/Drainage
- Road/Cart track
- Habitation
- Waterbody
- 30 Land parcel with No's
- Village boundary
- Micro-watershed boundary

Legend	Area in ha (%)
LMU-1	141 (21.92)
LMU-2	230 (35.85)
LMU-3	98 (15.24)
LMU-4	93 (14.50)
LMU-5	6 (1.01)
LMU-6	19 (2.96)
LMU-7	43 (6.67)
Others*	12 (1.85)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

Table 5. Proposed Crop Plan for Bhimnalli Micro-watershed, Kamlapur Sub-watershed Kalaburagi Taluk, Kalaburagi District based on soil-site–crop suitability Assessment

LMU No	Mapping unit	Characters	Survey No	Crops proposed				Suitable Intervention
				Field crops	Forestry Crop/ Grasses	Horticulture crops (Rainfed Condition)	Horticulture crops with suitable intervention	
1	21 MGTmB1g2 22 MGTmB2g1 23 MGTmB2g2 24 MGTmB3g1 25 MGTmB3g2 26 MGTmC2g2 13 KGImC3g1 14 KGImC3g2 15 KGImD3g2 16 KGImD3g3 17 KGImD4g2	Very shallow Soil, Depth (<25 cm) Slight to moderately gravelly, severely eroded	**Bheemanala:** 2,3,6,15,21,41 **Dongaragaov:** 136 **Kamalapura:** 73/2,74,75,76,77, 78	-	Silviculture, Neem, Glyricydia, Teak,Agave	-	-	Crescent bunds
2	7 KGImB2 8 KGImB2g1 9 KGImB2g2 10 KGImB2g1 11KGImC2g1 12KGImC2g2 27 NHAmB1 28 NHAmB2g1	Shallow black soil (25-50 cm) 1-3 % slope, slight . to moderately eroded, slight to mod. Gravelly	**Bheemanala:** 1,7,8/1,8/2,10,11, 12,13,14,17,18,19, 20, 22,38,40 **Dongaragaov:** 129,130,131, 138,,139,140,142 **Kamalapura:** 79 **Maragathi:** 30	Bajra, Linseed, Green gram, Black gram, Chick pea	Subabhul, Neem, Teak	Custard apple, Charoli, Ber, Amla Vegetable: Ladies finger, Brinjal, Cowpea, Flower: Marigold, Chrysanthemum	Custard apple, Charoli, Ber, Amla Vegetable: Onion, Tomato, Brinjal, Chillies, Bhendi Flower: Marigold, Chrysanthemum	Drip irrigation, suitable soil and water conservations like cultivation on raised beds with mulches and drip
3	1 DSImB1 2 DSImB2 3 DSImB2g1 6 HBLmB2g2 32RMNmD3g2	Moderately shallow black soil (50-75 cm) 1-3 % slope, moderately eroded.	**Bheemanala:** 4,5,9,42,43 **Maragathi:** 12,13,14,15, 16,29,32,138 & 132	Sorghum, Cotton, Red Gram, Black gram, Green gram, Soybean, Sesame, Sunflower, Safflower Rabi: Sorghum, Chickpea	Subabhul, Neem, Teak	Custard apple, Charoli, Ber, Amla Vegetable: Ladies finger, Brinjal, Cowpea, Flower: Marigold, Chrysanthemum	Custard apple, Charoli, Ber, Amla, Papaya, Banana, Lime, Citrus Vegetable: Onion, Tomato, Brinjal, Chillies, Bhendi Flower: Marigold, Chrysanthemum	Drip irrigation, suitable soil and water conservations like cultivation on raised beds with mulches and drip Graded bunds, Strengthening of field bunds

To be continued…

LMU No	Mapping unit	Characters	Survey No	Crops proposed				Suitable Intervention
				Field crops	Forestry Crop/ Grasses	Horticulture crops (Rainfed Condition)	Horticulture crops with suitable intervention	
4	18 KMPmB2 29RMNmB2g1 30 RMNmC2g2 31RMNmC3g2	Moderately deep black soil (75-100 cm),1-3 % slope, moderately eroded.	**Bheemanala:** 23,24,39 **Dongaragaov:** 135,137 **Maragathi:** 11	Sorghum, Cotton, Red Gram, Black gram, Green gram, Soybean, Sesame, Sunflower, Safflower Rabi: Sorghum, Chickpea	Subabhul, Neem, Teak	Custard apple, Charoli, Ber, Amla Vegetable: Ladies finger, Brinjal, Cowpea, Flower: Marigold, Chrysanthemum	Custard apple, Charoli, Ber, Amla, Papaya, Banana, Lime, Citrus Vegetable: Onion, Tomato, Brinjal, Chillies, Bhendi Flower: Marigold, Chrysanthemum	Drip irrigation, suitable soil and water conservations like cultivation on raised beds with mulches and drip Graded bunds, Strengthening of field bunds
5	19 KTIiC3g1	Moderately deep red soil (75-100 cm), 3-5 % slope, severely eroded, moderately gravelly	**Dongaragaov:** 143,144,137	Ragi, sorghum, bajra Horsegram, castor	Silviculture: *Accacia arculiformis,* Glyricidia, Agave, Simaruba, Cassia spp. Grasses:*Styl oxanthes hamata*, *Styloxanthes scabra, Khus grass*	Custard apple, Charoli, Ber	Custard apple, Charoli, Ber	suitable soil and water conservations like Trench cum bunds

To be continued…

LMU No	Mapping unit	Characters	Survey No	Crops proposed				Suitable Intervention
				Field crops	Forestry Crop/Grasses	Horticulture crops (Rainfed Condition)	Horticulture crops With suitable intervention	
6	4GNGiB2g1 5GNGmC3g1	Deep red soil (100-150 cm), 1-5 % slope, moderate severely eroded, slight gravelly	**Dongaragaov:** 134,143,144	Sorghum, Cotton, Red Gram, Black gram, Green gram, Sesame	Silviculture: *Accacia arculiformis,* Glyricidia, Agave, Simaruba, Cassia spp. Grasses:*Stylo xanthes hamata*, *Styloxanthes scabra, Khus grass*	Custard apple, Charoli, Ber, Amla Mango,	Mango, sapota, Guava, Lime, Banana, Papaya, Jamun. Mixed orcharding: Mango+Guava+Drumstick+curryl eaf Sapota+ Guava+Drumstick+curryleaf. Vegetables: Tomota, Capscicum, Green chilli, french bean, Bhendi, Crucifers Cucurbits. Flower crops: Tuberose, Aster, Chrysanthemum, Rose, Jasmine, spider lilly. Turmeric.	Drip irrigation, suitable soil and water conservations like cultivation on raised beds with mulches and drip Trench cum bunds
7	33RNLmB1 34RNLmB2g1 20MANmB2	Deep to very deep Black soil (100-150 & >150 cm), 1-3 % slope, slight erosion	**Bheemanala:** 37 **Maragathi:** 17,18,28,31,34	Sorghum, Cotton, Red Gram Black gram, Greengram, Soybean, Sesame, Sunflower, Safflower, Rabi: Sorghum, Chickpea	-	Vegetable: Ladies finger, Brinjal, Cowpea, coriander Field crops: Sorghum, Cotton, Red Gram, Sunflower, Safflower, Perennial component: Guava, Tamarind, Sapota, Lime, Mosambi Flower: Marigold, Chrysanthemum	Banana, Papaya, Lime. Mosambi, Guava, Tamrind Vegetable: Onion, Tomato, Brinjal, Chillies, Bhendi Flower: Marigold, Chrysanthemum	Drip irrigation, suitable soil and water conservations like cultivation on raised beds with mulches and drip Graded bunds, Strengthening of field bunds

LAND MANAGEMENT UNITS

Kamalapur Tanda Micro-watershed

(4D5B8K1d : Area - 546.77 ha)

Gulbarga Taluk

GULBARGA DISTRICT

References

- Stream/Drainage
- Road/Cart Track
- Habitation
- Waterbody
- 64 Land parcel with No's
- Village boundary
- Micro-watershed boundary

Legend	Area in ha (%)
LMU-1	180 (32.90)
LMU-2	131 (24.00)
LMU-3	64 (11.67)
LMU-4	16 (2.85)
LMU-5	49 (8.95)
LMU-6	71 (13.02)
Railway	8 (1.49)
Others*	28 (5.12)

* - Habitation & Waterbody

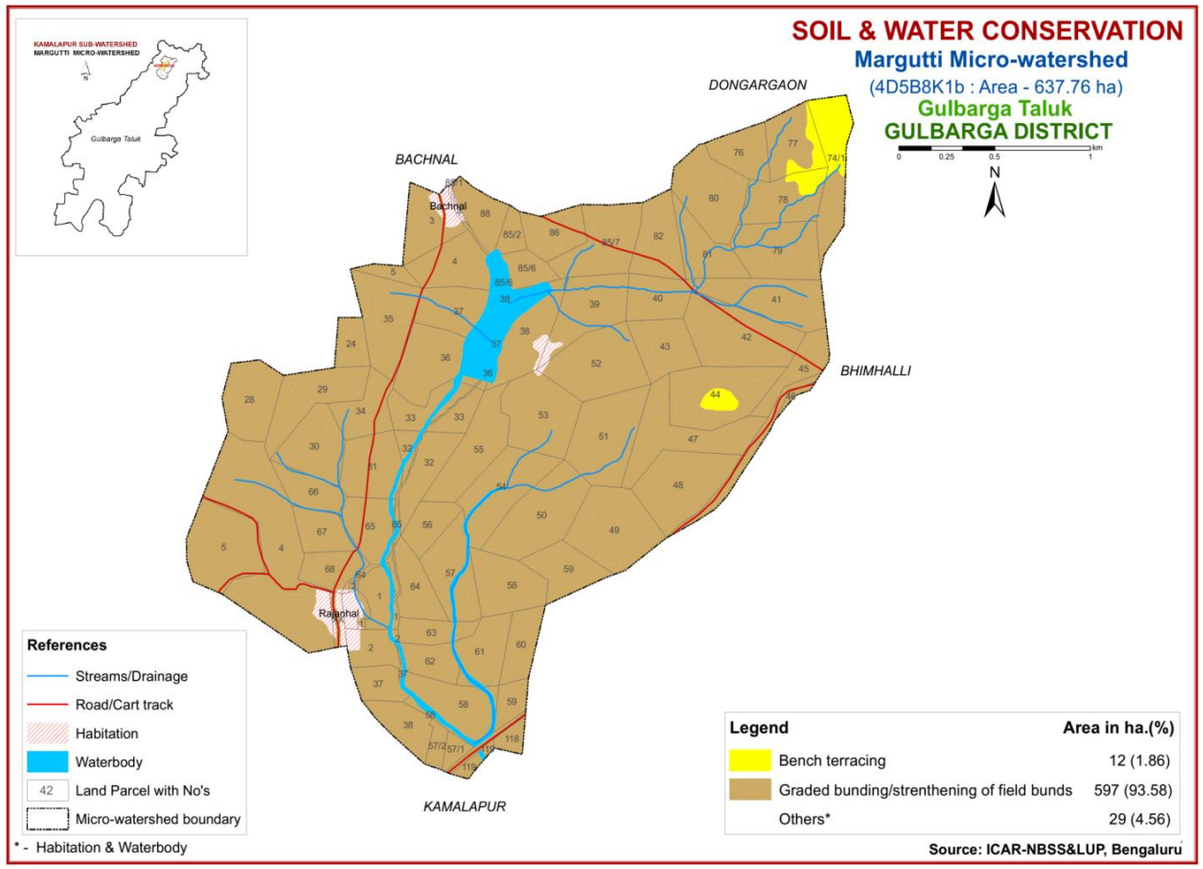
Source: ICAR-NBSS&LUP, Bengaluru

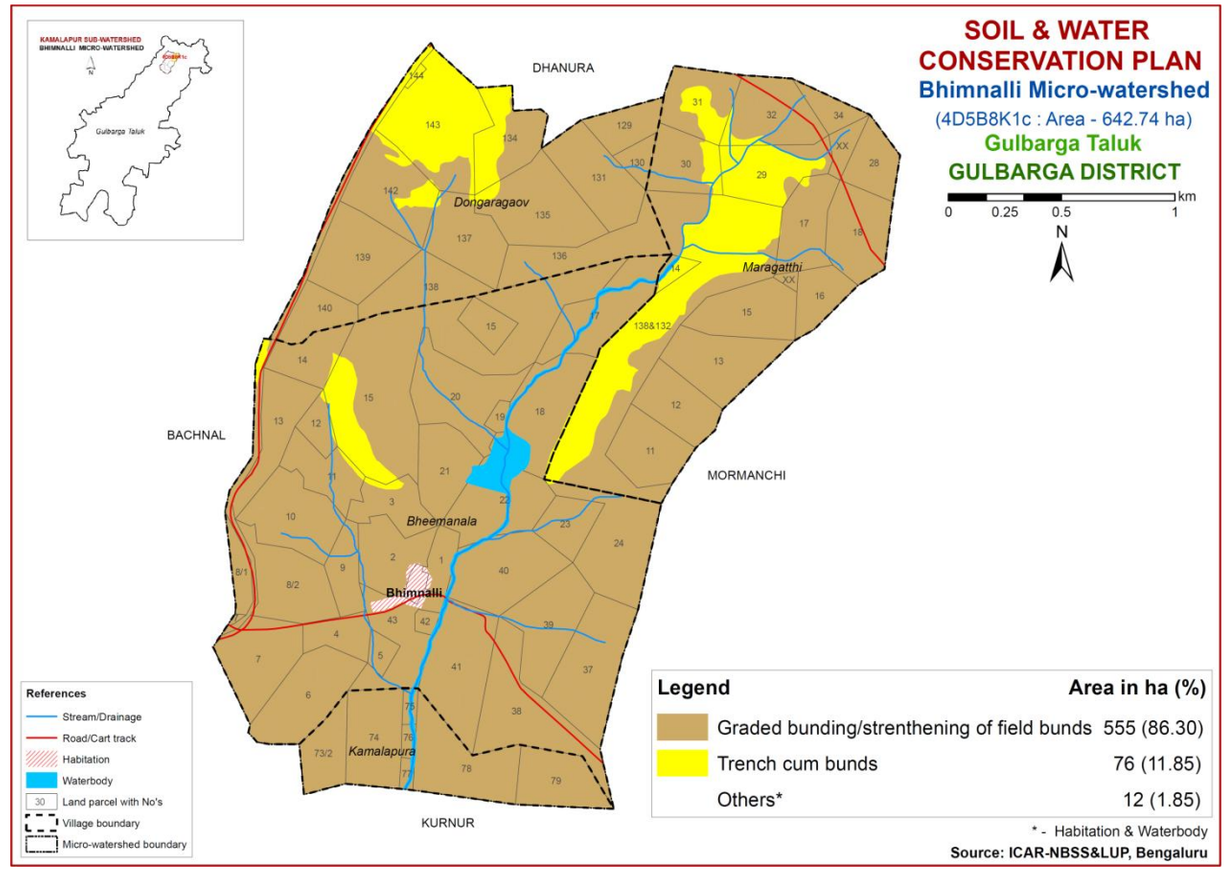
Table 6. Proposed Crop Plan for Kamlapur Tanda Micro-watershed, Kamlapur Sub-watershed Kalaburagi Taluk, Kalaburagi District based on soil-site–crop suitability Assessment

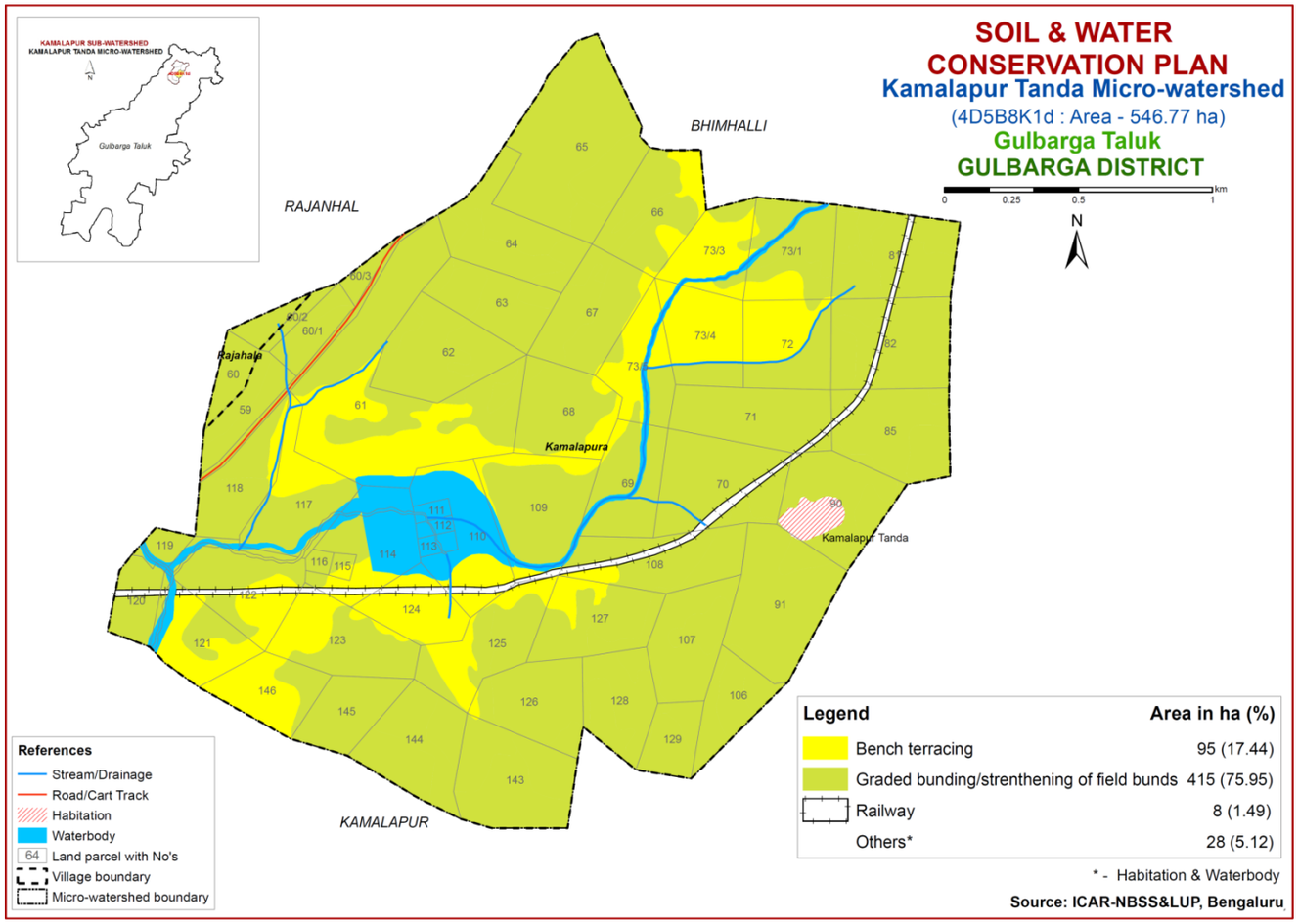
LMU No	Mapping unit	Characters	Survey No	Crops proposed				Suitable Intervention
				Field crops	Forestry Crop/Grasses	Horticulture crops (Rainfed Condition)	Horticulture crops with suitable intervention	
1	16 MGTmB1g2 17 MGTmB3g1 18 MGTmC2g2 14 KGImC3g2 19 MGTmD3g2 20 MGTmD3g3	Very shallow Soil, Depth (<25 cm) Slight to moderately gravelly, moderate to severely eroded	**Kamalapura:** 61,64,65,72,73/3, 73/4,73/5,81,91, 106,107,120,121, 124,125,146	-	Silviculture, Neem, Glyricydia, Teak,Agave	-	-	Crescent bunds
2	1BHImB2g1 2BHImC2g1 9 KGMB1g1 10 KGMB2 11 KGImB2g1 12 KGImB2g2 13 KGImC2g2 22 NHAmC2g2 7 GTTmC3g1	Shallow black soil (25-50 cm) 1-5 % slope, slight . to moderately eroded, slight to mod. Gravelly	**Kamalapura:** 59,60/1,60/2,60/3, 63,66,67,68,73/1,82,85,129, 144 **Rajahala:** 59,60	Bajra, Linseed, Green gram, Black gram, Chick pea	Subabhul, Neem, Teak	Custard apple, Charoli, Ber, Amla Vegetable: Ladies finger, Brinjal, Cowpea, Flower: Marigold, Chrysanthemum	Custard apple, Charoli, Ber, Amla Vegetable: Onion, Tomato, Brinjal, Chillies, Bhendi Flower: Marigold, Chrysanthemum	Drip irrigation, suitable soil and water conservations like cultivation on raised beds with mulches and drip
3	3 DSImB2 4 GTTmB1 5 GTTmB1g1 6 GTTmB2g1 8 HBLmB2g2	Moderately shallow black soil (50-75 cm) 1-3 % slope moderately eroded.	**Kamalapura:** 62,123,145	Sorghum, Cotton, Red Gram, Black gram, Green gram, Soybean, Sesame, Sunflower, Safflower Rabi: Sorghum, Chickpea	Subabhul, Neem, Teak	Custard apple, Charoli, Ber, Amla Vegetable: Ladies finger, Brinjal, Cowpea, Flower: Marigold, Chrysanthemum	Custard apple, Charoli, Ber, Amla, Papaya, Banana, Lime, Citrus Vegetable: Onion, Tomato, Brinjal, Chillies, Bhendi Flower: Marigold, Chrysanthemum	Drip irrigation, suitable soil and water conservations like cultivation on raised beds with mulches and drip Graded bunds, Strengthening of field bunds

To be continued…

LMU No	Mapping unit	Characters	Survey No	Crops proposed				Suitable Intervention
				Field crops	Forestry Crop/Grasses	Horticulture crops (Rainfed Condition)	Horticulture crops with suitable intervention	
4	21 MRDmB2g1	Moderately deep red soil (75-100 cm),1-3 % slope, severely eroded, moderately gravelly	**Kamalapura:** 108	Ragi, sorghum,bajra Horsegram, castor	Silviculture: *Accacia arculiformis*, Glyricidia, Agave, Simaruba, Cassia spp. Grasses:*Styloxanthes hamata*, *Styloxanthes scabra*, *Khus grass*	Custard apple, Charoli, Ber	Custard apple, Charoli, Ber	suitable soil and water conservations like Trench cum bunds
5	23 RMNmB1g1	Moderately deep black soil (75-100 cm),1-3 % slope, slightly eroded.	**Kamalapura:** 70,71,90	Sorghum, Cotton, Red Gram, Black gram, Green gram, Soybean, Sesame, Sunflower, Safflower Rabi: Sorghum, Chickpea	Subabhul, Neem, Teak	Custard apple, Charoli, Ber, Amla Vegetable: Ladies finger, Brinjal, Cowpea, Flower: Marigold, Chrysanthemum	Custard apple, Charoli, Ber, Amla, Papaya, Banana, Lime, Citrus Vegetable: Onion, Tomato, Brinjal, Chillies, Bhendi Flower: Marigold, Chrysanthemum	Drip irrigation, suitable soil and water conservations like cultivation on raised beds with mulches and drip Graded bunds, Strengthening of field bunds
6	15 MANmB2 24 RNLmB2	Deep to very deep Black soil (100-150 & >150 cm), 1-3 % slope, slight erosion	**Kamalapura:** 69,109,115,116,117,118,119,122,126,127,128, 143	Sorghum, Cotton, Red Gram Black gram, Green gram, Soybean, Sesame, Sunflower, Safflower, Rabi: Sorghum, Chickpea	-	Vegetable: Ladies finger, Brinjal, Cowpea, coriander Field crops: Sorghum, Cotton, Red Gram, Sunflower, Safflower, Perennial component: Guava, Tamarind, Sapota, Lime, Mosambi Flower: Marigold, Chrysanthemum	Banana, Papaya, Lime. Mosambi, Guava, Tamrind Vegetable: Onion, Tomato, Brinjal, Chillies, Bhendi Flower: Marigold, Chrysanthemum	Drip irrigation, suitable soil and water conservations like cultivation on raised beds with mulches and drip Graded bunds, Strengthening of field bunds


KAMALAPUR SUB-WATERSHED
MARGUTTI MICRO-WATERSHED
Gulbarga Taluk
SOIL & WATER CONSERVATION
Margutti Micro-watershed
(4D5B8K1b : Area - 637.76 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DONGARGAON
BACHNAL
BHIMHALLI
KAMALAPUR
Bachnal
Rajanhal
References
Streams/Drainage
Road/Cart track
Habitation
Waterbody
42 Land Parcel with No's
Micro-watershed boundary
* - Habitation & Waterbody
Legend
Area in ha.(%)
Bench terracing 12 (1.86)
Graded bunding/strenthening of field bunds 597 (93.58)
Others* 29 (4.56)
Source: ICAR-NBSS&LUP, Bengaluru


KAMALAPUR SUB-WATERSHED
BHIMNALLI MICRO-WATERSHED
Gulbarga Taluk
SOIL & WATER CONSERVATION PLAN
Bhimnalli Micro-watershed
(4D5B8K1c : Area - 642.74 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
DHANURA
BACHNAL
MORMANCHI
KURNUR
Dongaragaov
Maragatthi
Bheemanala
Bhimnalli
Kamalapura
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
30 Land parcel with No's
Village boundary
Micro-watershed boundary
Legend
Area in ha (%)
Graded bunding/strenthening of field bunds 555 (86.30)
Trench cum bunds 76 (11.85)
Others* 12 (1.85)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru


KAMALAPUR SUB-WATERSHED
KAMALAPUR TANDA MICRO-WATERSHED
Gulbarga Taluk
SOIL & WATER CONSERVATION PLAN
Kamalapur Tanda Micro-watershed
(4D5B8K1d : Area - 546.77 ha)
Gulbarga Taluk
GULBARGA DISTRICT
0 0.25 0.5 1 km
N
BHIMHALLI
RAJANHAL
KAMALAPURA
Rajahala
Kamalapura
Kamalapur Tanda
References
Stream/Drainage
Road/Cart Track
Habitation
Waterbody
64 Land parcel with No's
Village boundary
Micro-watershed boundary
Legend
Area in ha (%)
Bench terracing 95 (17.44)
Graded bunding/strenthening of field bunds 415 (75.95)
Railway 8 (1.49)
Others* 28 (5.12)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru

PART - B

Hydrological Inventory of Kamlapur Sub-atershed, Kalaburagi Taluk, Kalaburagi District, Karnataka for Watershed Planning and Development

Sujala - III
Karnataka Watershed Development Project-II
Watershed Development Department
Government of Karnataka

THE WORLD BANK

Hydrological Inventory of Kamlapur Sub-watershed, Kalaburagi Taluk, Kalaburagi District, Karnataka for Watershed Planning and Development

Prepared by
ICAR-National Bureau of Soil Survey and Land Use Planning
Regional Centre, Hebbal, Bangalore - 560 024

ICAR - NBSS & LUP

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Details of Hydrology Team of LRI Partner Responsible for Preparation of Atlas

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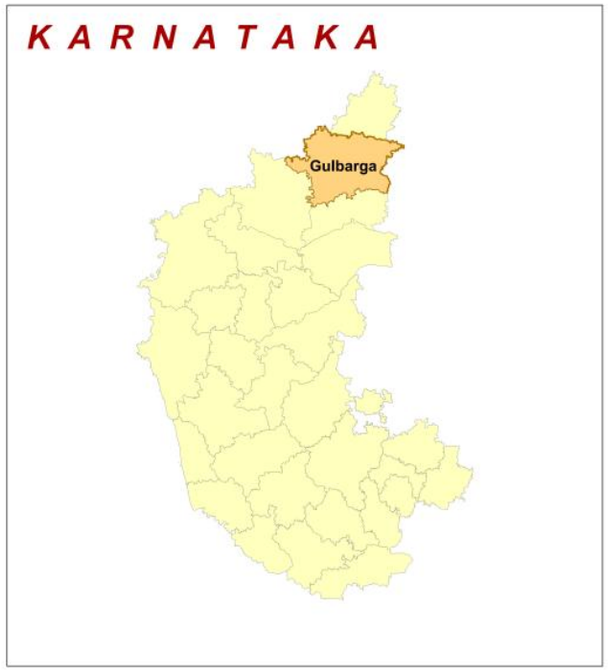
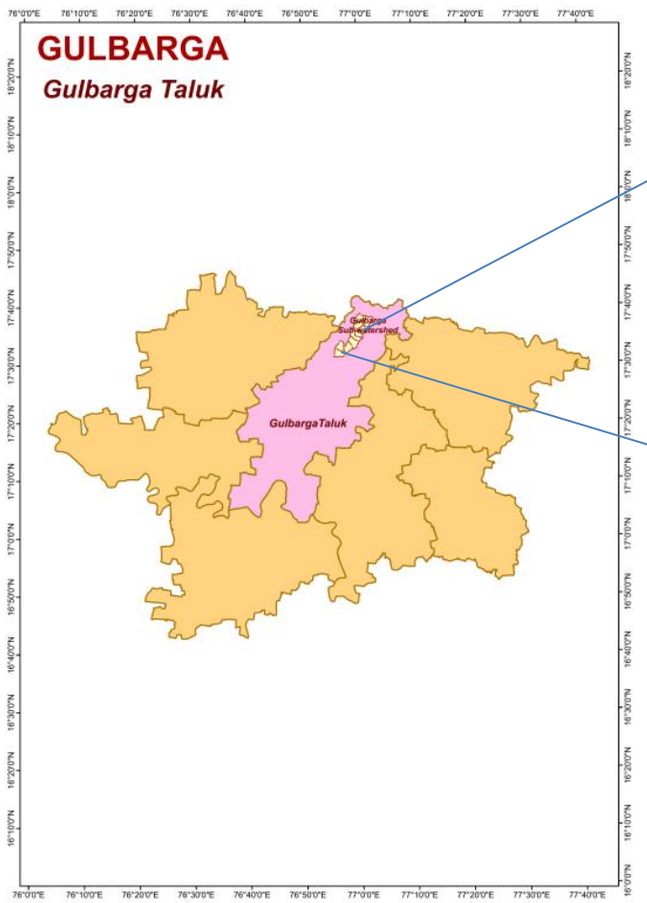
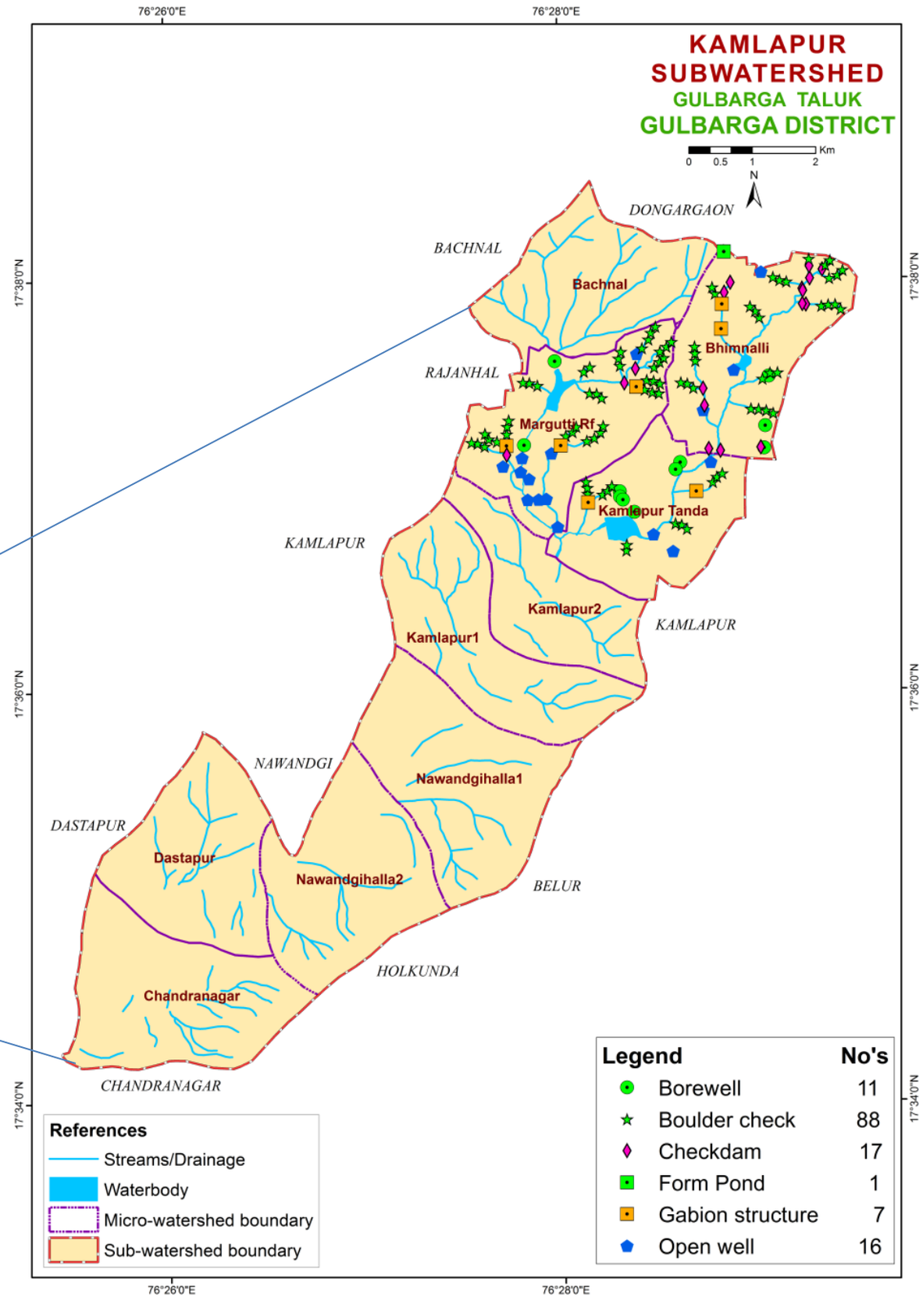
INTRODUCTION

- The inventory and documentation of spatial and temporal changes in hydrological components of Kamlapur sub-watershed (4D5B8K) in Kalaburagi taluk, Kalaburagi district, has been undertaken for integrated planning, development and management at the level of soil mapping units.
- Kamlapur sub-watershed (Kalaburagi taluk, Kalaburagi district) is located between $17^0$30'58''-17^0 38'4'' North latitudes and $76^0$54'31''- $77^0$3'13'' East longitudes, covering an area of about 6157 ha.
- This sub-watershed encompasses of 10 MWs namely, Bachnal (4D5B8K1a), Bhimnalli (4D5B8K1c), Chandranagar (4D5B8K2d), Dastapur (4D5B8K2c), Kamlapur Tanda (4D5B8K1d), Kamlapur-1 (4D5B8K1f), Kamlapur-2 (4D5B8K1e), Margutti Rf (4D5B8K1b), Nawandgihalla-1 (4D5B8K2a) and Nawandgihalla-2 (4D5B8K2b) micro watersheds. Land Resource Inventory (LRI) was generated for three among ten micro-watersheds.
- Average annual rainfall (1960-2014) of the Hobli (Block) pertaining to the sub-watershed is 790 mm.
- In this sub-watershed major *kharif* crops grown are Maize, Soyabean, Redgram, Groundnut, Sunflower, Cotton and major *rabi* crops are Sorghum, Chickpea, Safflower, Sesamum, Bajra and Wheat.
- Hydrological components namely rainfall (annual, *kharif*, *rabi* and summer), PET, AET, runoff, surface soil moisture, ground water status and water balance are presented.

LOCATION MAP OF KAMLAPUR SUB-WATERSHED

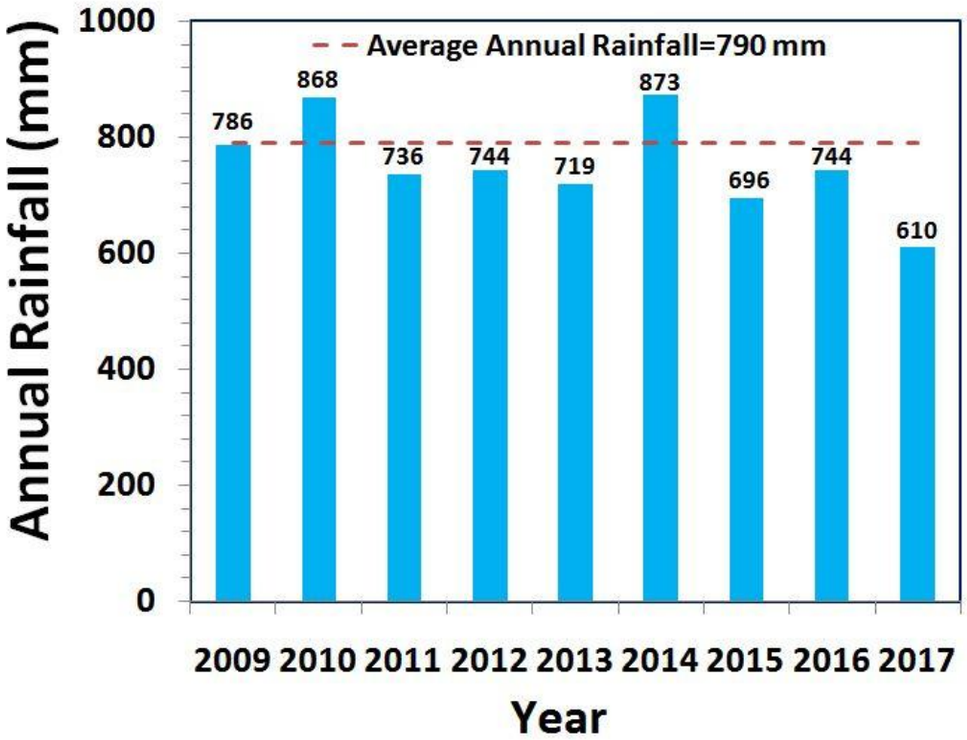






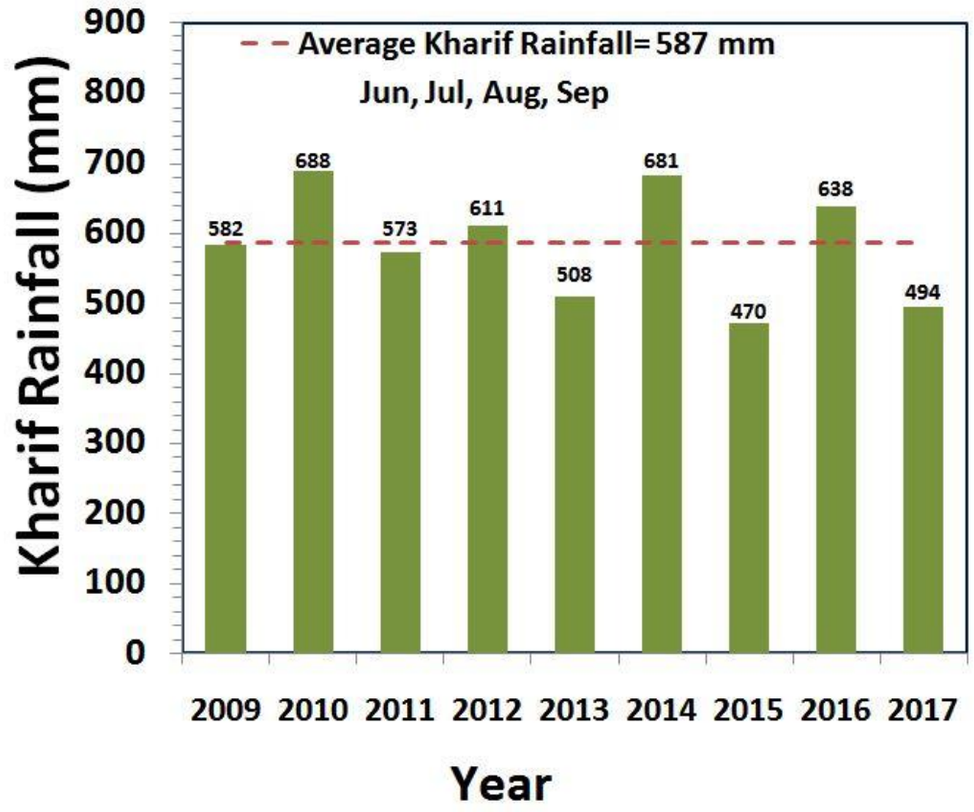
Soil & Water Conservation Structures in Kamlapur Sub-watershed, Kalaburagi taluk, Kalaburagi district

RAINFALL INDEX

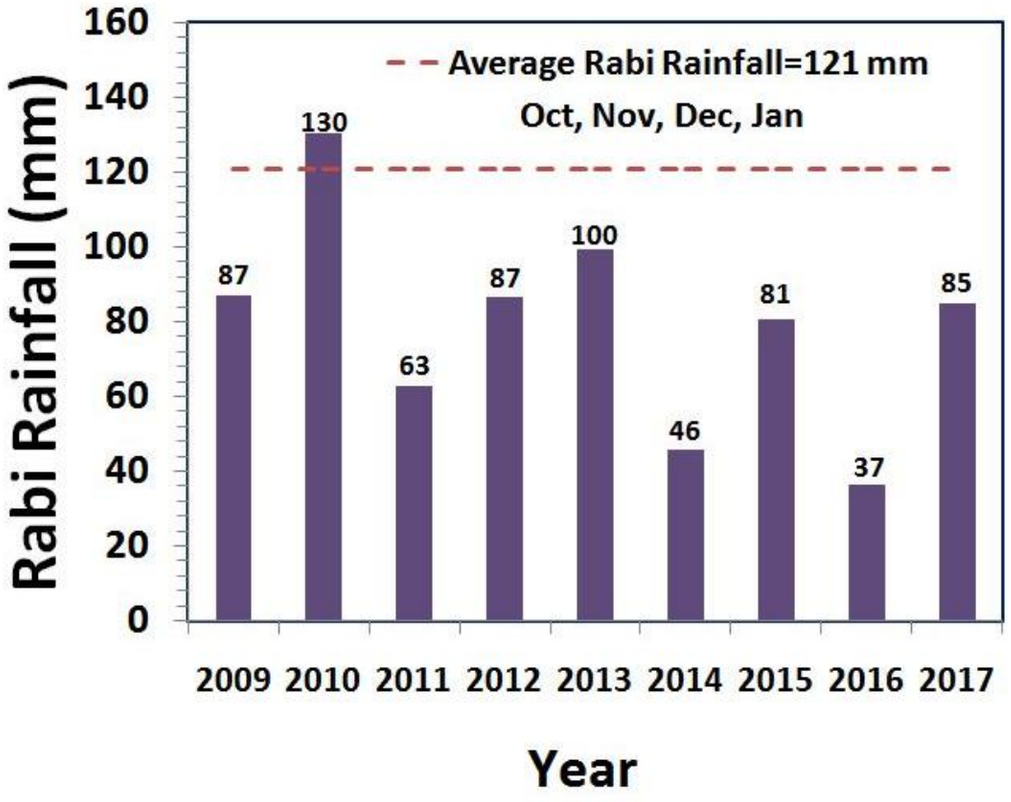


The average annual rainfall (1960-2014) recorded at the Kalaburagi station in Kalaburagi taluk of Kalaburagi district is 790 mm. The annual rainfall at Kamlapur station (Hobli H.Q.) is presented. During the years 2011, 2012, 2013, 2015, 2016 and 2017 the annual rainfall was deficient by 7%, 6%, 9%, 12%, 6% and 23% respectively.

The *kharif* rainfall (Jun–Sep) is an average about 77% of the annual rainfall and it typically follows the annual rainfall patterns. During the years 2011, 2013, 2015 and 2017 the *kharif* rainfall was deficient by 2%, 13%, 20% and 16% respectively.

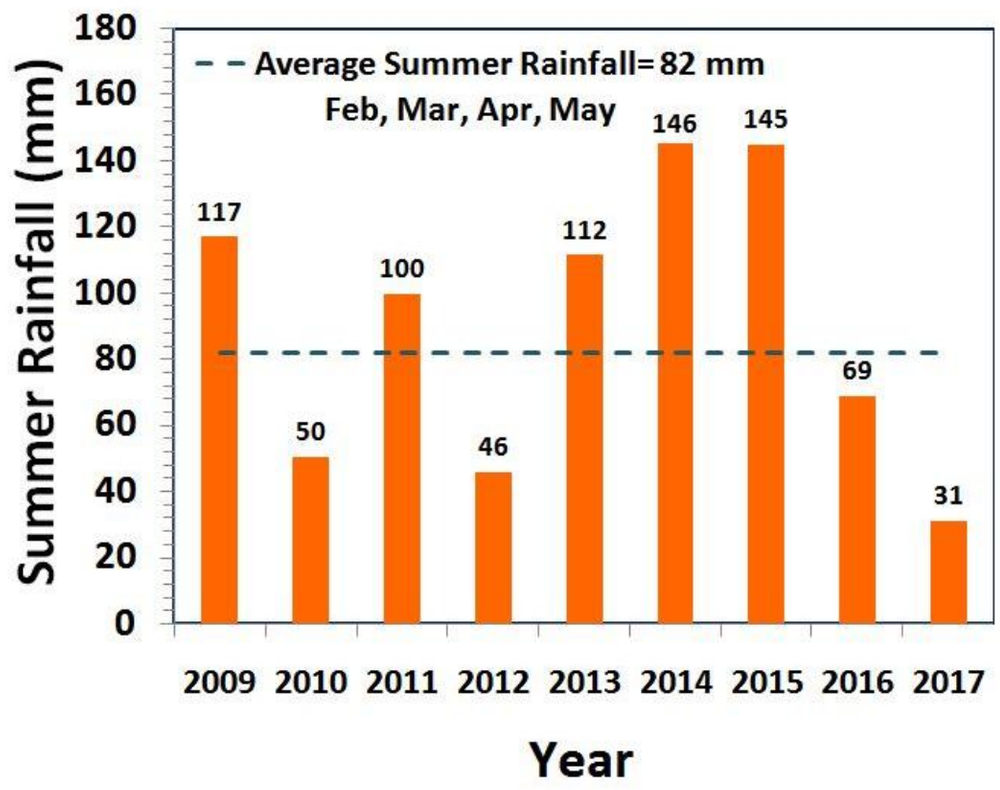


RAINFALL INDEX

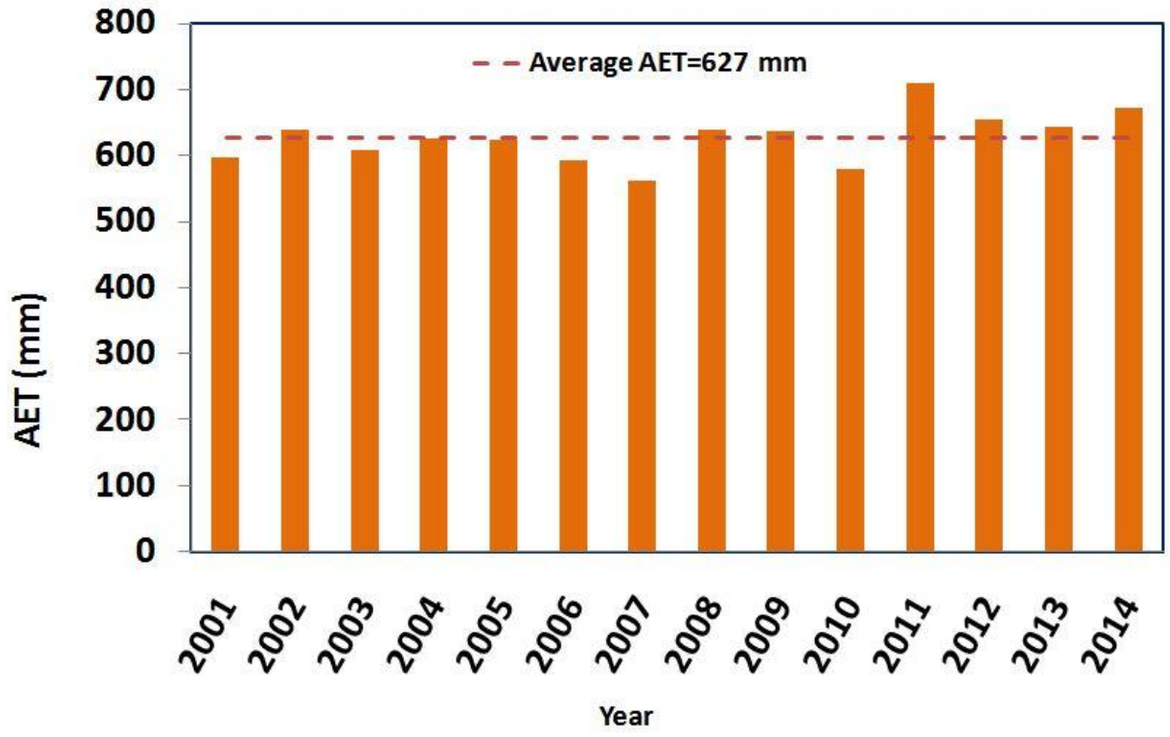


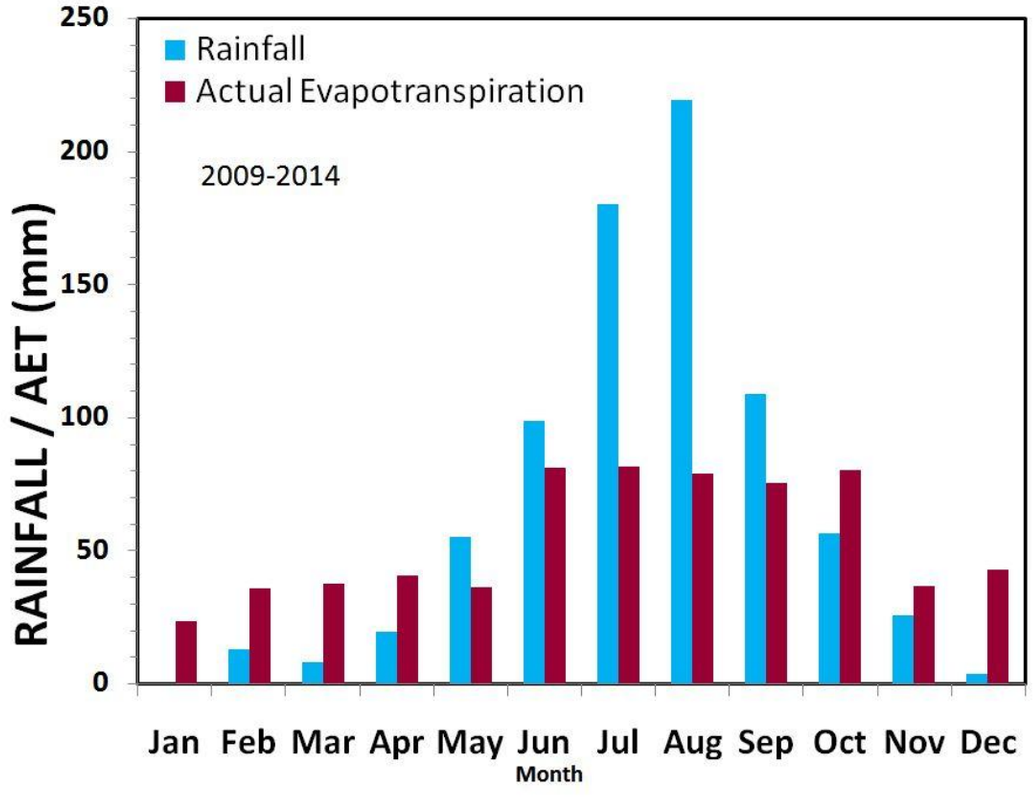
The average *rabi* rainfall (Oct-Jan) is about 11% of the average annual rainfall. During the year 2009 high *rabi* rainfall was received, where as other years showed deficient rainfall.

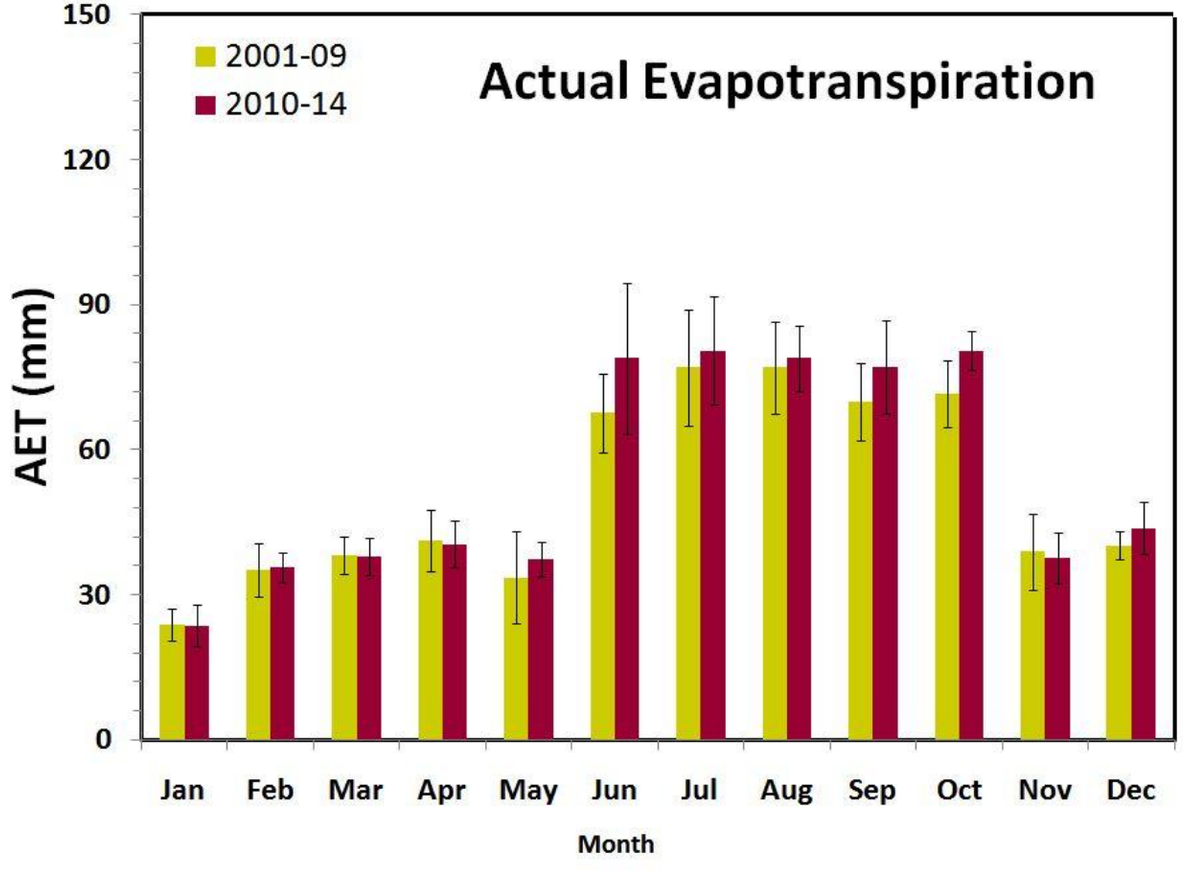
The average summer rainfall (Feb-May) is about 12% of the average annual rainfall.



EVAPOTRANSPIRATION

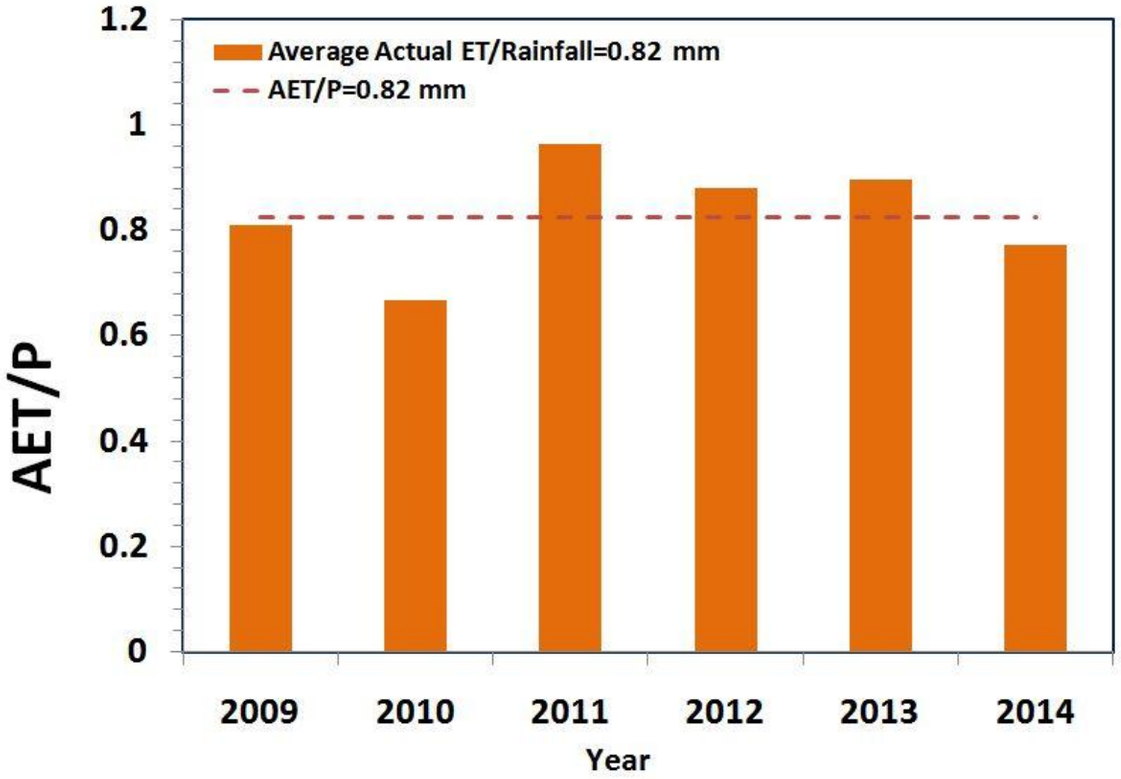


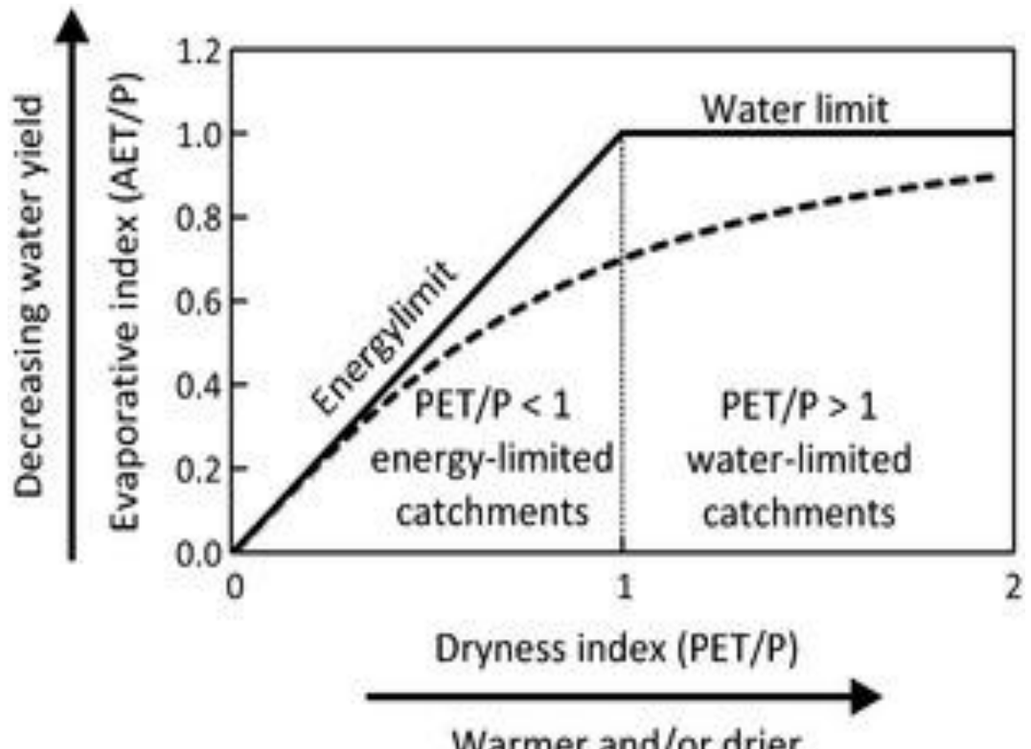




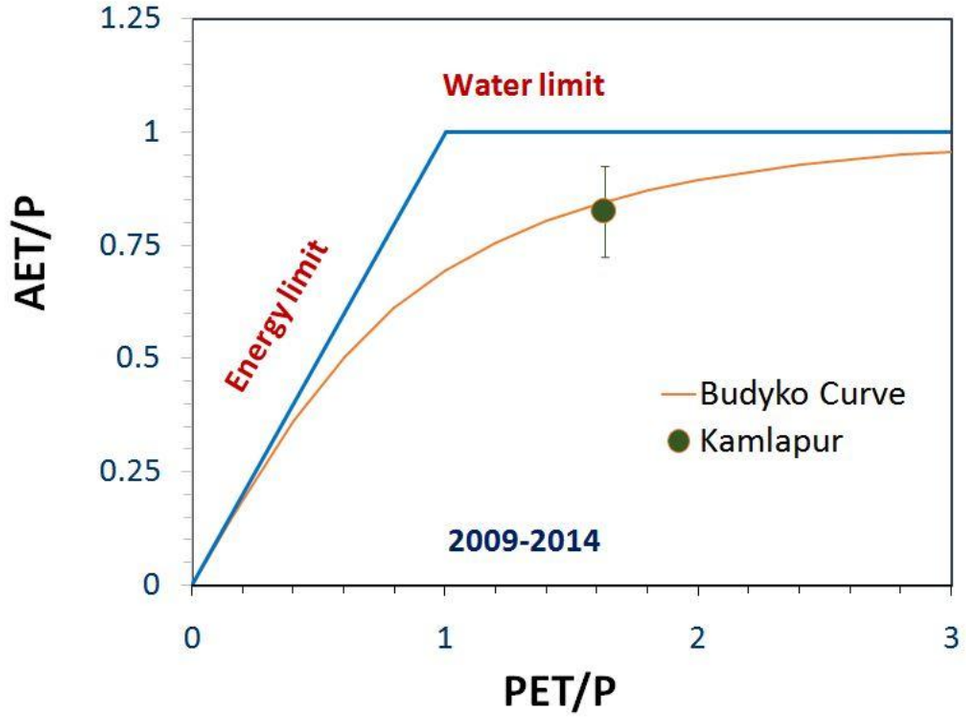
The average annual actual ET is lower than the average rainfall. During *kharif*, average rainfall and ET was found to be 583 mm and 317 mm respectively, whereas in *rabi* it was about 79 mm and 183 mm. In comparison to the 2001-2009, the annual ET increased by 6% during 2010-2014.

EVAPOTRANSPIRATION INDEX

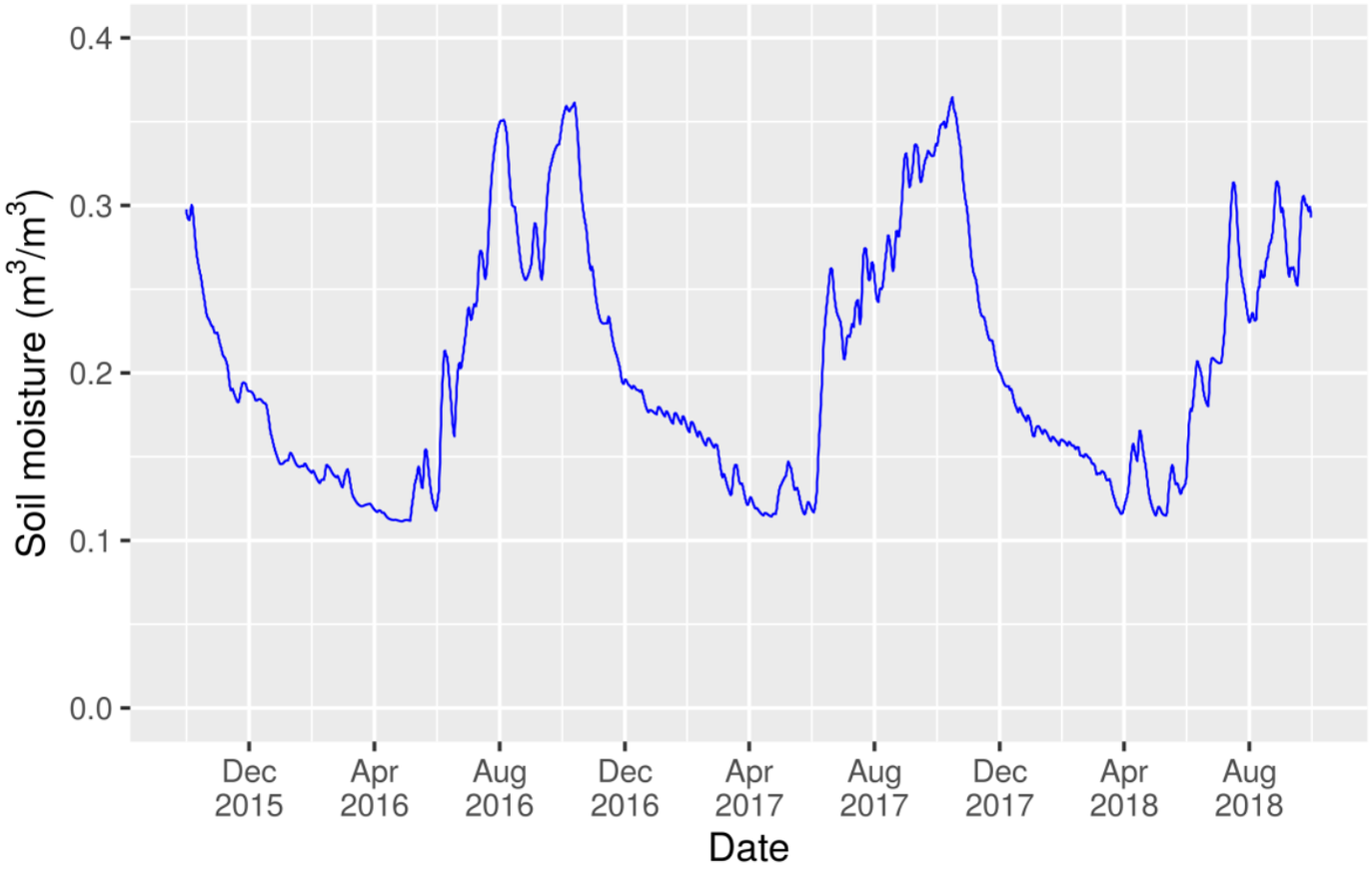




The average AET/P ratio was about 82%, which is slightly higher than the sustainable limit of about 80%. Even during extremely lower rainfall year of 2013, AET was 630 mm. This suggests the presence of water storage and utilization from other sources such as groundwater, which buffered the lower rainfall.

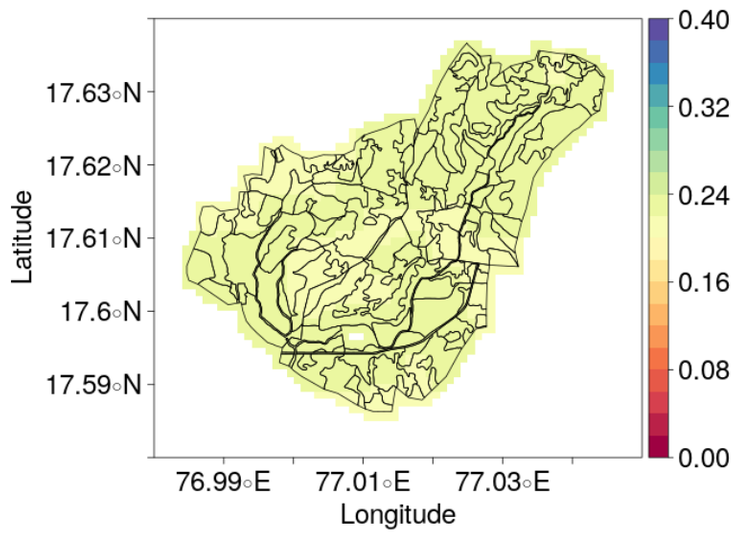


SATELLITE RETRIEVED SOIL MOISTURE

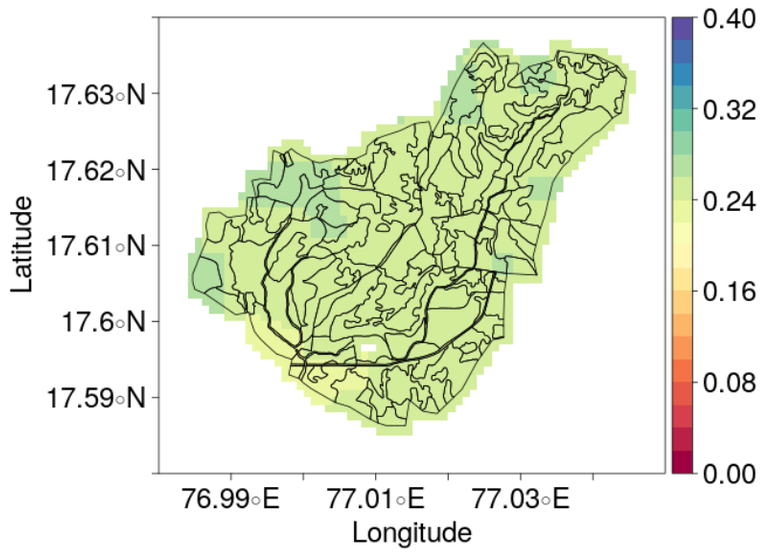


The method developed for retrieving soil moisture from multi-satellite observations allowed to map surface soil moisture behavior in the micro-watershed. The available surface moisture was varied in the range of 12-29 % in *kharif* and 18-36% in *rabi* seasons of 2016 and 12-33% in *kharif* and 18-35% in *rabi* seasons of 2017.

Kamlapur– *rabi* Soil Moisture



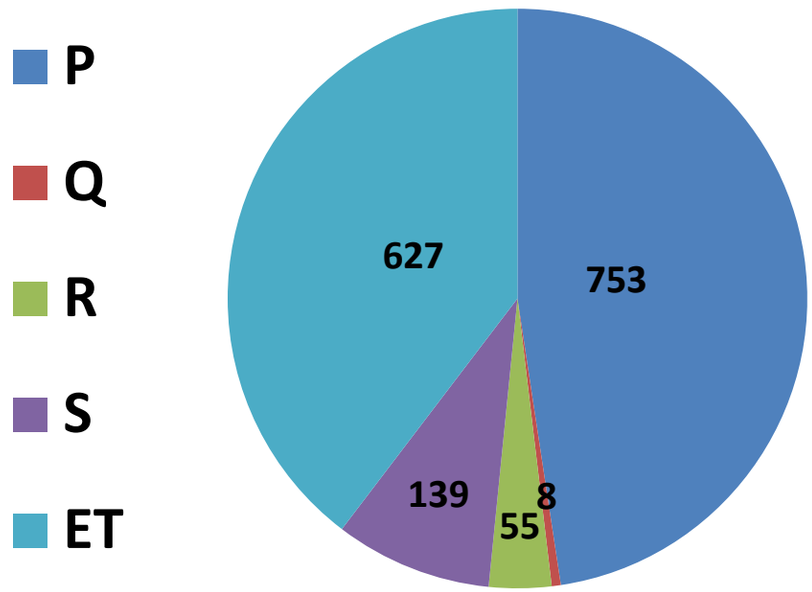
Kamlapur– *kharif* Soil Moisture



WATER BALANCE

$$Q = P - E - R - S$$

- Q = Runoff
- P = Precipitation
- E = Evapotranspiration
- R = Groundwater recharge
- S = Soil moisture storage change

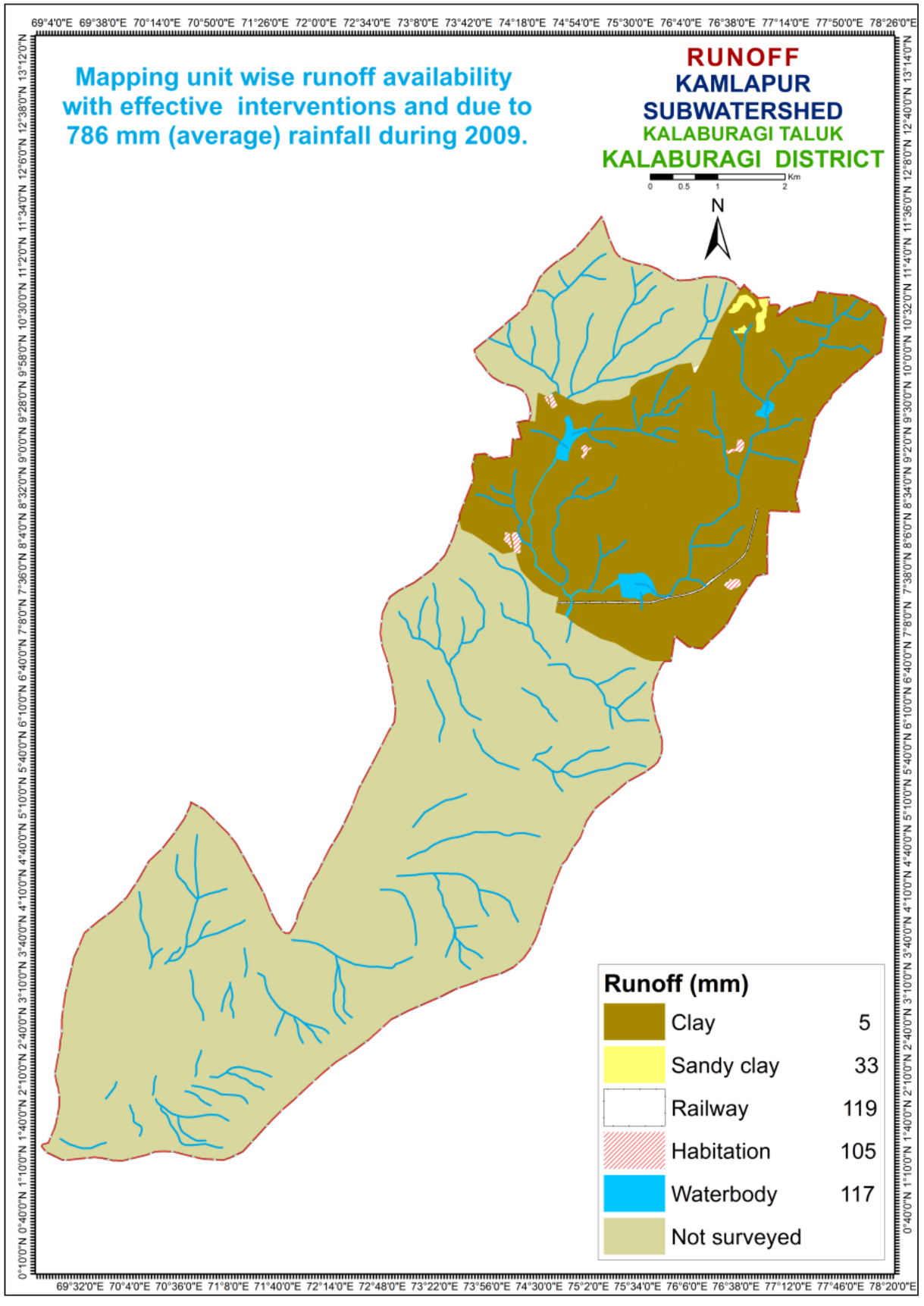


During June-September months, Precipitation is slightly higher than Evapotranspiration, hence Slight Runoff can occur in the watershed.

P = 753 mm (average of 2009-2017) ET = 627 mm R = 55 mm S = 139 mm Q = 8 mm

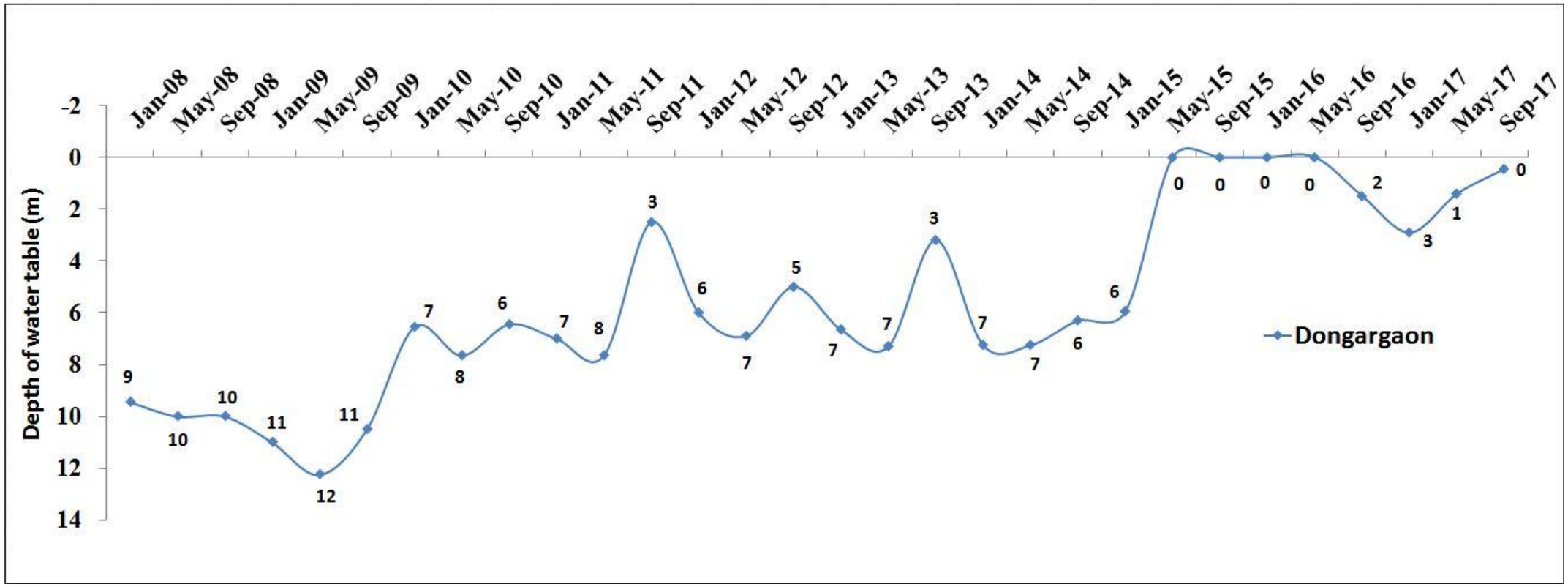
Sl. No.	Parameters	Average_ 2009 (mm)
1.	Rainfall	786
2.	Runoff availability with existing conditions	88
3.	Runoff availability with effective interventions	10
4.	Runoff allowed as environmental flow at the outlet	2
5.	Runoff excess for harvesting by construction of structures	8

RUNOFF


Mapping unit wise runoff availability with effective interventions and due to 786 mm (average) rainfall during 2009.
RUNOFF
KAMLAPUR
SUBWATERSHED
KALABURAGI TALUK
KALABURAGI DISTRICT
Km
0 0.5 1 2
N
Runoff (mm)
Clay 5
Sandy clay 33
Railway 119
Habitation 105
Waterbody 117
Not surveyed

GROUND WATER STATUS

DONGARGAON STATION



The total number of wells present in Kamlapur Sub-watershed as per LRI data are 27 (11 Borewells and 16 Openwells). The groundwater level was found from the data obtained from KSNDMC for the nearest station Dongargaon. The above graph depicts the groundwater levels during the years 2008-2009 and 2015-2017 was constant. Whereas groundwater levels during the years 2010-2014 were slightly varying. Deepest level was found in the year 2009.

x

SUMMARY

- The average annual rainfall of 790 mm in the Kamlapur sub-watershed as recorded from the Kamlapur station data by KSNDMC.

- 77%, 11% and 12% of the annual rainfall occurs during *kharif, rabi* and summer seasons respectively and exhibited a higher temporal variability.

- The evapotranspiration estimation tool developed indicates that the watershed water balance is in deficit .The cropping & irrigation choices are not appropriate and need to be altered to shift the deficit water balance.

- The estimated runoff available to use is 8 mm for an average annual rainfall of 753 mm (2009-2017). The utilizable groundwater is 38 mm (70% of 55 mm recharge estimated). This means the total available water resource combining the soil moisture store for kharif & rabi (139 mm) and utilizable runoff plus recharge is 185 (=139+38+8)

- The average actual evapotranspiration estimated in the watershed based on the current land use and irrigation practices for the kharif and rabi seasons is 500 mm. Hence the amount of water use for kharif and rabi seasons may be estimated as 625 mm (i.e 125% of AET). This demand for the two seasons is higher by 440 mm, i.e. (625-185). The AET in June-Sept months is 52% of rainfall. Hence, there is a good opportunity to harvest the excess water through watershed management practices for utilizing during rabi season.

- The groundwater level was found from the data obtained from KSNDMC for the nearest station Dongargaon. The groundwater levels during the years 2008-2009 and 2015-2017 was constant. Whereas groundwater levels during the years 2010-2014 were slightly varying. Deepest level was found in the year 2009.