हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद

Agrisearch with a human touch

ICAR-NBSS&LUP Sujala SWS- LRI Atlas No. 80

Land Resource and Hydrological Inventory of Pillahalli Sub-watershed for Watershed Planning and Development Gubbi Taluk, Tumkur District, Karnataka (AESR 8.2)

Sujala – III

Karnataka Watershed Development Project- II

Funded by World Bank

The World Bank

ICAR - NBSS & LUP

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 (ICAR-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, K.V. Niranjana, S. Srinivas, K.M. Nair, B.A. Dhanorkar, R.S.Reddy and S.K. Singh (2017). "Land Resource Inventory of Pillahalli Sub-watershed for Watershed Planning and Development, Gubbi Taluk, Tumkur District, Karnataka", Sujala SWS-LRI Atlas No.80, ICAR – NBSS & LUP, RC, Bangalore. p.51.

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PART - A

Land Resource Inventory of Pillahalli Sub-watershed for Watershed Planning and Development

Gubbi Taluk, Tumkur District, Karnataka (AESR 8.2)

CONTENTS

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How to read and use the Atlas

The Land Resource Inventory of Pillahalli Sub-watershed (Gubbi Taluk, Tumkur District) for Watershed Planning (AESR 8.2) 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.

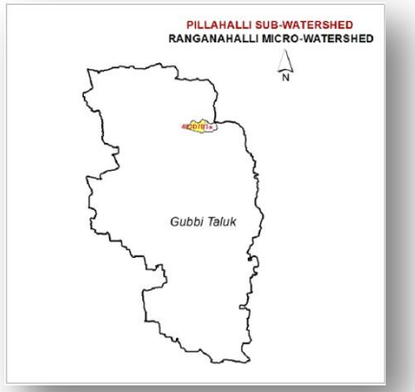
For easy map reading and understanding the information contain in different maps, the physical, cultural and scientific symbols used in the maps are illustrated in the form of colors, graphics and tables.

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.

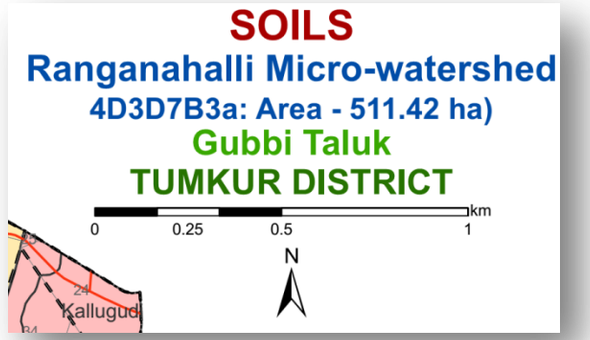
Inset map

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



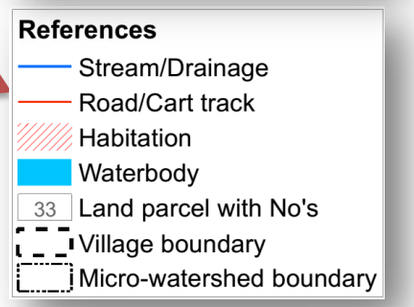
Map title

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



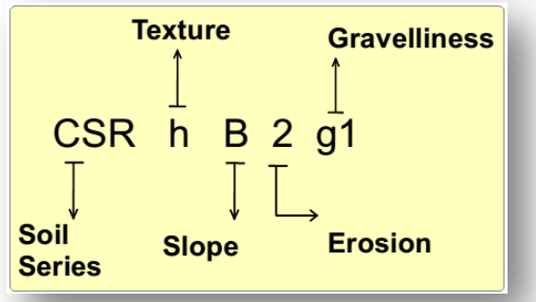
Legends and symbols

*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.*



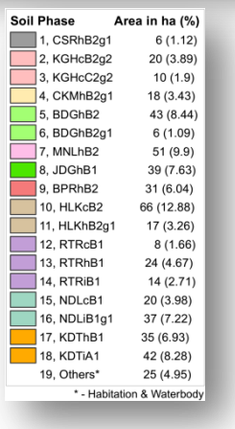
Soil Units

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.

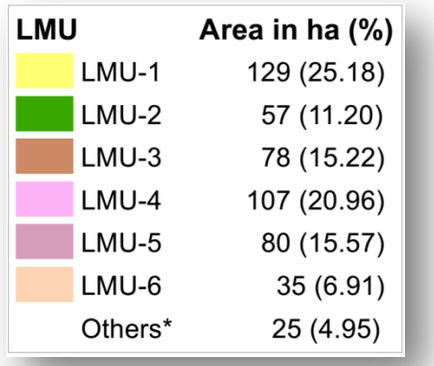


Soil Phase	Area in ha (%)
1, CSRhB2g1	6 (1.12)
2, KGHcB2g2	20 (3.89)
3, KGHcC2g2	10 (1.9)
4, CKMhB2g1	18 (3.43)
5, BDGhB2	43 (8.44)
6, BDGhB2g1	6 (1.09)
7, MNLhB2	51 (9.9)
8, JDGhB1	39 (7.63)
9, BPRhB2	31 (6.04)
10, HLKcB2	66 (12.88)
11, HLKhB2g1	17 (3.26)
12, RTRcB1	8 (1.66)
13, RTRhB1	24 (4.67)
14, RTRiB1	14 (2.71)
15, NDLcB1	20 (3.98)
16, NDLiB1g1	37 (7.22)
17, KDThB1	35 (6.93)
18, KDTiA1	42 (8.28)
19, Others*	25 (4.95)

* - Habitation & Waterbody

Land Management Units (LMU)

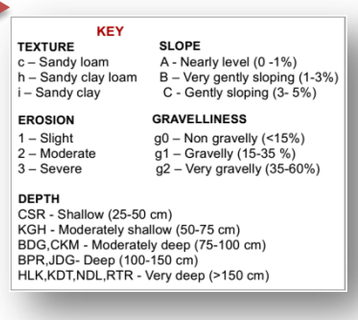
Grouping of similar soil areas based on their soil-site characteristics into management units that respond similarly for a given level of management are designated as land management units

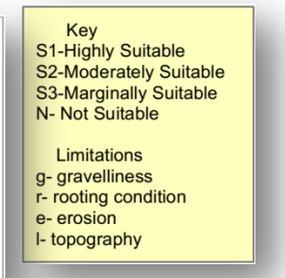


LMU	Area in ha (%)
LMU-1	129 (25.18)
LMU-2	57 (11.20)
LMU-3	78 (15.22)
LMU-4	107 (20.96)
LMU-5	80 (15.57)
LMU-6	35 (6.91)
Others*	25 (4.95)

Map key

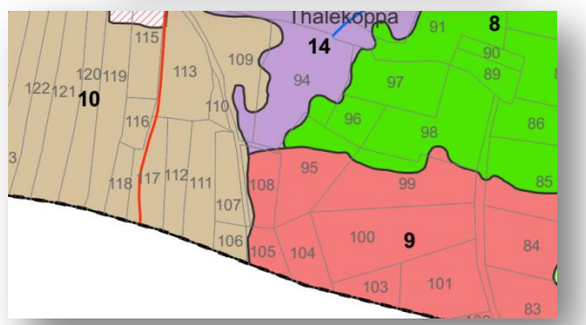
There are many thematic types to be differentiated on the map solely based on colour. Therefore soils and suitability types and their limitations are distinguished by colours with a combination of alpha-numeric characters.





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 PILLAHALLI MICRO-WATERSHED FOR PLANNING
GUBBI TALUK, TUMKUR 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

Tumakuru District popularly known as Kalpataru Nadu (For production of Coconuts) is located 71 kms away from the capital city of Karnataka state. The district is located in the Southern part of the state and lies between 12^{o} 45’ and 14^{o} 22’ North latitude and between 76^{o} 24’ and 77^{o} 30’ east longitude. The district has total geographical area of 10598 sq. kms. Majority of the population is dependent on agriculture in the district. The geology of the district consists of Granite gneiss and Schist. The average rainfall in the district is 688 mm. The major crops grown are ragi, groundnut, maize, sorghum, sugarcane, coconut, arecanut, mango, banana, mulberry, horsegram, greengram, field bean, pigeon pea and cow pea etc.

As a pilot study, **ICAR-NBSS&LUP, Bangalore** carried out the generation of LRI for the Pillahalli sub-watershed in Gubbi taluk, Tumkur district. It was selected for data base generation under batch VI of Sujala III project. This sub-watershed encompasses of 14 MWs namely Haldodder (4D3D7B1c), Haldodder (4D3D7B3c), Koradanakunte (4D3D7B1d), Koradanakunte (4D3D7B3d), Lakkenahalli-1 (4D3D7B2e), Lakkenahalli-2 (4D3D7B2d), Lakkenahalli-3 (4D3D7B2c), Nandihalli (4D3D7B1b), Nandihalli (4D3D7B3b), Pillahalli (4D3D7B3e), Ranganahalli (4D3D7B1a), Ranganahalli (4D3D7B3a), Yeladadluhatti-1 (4D3D7B2b) and Yeladadluhatti-2 (4D3D7B2a). Land Resource Inventory (LRI) was generated for two among fourteen micro-watersheds .

To be continued….

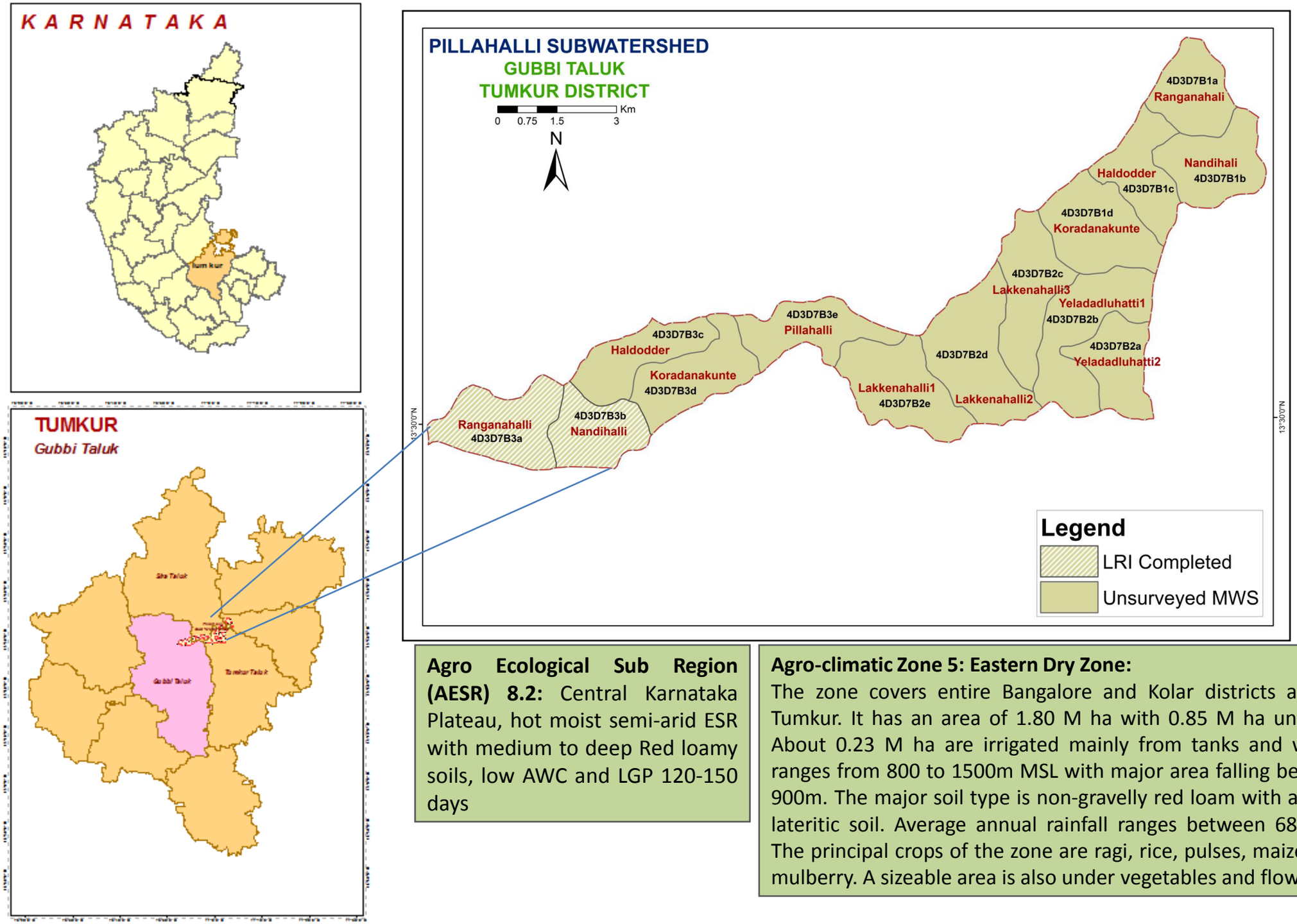
The major landforms identified in the micro-watersheds (Ranganahalli - 4D3D7B3a and Nandihalli- 4D3D7B3b) of Pillahalli sub-watershed are uplands and low lands. The database was generated by using cadastral map of the village as a base along with high resolution satellite imagery (IRS LISS IV and Cartosat-1). The objectives of the land resource survey, carried out during February-March 2015 in the Pillahalli Sub-watershed 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

Pillahalli sub-watershed (Gubbi Taluk, Tumkur District) is located between $13^0$28’ 38’’–$13^0$34’ 11’’ North latitudes and 76^0 52’26’’- 77^0 4’22’’ East longitudes, covering an area of about 6428 ha.

LOCATION MAP OF PILLAHALLI SUB-WATERSHED

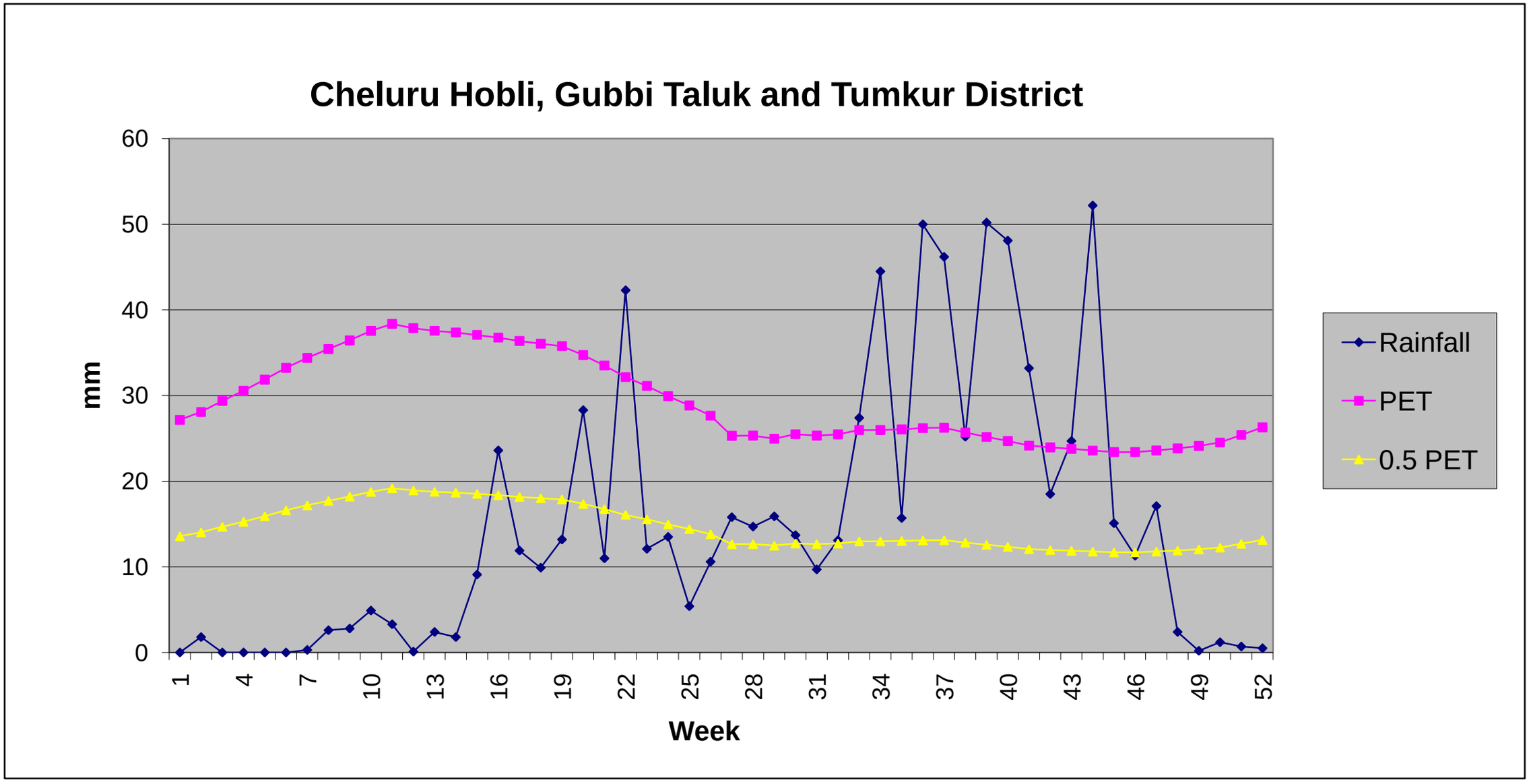


Agro Ecological Sub Region (AESR) 8.2: Central Karnataka Plateau, hot moist semi-arid ESR with medium to deep Red loamy soils, low AWC and LGP 120-150 days

Agro-climatic Zone 5: Eastern Dry Zone:
The zone covers entire Bangalore and Kolar districts and 2 taluks of Tumkur. It has an area of 1.80 M ha with 0.85 M ha under cultivation. About 0.23 M ha are irrigated mainly from tanks and wells. Elevation ranges from 800 to 1500m MSL with major area falling between 800 and 900m. The major soil type is non-gravelly red loam with a narrow belt of lateritic soil. Average annual rainfall ranges between 680 and 890mm. The principal crops of the zone are ragi, rice, pulses, maize, oil seeds and mulberry. A sizeable area is also under vegetables and flowering plants

Note: In this Sub-watershed,Land Resource Inventory (LRI) was generated for two (Ranganahalli - 4D3D7B3a and Nandihalli- 4D3D7B3b) among the fourteen micro-watersheds.

Climate

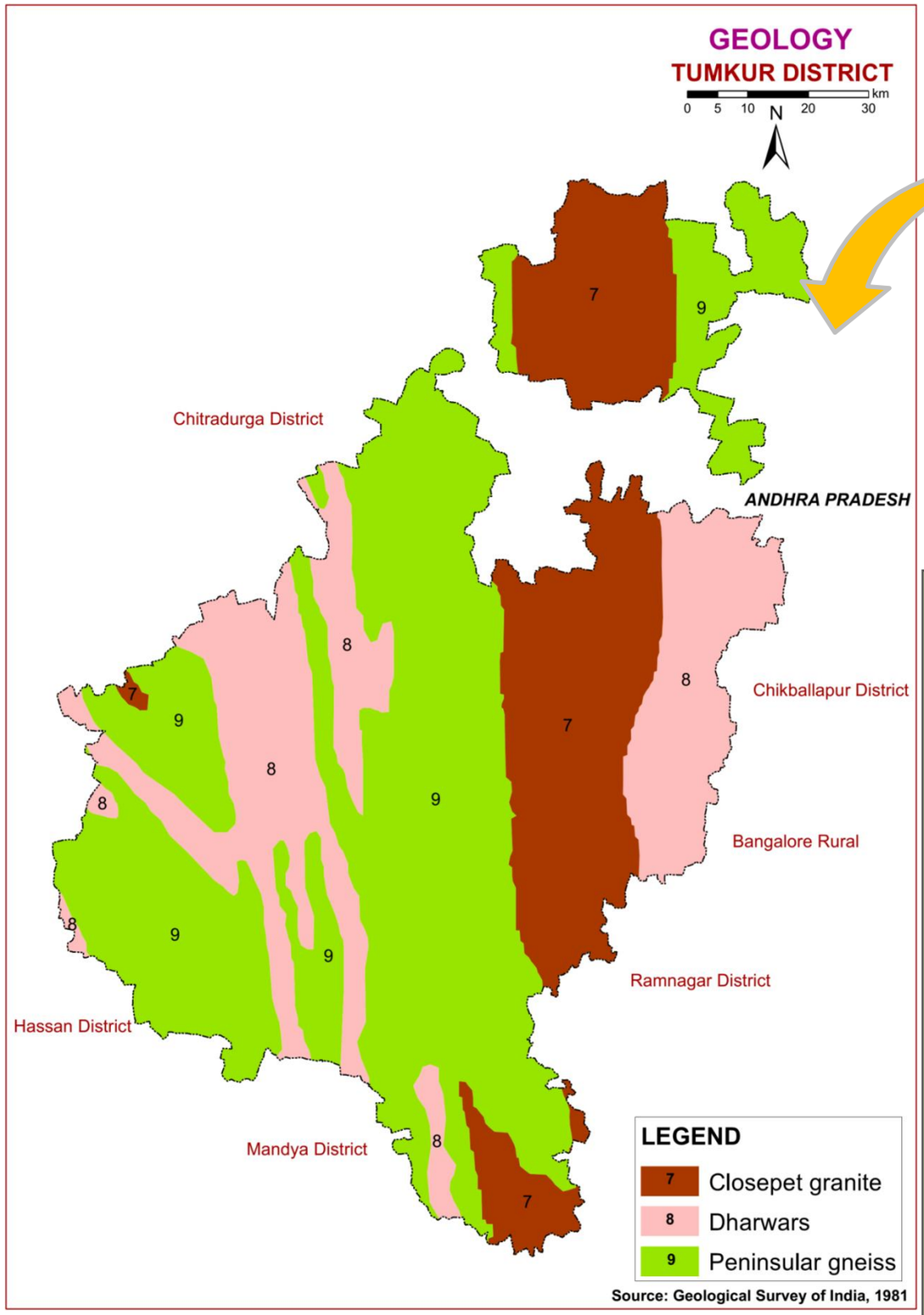


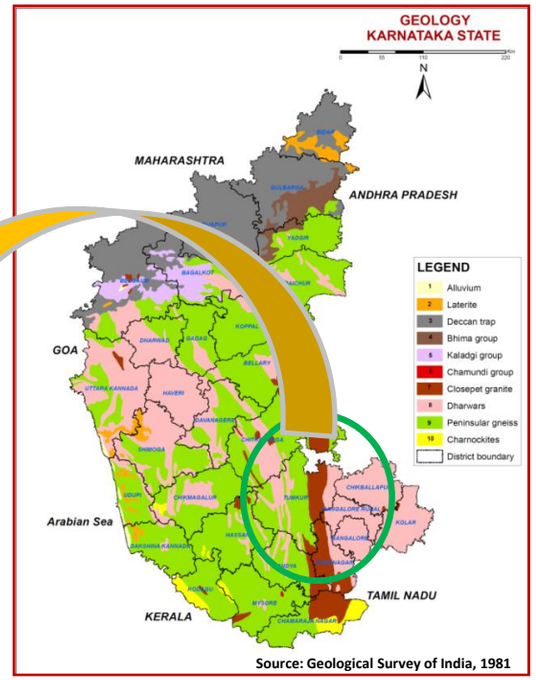
Length of Growing Period (LGP) is varying from July 1st week to 4th week of November about 120-150 days.

Annual Rainfall : 778mm. in the Cheluru Hobli, Gubbi taluk.

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 - TUMKUR DISTRICT

Upper Proterozoic Group

Formations of the Upper Proterozoic in Karnataka are Closepet granites, Chamundi granites, Kaladgi series and Bhima series. Out of these Chamarajanagara district consists of Closepet granites.

Closepet granites

Closepet granites are also known as Ramanagaram granites, constitute a well-defined range of hills and composed of various types of granite, granodiorite and granite porphyry

Archaean group: The Archaean group of rocks of Karnataka are the oldest formations (> 3000 million years) of the earth's crust. They are unfossiliferous, thoroughly crystalline, extremely contorted and faulted rocks, with well-defined foliated structure. They are intruded by plutonic rocks. The Archeans are also known as the Basement Complex or the Gneissic Complex. 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 is a heterogeneous mixture of several types of granitic rocks such as banded gneisses, granitic gneisses, granites and gneissic granites, granodiorites and diorites. The banded gneisses consist of white bands of quartz-feldspar alternating with dark bands of biotite, hornblende, and minor accessories. The granite group includes granites of all shades with varying composition. Peninsular gneiss seems to have formed by the granitization of the older rocks.

Dharwar schists

The Dharwar schists consist of a complex series of crystalline schists associated with ultrabasic rocks such as amphibolite, peridotites and dunites. These schists are found in long, narrow bands of various dimensions running NW-SE through the Peninsular Gneiss. The Dharwars are divided into Upper and Lower.

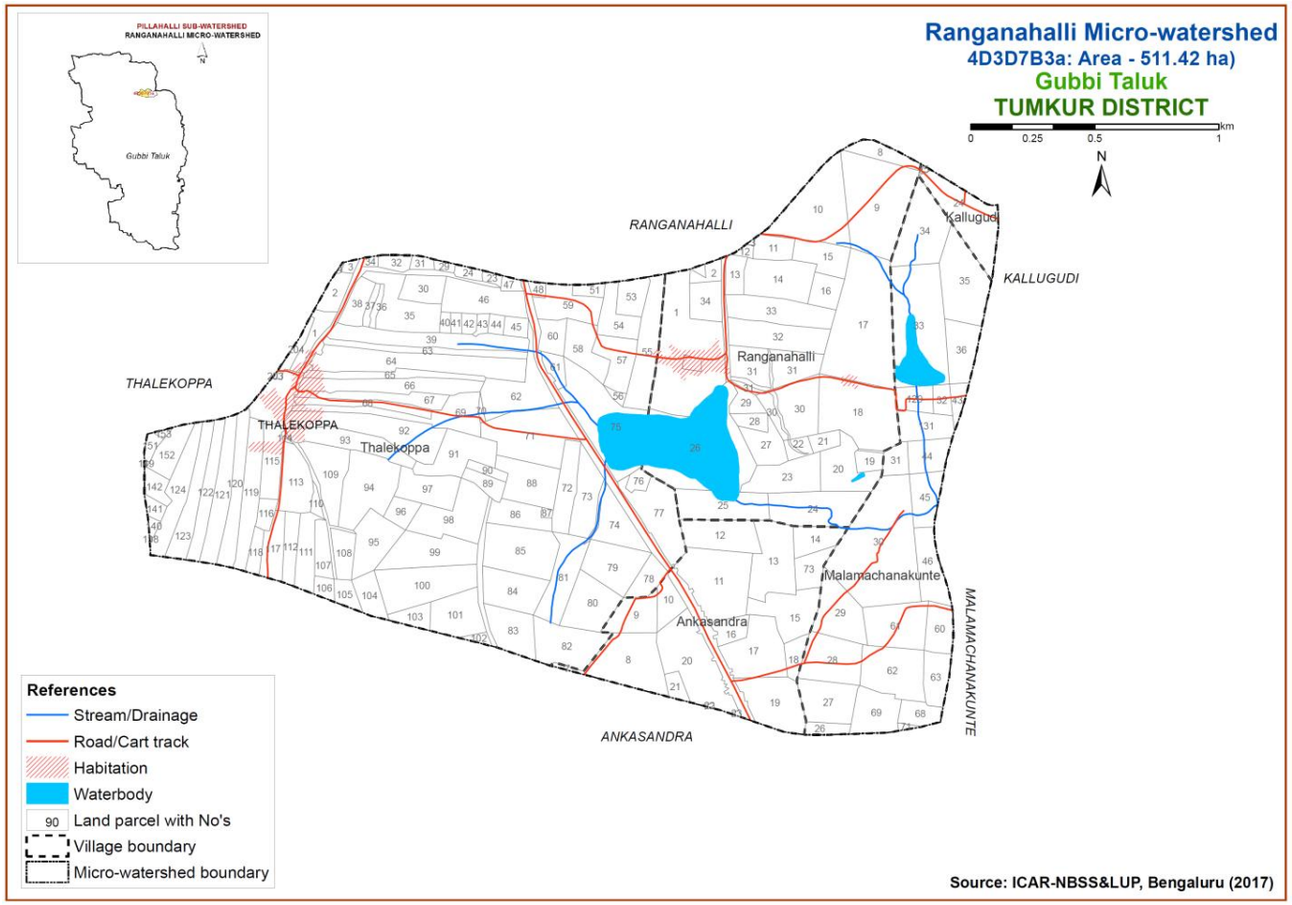
Upper Dharwars are equivalent to the Archaean to Lower Proterozoic, and are divided into Bababudan (comprises banded ferruginous quartzites, pyroxenite, gabbro, serpentinite, acid volcanic, phyllites, metabasalt, and quartz-chlorite schist) and Chitradurga groups (includes quartzite, limestone, dolomite, chlorite-schist, and manganese and iron ores with phyllite, metabasalt and conglomerates).

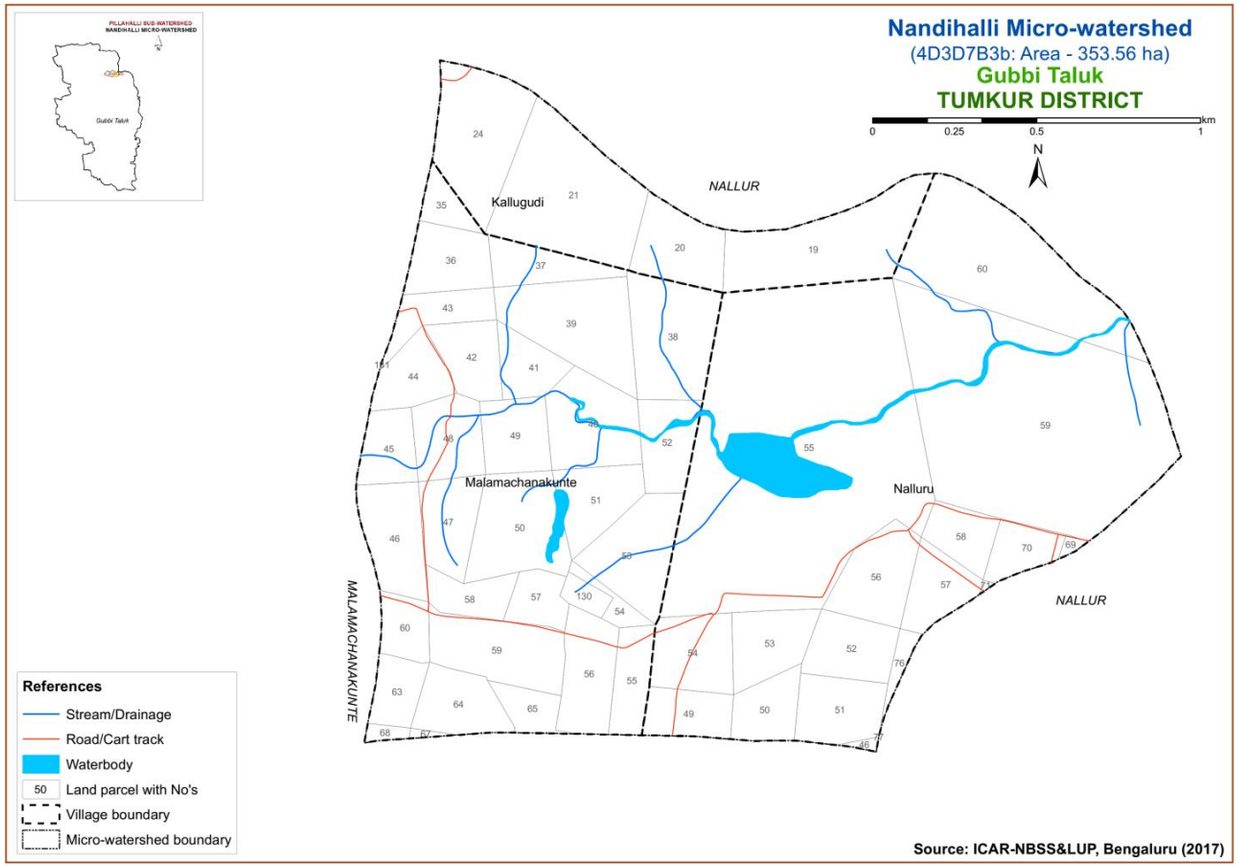
Lower Dharwars occur in Mysore district and include amphibolite schist, quartzite, ironstone and marble.

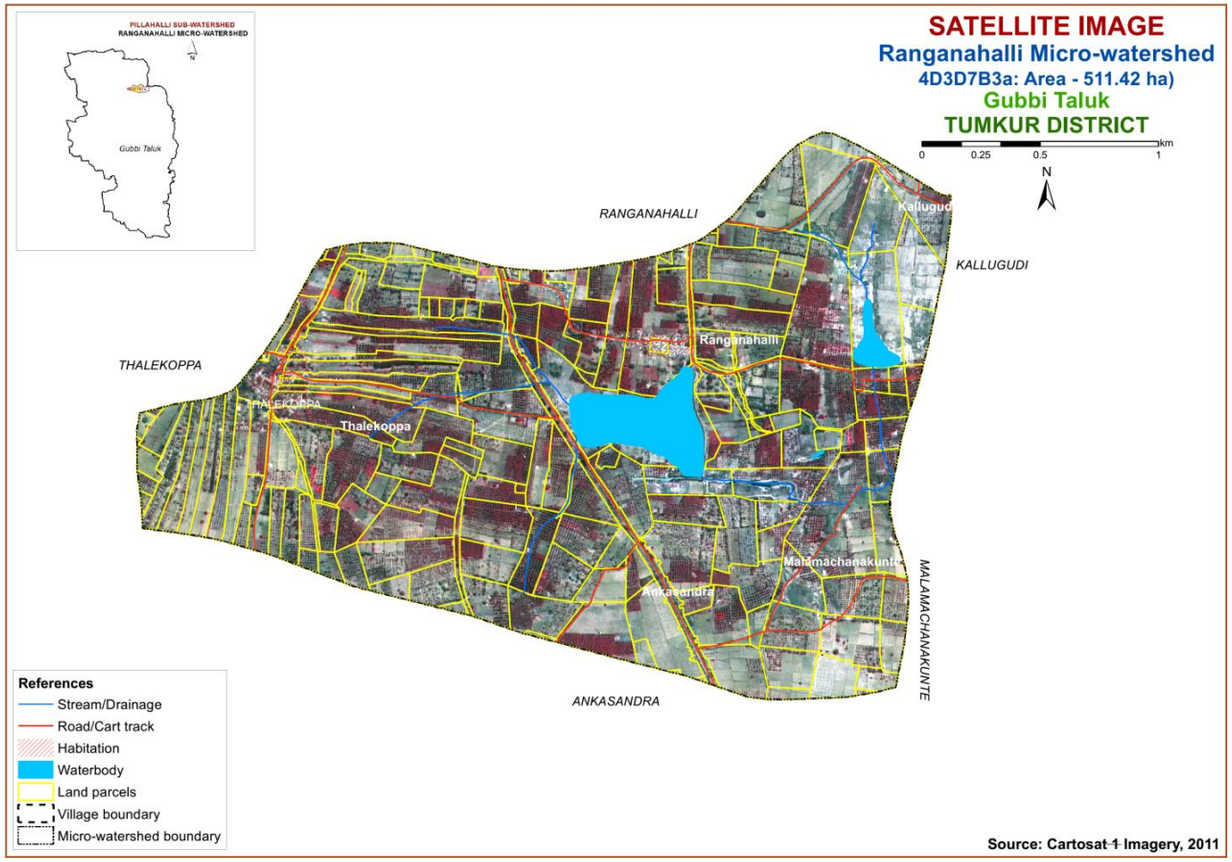
SURVEY METHODOLOGY
Sequence of activities in generation of LRI

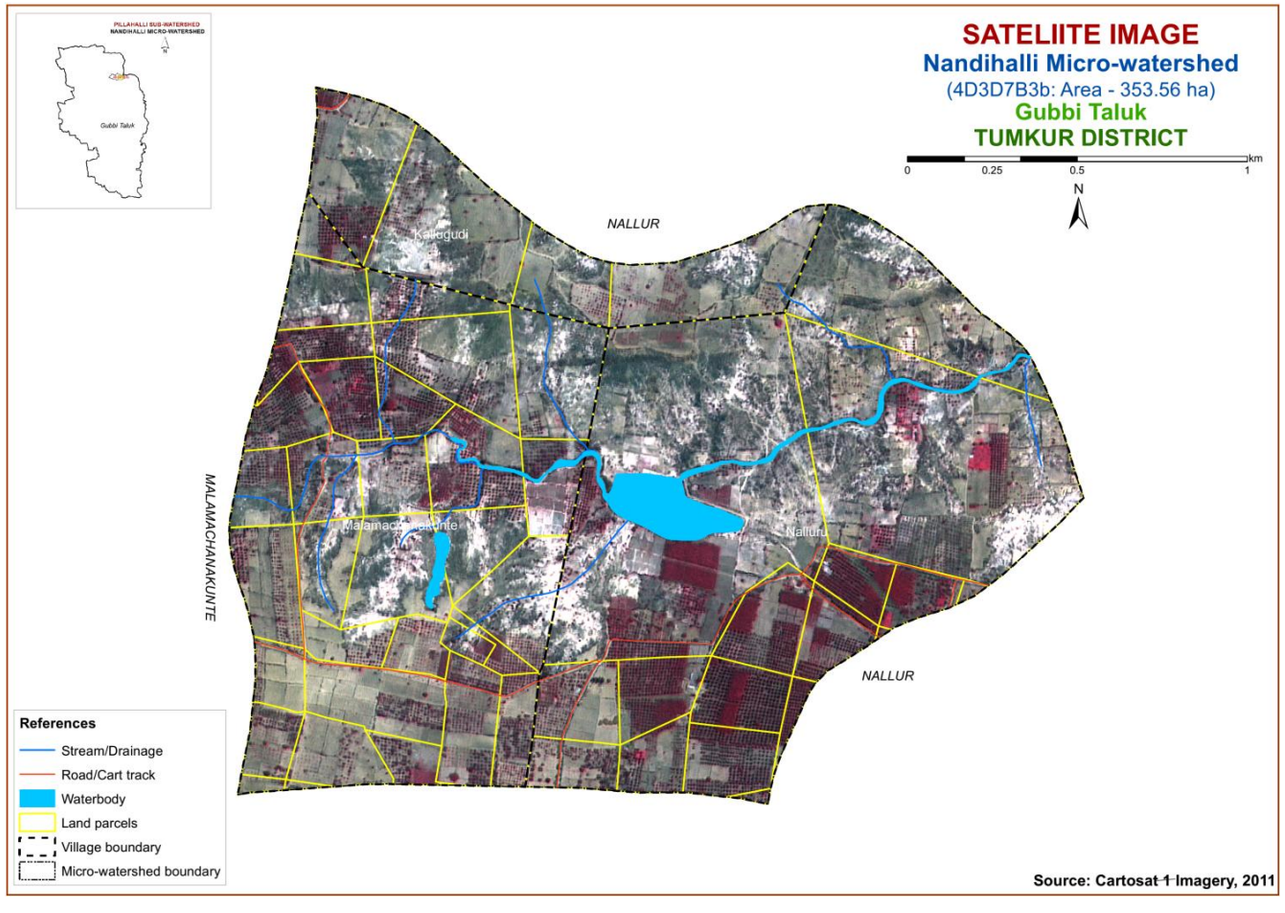
- Traversing the watershed using cadastral maps and imagery as base
- Identifying landforms, geology, land use and other features
- Selecting fields representing land units
- Opening profiles to 2 m depth
- Studying soil and site characteristics
- Grouping similar areas based on their soil-site characteristics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

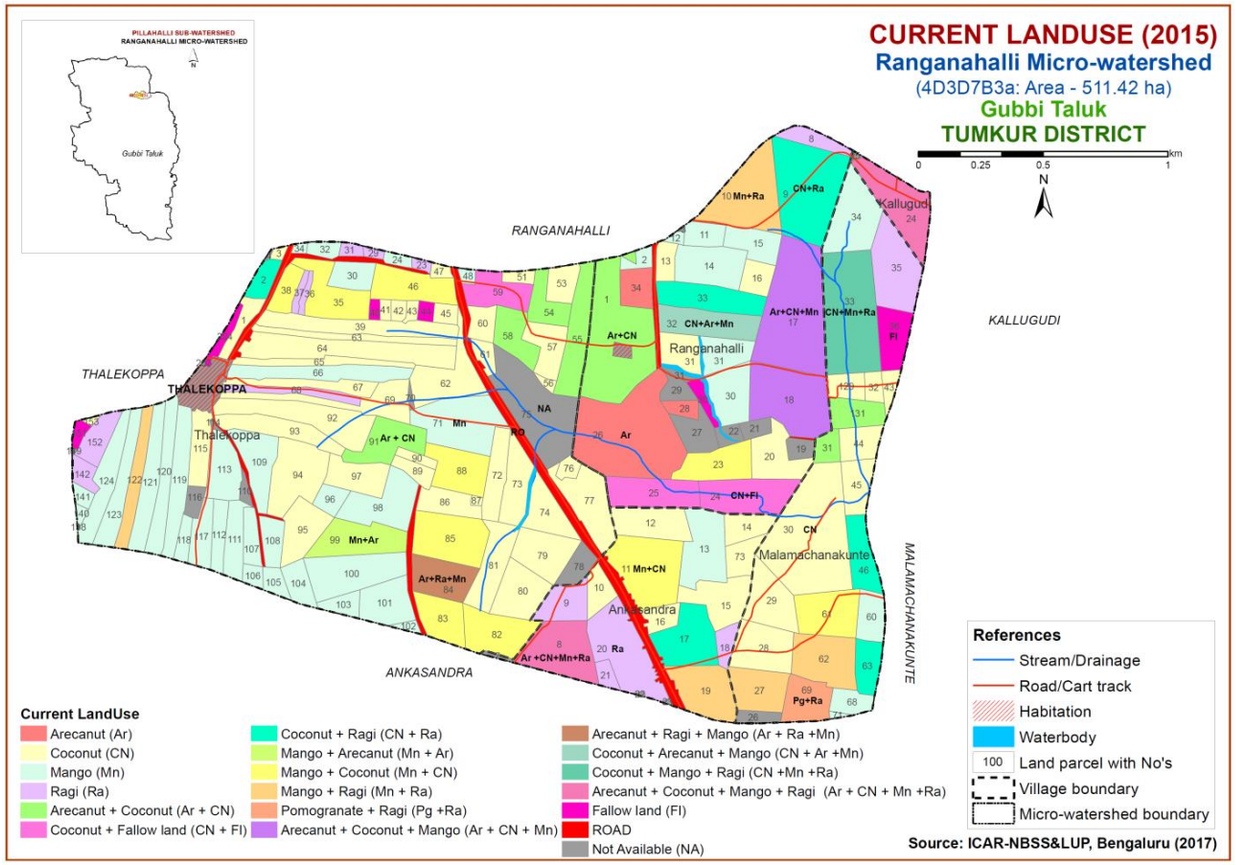
The required site and soil characteristics are described and recorded on a standard proforma by following the protocols and guidelines given in the soil survey manual and field guide. Collection of soil samples from representative pedons for laboratory characterization and collection of surface soil 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.

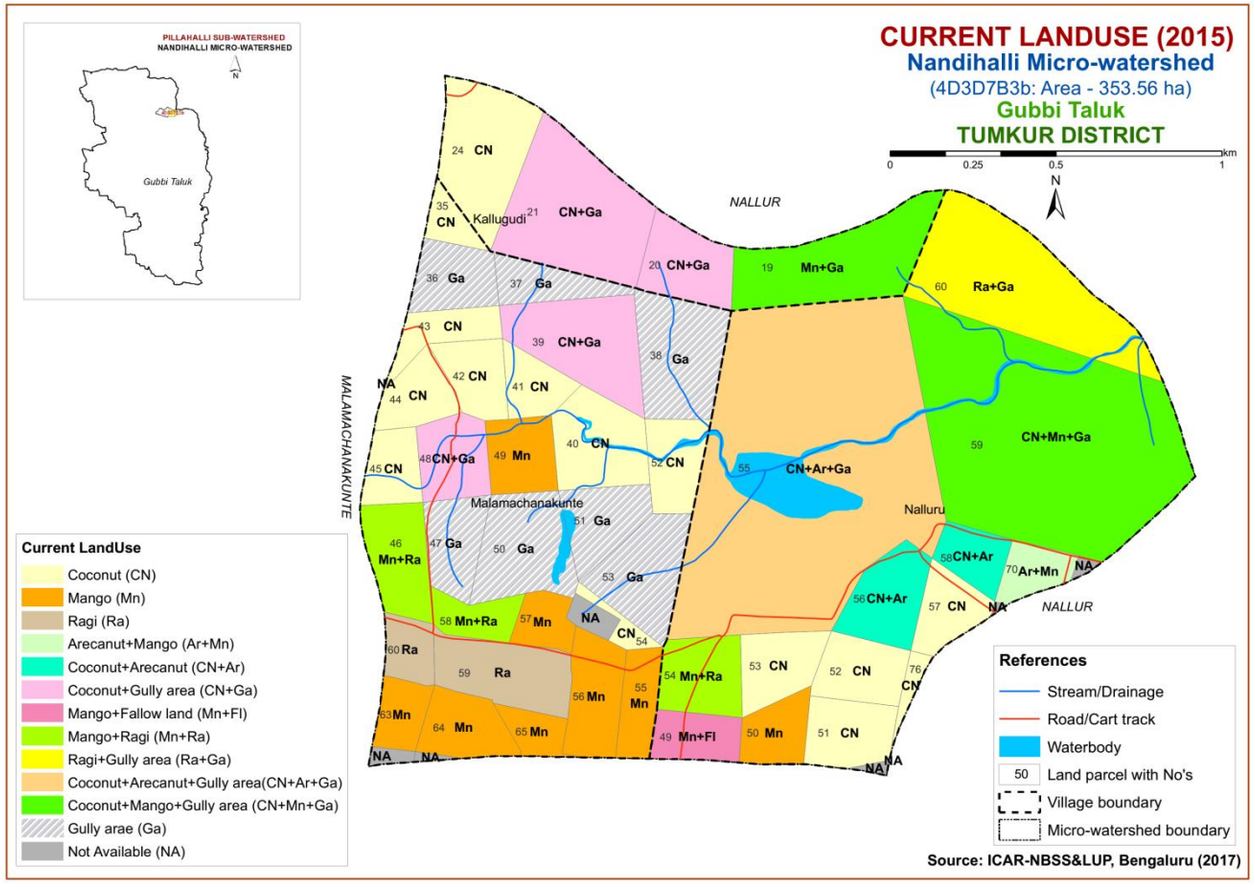

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
Ranganahalli Micro-watershed
4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
Kallugudi
Ranganahalli
THALEKOPPA
THALEKOPPA
Thalekoppa
Malamachanakunte
Ankasandra
MALAMACHANAKUNTE
ANKASANDRA
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
90 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

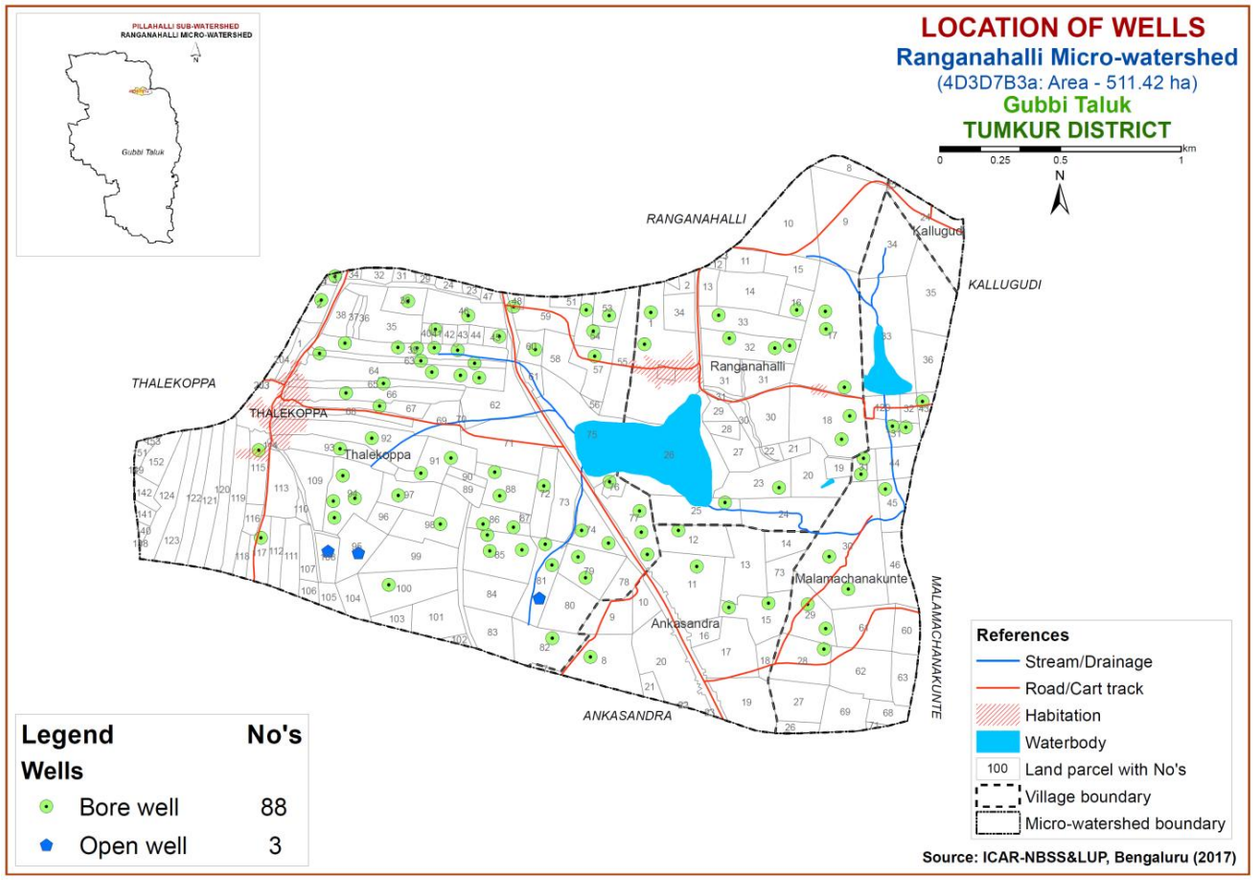

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
Kallugudi
Malamachanakunte
Nalluru
NALLUR
MALAMACHANAKUNTE
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)


PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
SATELLITE IMAGE
Ranganahalli Micro-watershed
4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0
0.25
0.5
1
km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
MALAMACHANAKUNTE
ANKASANDRA
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
Land parcels
Village boundary
Micro-watershed boundary
Source: Cartosat-1 Imagery, 2011


PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
SATELIITE IMAGE
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0
0.25
0.5
1
km
N
NALLUR
Kallagudi
Nallur
MALAMACHANAKUNTE
NALLUR
References
Stream/Drainage
Road/Cart track
Waterbody
Land parcels
Village boundary
Micro-watershed boundary
Source: Cartosat-1 Imagery, 2011


PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
CURRENT LANDUSE (2015)
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Thalekoppa
Ranganahalli
Kallugudi
Malamachanakunte
Anchasandra
Current LandUse
Arecanut (Ar)
Coconut (CN)
Mango (Mn)
Ragi (Ra)
Arecanut + Coconut (Ar + CN)
Coconut + Fallow land (CN + Fl)
Coconut + Ragi (CN + Ra)
Mango + Arecanut (Mn + Ar)
Mango + Coconut (Mn + CN)
Mango + Ragi (Mn + Ra)
Pomogranate + Ragi (Pg +Ra)
Arecanut + Coconut + Mango (Ar + CN + Mn)
Arecanut + Ragi + Mango (Ar + Ra +Mn)
Coconut + Arecanut + Mango (CN + Ar +Mn)
Coconut + Mango + Ragi (CN +Mn +Ra)
Arecanut + Coconut + Mango + Ragi (Ar + CN + Mn +Ra)
Fallow land (Fl)
ROAD
Not Available (NA)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)


PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
CURRENT LANDUSE (2015)
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
Current LandUse
Coconut (CN)
Mango (Mn)
Ragi (Ra)
Arecanut+Mango (Ar+Mn)
Coconut+Arecanut (CN+Ar)
Coconut+Gully area (CN+Ga)
Mango+Fallow land (Mn+Fl)
Mango+Ragi (Mn+Ra)
Ragi+Gully area (Ra+Ga)
Coconut+Arecanut+Gully area(CN+Ar+Ga)
Coconut+Mango+Gully area (CN+Mn+Ga)
Gully arae (Ga)
Not Available (NA)
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)


PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LOCATION OF WELLS
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
Kallugudi
Ranganahalli
THALEKOPPA
Thalekoppa
Malamachanakunte
MALAMACHANAKUNTE
Ankasandra
ANKASANDRA
Legend No's
Wells
Bore well 88
Open well 3
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)


PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LOCATION OF WELLS
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
Kallugudi
MALAMACHANAKUNTE
Malamachanakunte
Nalluru
Legend No's
Borewell 45
Check Dam 2
References
Road/Cart track
Stream/Drainage
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

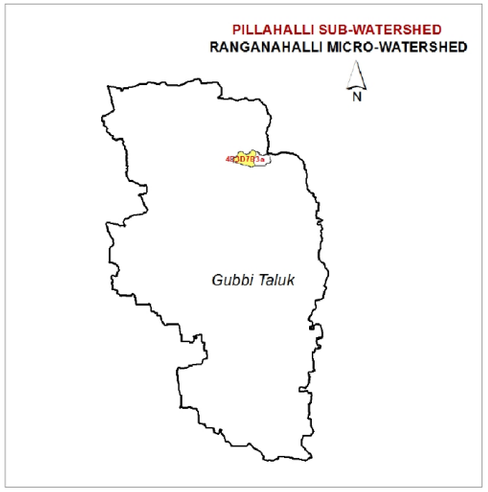
SOILS

Ranganahalli Micro-watershed

4D3D7B3a: Area - 511.42 ha)

Gubbi Taluk

TUMKUR DISTRICT



0 0.25 0.5 1 km

N

RANGANAHALLI

KALLUGUDI

MALAMACHANAKUNTE

ANKASANDRA

THALEKOPPA

Kallugudi

Ranganahalli

Thalekoppa

Malamachanakunte

Ankasandra

Soil Phase	Area in ha (%)
1, CSRhB2g1	6 (1.12)
2, KGHcB2g2	20 (3.89)
3, KGHcC2g2	10 (1.9)
4, CKMhB2g1	18 (3.43)
5, BDGhB2	43 (8.44)
6, BDGhB2g1	6 (1.09)
7, MNLhB2	51 (9.9)
8, JDGhB1	39 (7.63)
9, BPRhB2	31 (6.04)
10, HLKcB2	66 (12.88)
11, HLKhB2g1	17 (3.26)
12, RTRcB1	8 (1.66)
13, RTRhB1	24 (4.67)
14, RTRiB1	14 (2.71)
15, NDLcB1	20 (3.98)
16, NDLiB1g1	37 (7.22)
17, KDThB1	35 (6.93)
18, KDTiA1	42 (8.28)
19, Others*	25 (4.95)

* - Habitation & Waterbody

References

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

KEY

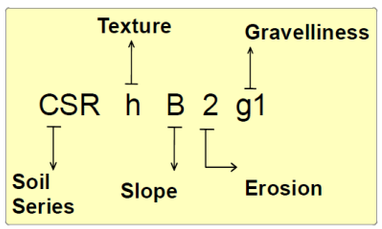
TEXTURE
c – Sandy loam
h – Sandy clay loam
i – Sandy clay

SLOPE
A - Nearly level (0 -1%)
B – Very gently sloping (1-3%)
C - Gently sloping (3- 5%)

EROSION
1 – Slight
2 – Moderate
3 – Severe

GRAVELLINESS
g0 – Non gravelly (<15%)
g1 – Gravelly (15-35 %)
g2 – Very gravelly (35-60%)

DEPTH
CSR - Shallow (25-50 cm)
KGH - Moderately shallow (50-75 cm)
BDG,CKM - Moderately deep (75-100 cm)
BPR,JDG- Deep (100-150 cm)
HLK,KDT,NDL,RTR - Very deep (>150 cm)



Source: ICAR-NBSS&LUP, Bengaluru (2017)

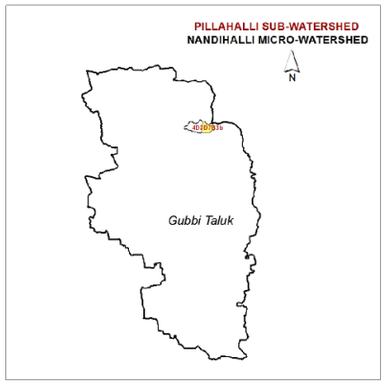
Table 1. Mapping unit description of Ranganahalli Micro-watershed in Gubbi taluk, Tumkur district

Soil No	Soil Series	Soil Phase	Mapping Unit Description	Area in ha (%)
SOILS OF GRANITE GNEISS LANDSCAPE				
	CSR	Chikkasavanur soils are shallow (25-50 cm), well drained, have dark brown to light yellowish brown sandy clay loam soils occurring on very gently sloping uplands under cultivation		**6 (1.12)**
1		CSRhB2g1	Sandy clay loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	6 (1.12)
	KGH	Kutegoudanahundi soils are moderately shallow (50-75 cm), well drained, have brown to dark brown gravelly sandy clay loam soils occurring on very gently to gently sloping uplands under cultivation		**30 (5.79)**
2		KGHcB2g2	Sandy loam surface, slope 1-3%, moderate erosion, very gravelly (35-60%)	20 (3.89)
3		KGHcC2g2	Sandy loam surface, slope 3-5%, moderate erosion, very gravelly (35-60%)	10 (1.90)
	CKM	Chikkamegheri soils are moderately deep (75-100 cm), well drained, have dark brown to dark reddish brown sandy clay soils occurring on very gently sloping uplands under cultivation		**18 (3.43)**
4		CKMhB2g1	Sandy clay loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	18 (3.43)
	BDG	Bidanagere soils are moderately deep (75-100 cm), well drained, have dark reddish brown gravelly sandy clay loam to sandy clay soils occurring on very gently sloping uplands under cultivation		**49 (9.53)**
5		BDGhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	43 (8.44)
6		BDGhB2g1	Sandy clay loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	6 (1.09)
	MNL	Mornal soils are deep (100-150 cm), well drained, have dark reddish brown to red gravelly sandy clay loam to sandy clay soils occurring on very gently sloping uplands under cultivation		**51 (9.90)**
7		MNLhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	51 (9.90)
	JDG	Jedigere soils are deep (100-150 cm), well drained, have dark brown to dark reddish brown sandy clay to clay soils occurring on very gently sloping uplands under cultivation		**39 (7.63)**
8		JDGhB1	Sandy clay loam surface, slope 1-3%, slight erosion	39 (7.63)

To be continued..

Soil No	Soil Series	Soil Phase	Mapping Unit Description	Area in ha (%)
	BPR	Balapur soils are deep (100-150 cm), well drained, have dark reddish brown to dark red gravelly sandy clay to clay soils occurring on very gently sloping uplands under cultivation		**31 (6.04)**
9		BPRhB2	Sandy loam surface, slope 1-3%, moderate erosion	31 (6.04)
	HLK	Hallikere soils are very deep (>150 cm), well drained, have dark brown to dark reddish brown clayey soils occurring on very gently sloping uplands under cultivation		**83 (16.14)**
10		HLKcB2	Sandy loam surface, slope 1-3%, moderate erosion	66 (12.88)
11		HLKhB2g1	Sandy clay loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	17 (3.26)
	RTR	Ranatur soils are very deep (>150 cm), well drained, have dark reddish brown to dark red clay soils occurring on very gently sloping uplands under cultivation		**46 (9.04)**
12		RTRcB1	Sandy loam surface, slope 1-3%, slight erosion	8 (1.66)
13		RTRhB1	Sandy clay loam surface, slope 1-3%, slight erosion	24 (4.67)
14		RTRiB1	Sandy clay surface, slope 1-3%, slight erosion	14 (2.71)
	NDL	Niduvalalu soils are very deep (>150 cm), well drained, have red to dark reddish brown gravelly sandy clay soils occurring on very gently sloping uplands under cultivation		**57 (11.2)**
15		NDLcB1	Sandy loam surface, slope 1-3%, slight erosion	20 (3.98)
16		NDLiB1g1	Sandy clay surface, slope 1-3%, slight erosion, gravelly (15-35%)	37 (7.22)
	KDT	Kadagathur soils are very deep (>150 cm), moderately well drained, have dark brown to very dark grayish brown sandy clay to clay soils occurring on very gently sloping uplands under cultivation		**77 (15.21)**
17		KDThB1	Sandy clay loam surface, slope 1-3%, slight erosion	35 (6.93)
18		KDTiA1	Sandy clay surface, slope 0-1%, slight erosion	42 (8.28)
19		Others	Waterbody	25 (4.95

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



KEY

TEXTURE
c – Sandy loam
h – Sandy clay loam
i – Sandy clay

SLOPE
A - Nearly level (0 -1%)
B – Very gently sloping (1-3%)
C - Gently sloping (3- 5%)

EROSION
1 – Slight
2 – Moderate
3 – Severe

GRAVELLINESS
g0 – Non gravelly (<15%)
g1 – Gravelly (15-35 %)
g2 – Very gravelly (35-60%)

DEPTH
TDH, KGH - Moderately shallow (50-75 cm)
KKR - Moderately deep (75-100 cm)
JDG- Deep (100-150 cm)
HLK, RTR, NDL, KDT - Very deep (>150 cm)

Soil Phase	Area in ha (%)
1, TDHhB2g1	11 (3.18)
2, KGHcB2g2	4 (1.15)
3, KGHhB2	12 (3.34)
4, KGHhC3	3 (0.72)
5, KKRhC2	12 (3.26)
6, JDGhB1	17 (4.77)
7, HLKhB1	39 (11.09)
8, RTRhB2	20 (5.58)
9, NDLcB1	48 (13.51)
10, KDTiA1	11 (2.98)
11, KDTiB1g1	14 (3.86)
12, KDTiB2	10 (2.87)
13, Gullied region	147 (41.44)
14, Others*	8 (2.24)

* - Waterbody

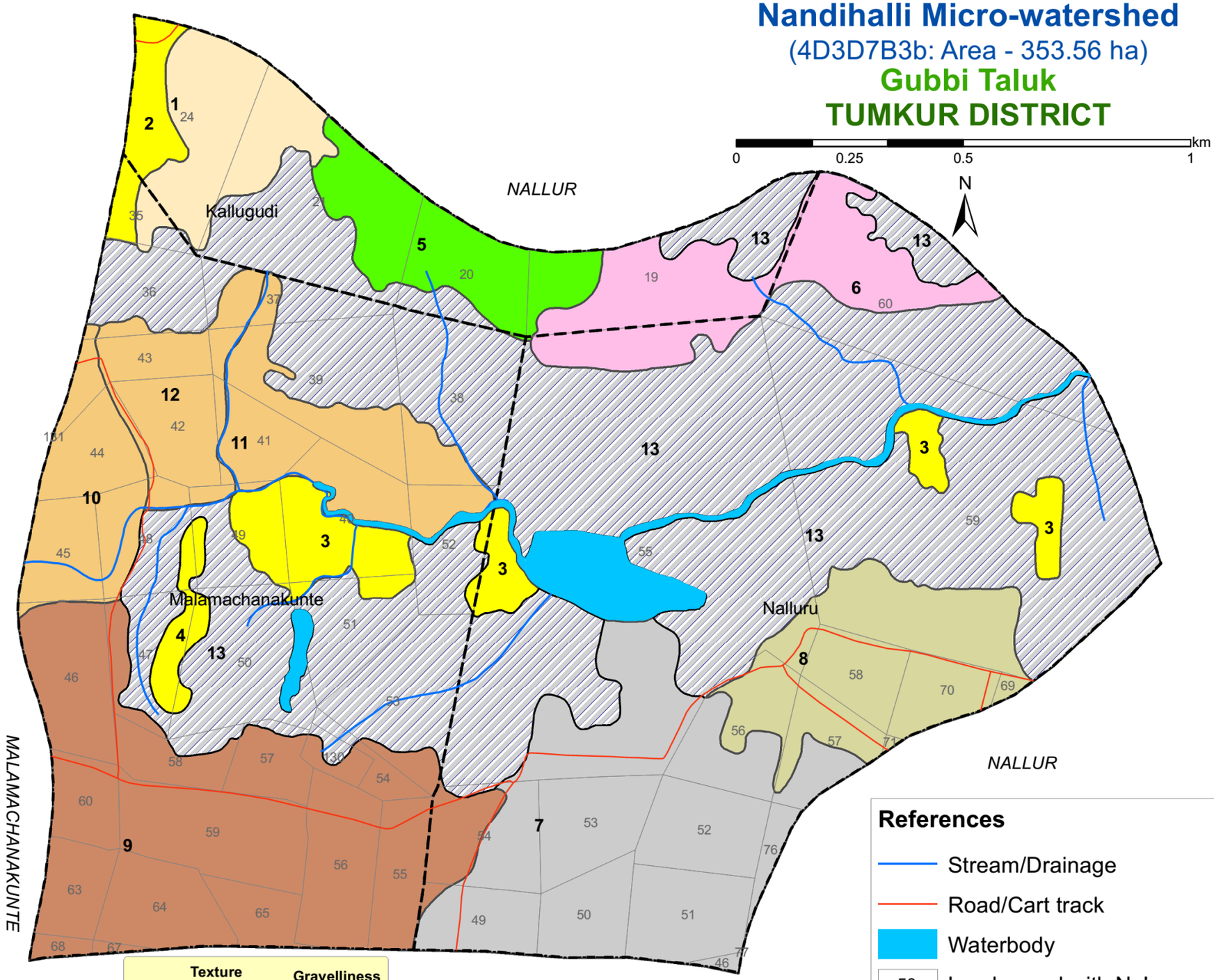
SOILS

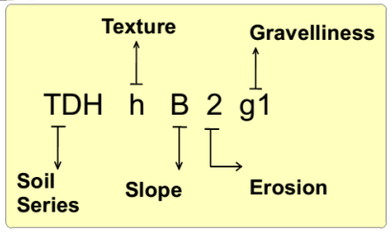
Nandihalli Micro-watershed

(4D3D7B3b: Area - 353.56 ha)

Gubbi Taluk

TUMKUR DISTRICT





Source: ICAR-NBSS&LUP, Bengaluru (2017)

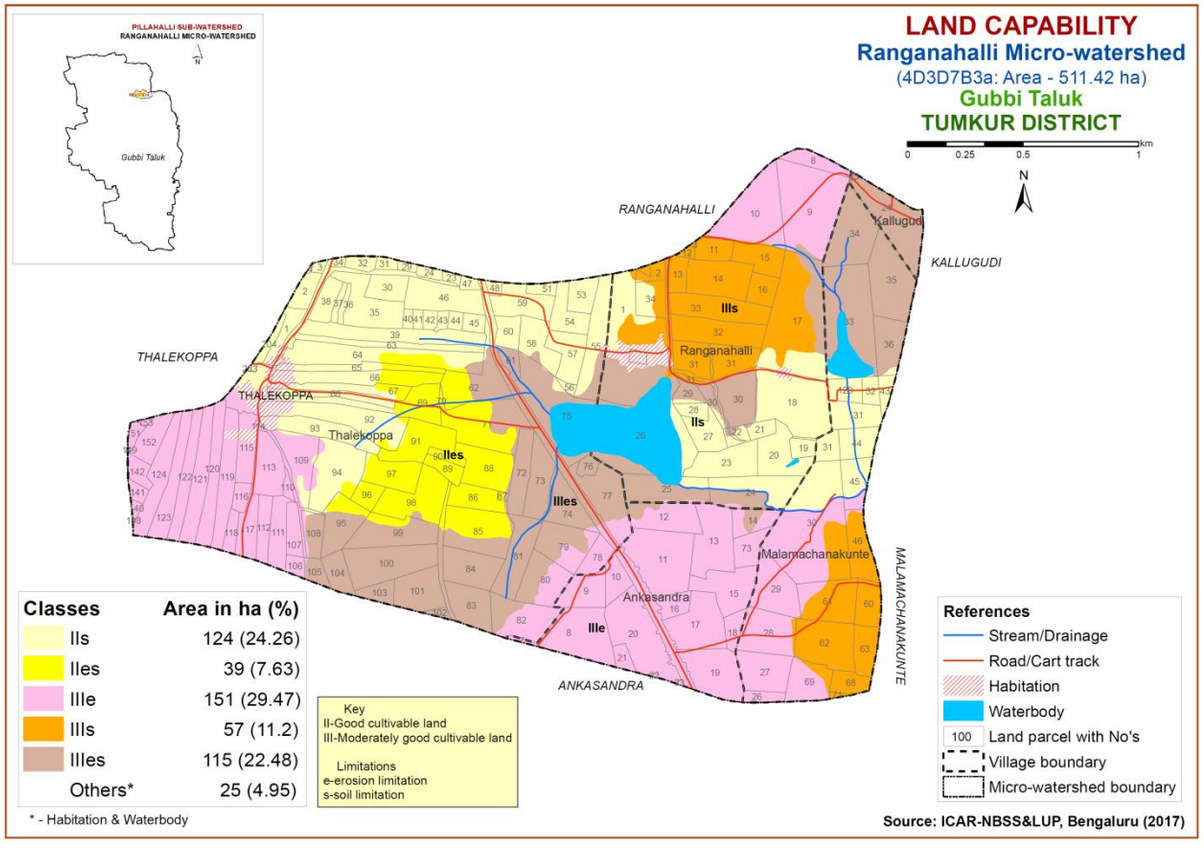
Table 2. Mapping unit description of Nandihalli Micro-watershed in Gubbi taluk, Tumkur district

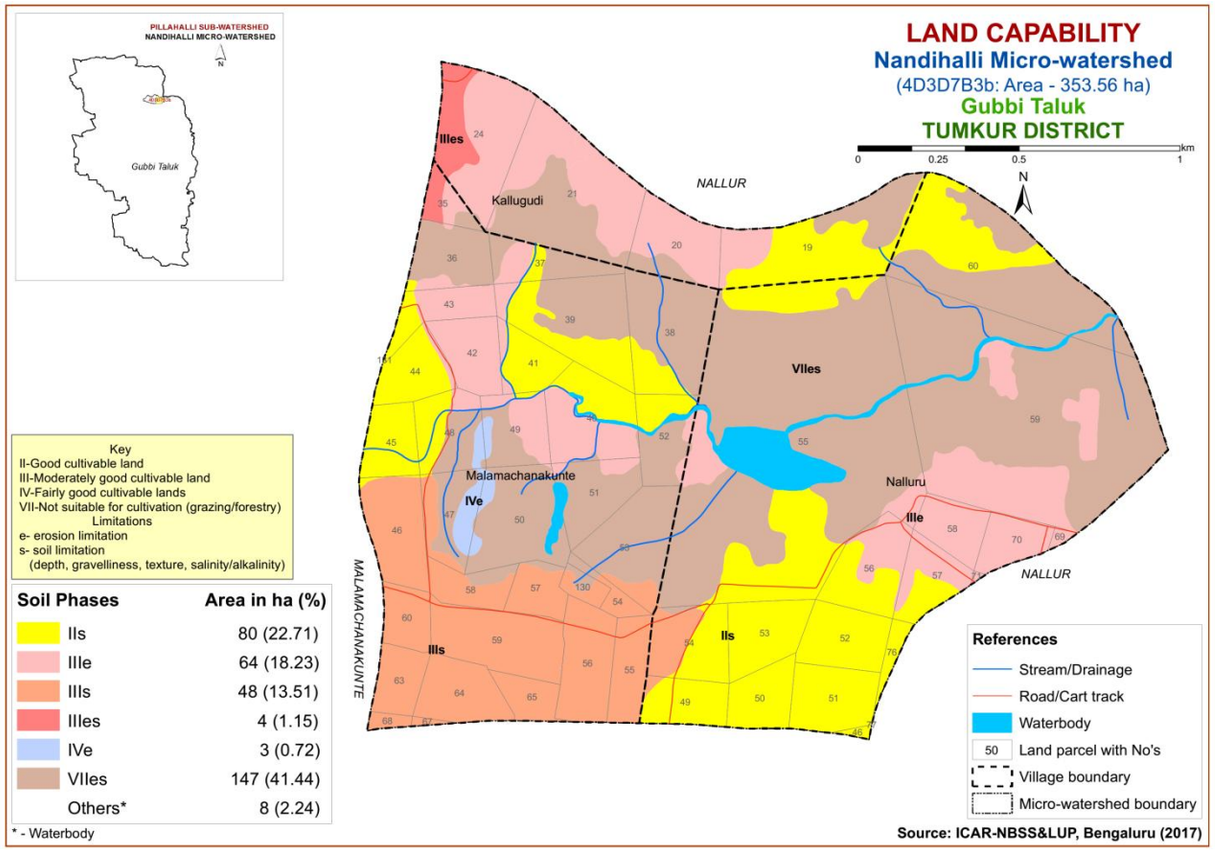
Soil No	Soil Series	Soil Phase	Mapping Unit Description	Area in ha (%)
SOILS OF GRANITE GNEISS LANDSCAPE				
	TDH	Thammadahalli soils are moderately shallow (50-75cm), well drained, have dark red to dark reddish brown sandy clay to clay soils occurring on very gently sloping uplands under cultivation		**11 (3.18)**
1		TDHhB2g1	Sandy clay loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	11 (3.18)
	KGH	Kutegoudanahundi soils are moderately shallow (50-75 cm), well drained, have brown to dark brown gravelly sandy clay loam soils occurring on very gently to gently sloping uplands under cultivation		**19 (5.21)**
2		KGHcB2g2	Sandy loam surface, slope 1-3%, moderate erosion, very gravelly (35-60%)	4 (1.15)
3		KGHhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	12 (3.34)
4		KGHhC3	Sandy clay loam surface, slope 3-5%, severe erosion	3 (0.72)
	KKR	Kanchikere soils are moderately deep (75-100 cm), well drained, have dark brown to very dark grayish brown clay loam to sandy clay soils occurring on gently sloping uplands under cultivation		**12 (3.26)**
5		KKRhC2	Sandy clay loam surface, slope 3-5%, moderate erosion	12 (3.26)
	JDG	Jedigere soils are deep (100-150 cm), well drained, have dark brown to dark reddish brown sandy clay to clay soils occurring on very gently sloping uplands under cultivation		**17 (4.77)**
6		JDGhB1	Sandy clay loam surface, slope 1-3%, slight erosion	17 (4.77)
	HLK	Hallikere soils are very deep (>150 cm), well drained, have dark brown to dark reddish brown clayey soils occurring on very gently sloping uplands under cultivation		**39 (11.09)**
7		HLKhB1	Sandy clay loam surface, slope 1-3%, slight erosion	39 (11.09)
	RTR	Ranatur soils are very deep (> 150 cm), well drained, have dark reddish brown to dark red clay soils occurring on very gently sloping uplands under cultivation		**20 (5.58)**
8		RTRhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	20 (5.58)
	NDL	Niduvalalu soils are very deep (>150 cm), well drained, have red to dark reddish brown gravelly sandy clay soils occurring on very gently sloping uplands under cultivation		**48 (13.51)**
9		NDLcB1	Sandy loam surface, slope 1-3%, slight erosion	48 (13.51)

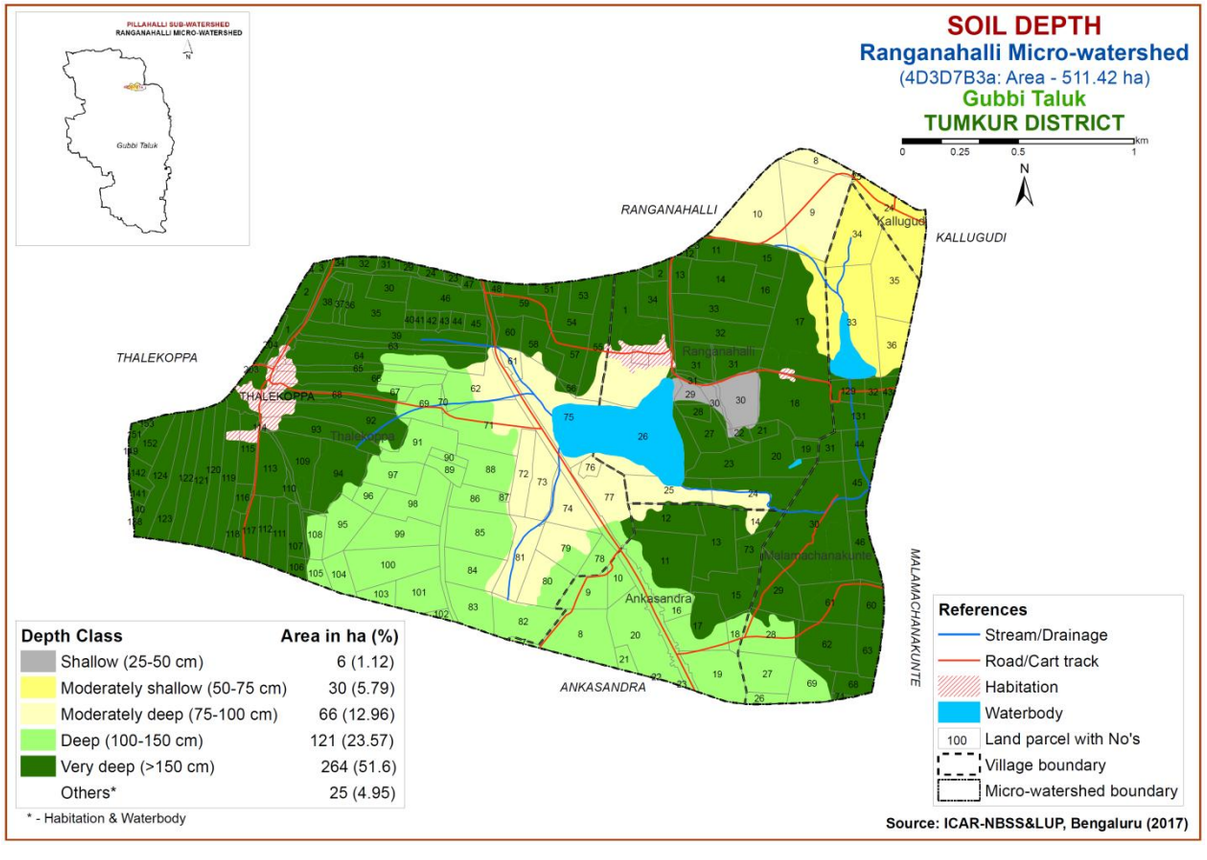
To be continued..

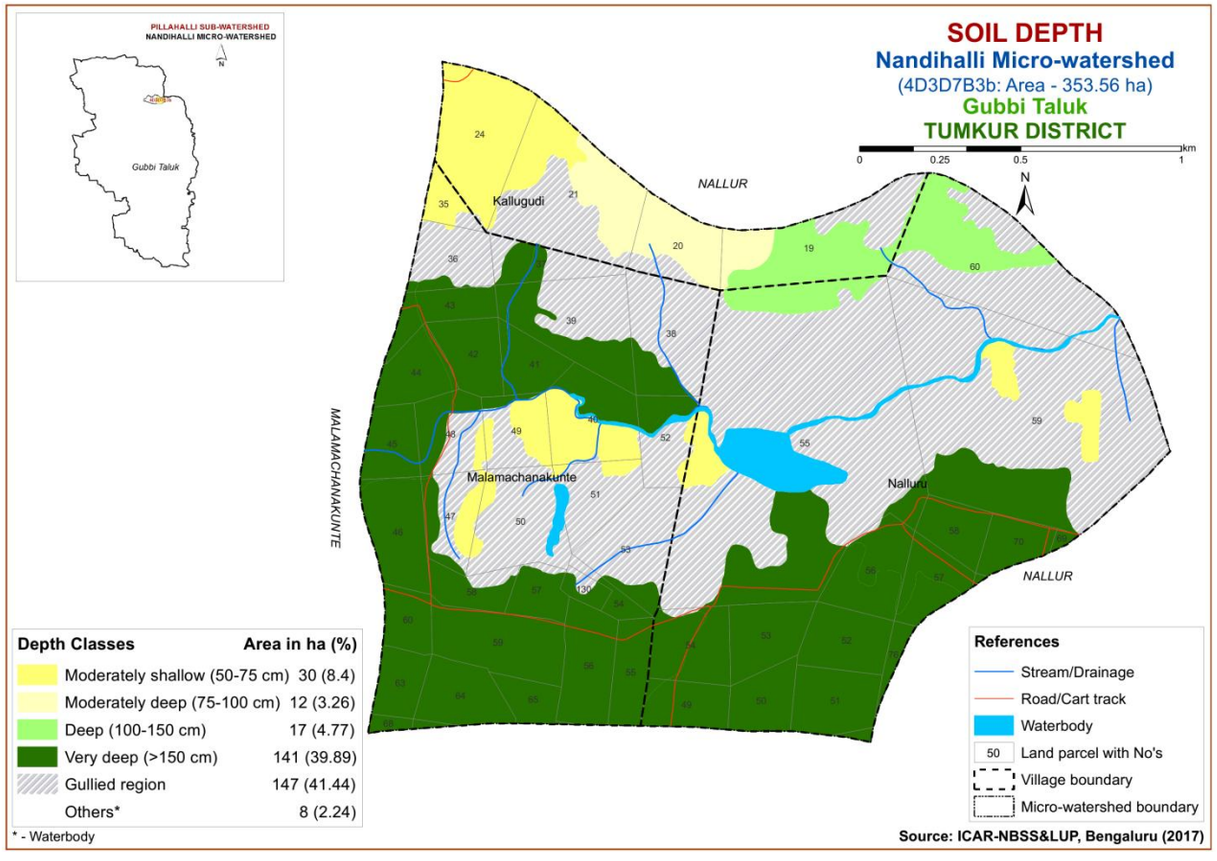
Soil No	Soil Series	Soil Phase	Mapping Unit Description	Area in ha (%)
	KDT	Kadagathur soils are very deep (>150 cm), moderately well drained, have dark brown to very dark grayish brown sandy clay to clay soils occurring on very gently sloping uplands under cultivation		**35 (9.71)**
10		KDTiA1	Sandy clay surface, slope 0-1%, slight erosion	11 (2.98)
11		KDTiB1g1	Sandy clay surface, slope 1-3%, slight erosion, gravelly (15-35%)	14 (3.86)
12		KDTiB2	Sandy clay surface, slope 1-3%, moderate erosion	10 (2.87)
13		Gully		**147 (41.44)**
14	Others			8 (2.24)

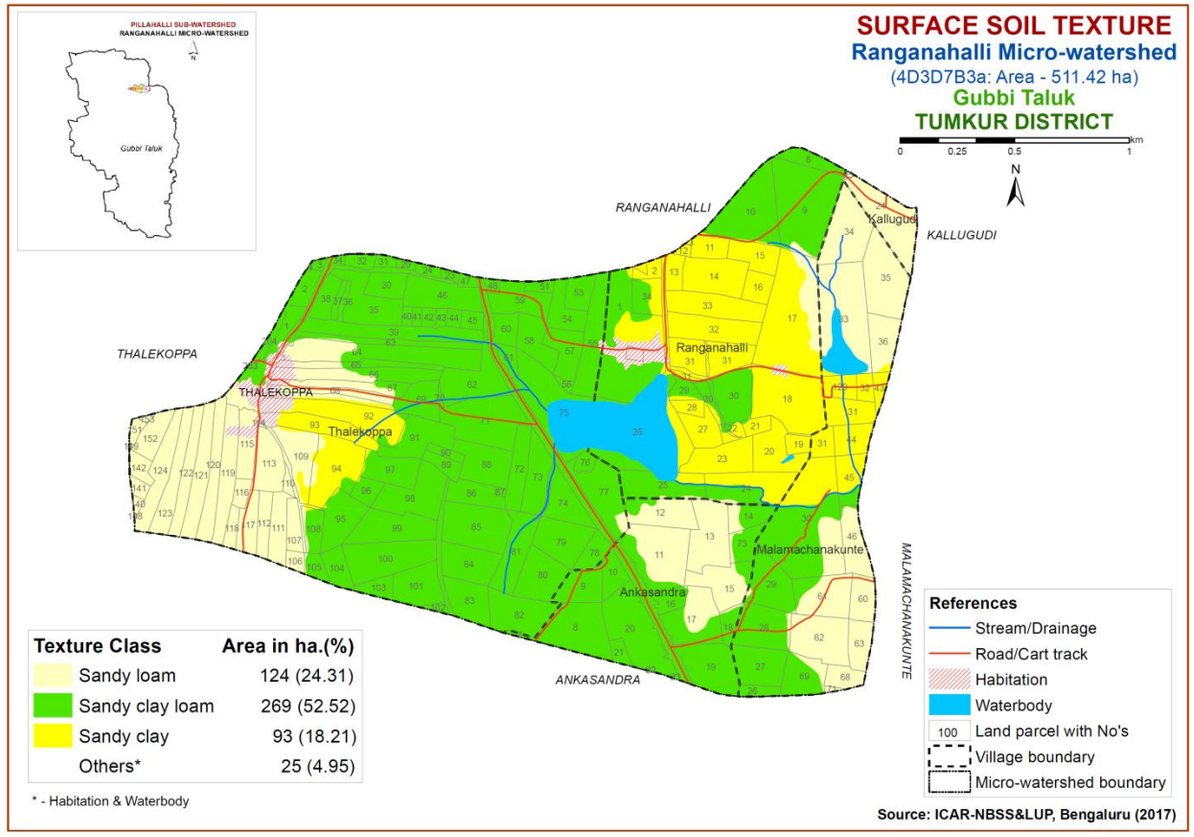
*Soil map unit numbers are continuous for the taluk, not the micro-watershed

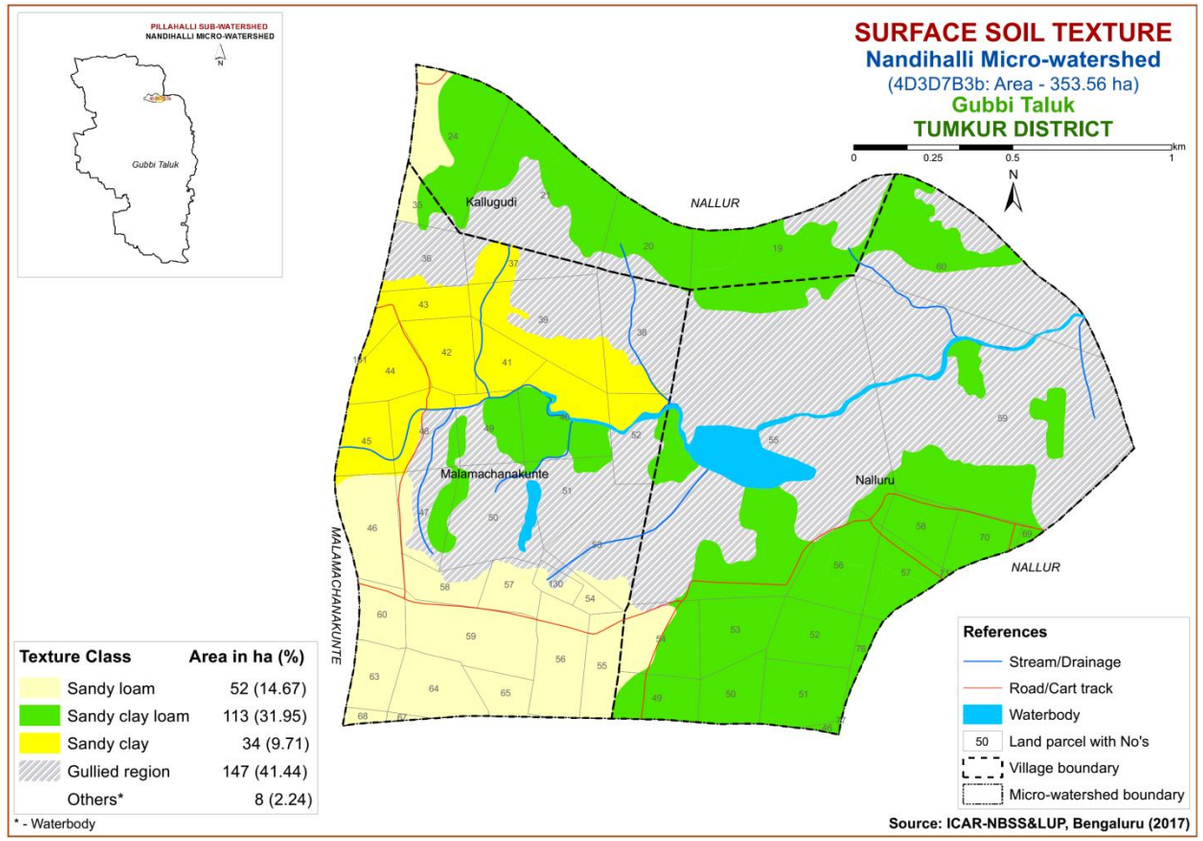

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND CAPABILITY
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
IIIs
IIs
IIIes
IIIe
Classes Area in ha (%)
IIs 124 (24.26)
IIes 39 (7.63)
IIIe 151 (29.47)
IIIs 57 (11.2)
IIIes 115 (22.48)
Others* 25 (4.95)
* - Habitation & Waterbody
Key
II-Good cultivable land
III-Moderately good cultivable land
Limitations
e-erosion limitation
s-soil limitation
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

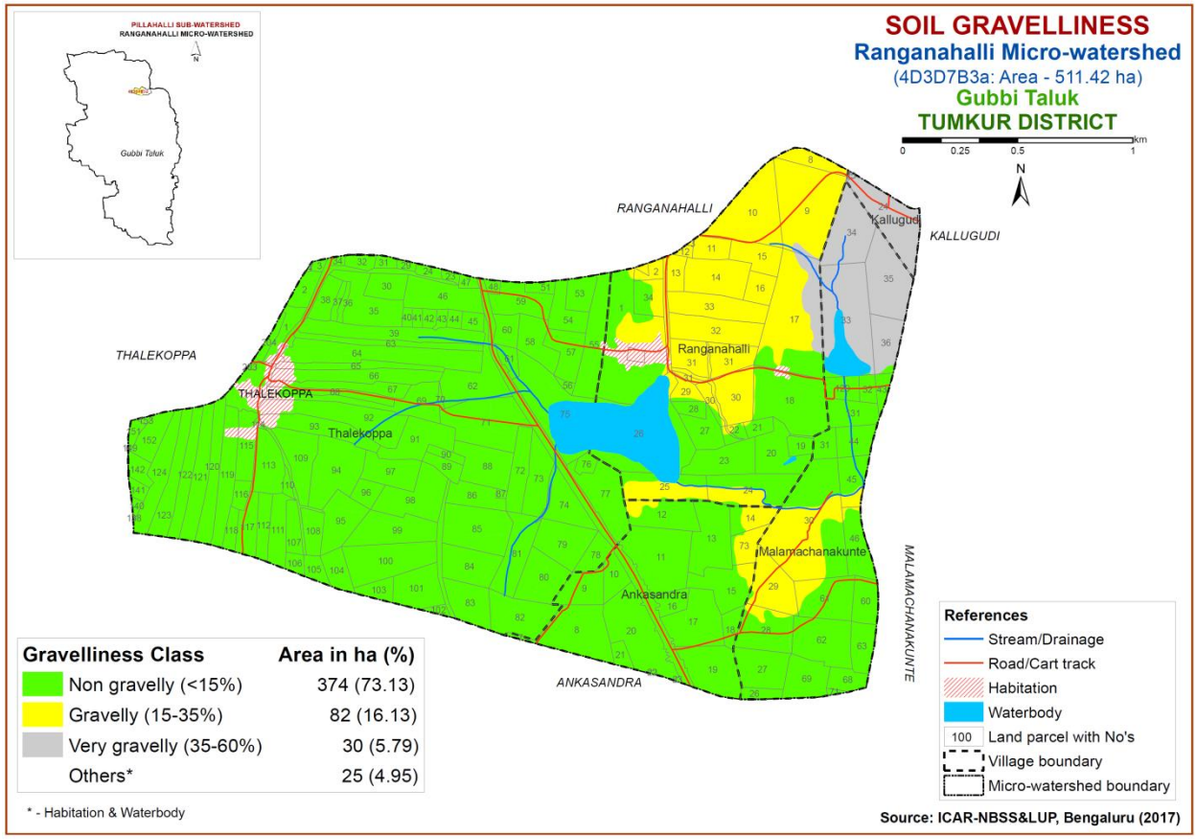

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND CAPABILITY
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
IIIes
VIIes
IVe
IIIe
IIIs
IIs
Key
II-Good cultivable land
III-Moderately good cultivable land
IV-Fairly good cultivable lands
VII-Not suitable for cultivation (grazing/forestry)
Limitations
e- erosion limitation
s- soil limitation
(depth, gravelliness, texture, salinity/alkalinity)
Soil Phases Area in ha (%)
IIs 80 (22.71)
IIIe 64 (18.23)
IIIs 48 (13.51)
IIIes 4 (1.15)
IVe 3 (0.72)
VIIes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

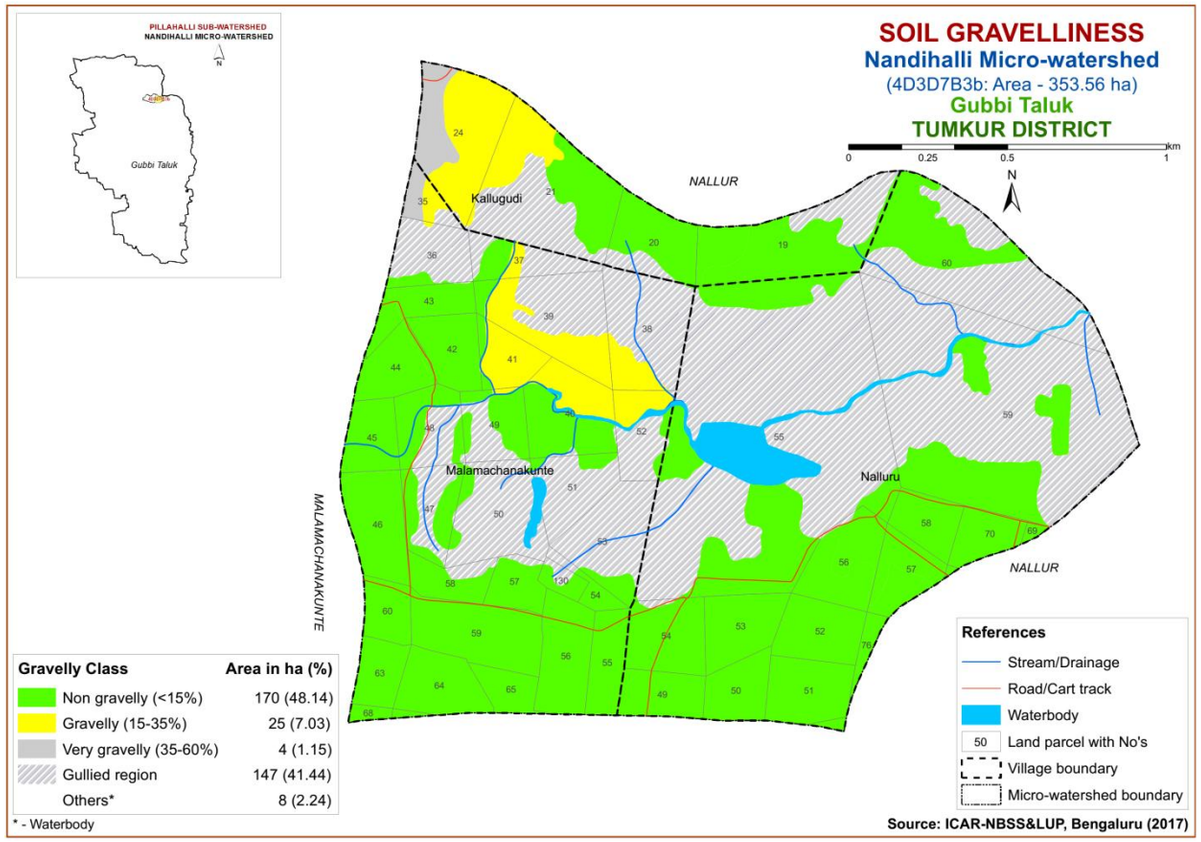

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
SOIL DEPTH
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
Depth Class Area in ha (%)
Shallow (25-50 cm) 6 (1.12)
Moderately shallow (50-75 cm) 30 (5.79)
Moderately deep (75-100 cm) 66 (12.96)
Deep (100-150 cm) 121 (23.57)
Very deep (>150 cm) 264 (51.6)
Others* 25 (4.95)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

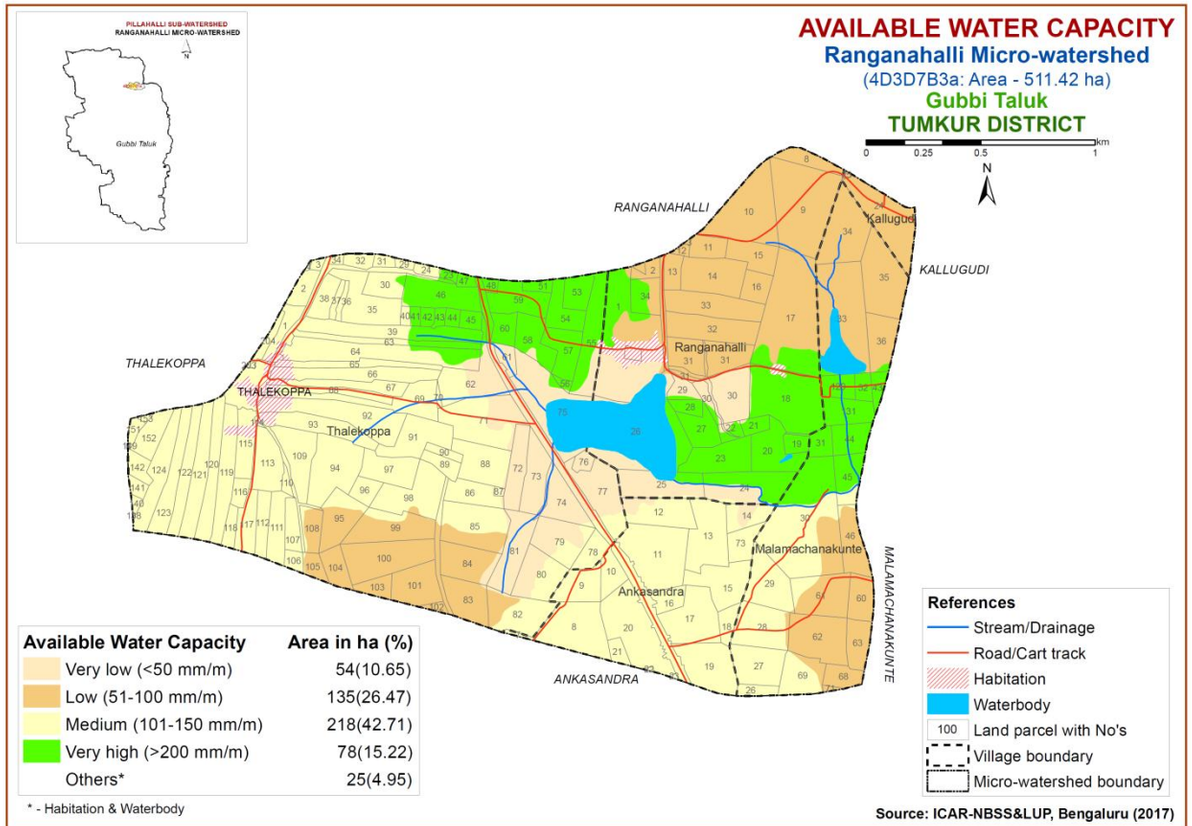

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
SOIL DEPTH
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
Depth Classes Area in ha (%)
Moderately shallow (50-75 cm) 30 (8.4)
Moderately deep (75-100 cm) 12 (3.26)
Deep (100-150 cm) 17 (4.77)
Very deep (>150 cm) 141 (39.89)
Gullied region 147 (41.44)
Others* 8 (2.24)
* - Waterbody
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

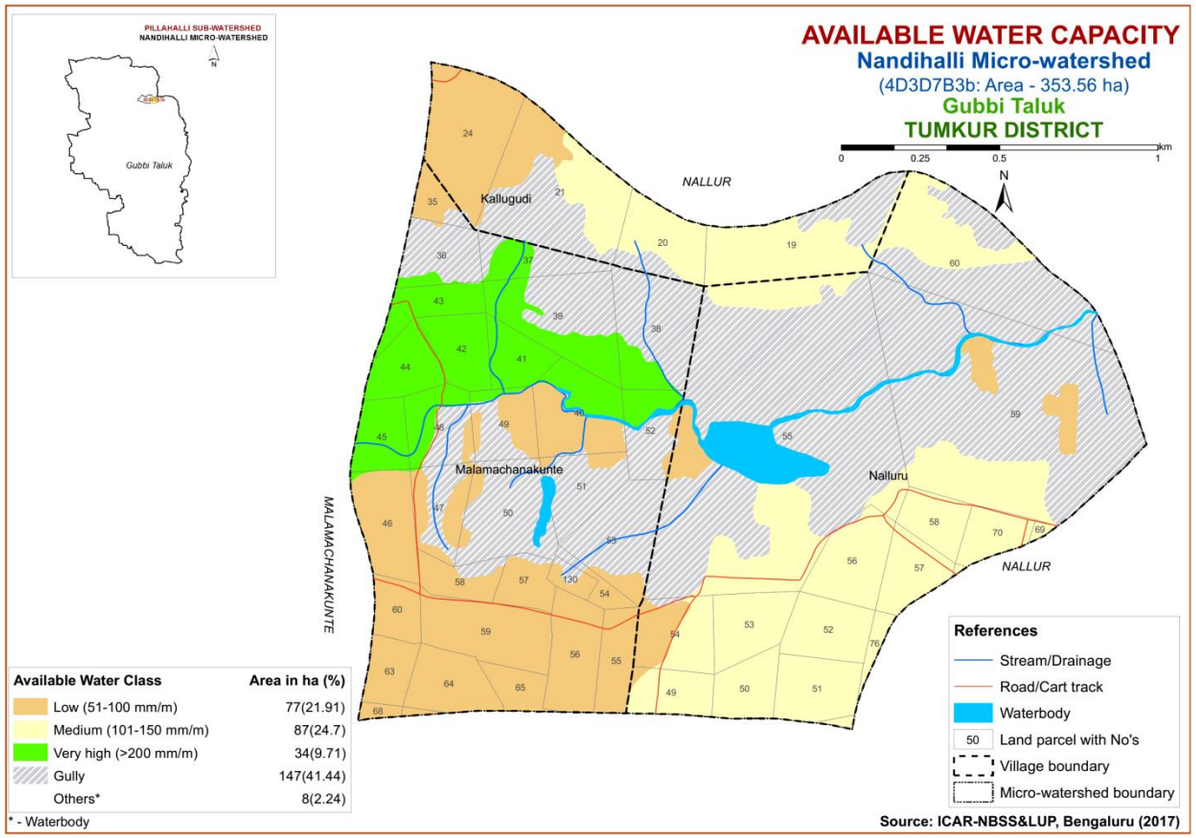

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
SURFACE SOIL TEXTURE
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
Texture Class
Area in ha.(%)
Sandy loam 124 (24.31)
Sandy clay loam 269 (52.52)
Sandy clay 93 (18.21)
Others* 25 (4.95)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

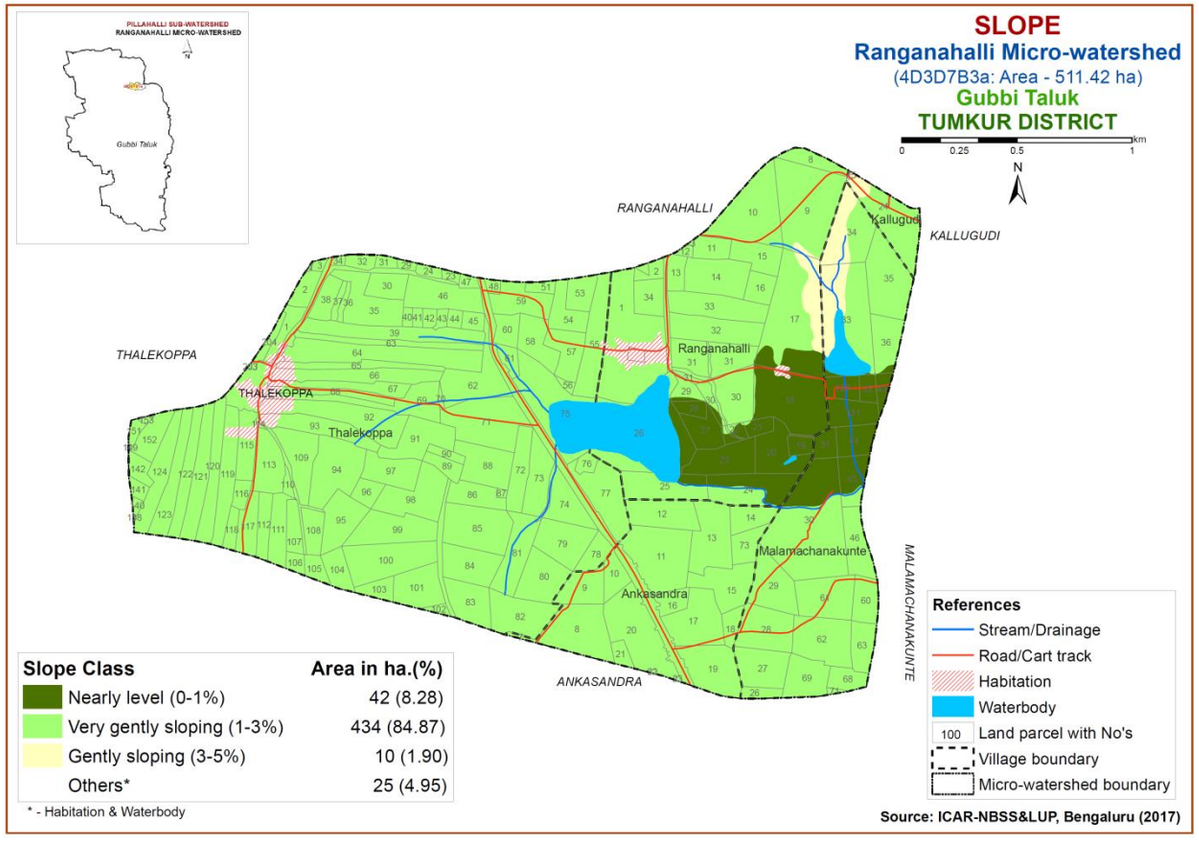

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
SURFACE SOIL TEXTURE
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
Texture Class
Area in ha (%)
Sandy loam 52 (14.67)
Sandy clay loam 113 (31.95)
Sandy clay 34 (9.71)
Gullied region 147 (41.44)
Others* 8 (2.24)
* - Waterbody
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

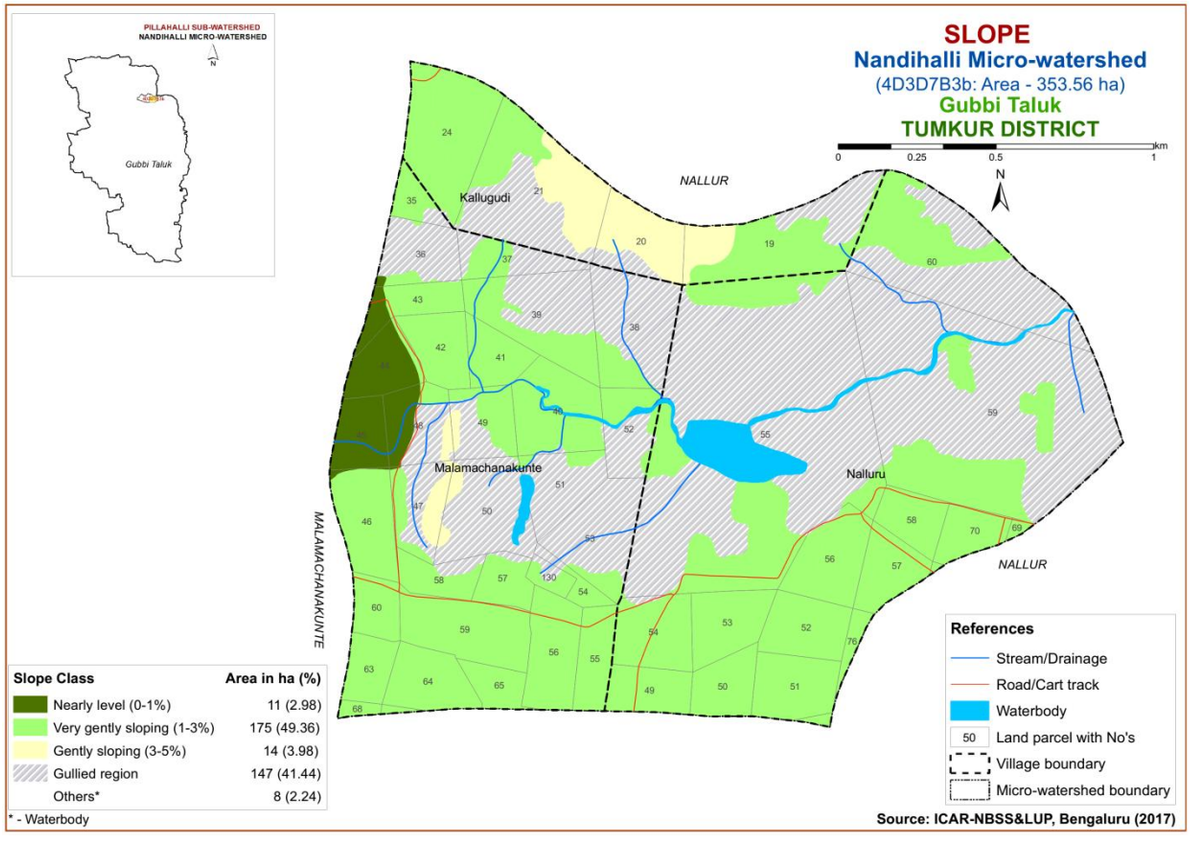

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
SOIL GRAVELLINESS
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
Gravelliness Class
Area in ha (%)
Non gravelly (<15%) 374 (73.13)
Gravelly (15-35%) 82 (16.13)
Very gravelly (35-60%) 30 (5.79)
Others* 25 (4.95)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

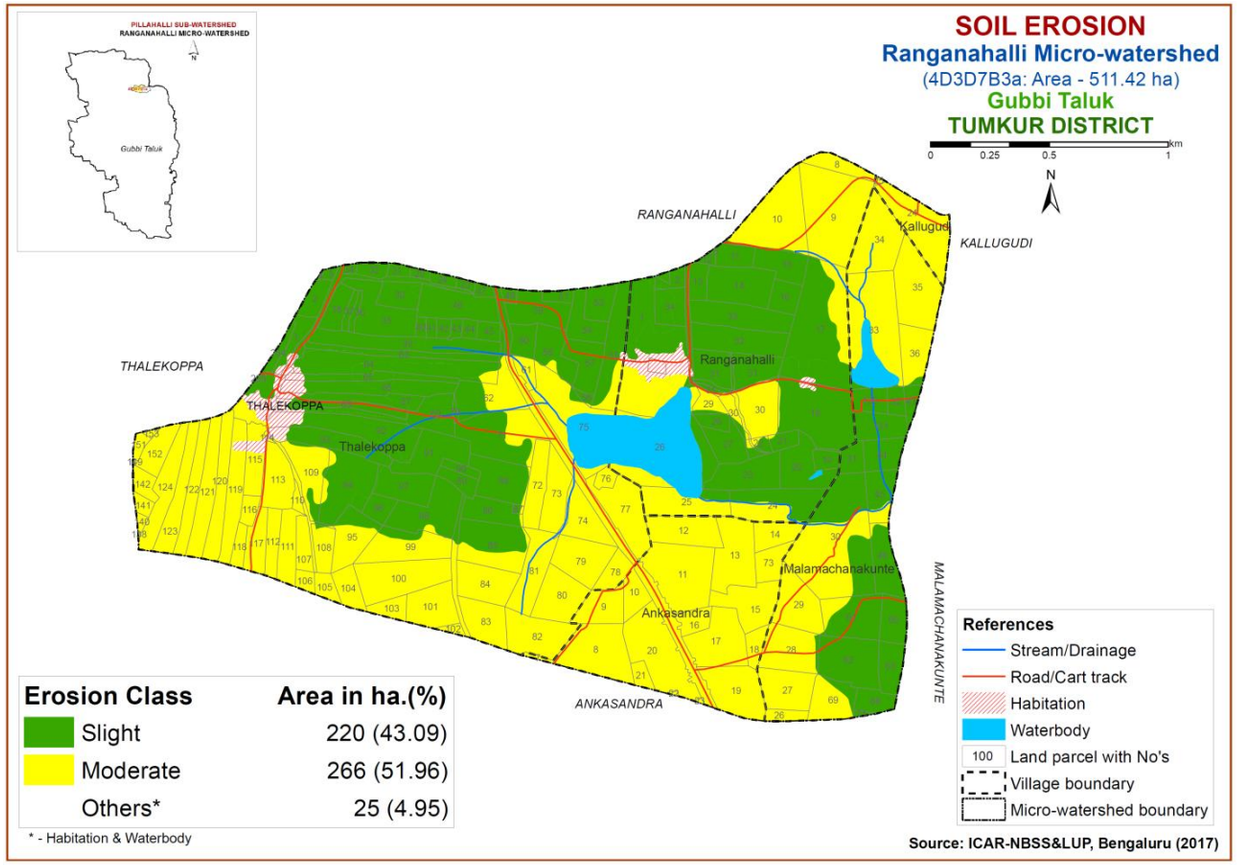

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
SOIL GRAVELLINESS
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
Gravelly Class
Area in ha (%)
Non gravelly (<15%) 170 (48.14)
Gravelly (15-35%) 25 (7.03)
Very gravelly (35-60%) 4 (1.15)
Gullied region 147 (41.44)
Others* 8 (2.24)
* - Waterbody
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

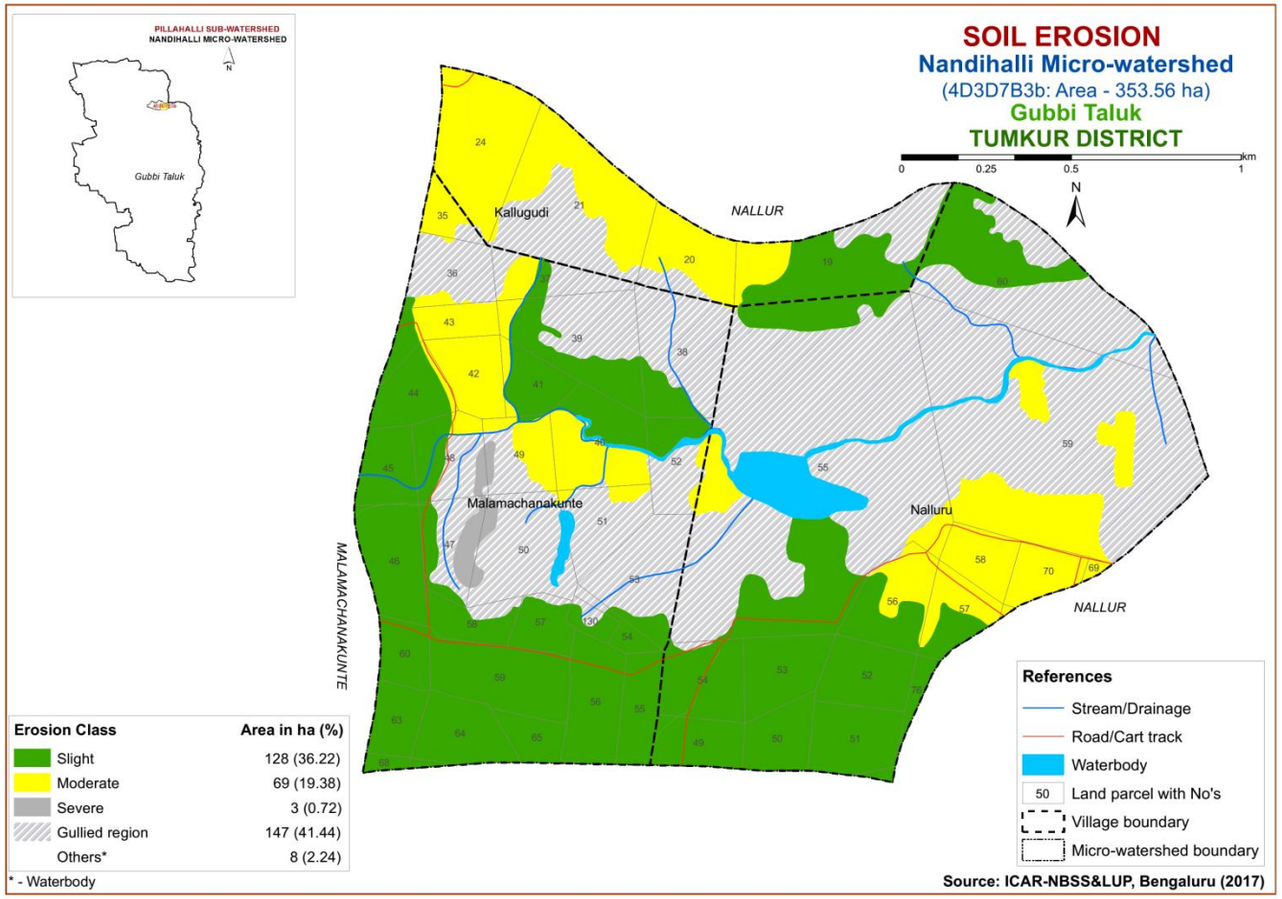

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE WATER CAPACITY
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
Available Water Capacity | Area in ha (%)
Very low (<50 mm/m) | 54(10.65)
Low (51-100 mm/m) | 135(26.47)
Medium (101-150 mm/m) | 218(42.71)
Very high (>200 mm/m) | 78(15.22)
Others* | 25(4.95)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

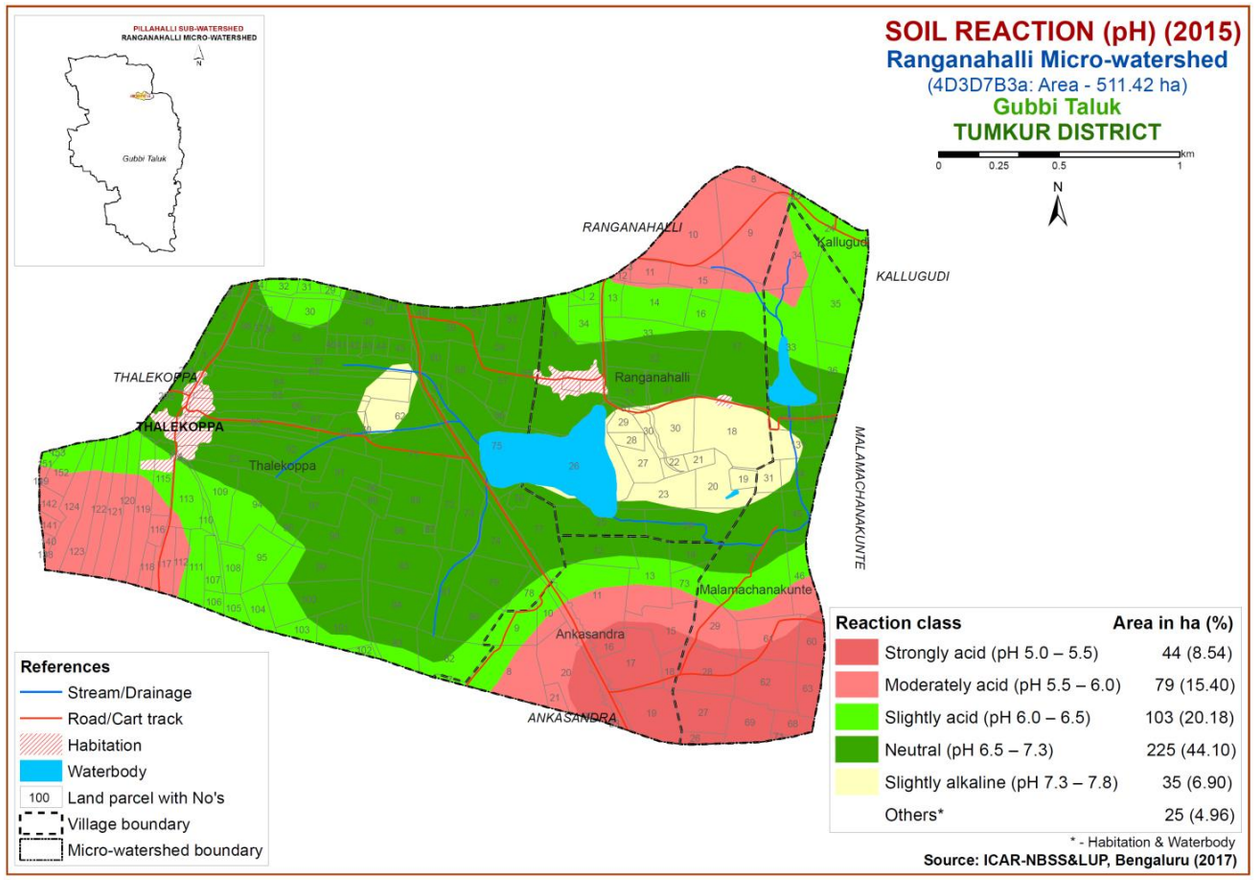

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE WATER CAPACITY
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
Available Water Class | Area in ha (%)
Low (51-100 mm/m) | 77(21.91)
Medium (101-150 mm/m) | 87(24.7)
Very high (>200 mm/m) | 34(9.71)
Gully | 147(41.44)
Others* | 8(2.24)
* - Waterbody
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

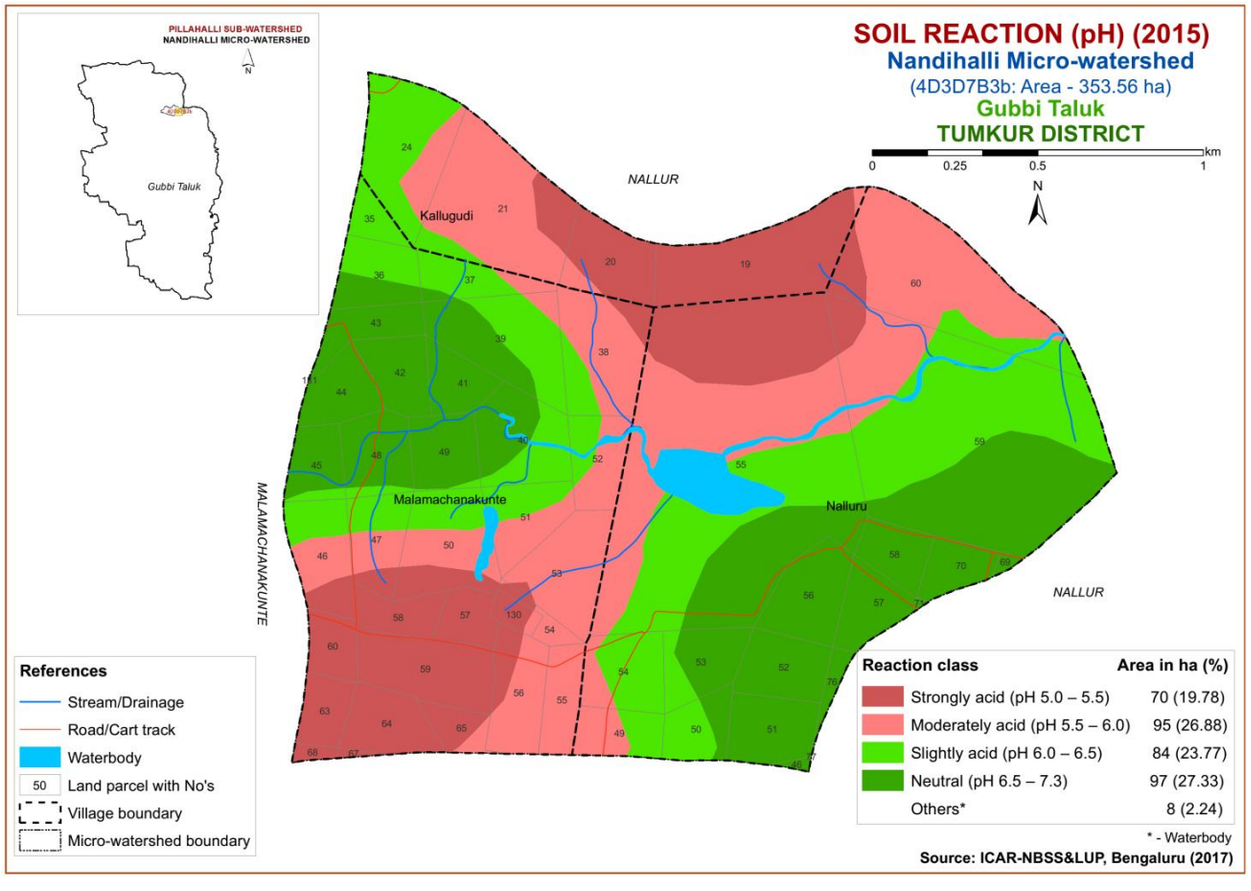

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
SLOPE
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
Slope Class | Area in ha.(%)
Nearly level (0-1%) | 42 (8.28)
Very gently sloping (1-3%) | 434 (84.87)
Gently sloping (3-5%) | 10 (1.90)
Others* | 25 (4.95)
* - Habitation & Waterbody
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

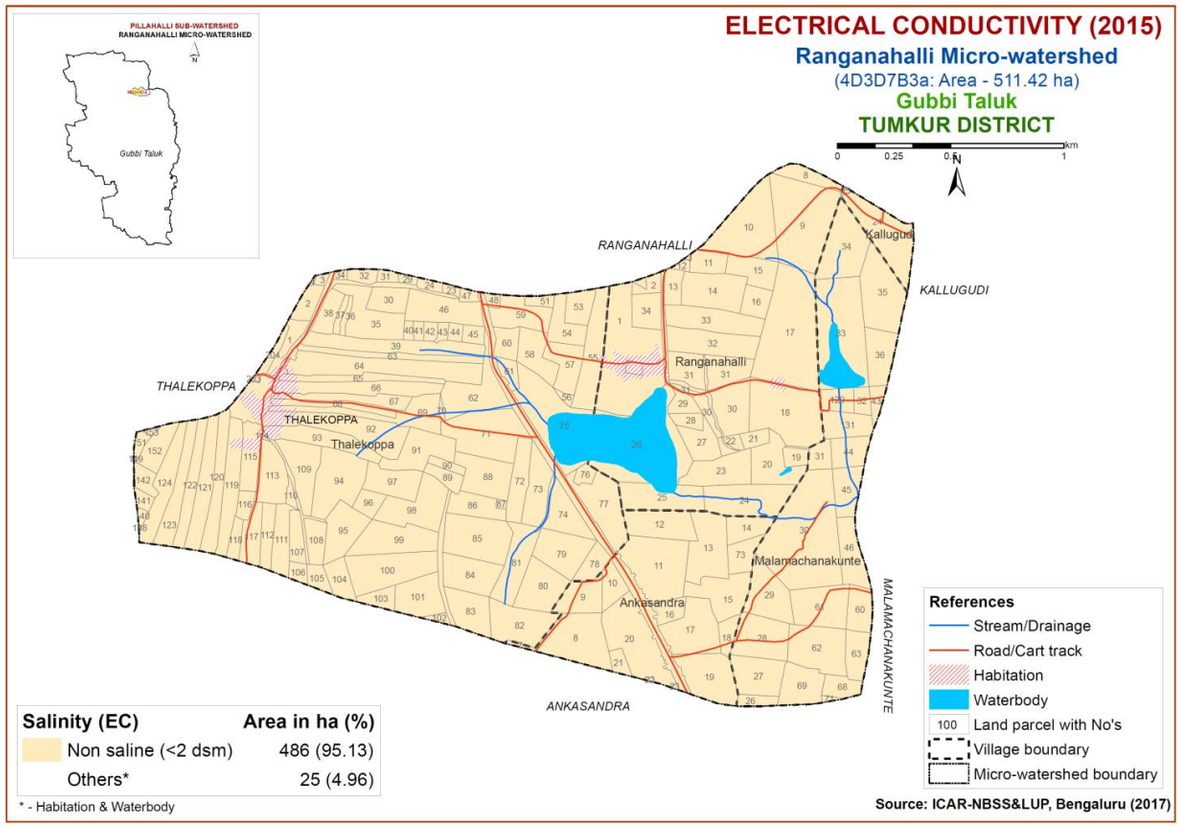

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
SLOPE
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
Slope Class | Area in ha (%)
Nearly level (0-1%) | 11 (2.98)
Very gently sloping (1-3%) | 175 (49.36)
Gently sloping (3-5%) | 14 (3.98)
Gullied region | 147 (41.44)
Others* | 8 (2.24)
* - Waterbody
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

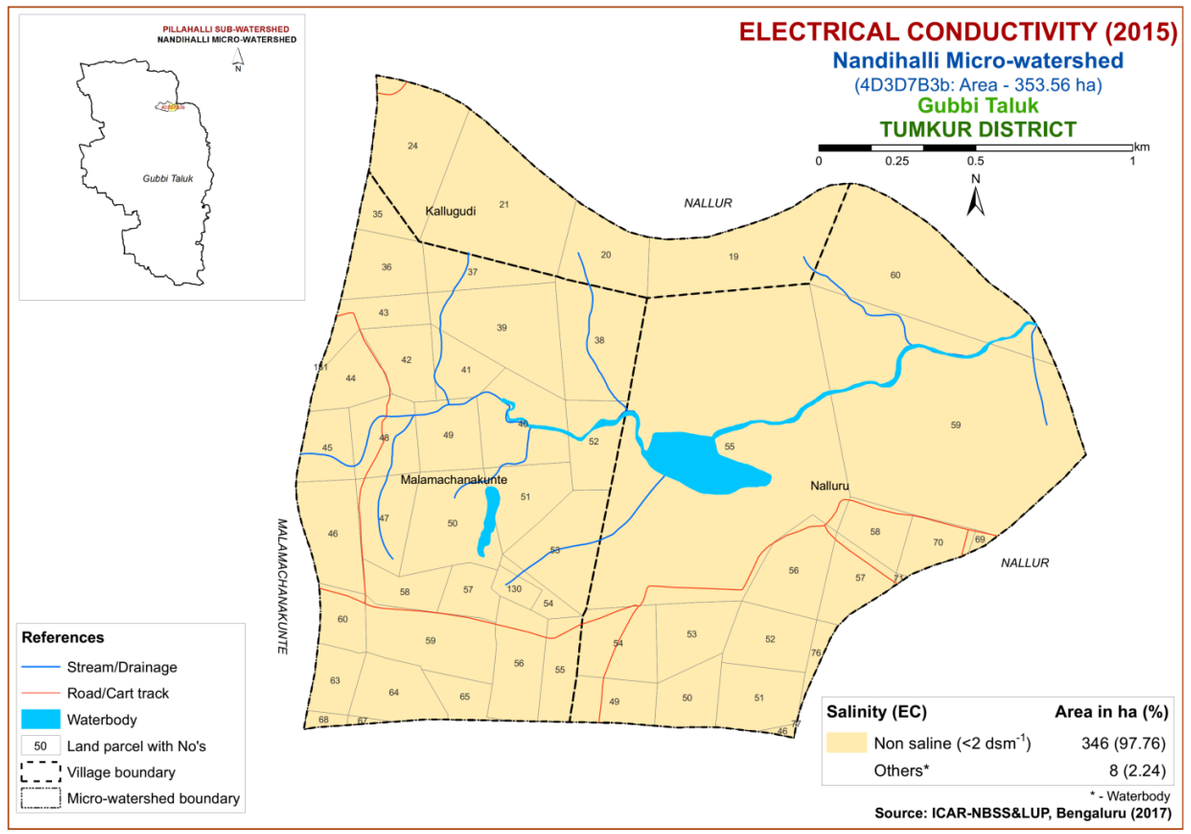

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
SOIL EROSION
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
Kallugudi
THALEKOPPA
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
MALAMACHANAKUNTE
ANKASANDRA
Erosion Class
Area in ha.(%)
Slight 220 (43.09)
Moderate 266 (51.96)
Others* 25 (4.95)
* - 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 (2017)

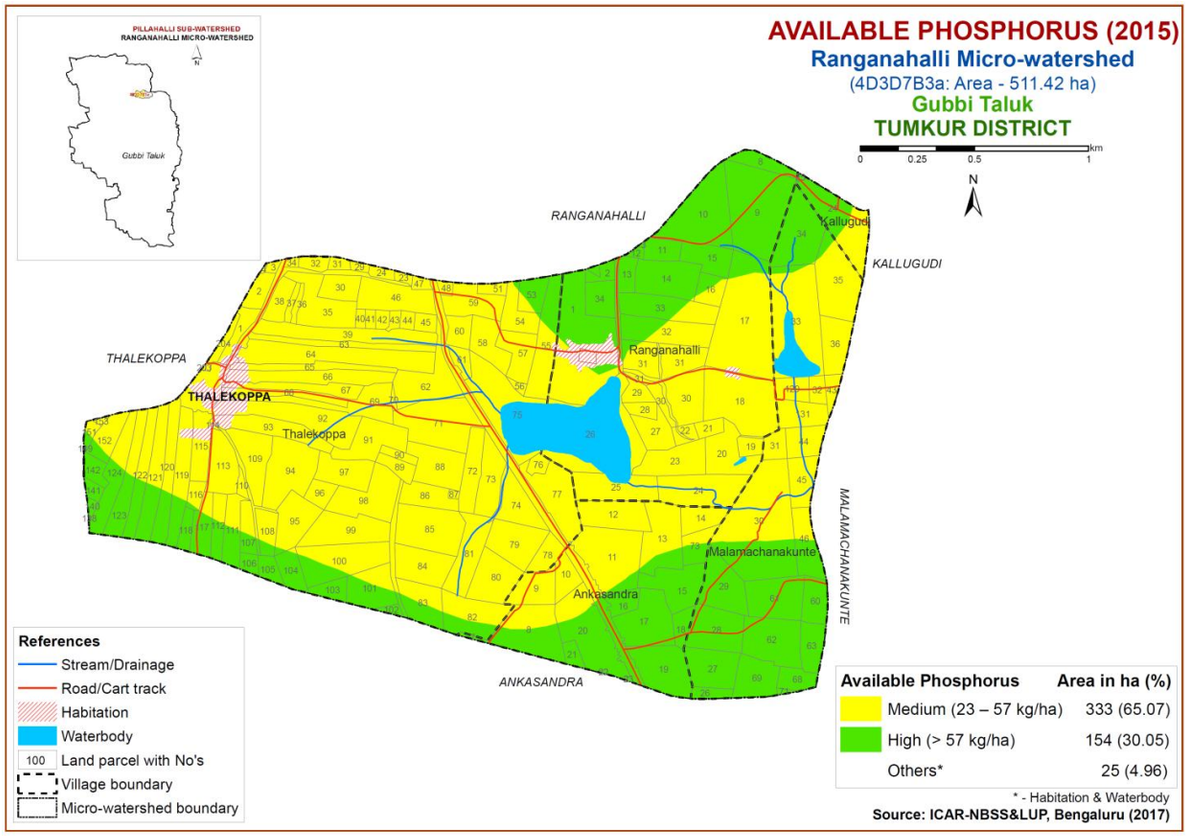

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
SOIL EROSION
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
Kallugudi
NALLUR
Malamachanakunte
Nalluru
MALAMACHANAKUNTE
Erosion Class
Area in ha (%)
Slight 128 (36.22)
Moderate 69 (19.38)
Severe 3 (0.72)
Gullied region 147 (41.44)
Others* 8 (2.24)
* - Waterbody
References
Stream/Drainage
Road/Cart track
Waterbody
Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

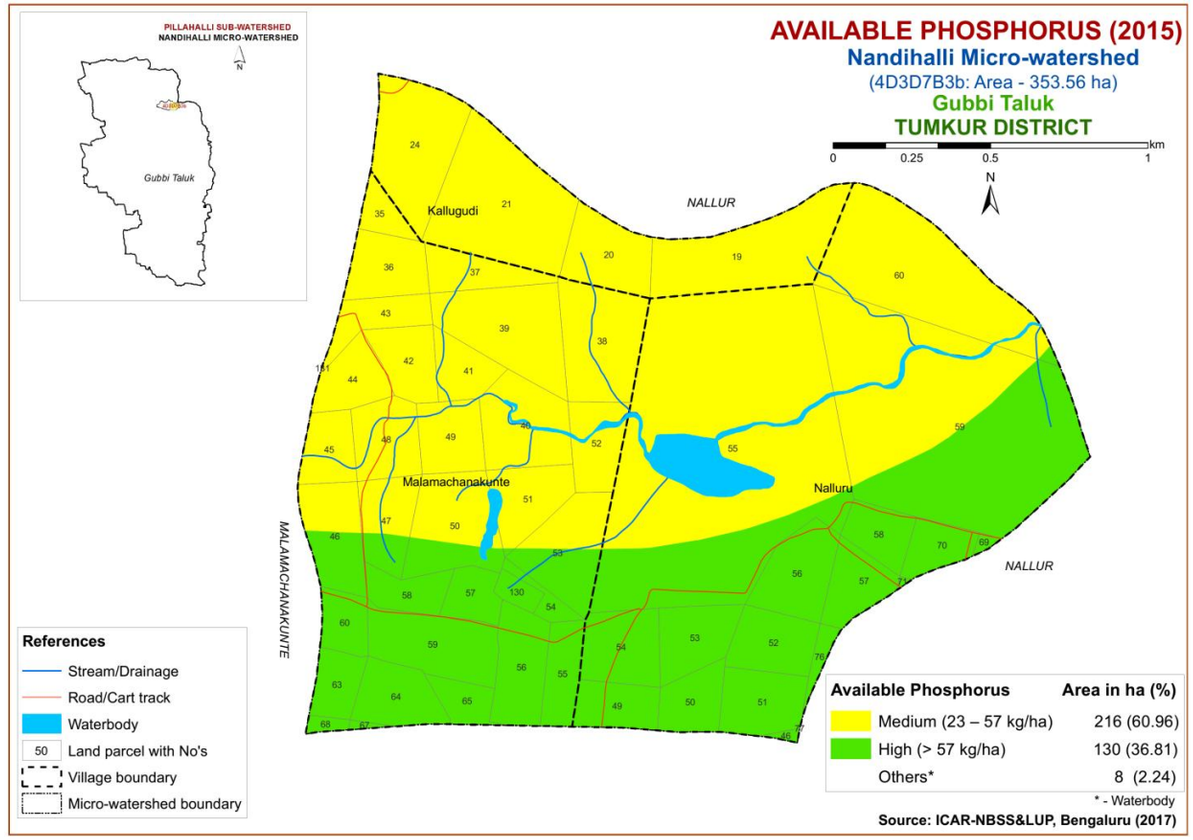

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
SOIL REACTION (pH) (2015)
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
Ranganahalli
Thalekoppa
MALAMACHANAKUNTE
Malamachanakunte
Ankasandra
ANKASANDRA
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Reaction class Area in ha (%)
Strongly acid (pH 5.0 – 5.5) 44 (8.54)
Moderately acid (pH 5.5 – 6.0) 79 (15.40)
Slightly acid (pH 6.0 – 6.5) 103 (20.18)
Neutral (pH 6.5 – 7.3) 225 (44.10)
Slightly alkaline (pH 7.3 – 7.8) 35 (6.90)
Others* 25 (4.96)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

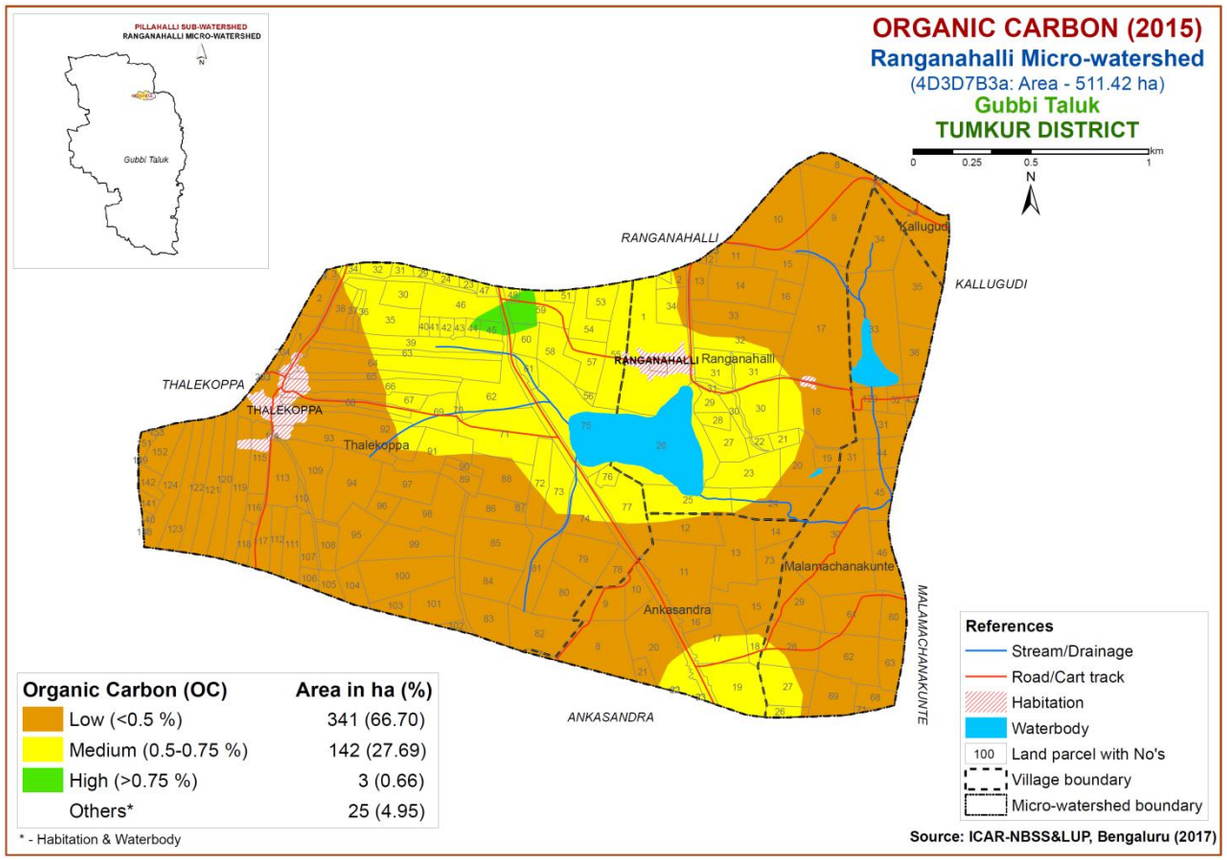

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
SOIL REACTION (pH) (2015)
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
Kallugudi
MALAMACHANAKUNTE
Malamachanakunte
Nalluru
NALLUR
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Reaction class Area in ha (%)
Strongly acid (pH 5.0 – 5.5) 70 (19.78)
Moderately acid (pH 5.5 – 6.0) 95 (26.88)
Slightly acid (pH 6.0 – 6.5) 84 (23.77)
Neutral (pH 6.5 – 7.3) 97 (27.33)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

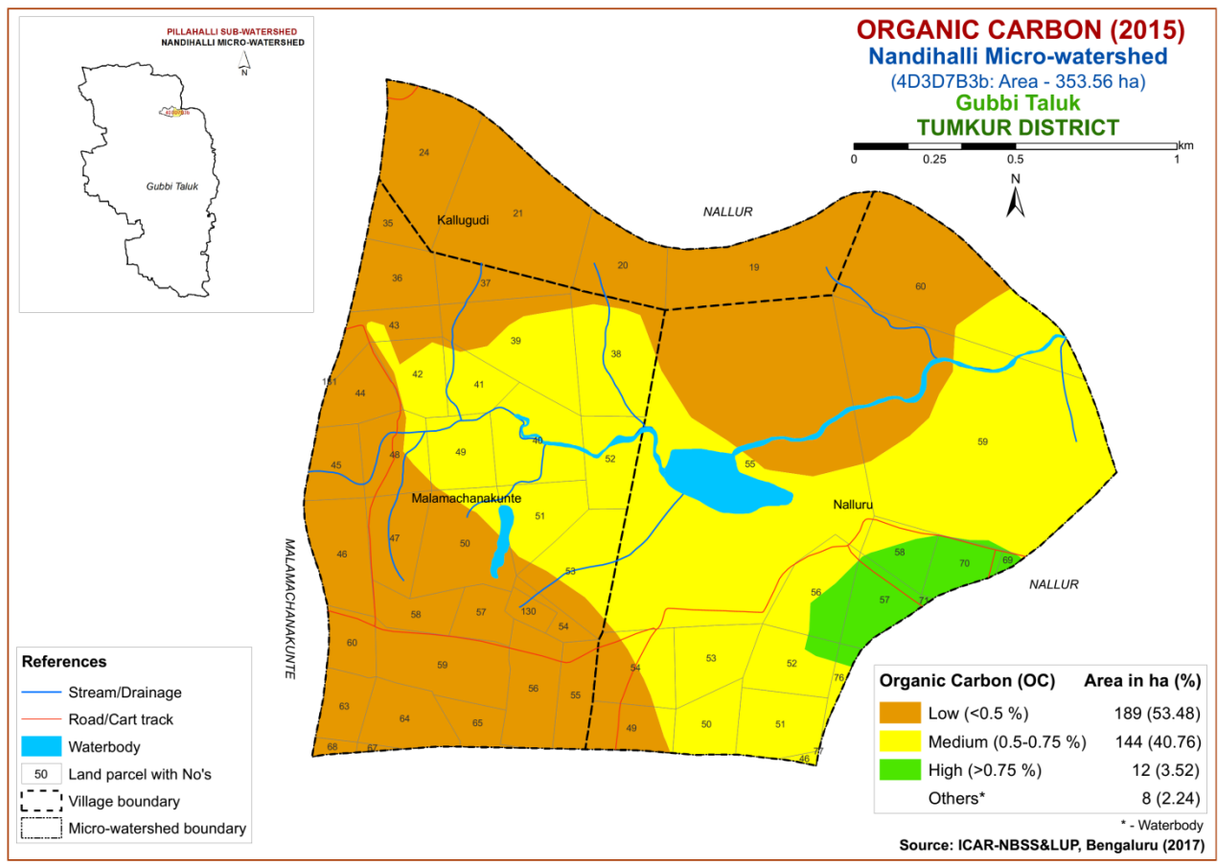

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
ELECTRICAL CONDUCTIVITY (2015)
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Ankasandra
Malamachanakunte
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Salinity (EC) Area in ha (%)
Non saline (<2 dsm) 486 (95.13)
Others* 25 (4.96)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

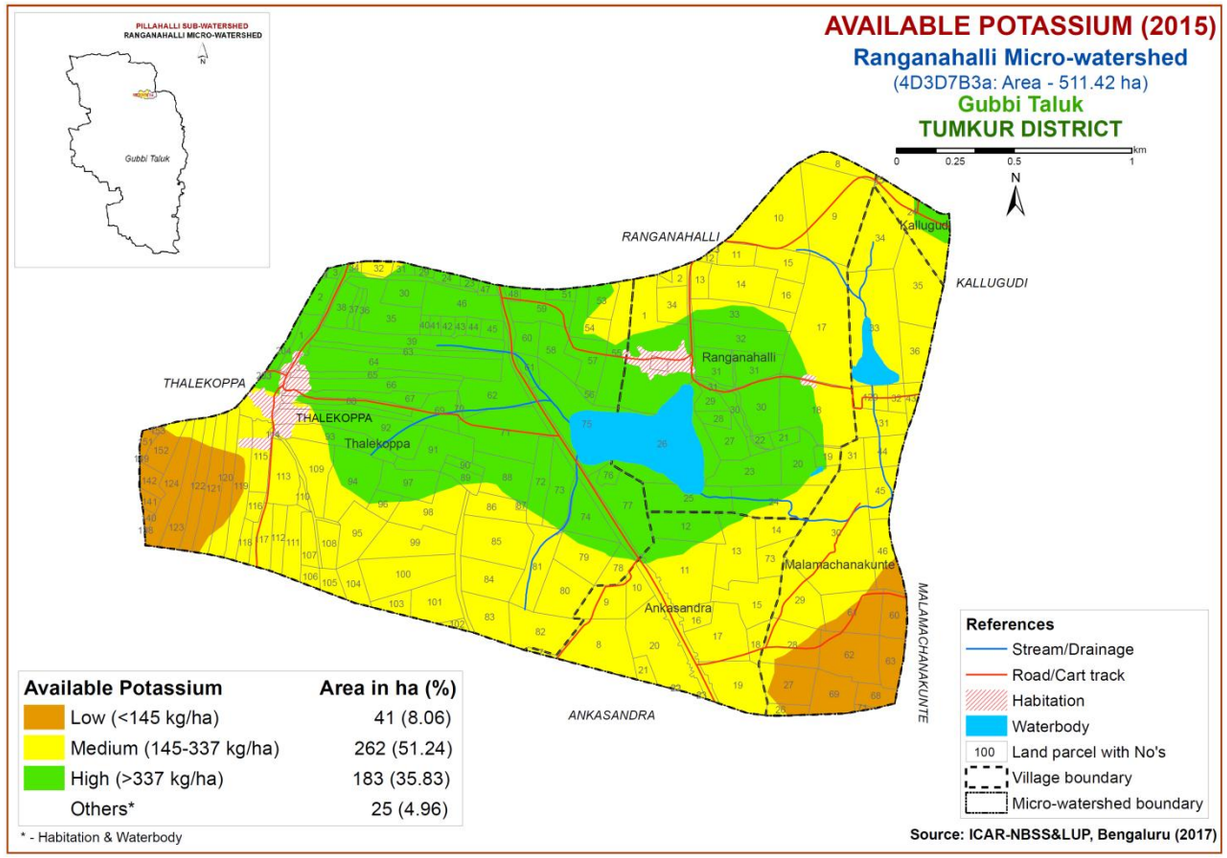

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
ELECTRICAL CONDUCTIVITY (2015)
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Salinity (EC) Area in ha (%)
Non saline (<2 dsm-1) 346 (97.76)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

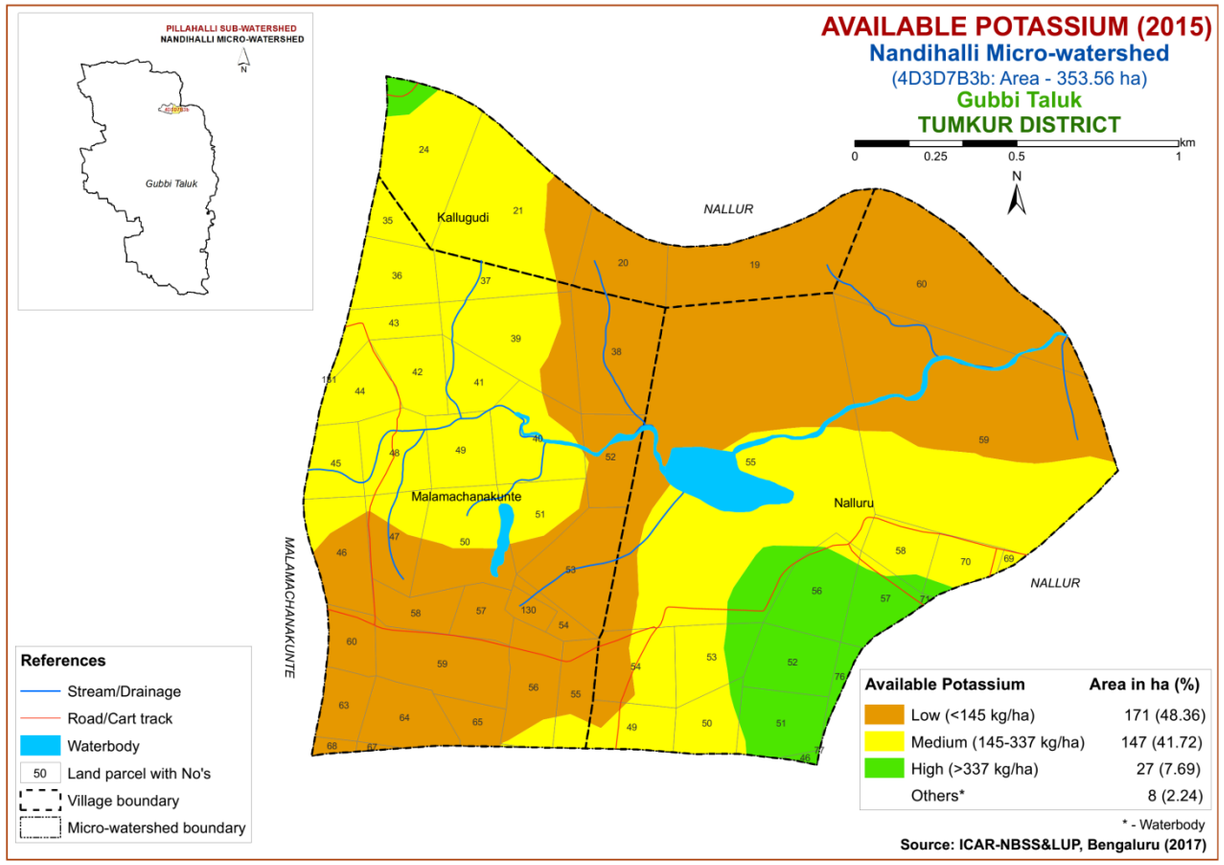

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE PHOSPHORUS (2015)
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Ankasandra
Malamachanakunte
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Phosphorus Area in ha (%)
Medium (23 – 57 kg/ha) 333 (65.07)
High (> 57 kg/ha) 154 (30.05)
Others* 25 (4.96)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

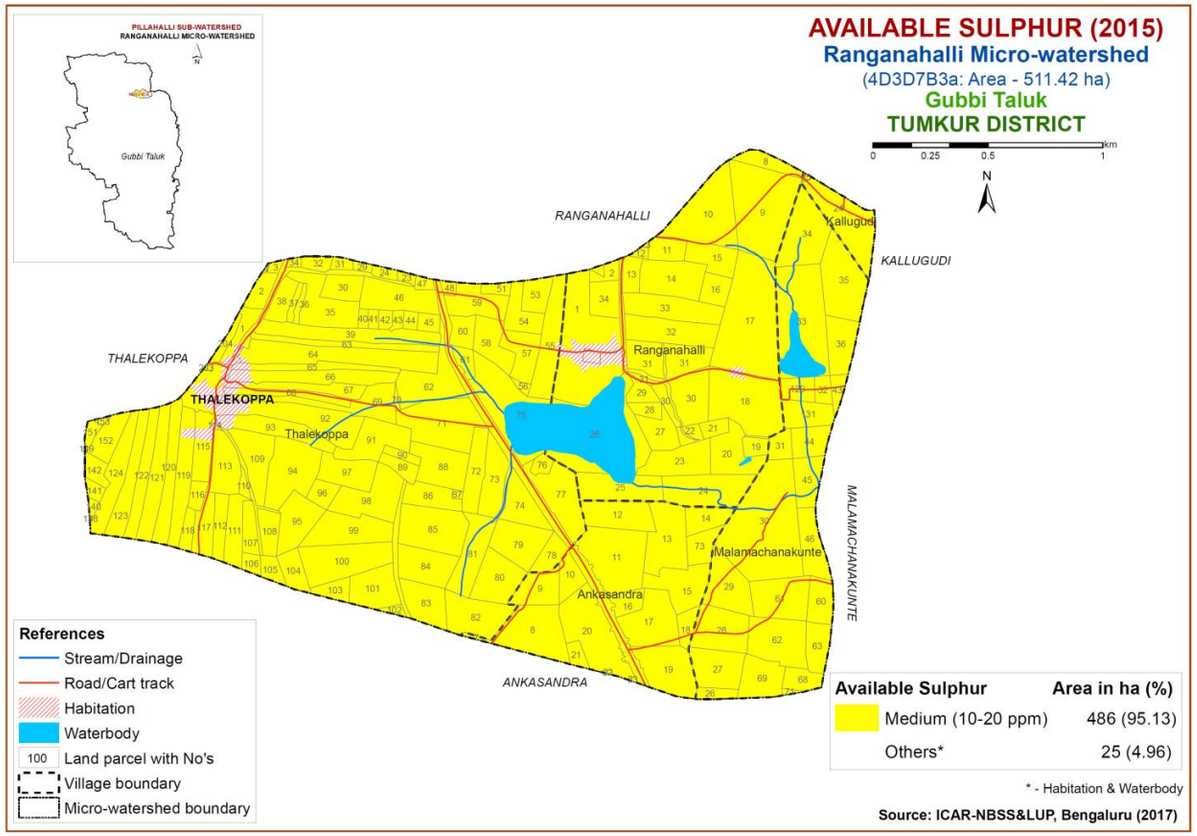

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE PHOSPHORUS (2015)
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Phosphorus Area in ha (%)
Medium (23 – 57 kg/ha) 216 (60.96)
High (> 57 kg/ha) 130 (36.81)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

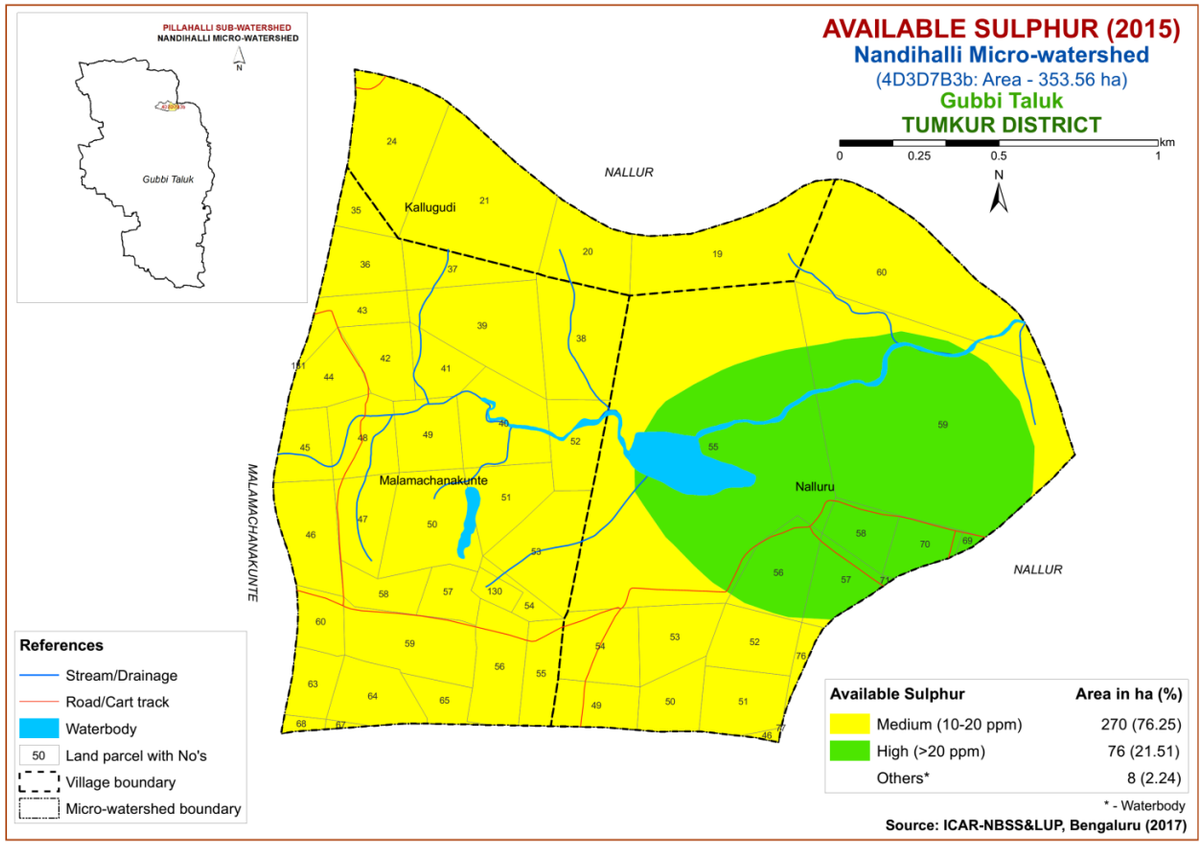

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
ORGANIC CARBON (2015)
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Organic Carbon (OC) Area in ha (%)
Low (<0.5 %) 341 (66.70)
Medium (0.5-0.75 %) 142 (27.69)
High (>0.75 %) 3 (0.66)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

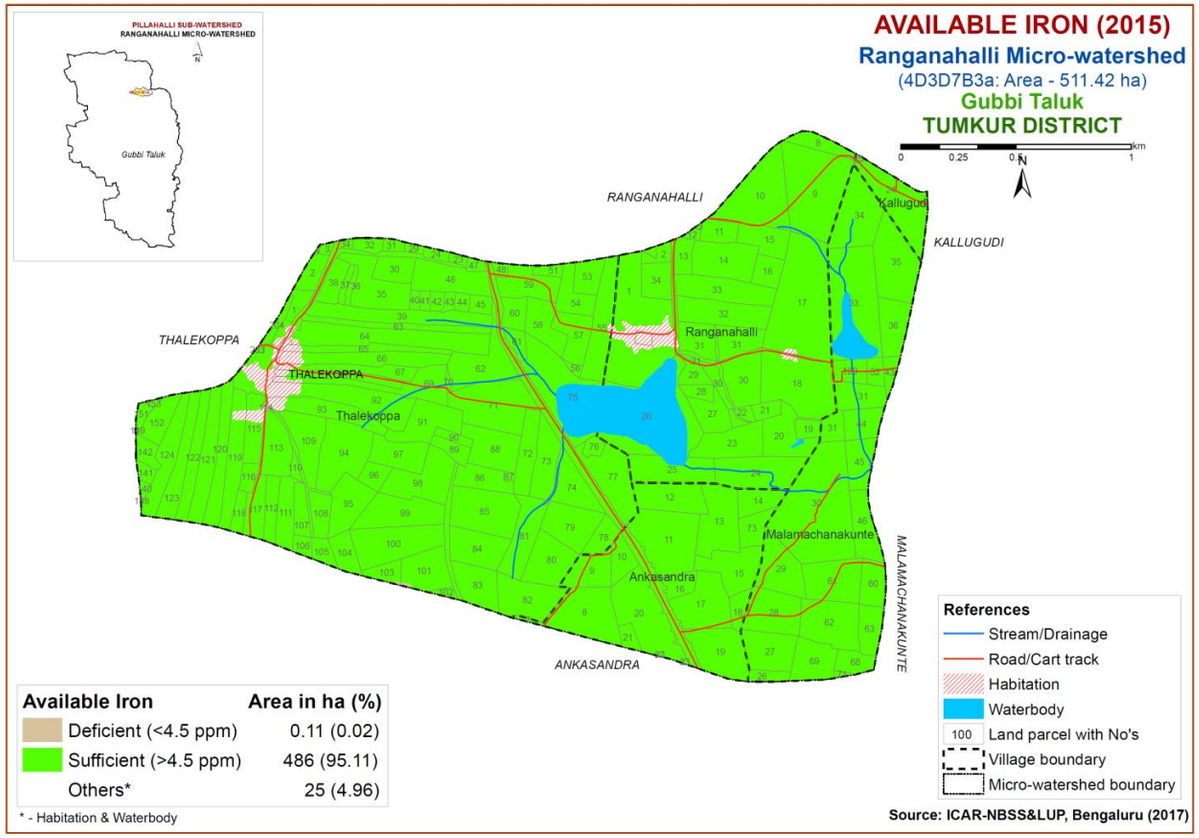

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
ORGANIC CARBON (2015)
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Organic Carbon (OC) Area in ha (%)
Low (<0.5 %) 189 (53.48)
Medium (0.5-0.75 %) 144 (40.76)
High (>0.75 %) 12 (3.52)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

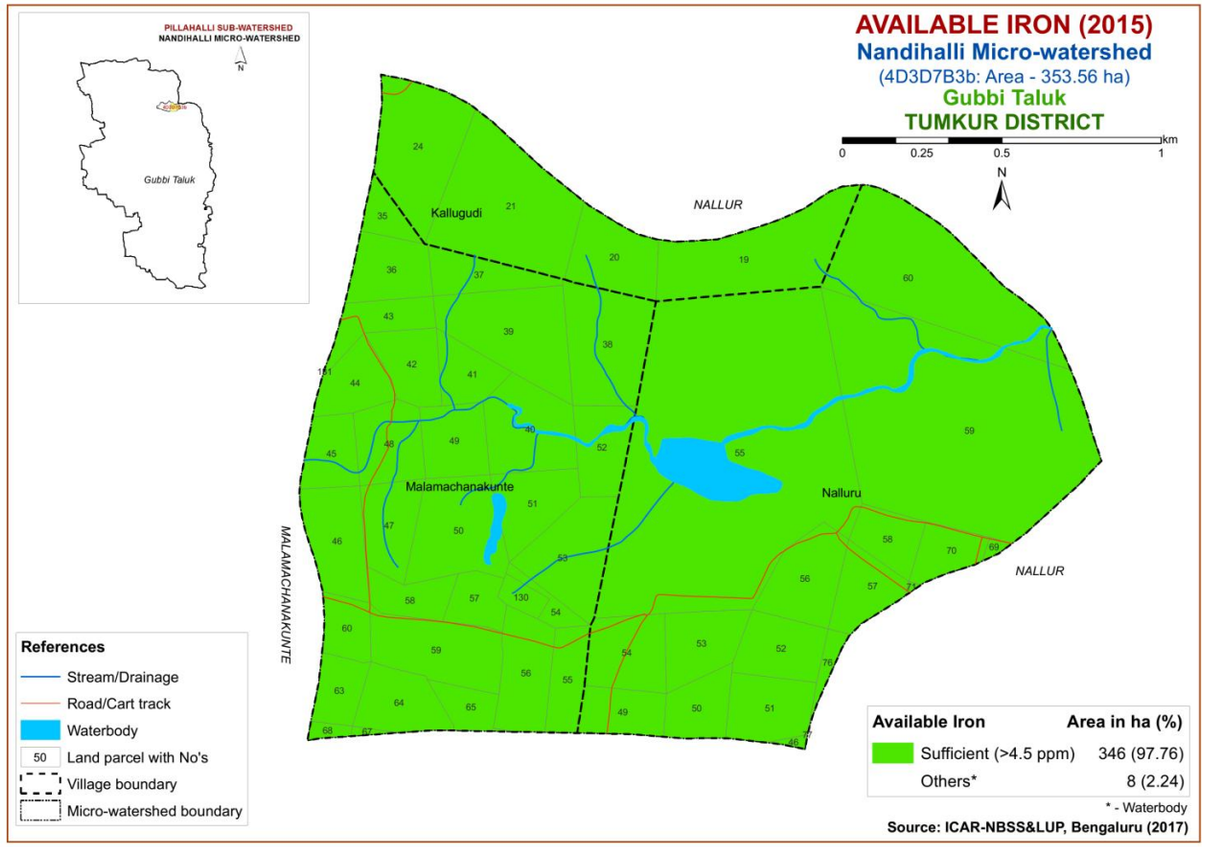

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE POTASSIUM (2015)
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Potassium Area in ha (%)
Low (<145 kg/ha) 41 (8.06)
Medium (145-337 kg/ha) 262 (51.24)
High (>337 kg/ha) 183 (35.83)
Others* 25 (4.96)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

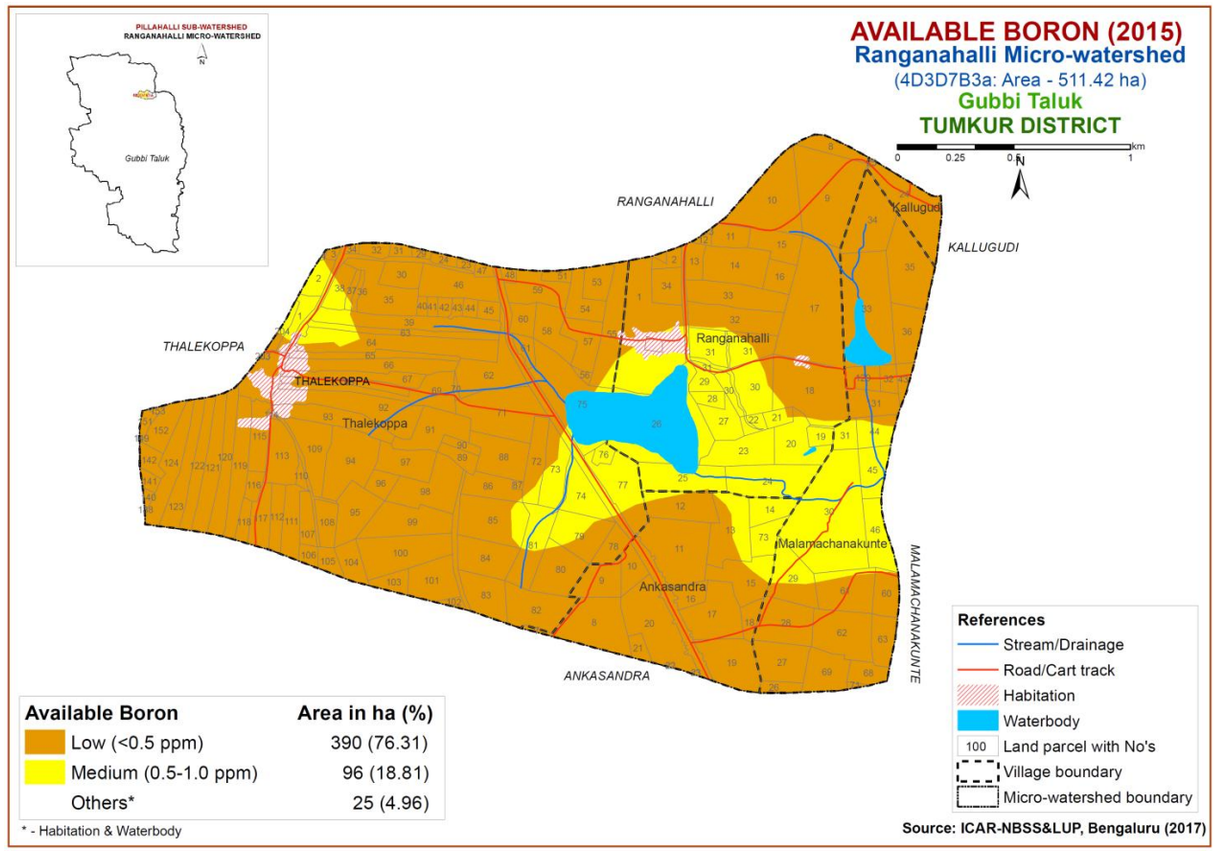

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE POTASSIUM (2015)
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Potassium Area in ha (%)
Low (<145 kg/ha) 171 (48.36)
Medium (145-337 kg/ha) 147 (41.72)
High (>337 kg/ha) 27 (7.69)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

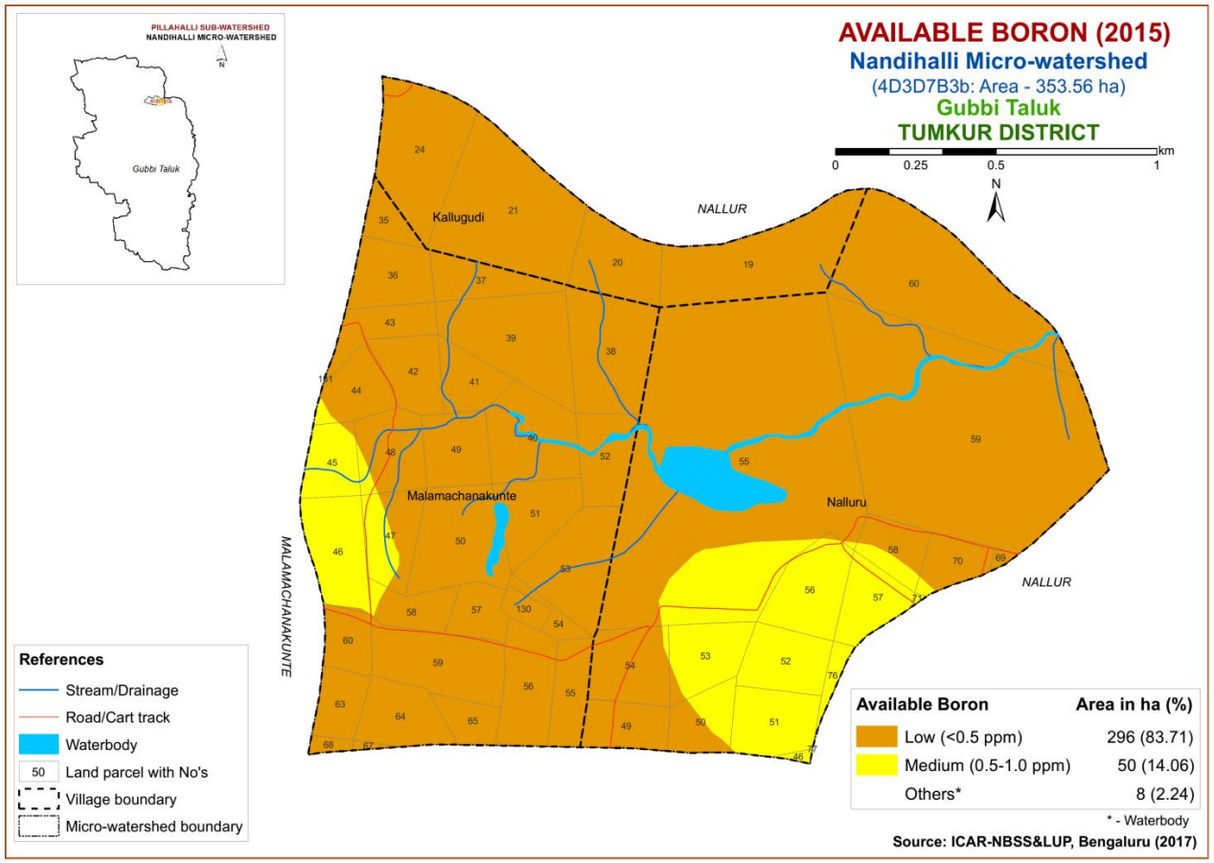

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE SULPHUR (2015)
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
MALAMACHANAKUNTE
ANKASANDRA
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Sulphur
Area in ha (%)
Medium (10-20 ppm) 486 (95.13)
Others* 25 (4.96)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

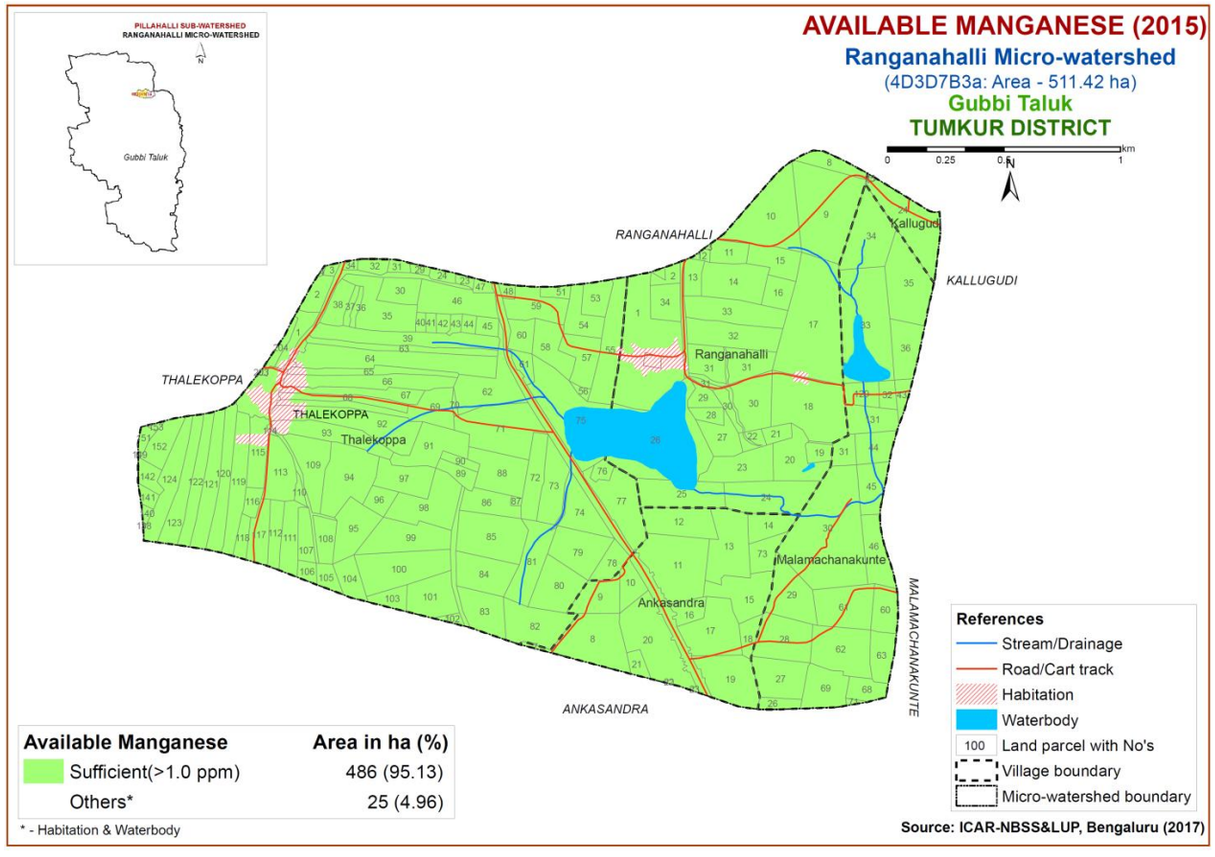

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE SULPHUR (2015)
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
NALLUR
Kallugudi
Malamachanakunte
Nalluru
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Sulphur
Area in ha (%)
Medium (10-20 ppm) 270 (76.25)
High (>20 ppm) 76 (21.51)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

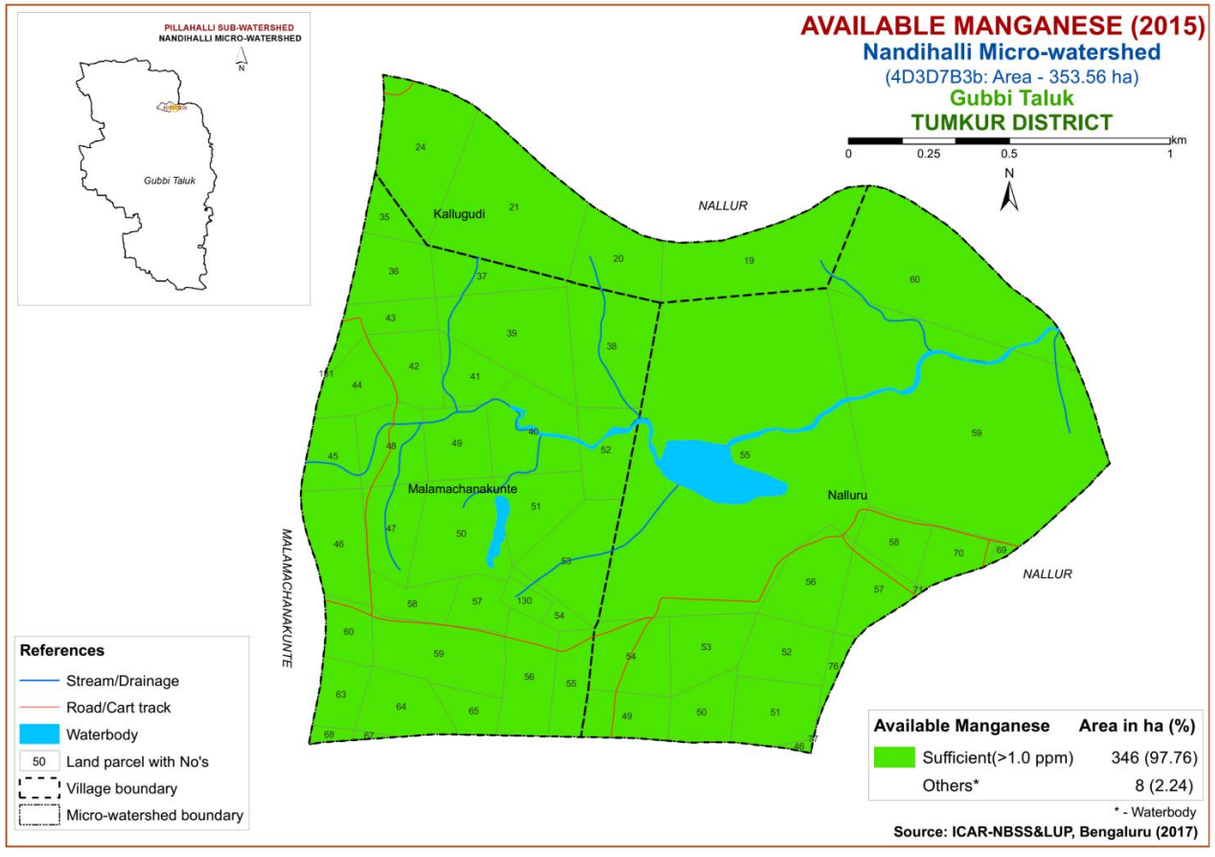

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE IRON (2015)
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
MALAMACHANAKUNTE
ANKASANDRA
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Iron
Area in ha (%)
Deficient (<4.5 ppm) 0.11 (0.02)
Sufficient (>4.5 ppm) 486 (95.11)
Others* 25 (4.96)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

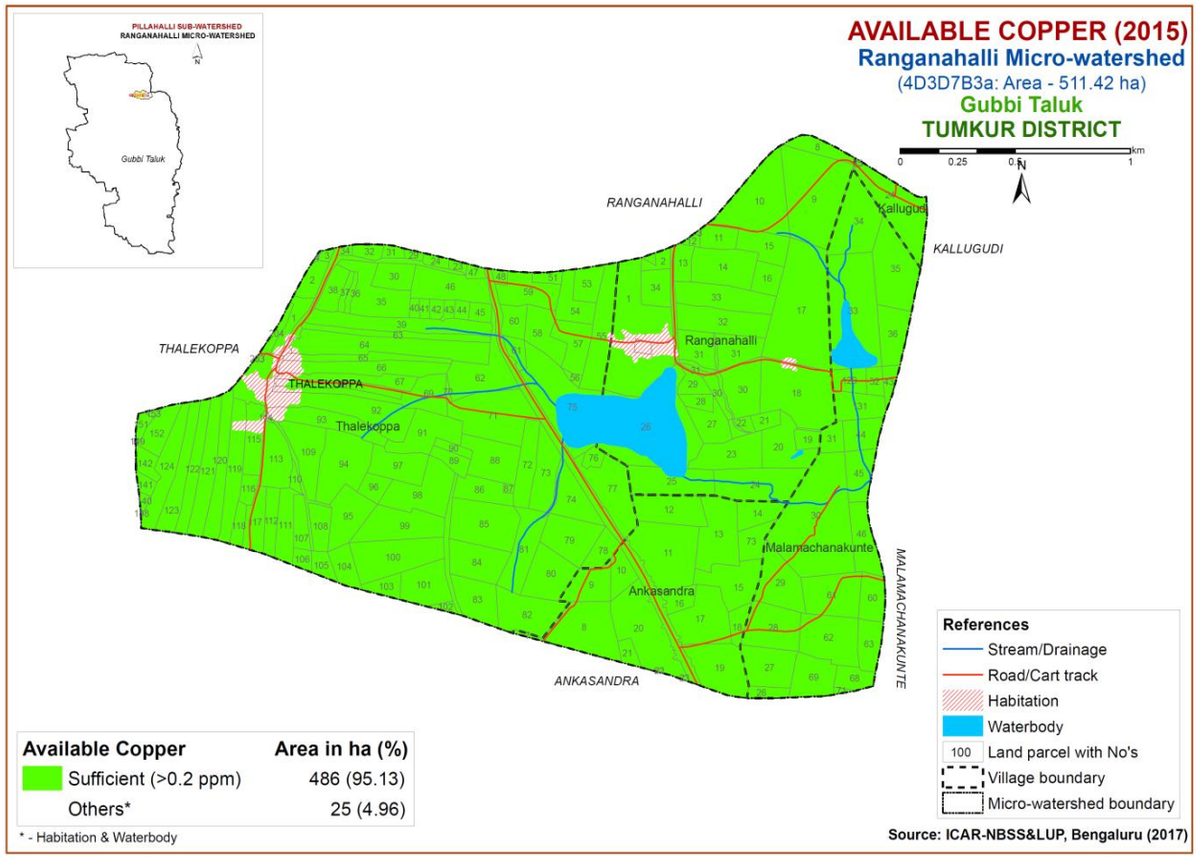

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE IRON (2015)
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
NALLUR
Kallugudi
Malamachanakunte
Nalluru
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Iron
Area in ha (%)
Sufficient (>4.5 ppm) 346 (97.76)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

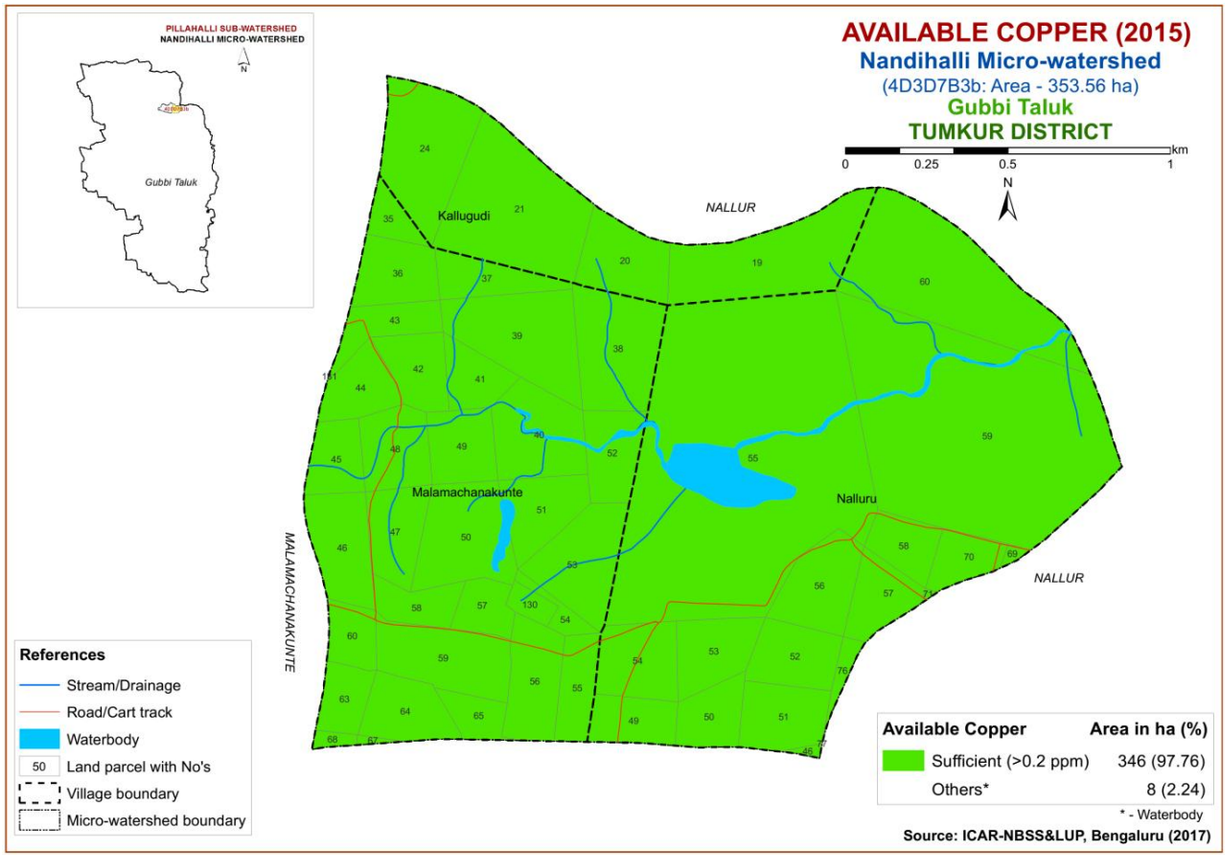

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE BORON (2015)
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Boron | Area in ha (%)
Low (<0.5 ppm) | 390 (76.31)
Medium (0.5-1.0 ppm) | 96 (18.81)
Others* | 25 (4.96)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

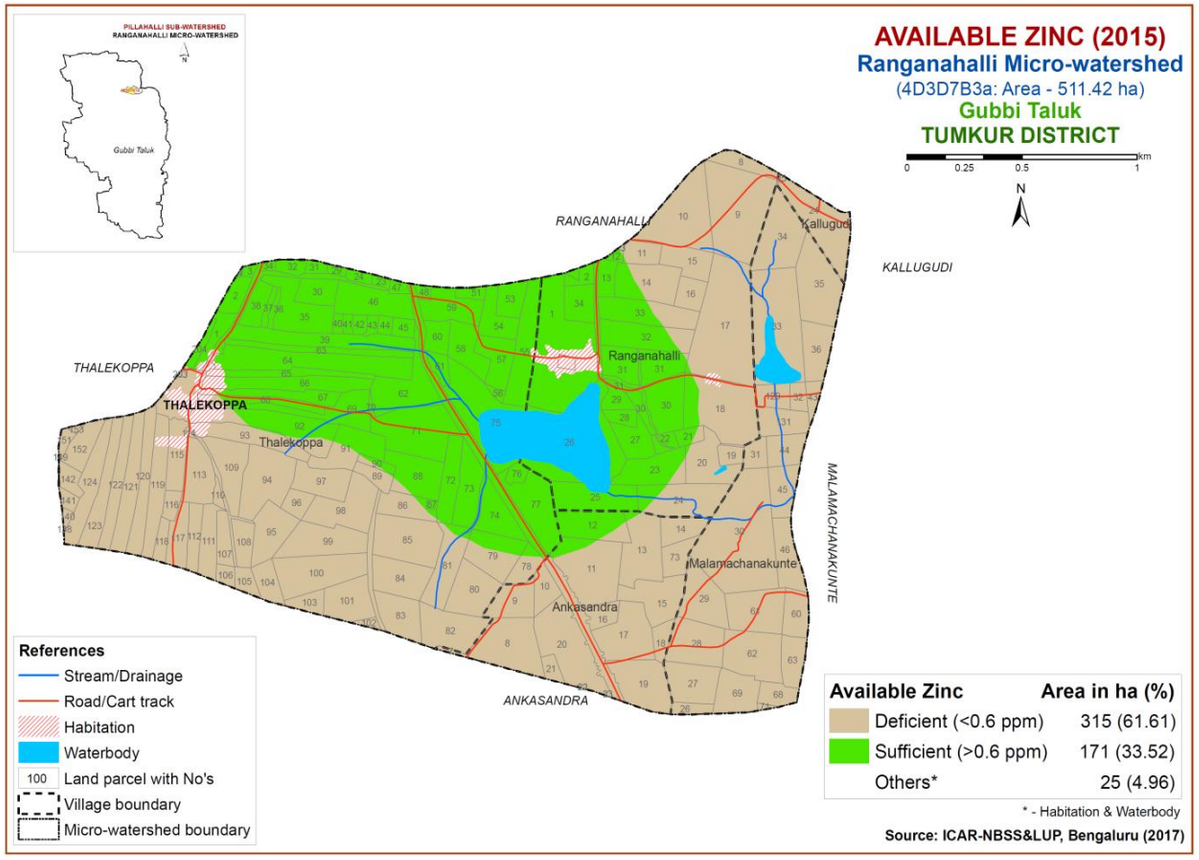

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE BORON (2015)
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Boron | Area in ha (%)
Low (<0.5 ppm) | 296 (83.71)
Medium (0.5-1.0 ppm) | 50 (14.06)
Others* | 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

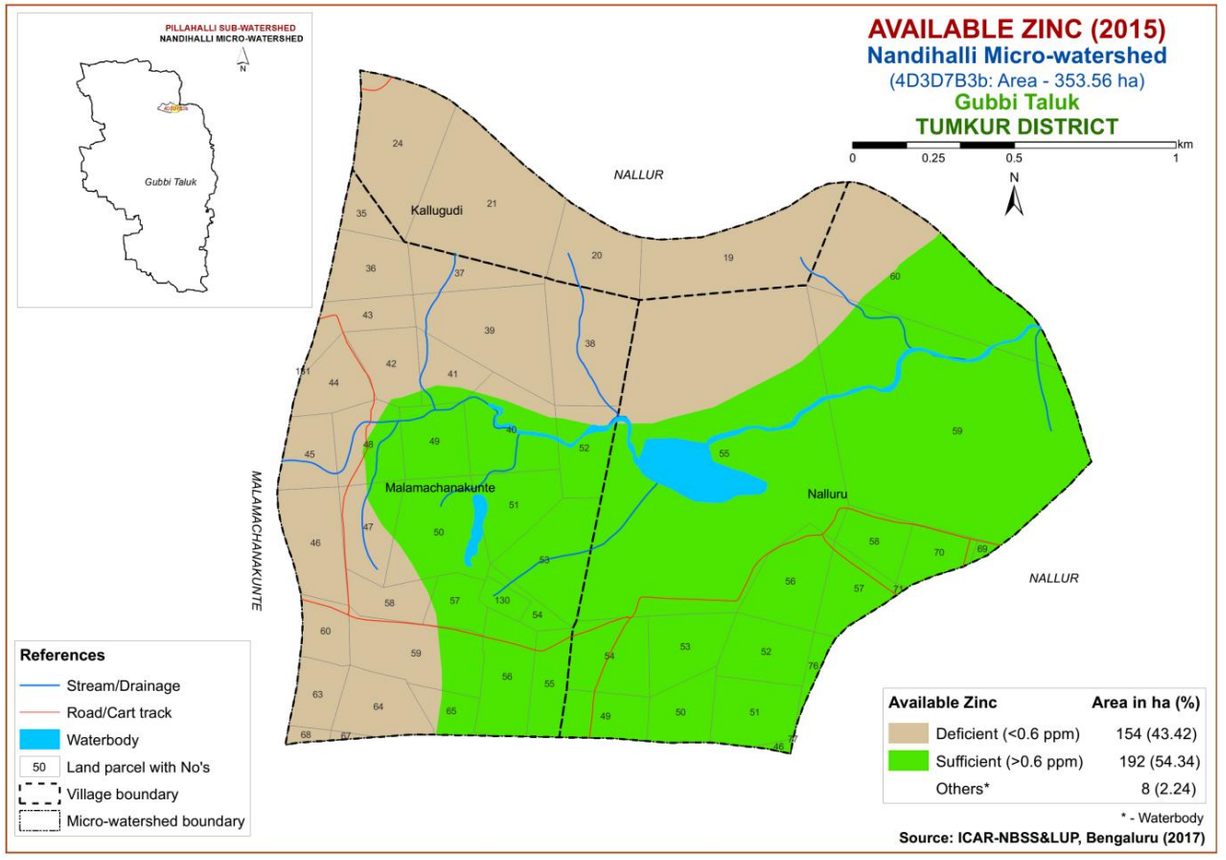

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE MANGANESE (2015)
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Manganese | Area in ha (%)
Sufficient(>1.0 ppm) | 486 (95.13)
Others* | 25 (4.96)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

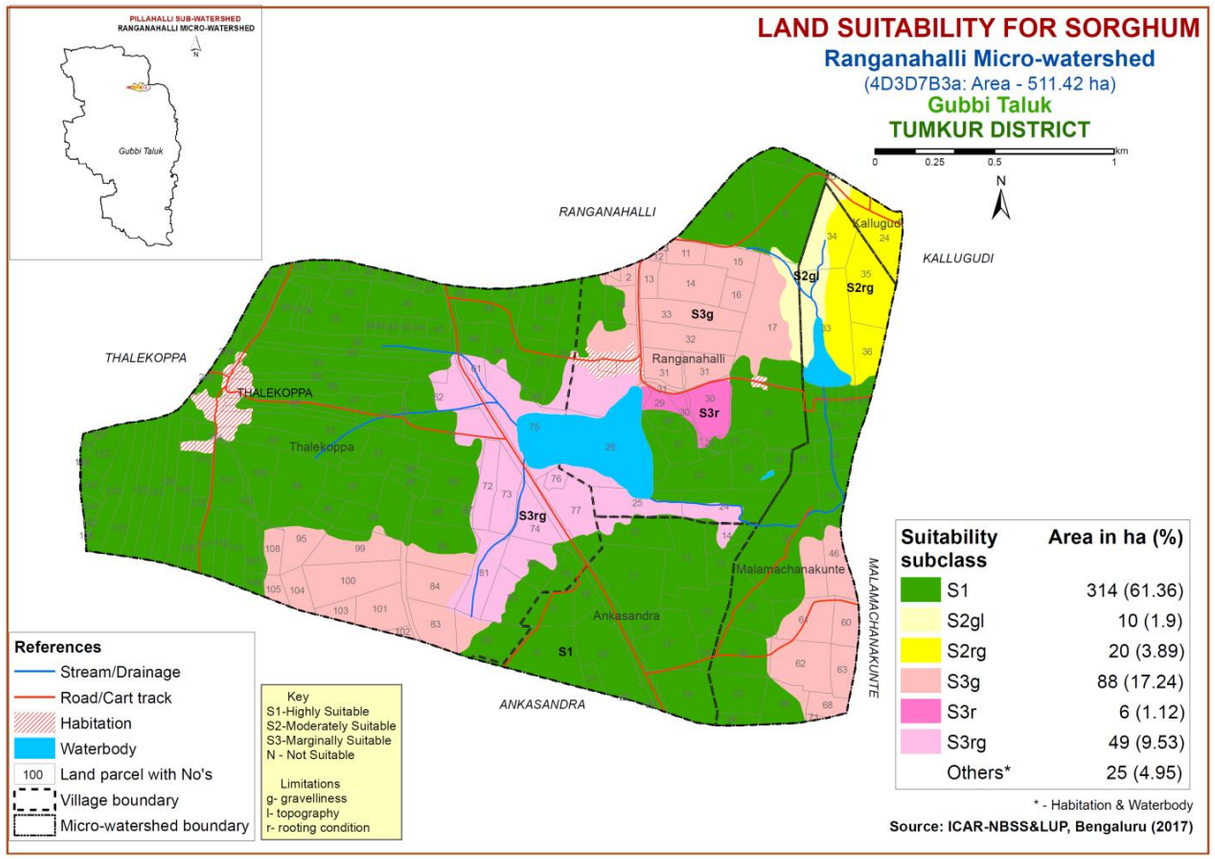

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE MANGANESE (2015)
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Manganese | Area in ha (%)
Sufficient(>1.0 ppm) | 346 (97.76)
Others* | 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

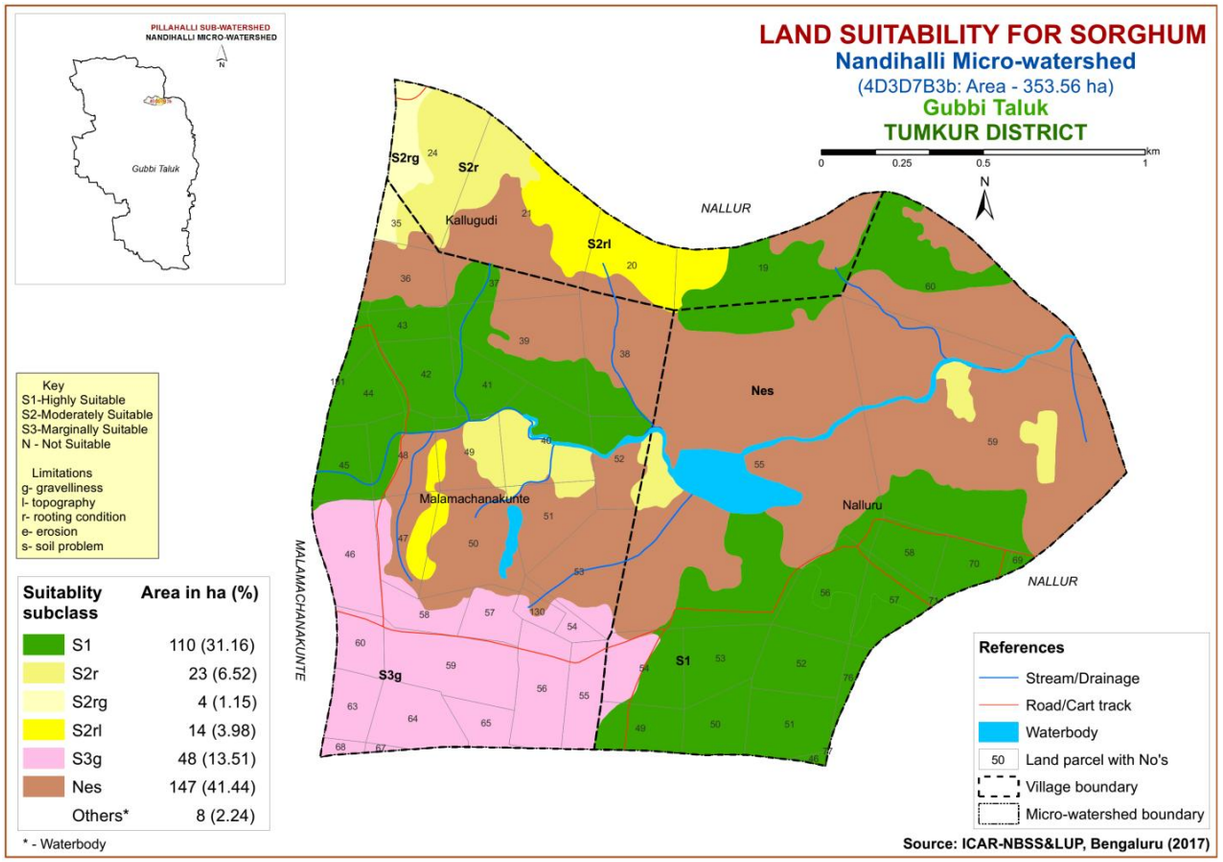

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE COPPER (2015)
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
THALEKOPPA
Thalekoppa
Ranganahalli
Kallugudi
Malamachanakunte
Ankasandra
ANKASANDRA
MALAMACHANAKUNTE
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Copper
Area in ha (%)
Sufficient (>0.2 ppm) 486 (95.13)
Others* 25 (4.96)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

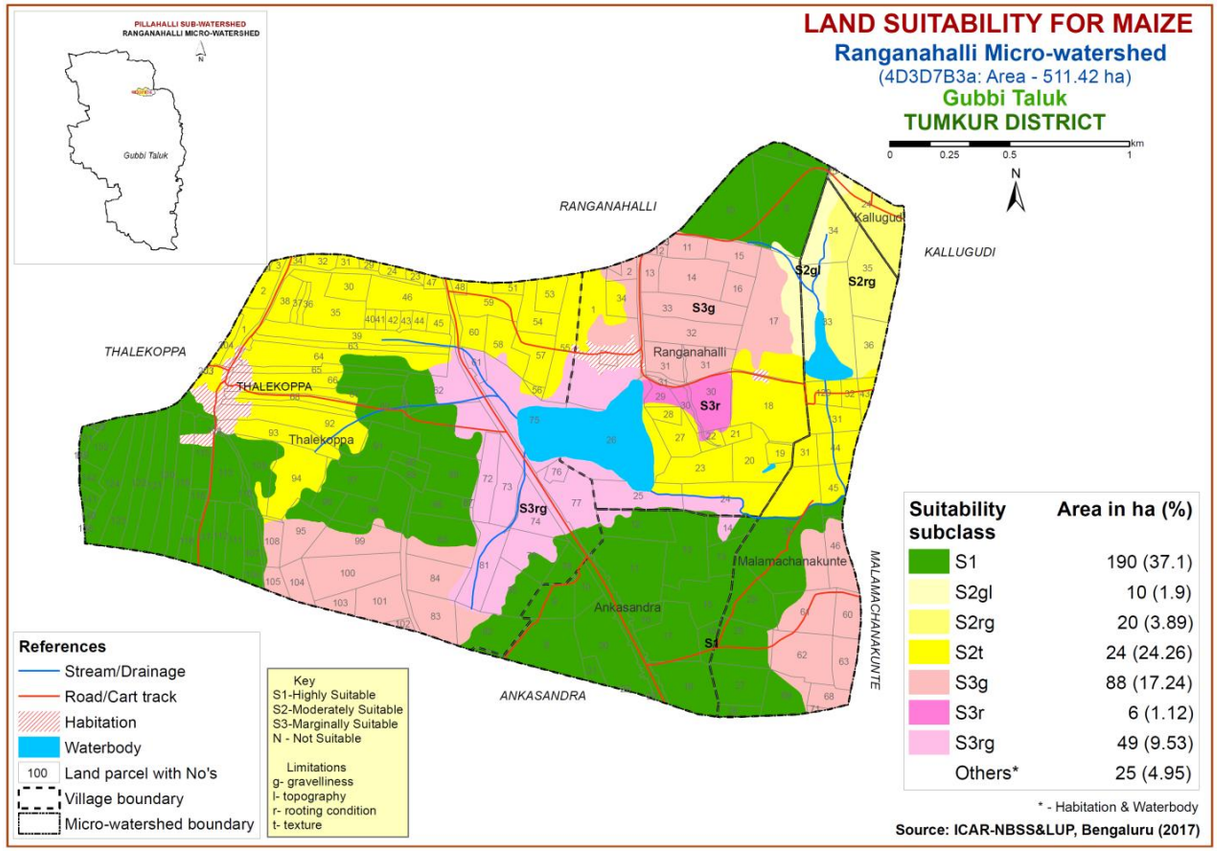

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE COPPER (2015)
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
Kallugudi
Malamachanakunte
Nalluru
NALLUR
MALAMACHANAKUNTE
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Copper
Area in ha (%)
Sufficient (>0.2 ppm) 346 (97.76)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

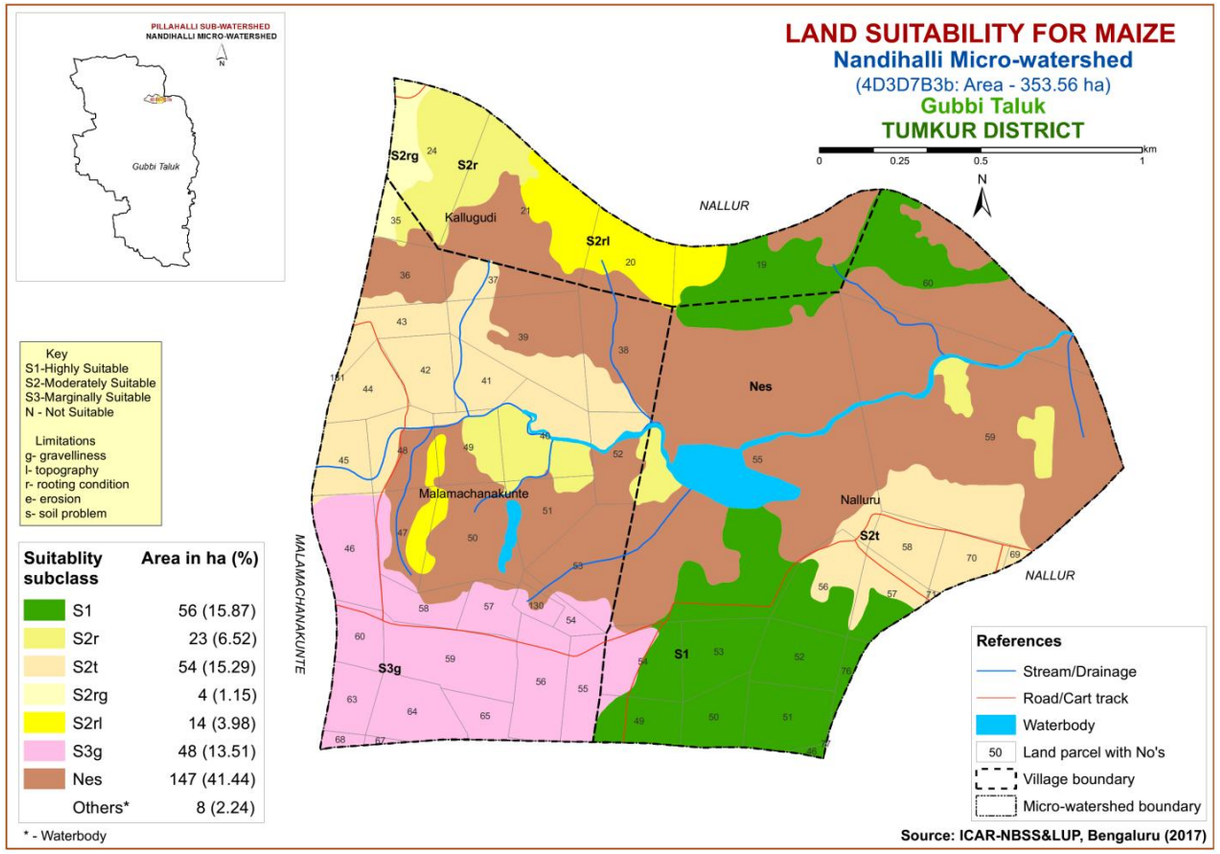

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE ZINC (2015)
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
THALEKOPPA
Thalekoppa
Ranganahalli
Kallugudi
Malamachanakunte
Ankasandra
ANKASANDRA
MALAMACHANAKUNTE
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Zinc
Area in ha (%)
Deficient (<0.6 ppm) 315 (61.61)
Sufficient (>0.6 ppm) 171 (33.52)
Others* 25 (4.96)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

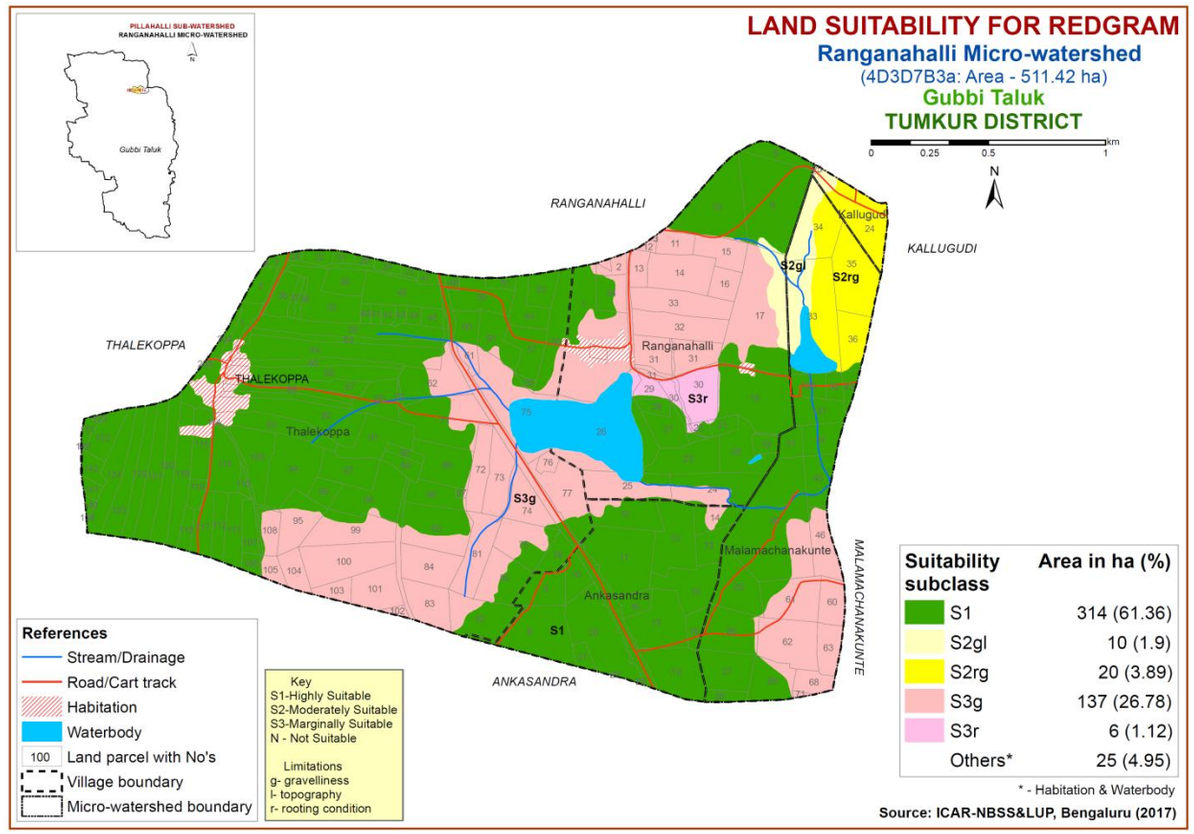

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
AVAILABLE ZINC (2015)
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
Kallugudi
Malamachanakunte
Nalluru
NALLUR
MALAMACHANAKUNTE
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Available Zinc
Area in ha (%)
Deficient (<0.6 ppm) 154 (43.42)
Sufficient (>0.6 ppm) 192 (54.34)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

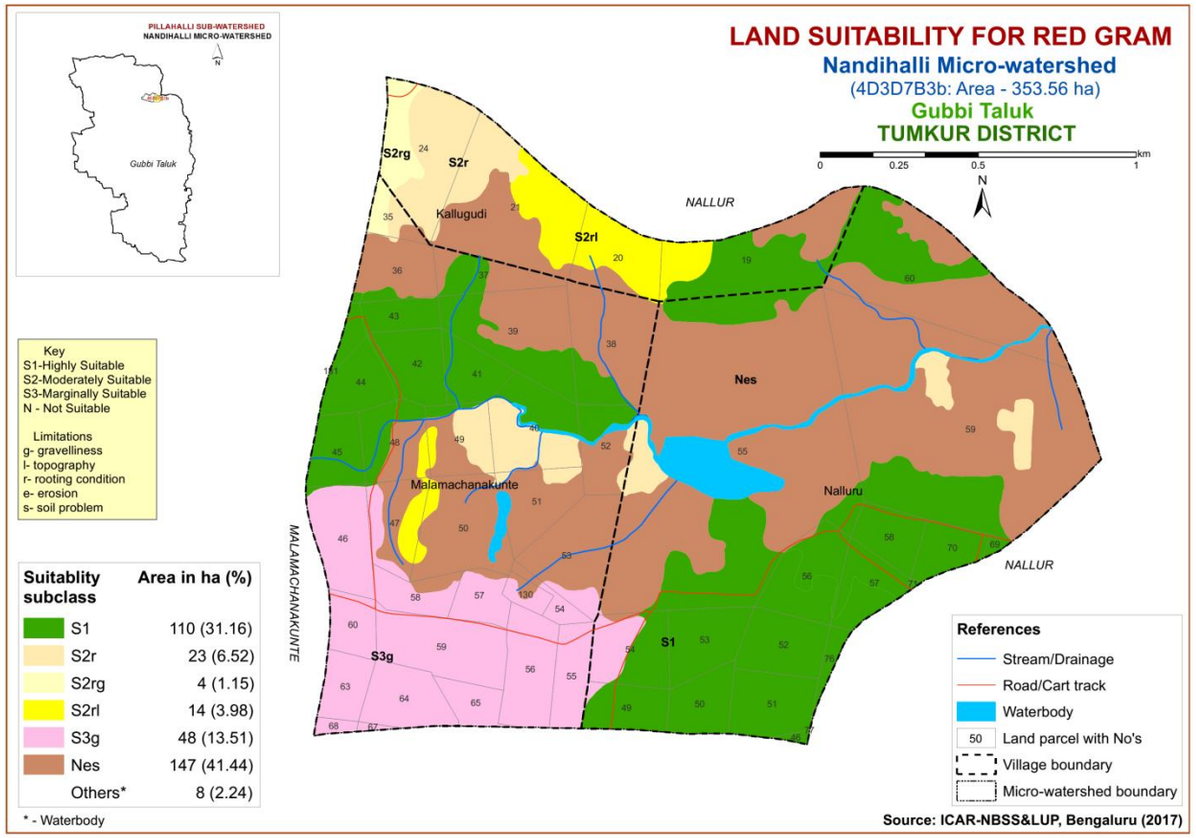

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR SORGHUM
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
MALAMACHANAKUNTE
ANKASANDRA
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2gl
S2rg
S3g
S3r
S3rg
Suitability subclass
Area in ha (%)
S1 314 (61.36)
S2gl 10 (1.9)
S2rg 20 (3.89)
S3g 88 (17.24)
S3r 6 (1.12)
S3rg 49 (9.53)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition

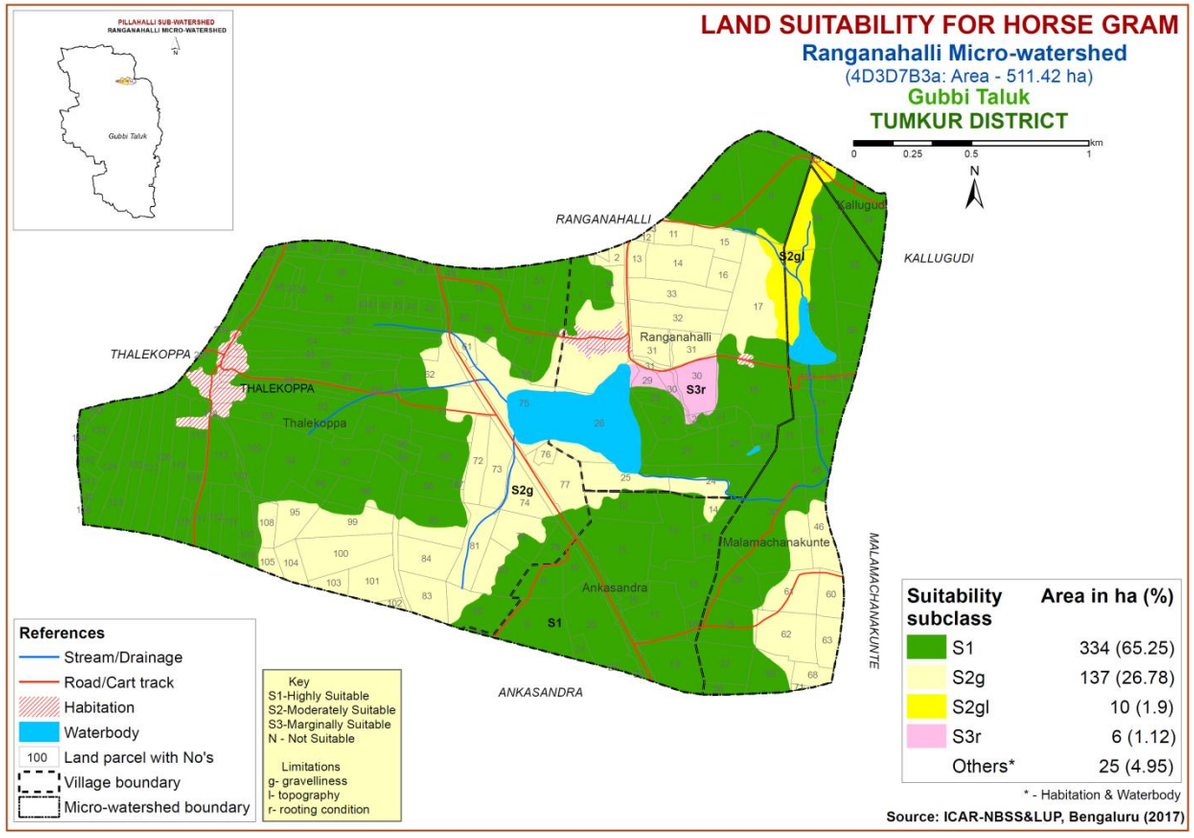

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR SORGHUM
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S2r
S2rg
S2rl
S3g
Nes
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2r 23 (6.52)
S2rg 4 (1.15)
S2rl 14 (3.98)
S3g 48 (13.51)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)
References
Stream/Drainage
Road/Cart track
Waterbody
50 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
l- topography
r- rooting condition
e- erosion
s- soil problem

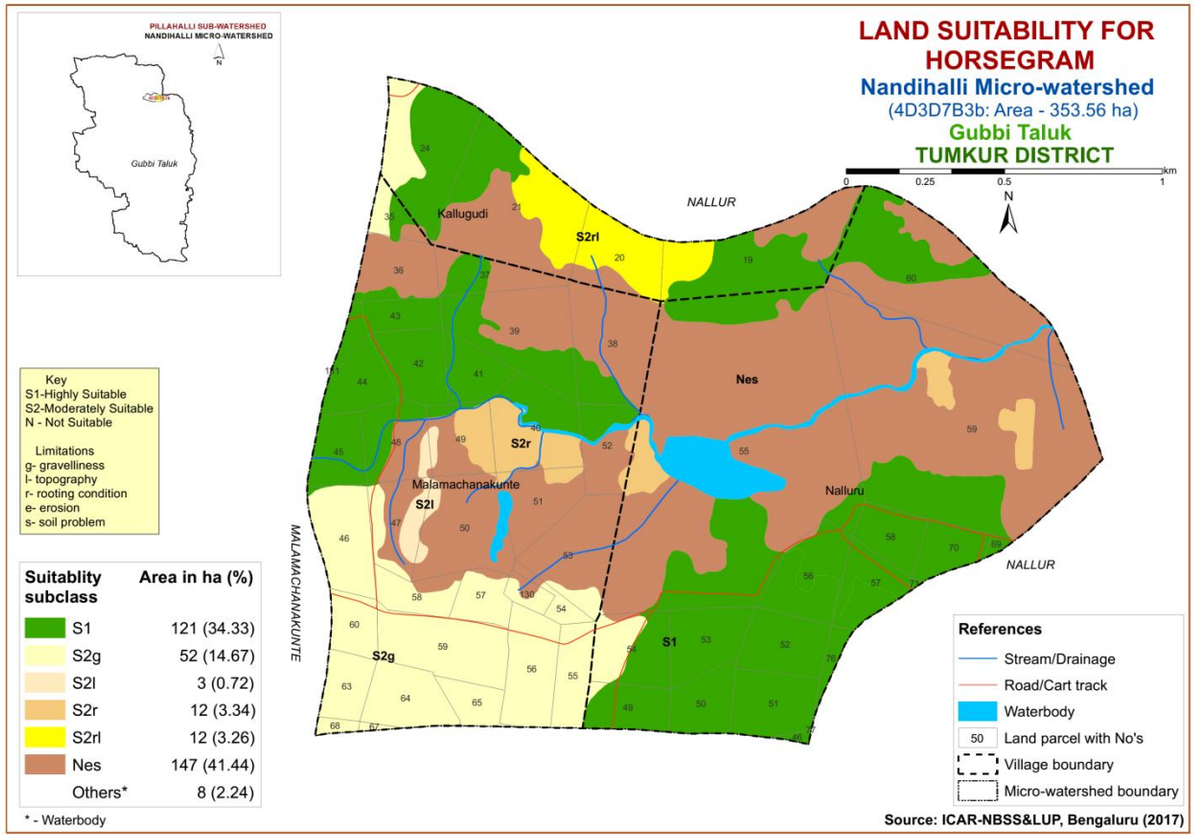

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR MAIZE
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
MALAMACHANAKUNTE
ANKASANDRA
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2gl
S2rg
S3g
S3r
S3rg
Suitability subclass
Area in ha (%)
S1 190 (37.1)
S2gl 10 (1.9)
S2rg 20 (3.89)
S2t 24 (24.26)
S3g 88 (17.24)
S3r 6 (1.12)
S3rg 49 (9.53)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
t- texture

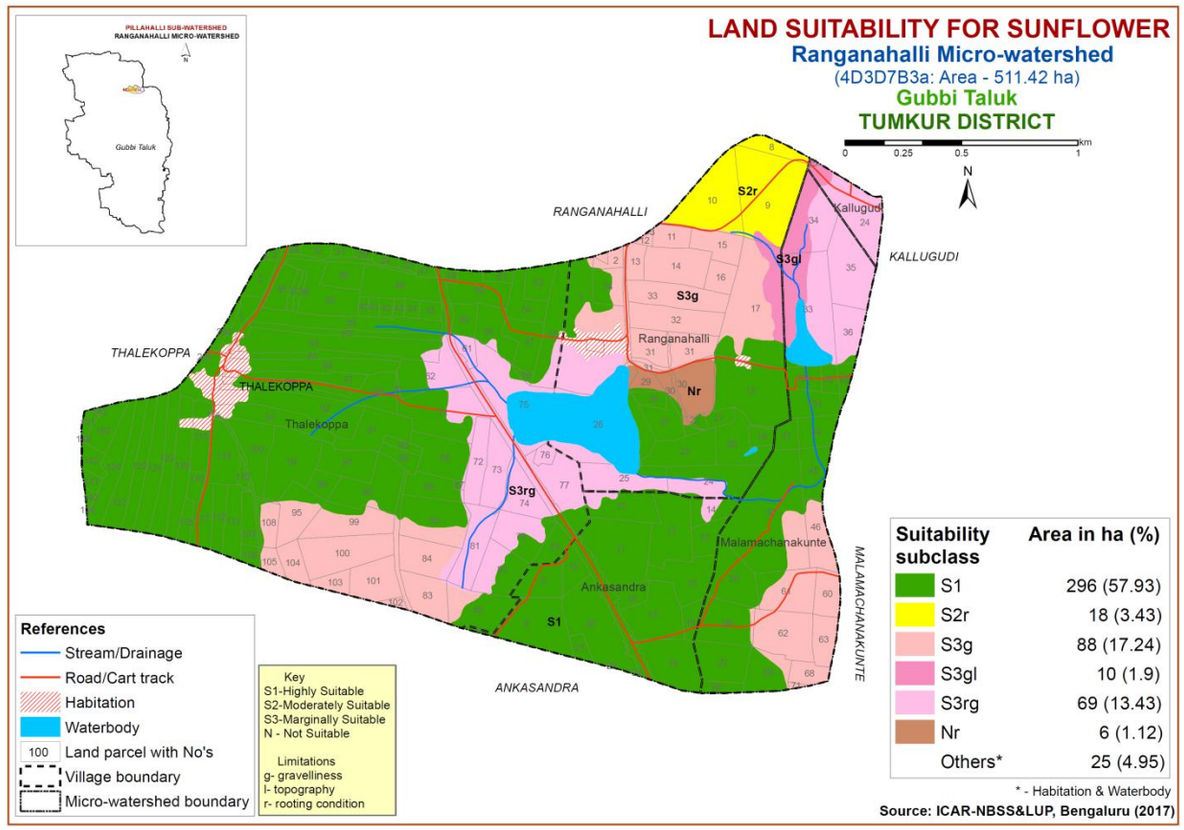

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR MAIZE
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S2r
S2rg
S2rl
S2t
S3g
Nes
Suitablity subclass
Area in ha (%)
S1 56 (15.87)
S2r 23 (6.52)
S2t 54 (15.29)
S2rg 4 (1.15)
S2rl 14 (3.98)
S3g 48 (13.51)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)
References
Stream/Drainage
Road/Cart track
Waterbody
50 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
l- topography
r- rooting condition
e- erosion
s- soil problem

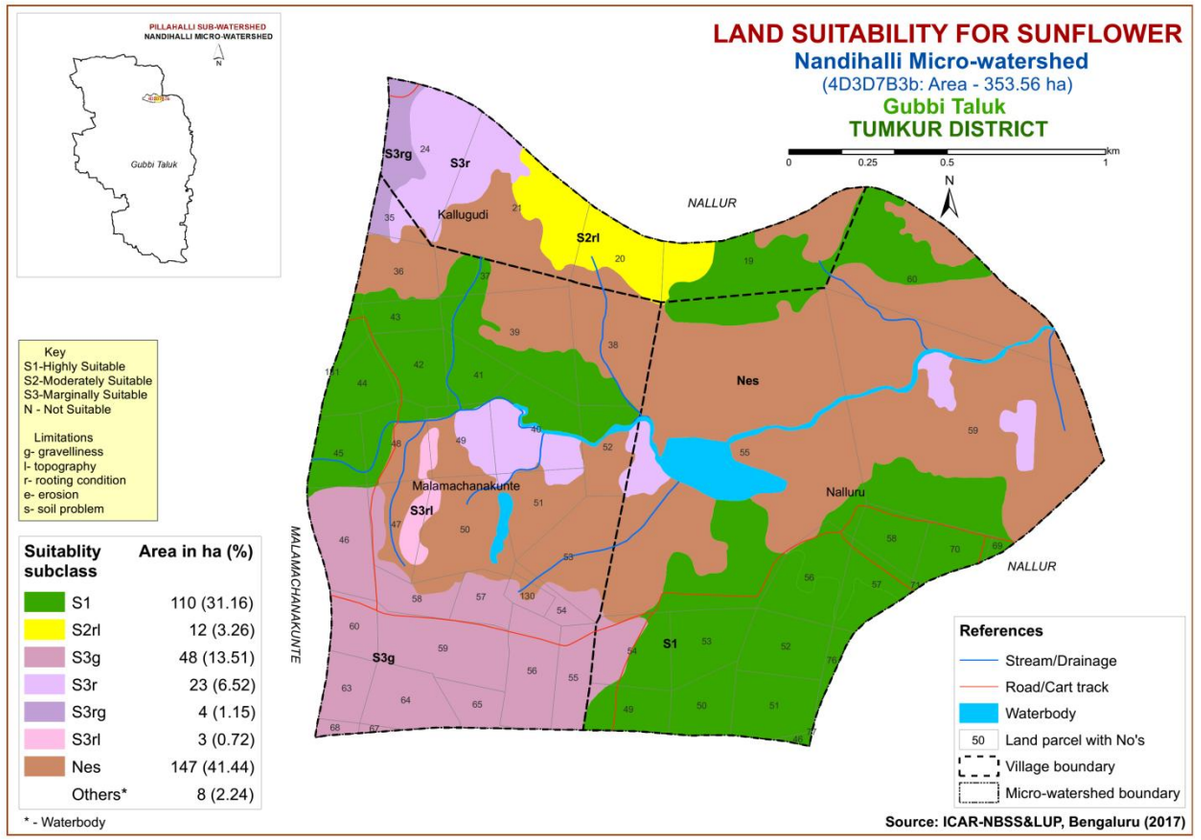

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR REDGRAM
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Ankasandra
Malamachanakunte
S1
S2gl
S2rg
S3g
S3r
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
Suitability subclass
Area in ha (%)
S1 314 (61.36)
S2gl 10 (1.9)
S2rg 20 (3.89)
S3g 137 (26.78)
S3r 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

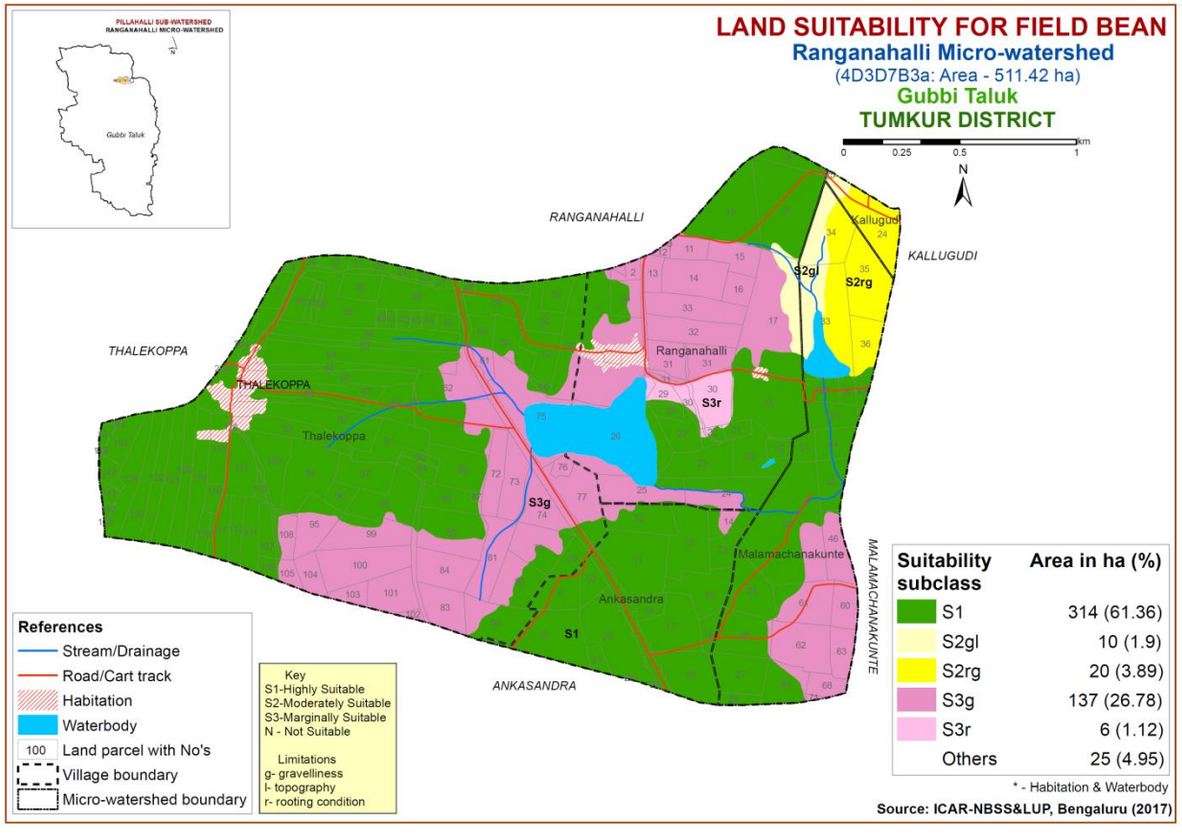

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR RED GRAM
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S2r
S2rg
S2rl
S3g
Nes
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2r 23 (6.52)
S2rg 4 (1.15)
S2rl 14 (3.98)
S3g 48 (13.51)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

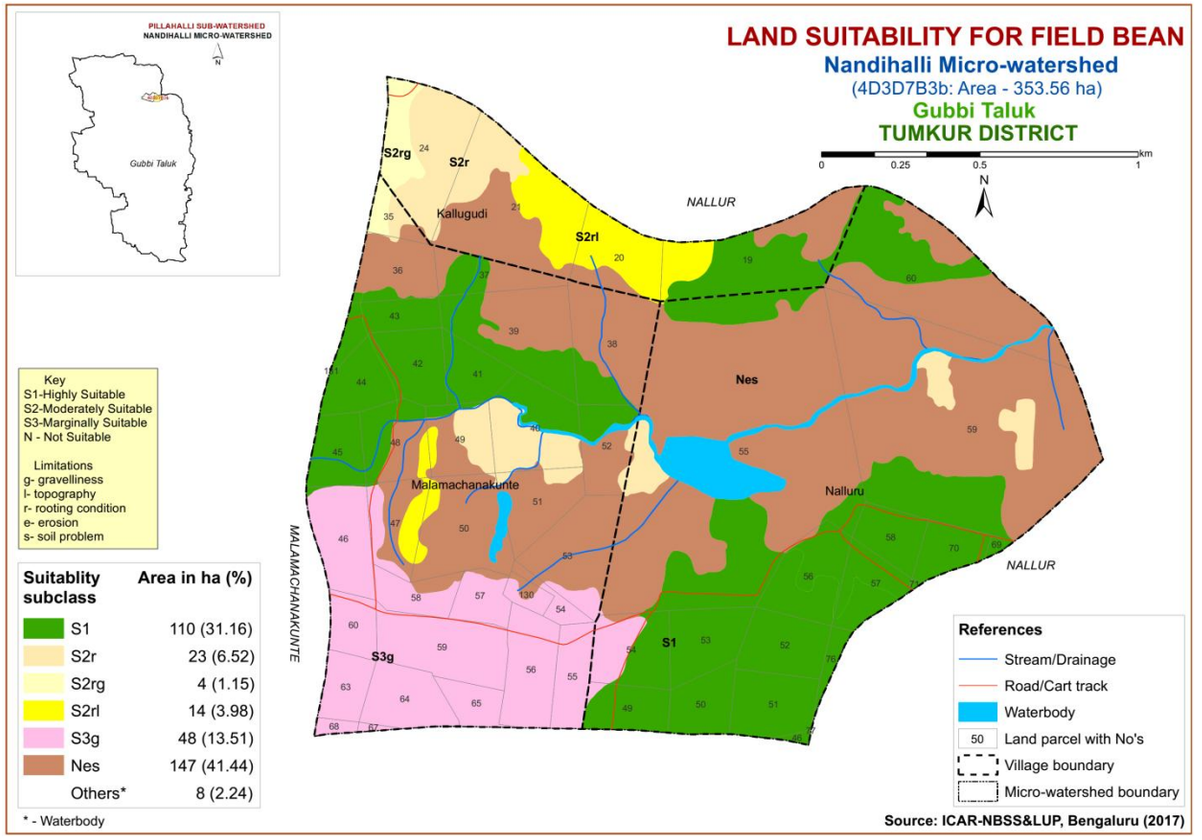

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR HORSE GRAM
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Ankasandra
Malamachanakunte
S1
S2g
S2gl
S3r
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
Suitability subclass
Area in ha (%)
S1 334 (65.25)
S2g 137 (26.78)
S2gl 10 (1.9)
S3r 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

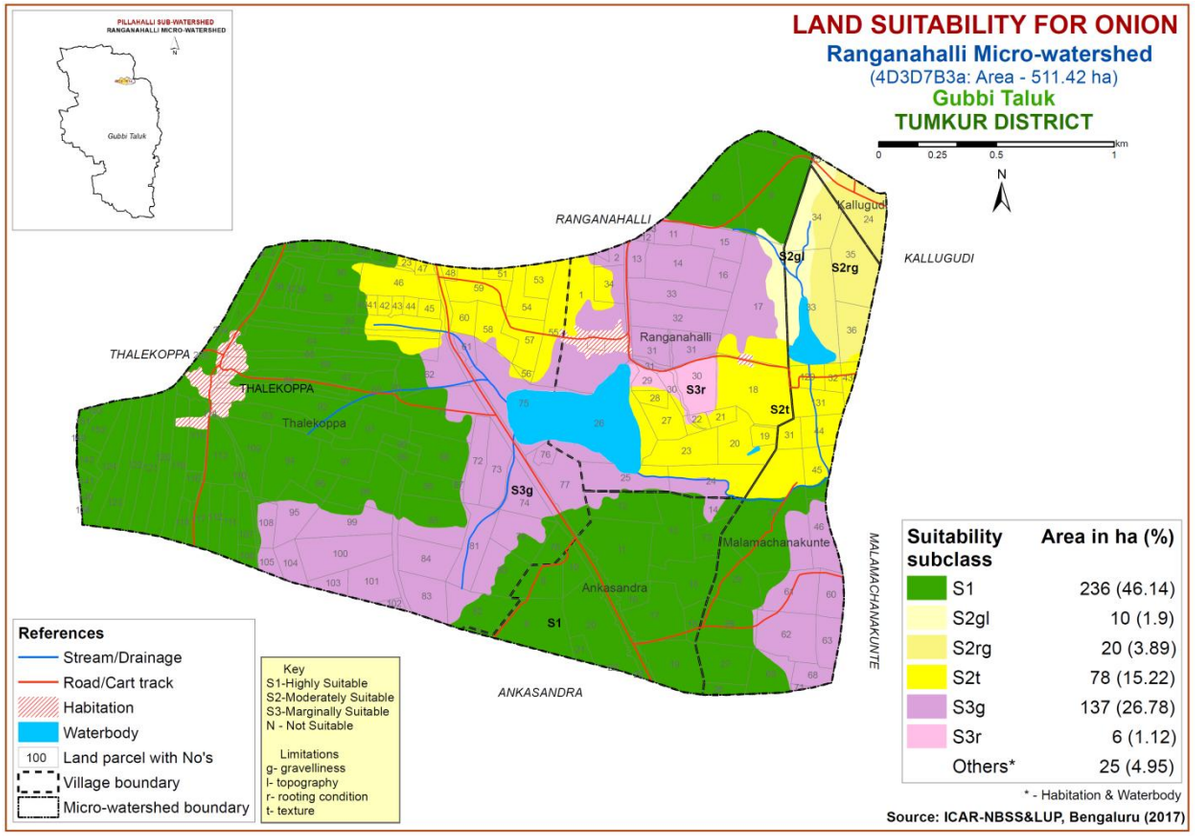

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR HORSEGRAM
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S2g
S2l
S2r
S2rl
Nes
Key
S1-Highly Suitable
S2-Moderately Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 121 (34.33)
S2g 52 (14.67)
S2l 3 (0.72)
S2r 12 (3.34)
S2rl 12 (3.26)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

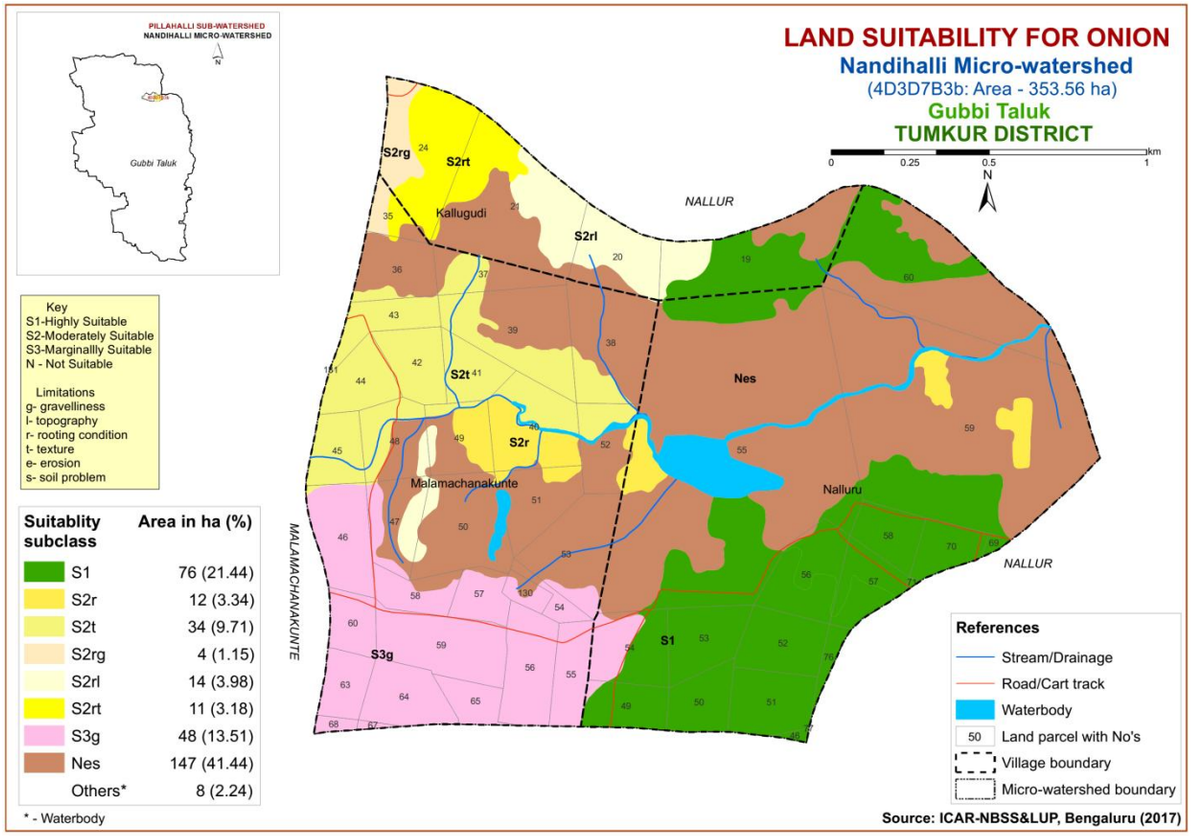

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR SUNFLOWER
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2r
S3g
S3gl
S3rg
Nr
Suitability subclass
Area in ha (%)
S1 296 (57.93)
S2r 18 (3.43)
S3g 88 (17.24)
S3gl 10 (1.9)
S3rg 69 (13.43)
Nr 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary

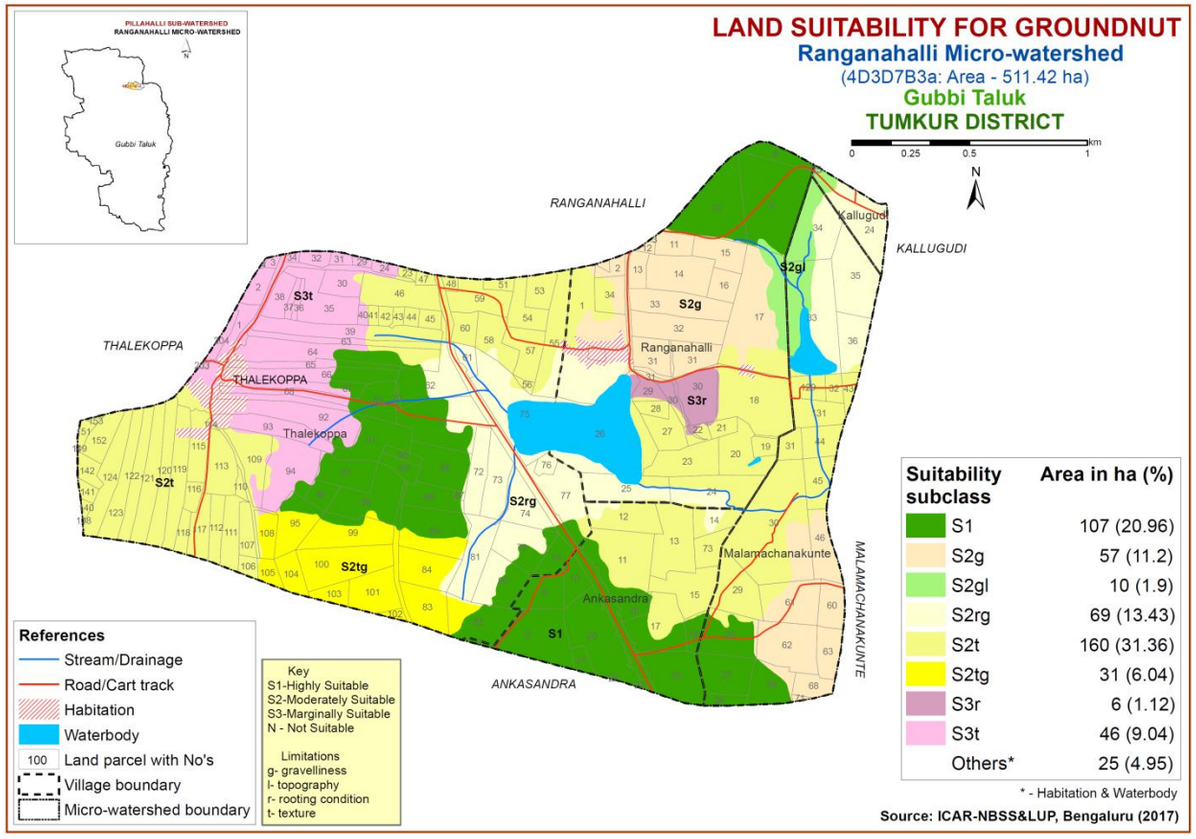

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR SUNFLOWER
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Nes
Nalluru
Malamachanakunte
S1
S2rl
S3g
S3r
S3rg
S3rl
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2rl 12 (3.26)
S3g 48 (13.51)
S3r 23 (6.52)
S3rg 4 (1.15)
S3rl 3 (0.72)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e- erosion
s- soil problem
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary

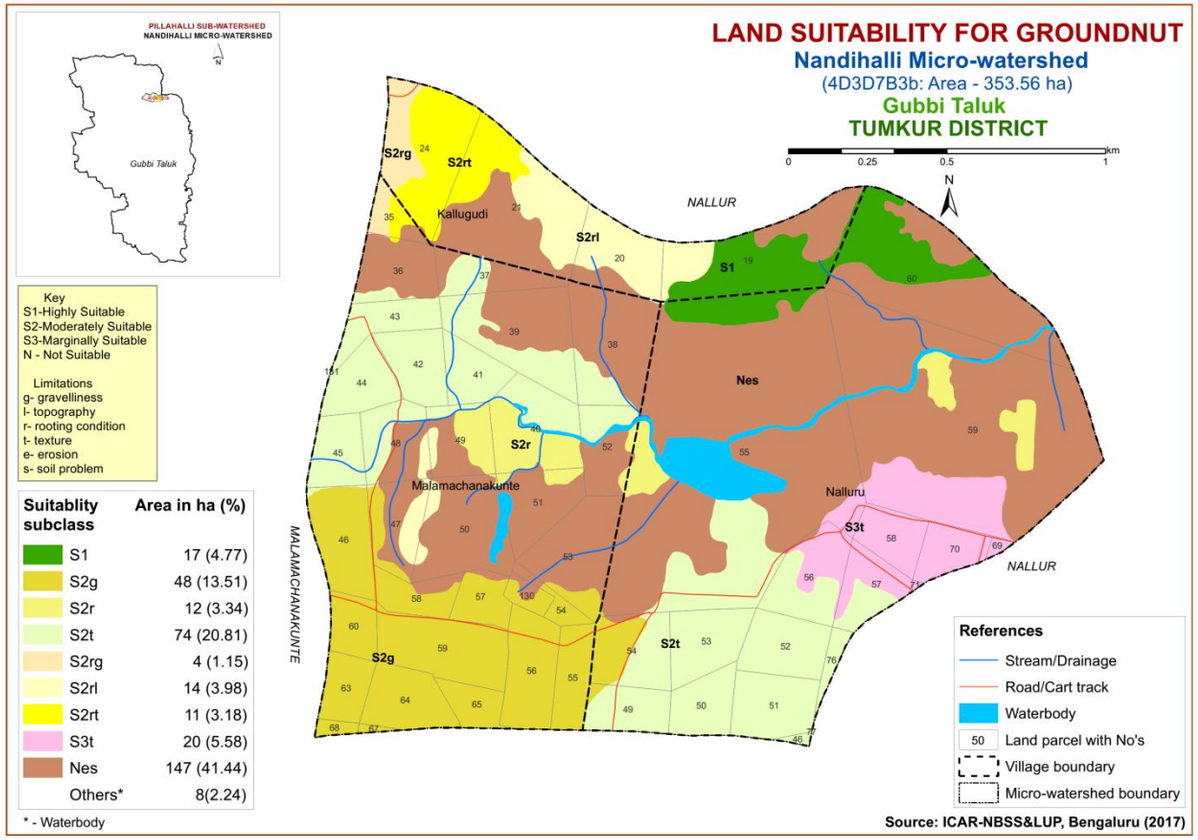

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR FIELD BEAN
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2gl
S2rg
S3r
S3g
Suitability subclass
Area in ha (%)
S1 314 (61.36)
S2gl 10 (1.9)
S2rg 20 (3.89)
S3g 137 (26.78)
S3r 6 (1.12)
Others 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary

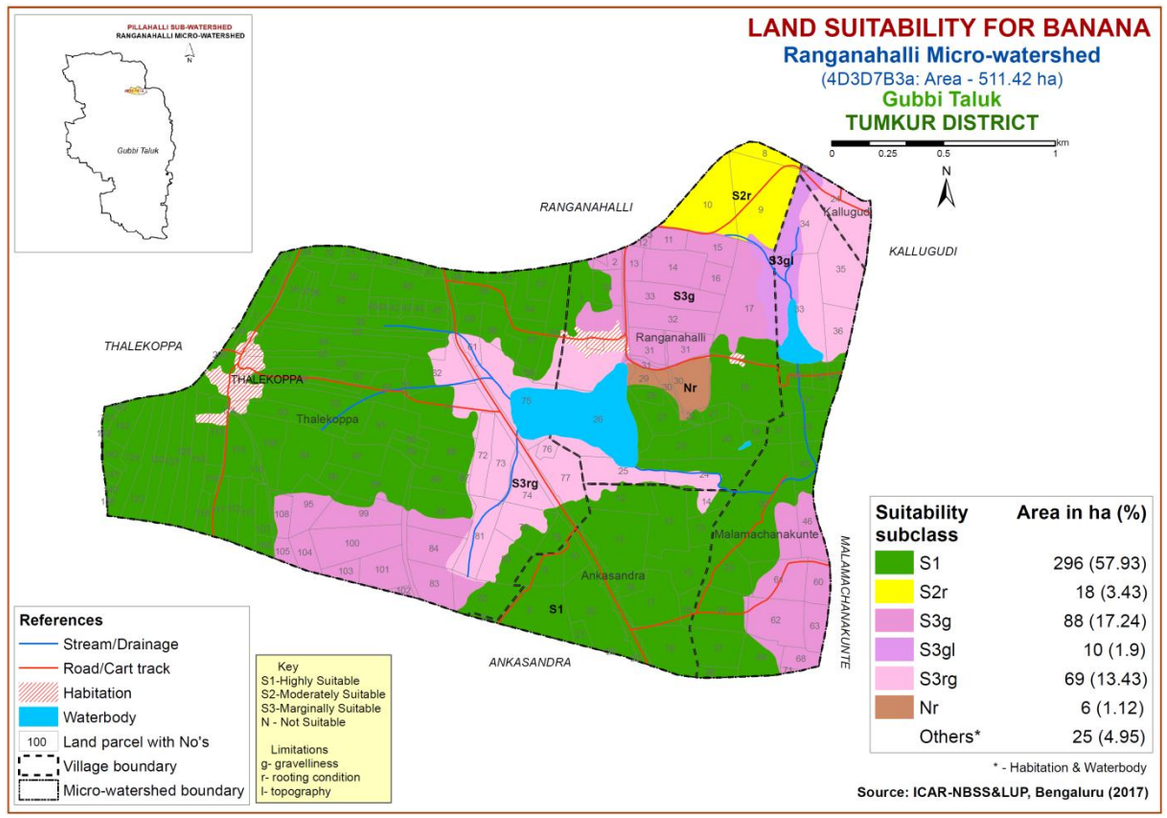

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR FIELD BEAN
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Nes
Nalluru
Malamachanakunte
S1
S2r
S2rg
S2rl
S3g
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2r 23 (6.52)
S2rg 4 (1.15)
S2rl 14 (3.98)
S3g 48 (13.51)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e- erosion
s- soil problem
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary

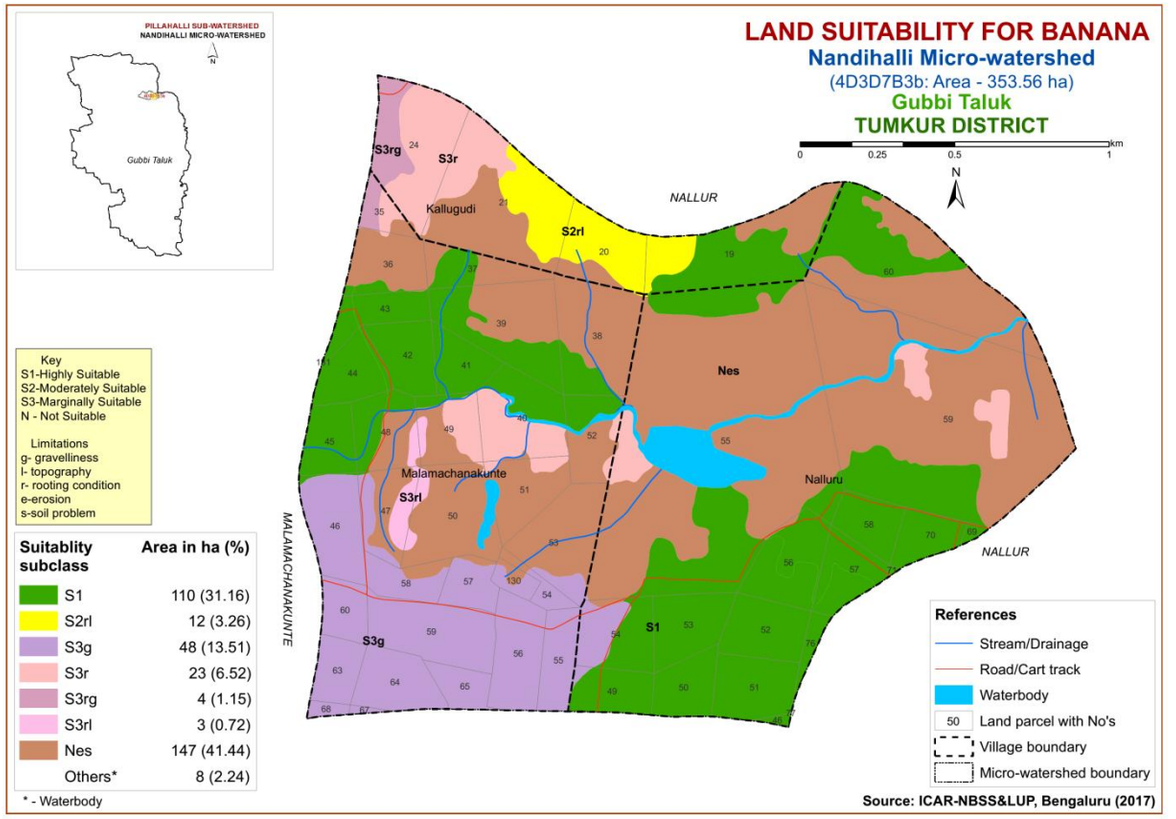

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR ONION
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Ankasandra
Malamachanakunte
S1
S2gl
S2rg
S2t
S3g
S3r
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
t- texture
Suitability subclass
Area in ha (%)
S1 236 (46.14)
S2gl 10 (1.9)
S2rg 20 (3.89)
S2t 78 (15.22)
S3g 137 (26.78)
S3r 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

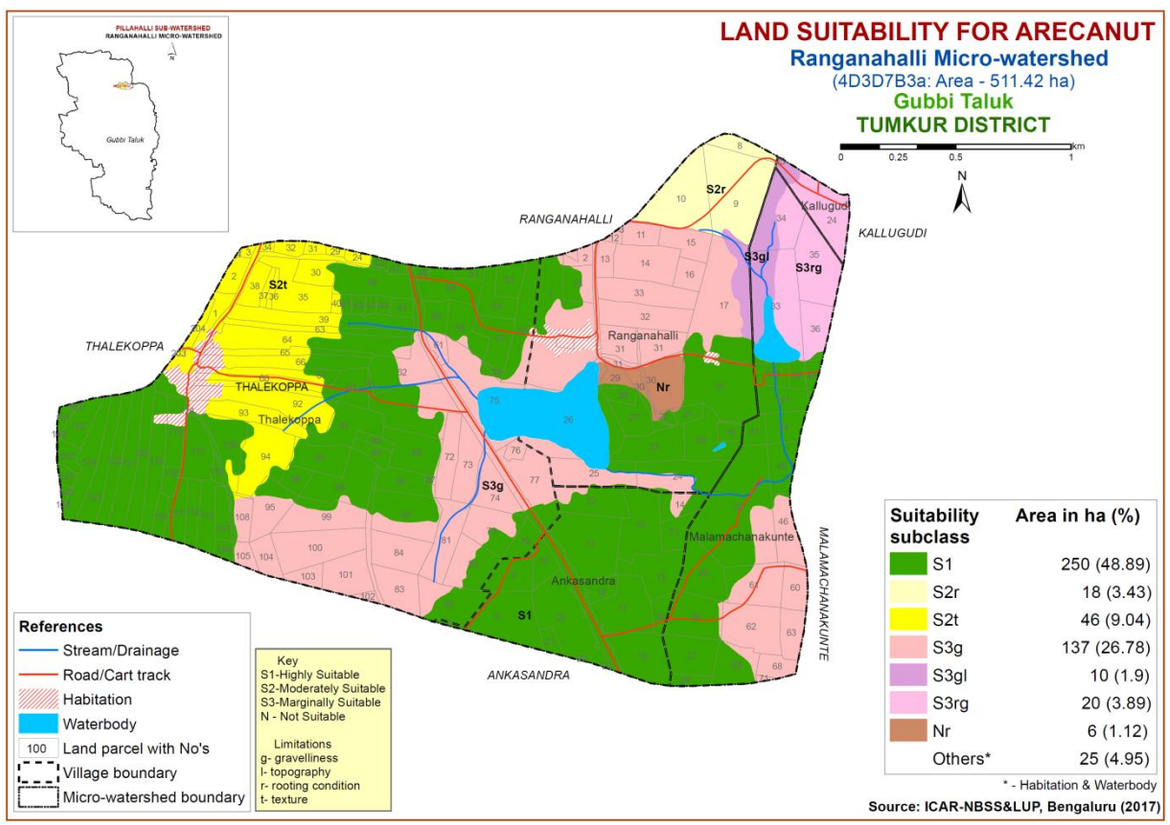

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR ONION
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
KALLUGUDI
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S2rg
S2rt
S2rl
S2t
S2r
S3g
Nes
References
Stream/Drainage
Road/Cart track
Waterbody
50 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
l- topography
r- rooting condition
t- texture
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 76 (21.44)
S2r 12 (3.34)
S2t 34 (9.71)
S2rg 4 (1.15)
S2rl 14 (3.98)
S2rt 11 (3.18)
S3g 48 (13.51)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

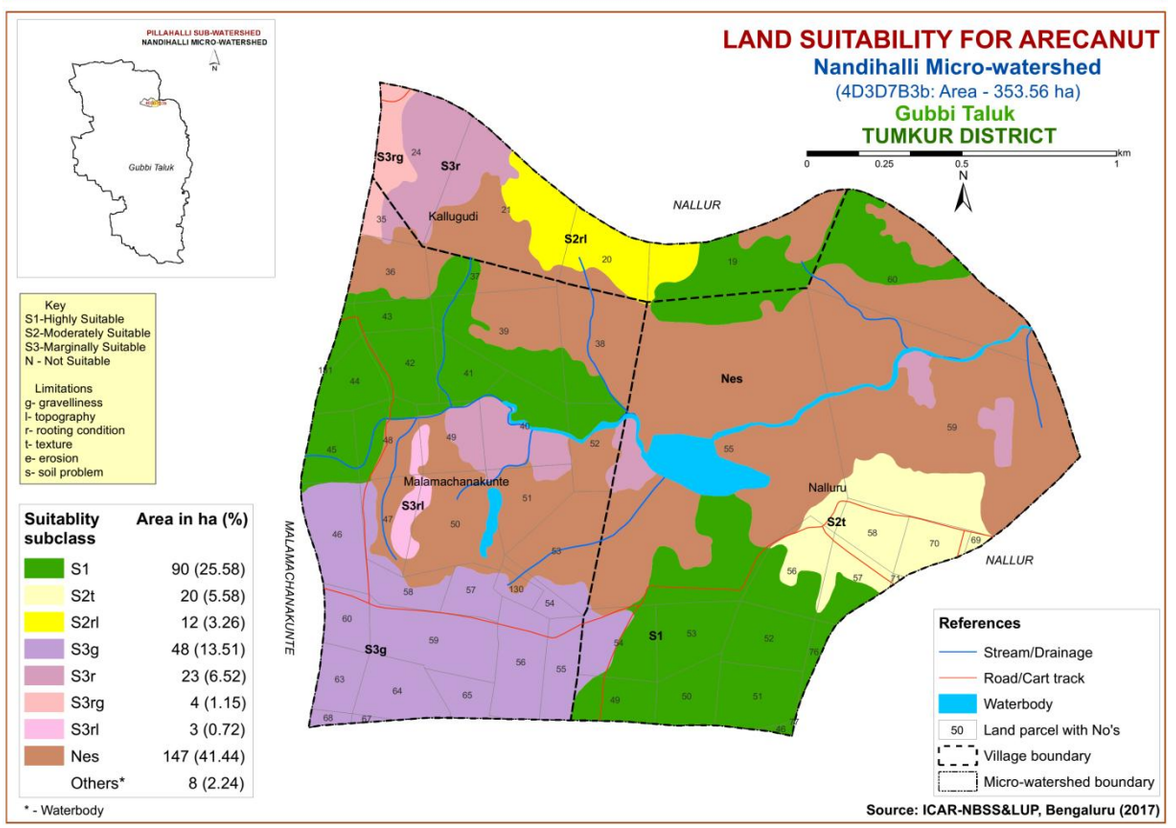

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR GROUNDNUT
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Ankasandra
Malamachanakunte
S1
S2g
S2gl
S2rg
S2t
S2tg
S3g
S3r
S3t
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
t- texture
Suitability subclass
Area in ha (%)
S1 107 (20.96)
S2g 57 (11.2)
S2gl 10 (1.9)
S2rg 69 (13.43)
S2t 160 (31.36)
S2tg 31 (6.04)
S3r 6 (1.12)
S3t 46 (9.04)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

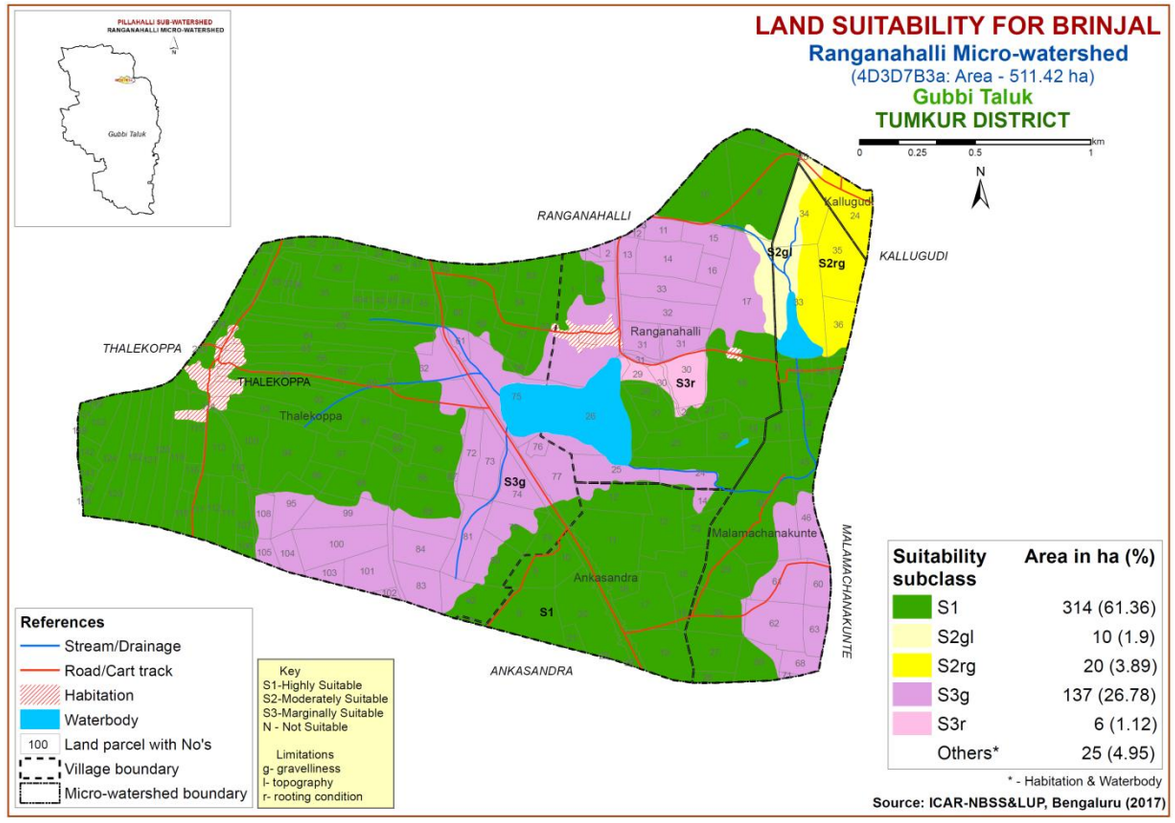

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR GROUNDNUT
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
KALLUGUDI
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S2g
S2r
S2rg
S2rt
S2rl
S2t
S3t
Nes
References
Stream/Drainage
Road/Cart track
Waterbody
50 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
l- topography
r- rooting condition
t- texture
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 17 (4.77)
S2g 48 (13.51)
S2r 12 (3.34)
S2t 74 (20.81)
S2rg 4 (1.15)
S2rl 14 (3.98)
S2rt 11 (3.18)
S3t 20 (5.58)
Nes 147 (41.44)
Others* 8(2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

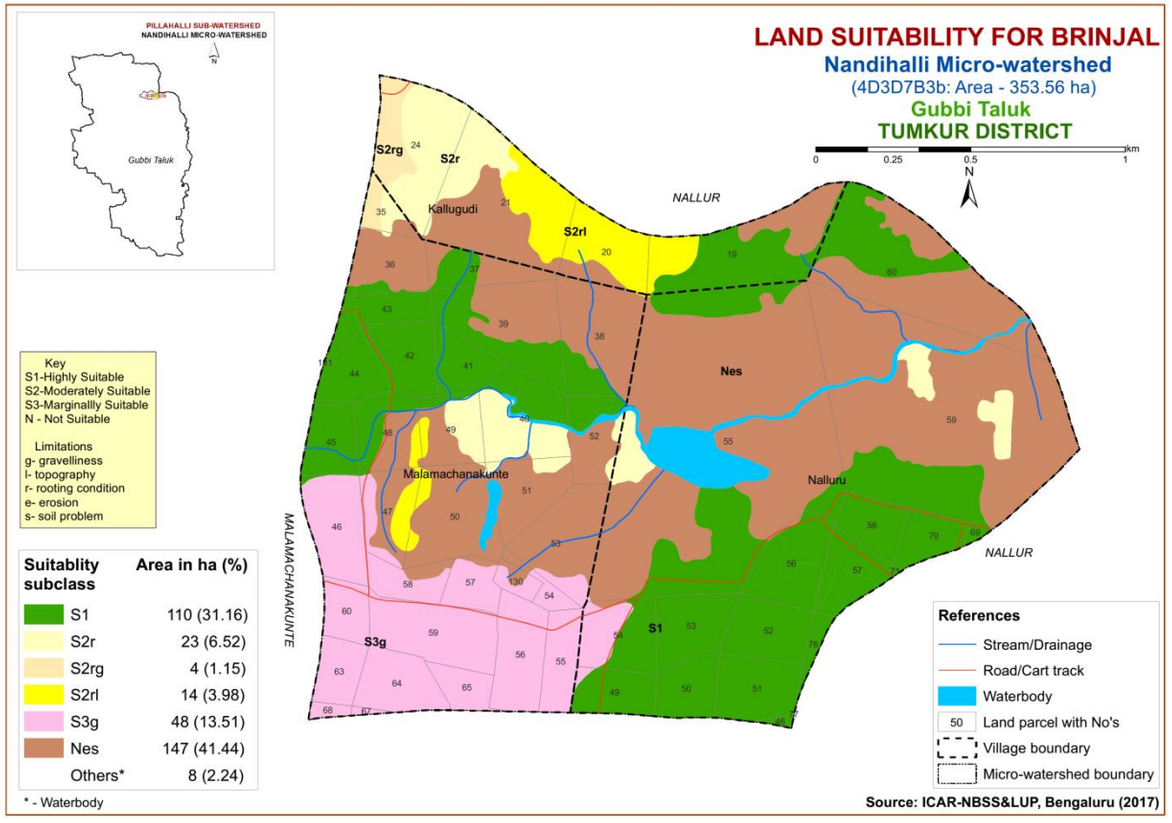

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR BANANA
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
S1
S2r
S3g
S3gl
S3rg
Nr
Ranganahalli
Kallugudi
Thalekoppa
Ankasandra
Malamachanakunte
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
r- rooting condition
l- topography
Suitability subclass
Area in ha (%)
S1 296 (57.93)
S2r 18 (3.43)
S3g 88 (17.24)
S3gl 10 (1.9)
S3rg 69 (13.43)
Nr 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

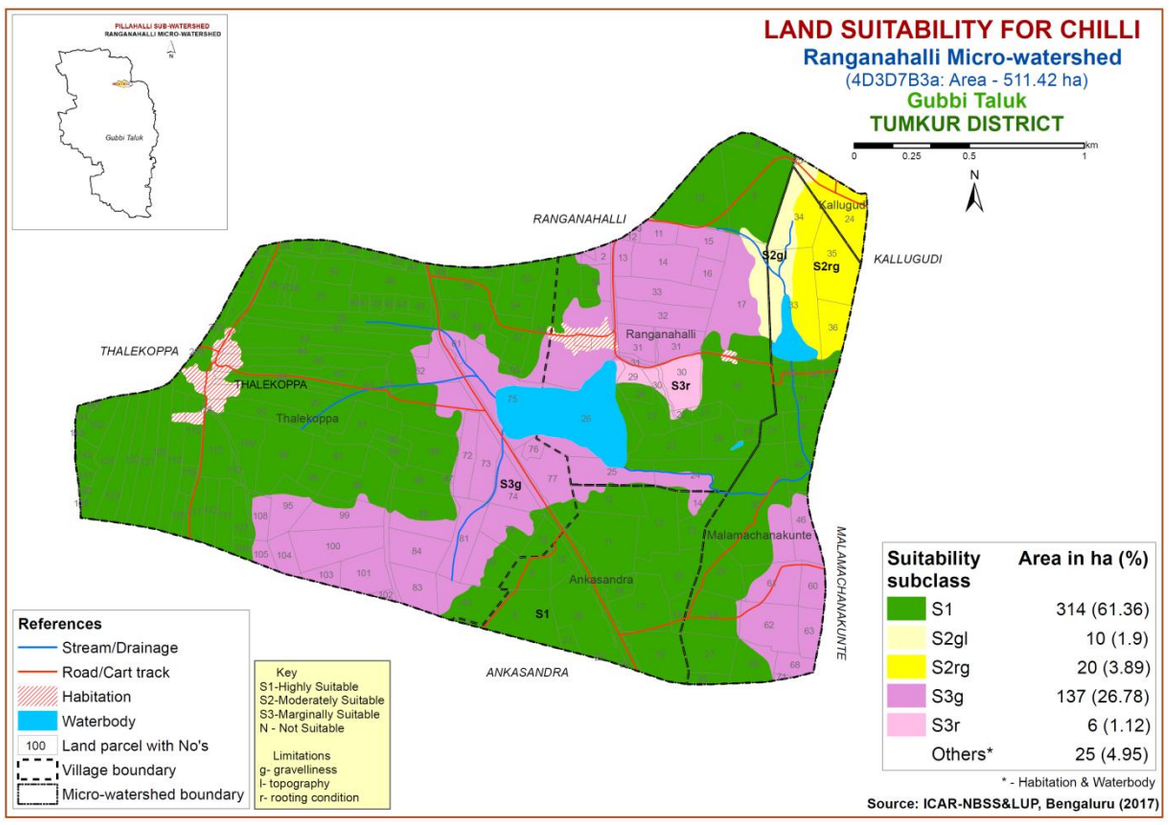

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR BANANA
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
S3rg
S3r
S2rl
S3rl
S3g
S1
Nes
Kallugudi
Malamachanakunte
Nalluru
References
Stream/Drainage
Road/Cart track
Waterbody
50 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
l- topography
r- rooting condition
e-erosion
s-soil problem
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2rl 12 (3.26)
S3g 48 (13.51)
S3r 23 (6.52)
S3rg 4 (1.15)
S3rl 3 (0.72)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

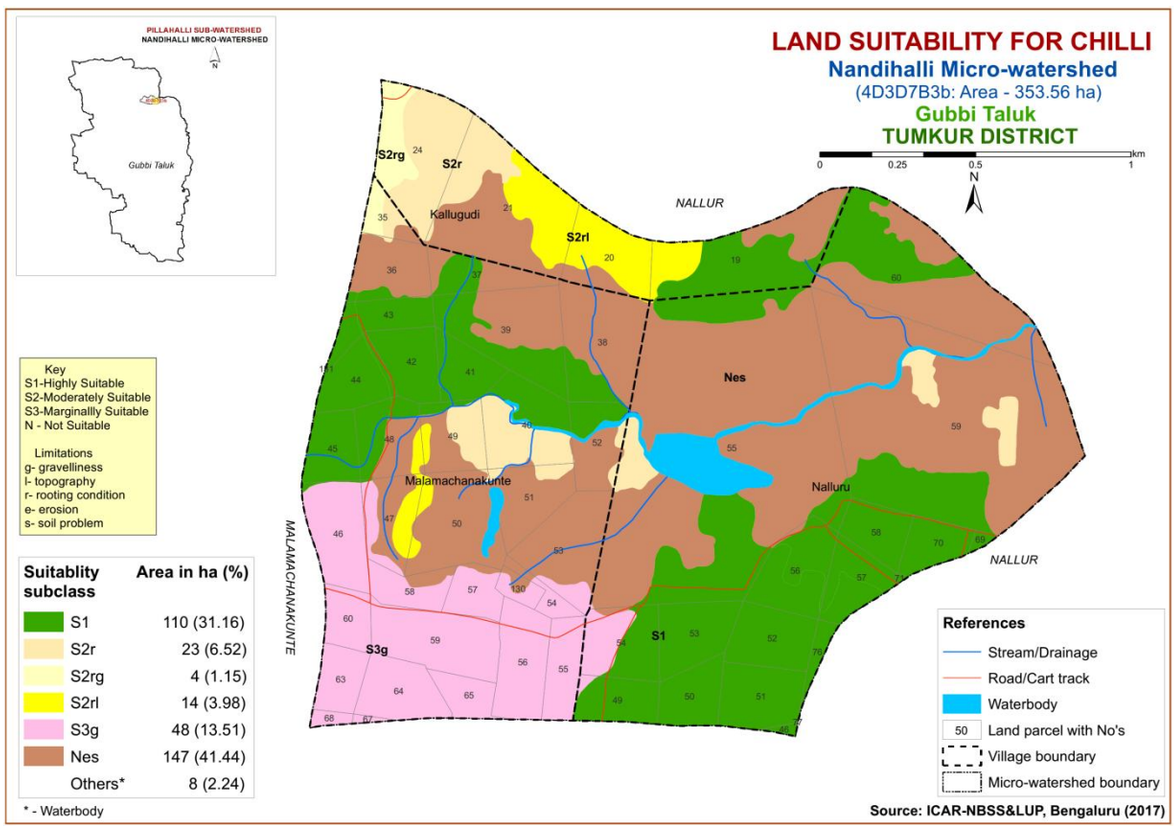

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR ARECANUT
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
S1
S2r
S2t
S3g
S3gl
S3rg
Nr
Ranganahalli
Kallugudi
Thalekoppa
Ankasandra
Malamachanakunte
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
t- texture
Suitability subclass
Area in ha (%)
S1 250 (48.89)
S2r 18 (3.43)
S2t 46 (9.04)
S3g 137 (26.78)
S3gl 10 (1.9)
S3rg 20 (3.89)
Nr 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

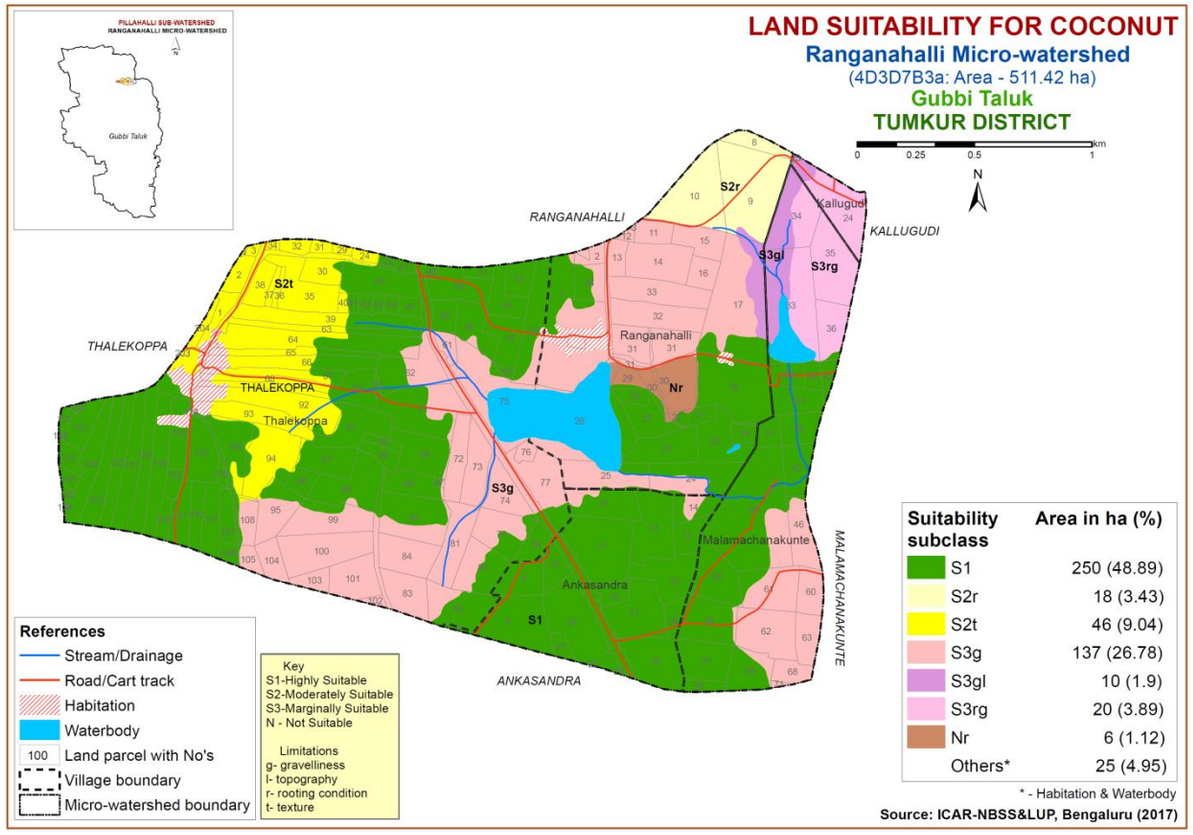

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR ARECANUT
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
S3rg
S3r
S2rl
S3rl
S3g
S1
Nes
S2t
Kallugudi
Malamachanakunte
Nalluru
References
Stream/Drainage
Road/Cart track
Waterbody
50 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
l- topography
r- rooting condition
t- texture
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 90 (25.58)
S2t 20 (5.58)
S2rl 12 (3.26)
S3g 48 (13.51)
S3r 23 (6.52)
S3rg 4 (1.15)
S3rl 3 (0.72)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

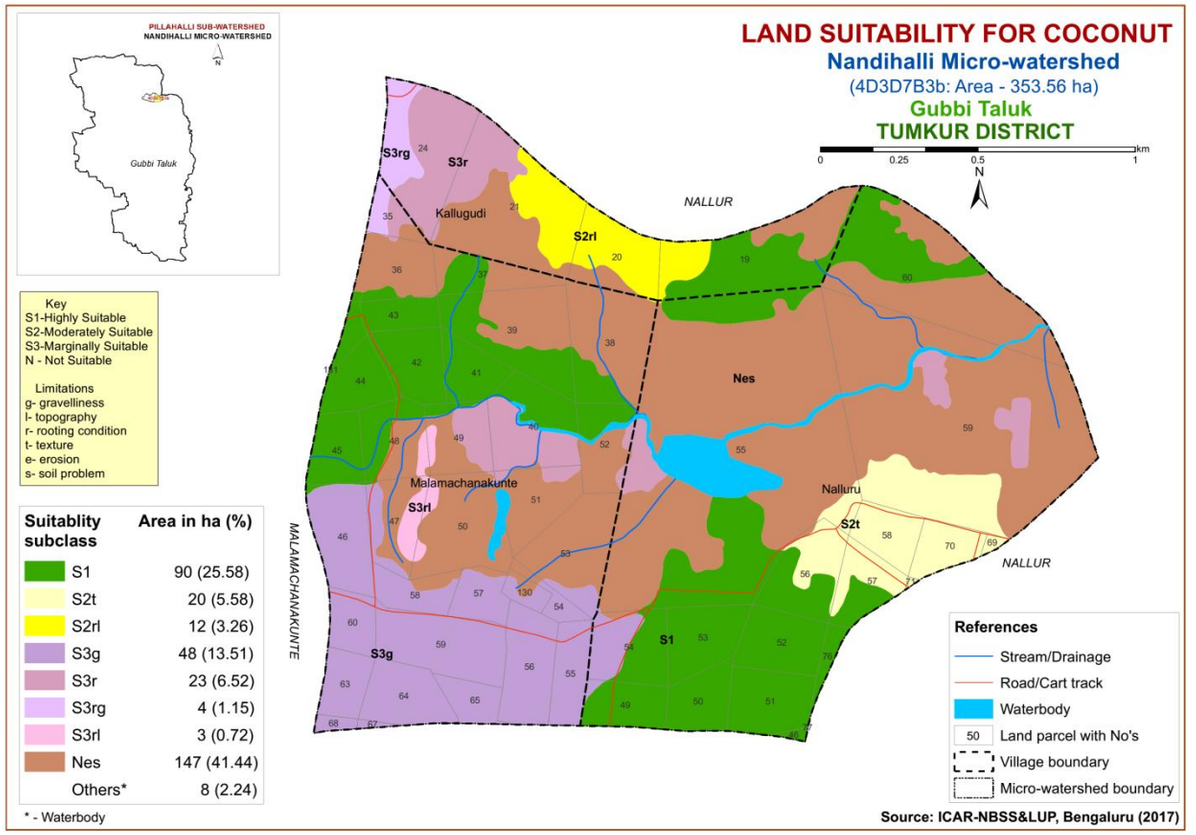

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR BRINJAL
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Ankasandra
Malamachanakunte
S1
S2gl
S2rg
S3g
S3r
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
Suitability subclass
Area in ha (%)
S1 314 (61.36)
S2gl 10 (1.9)
S2rg 20 (3.89)
S3g 137 (26.78)
S3r 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

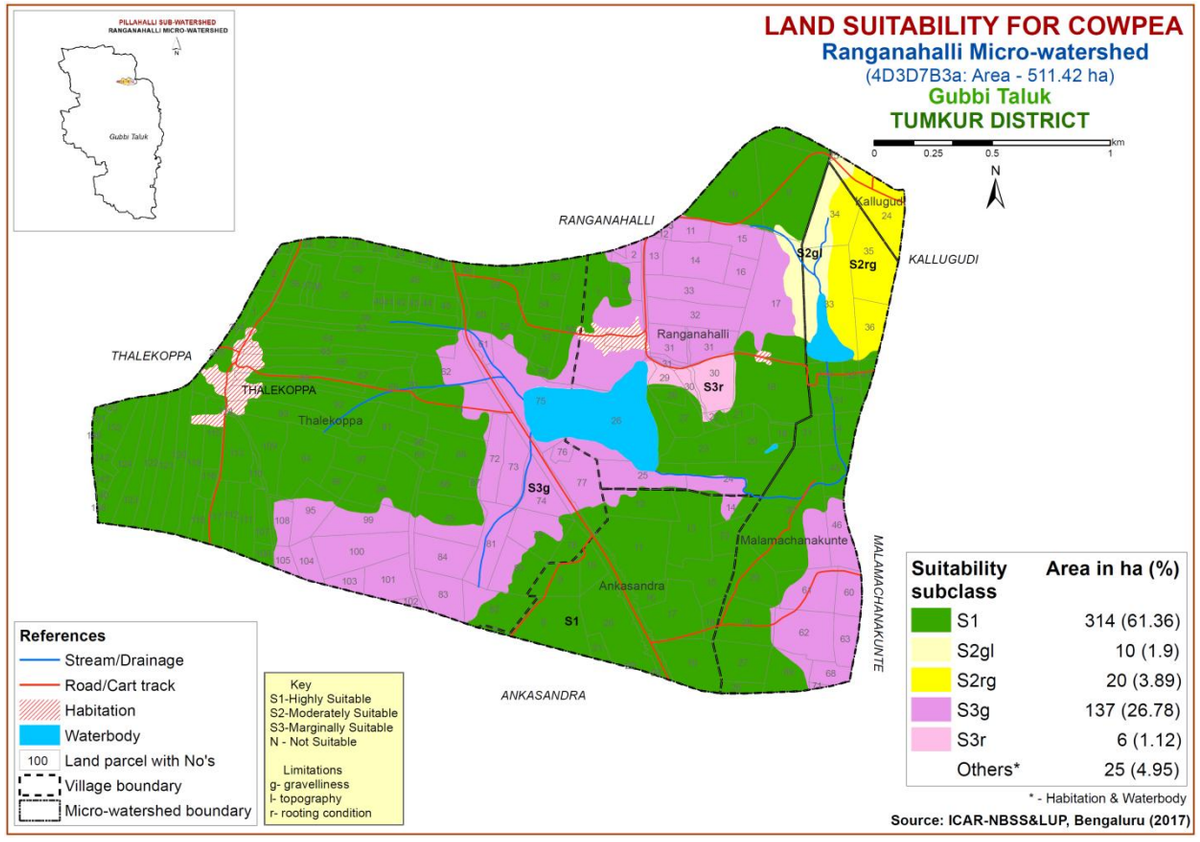

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR BRINJAL
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
Nes
S1
S2r
S2rg
S2rl
S3g
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginallly Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2r 23 (6.52)
S2rg 4 (1.15)
S2rl 14 (3.98)
S3g 48 (13.51)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

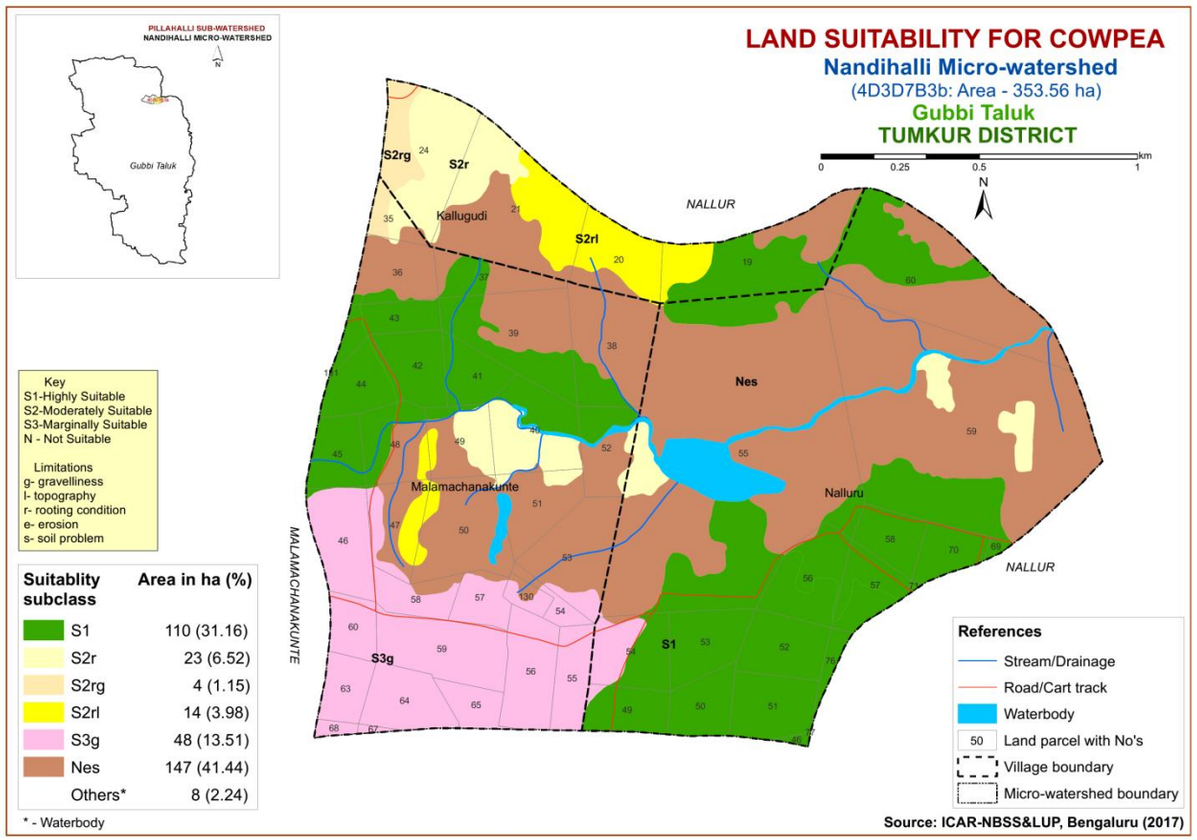

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR CHILLI
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Ankasandra
Malamachanakunte
S1
S2gl
S2rg
S3g
S3r
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
Suitability subclass
Area in ha (%)
S1 314 (61.36)
S2gl 10 (1.9)
S2rg 20 (3.89)
S3g 137 (26.78)
S3r 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

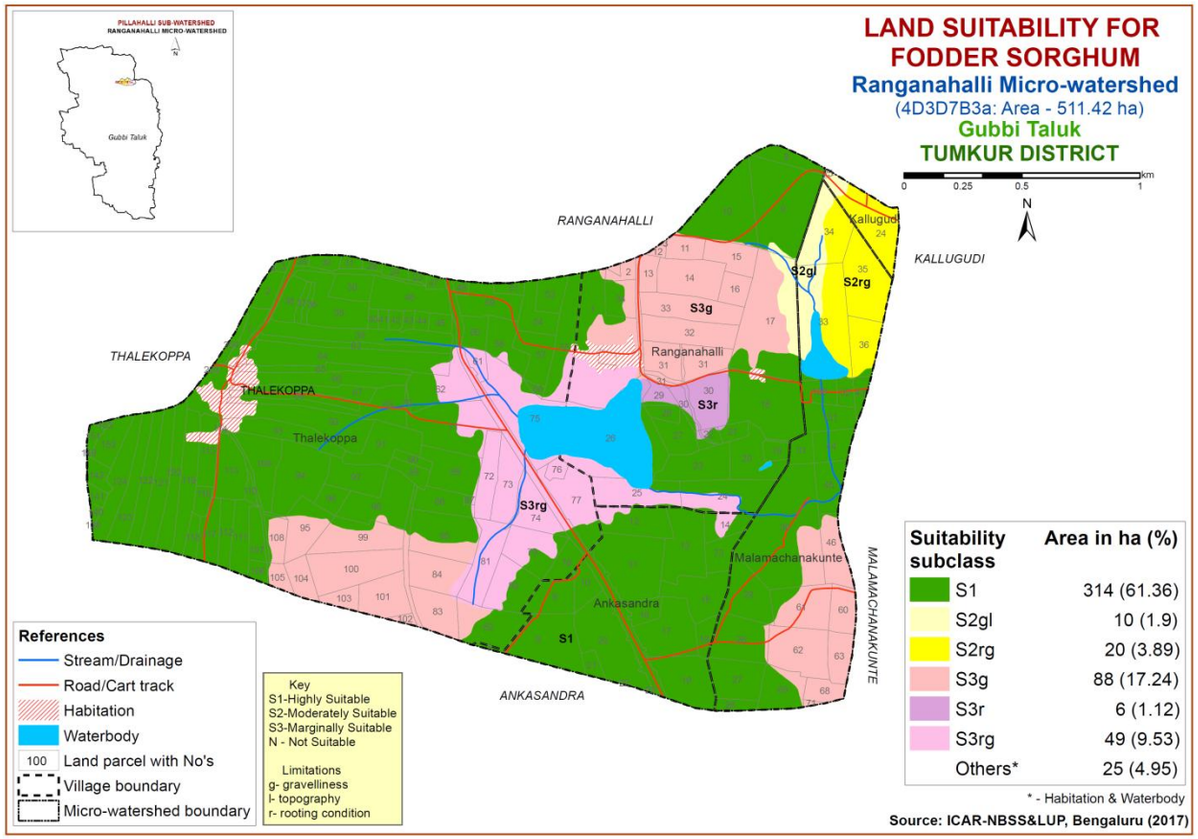

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR CHILLI
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
Nes
S1
S2r
S2rg
S2rl
S3g
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginallly Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2r 23 (6.52)
S2rg 4 (1.15)
S2rl 14 (3.98)
S3g 48 (13.51)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

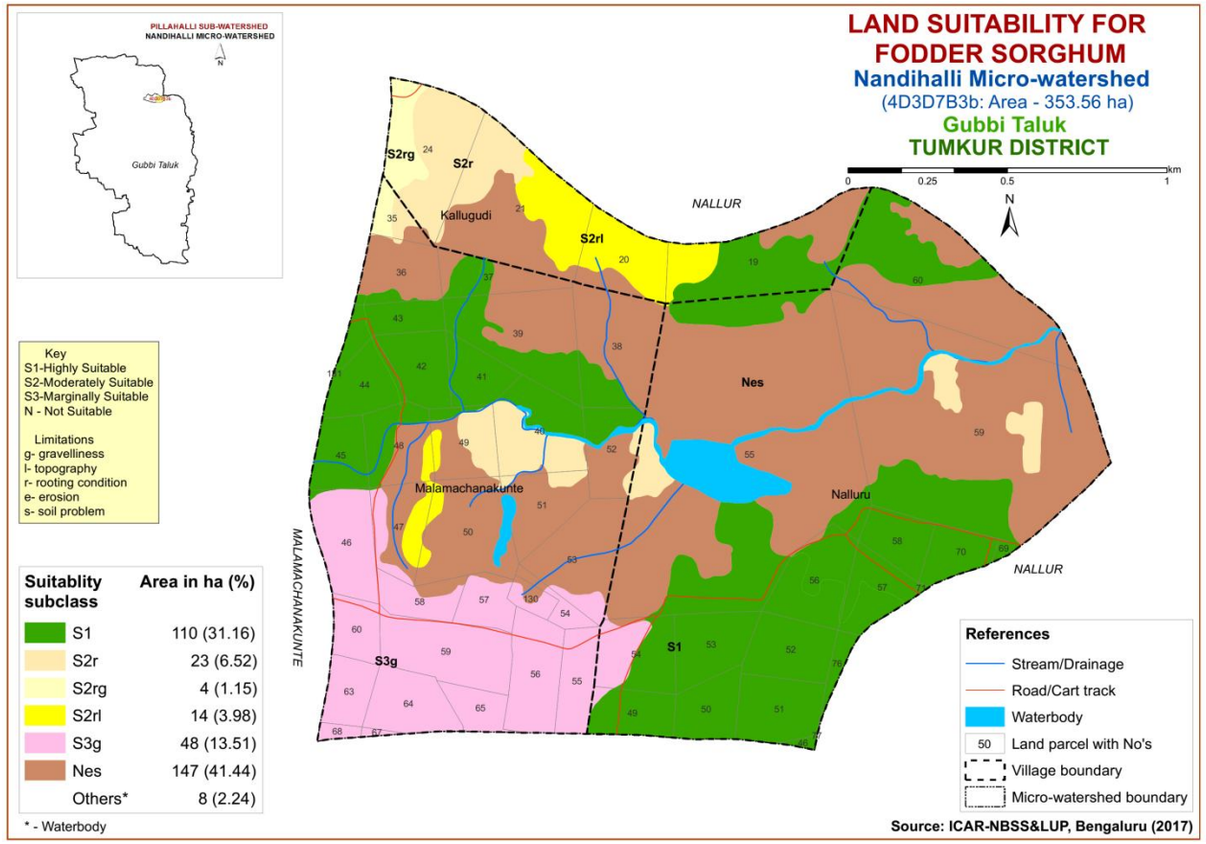

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR COCONUT
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Ranganahalli
Kallugudi
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2r
S2t
S3g
S3gl
S3rg
Nr
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
t- texture
Suitability subclass
Area in ha (%)
S1 250 (48.89)
S2r 18 (3.43)
S2t 46 (9.04)
S3g 137 (26.78)
S3gl 10 (1.9)
S3rg 20 (3.89)
Nr 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

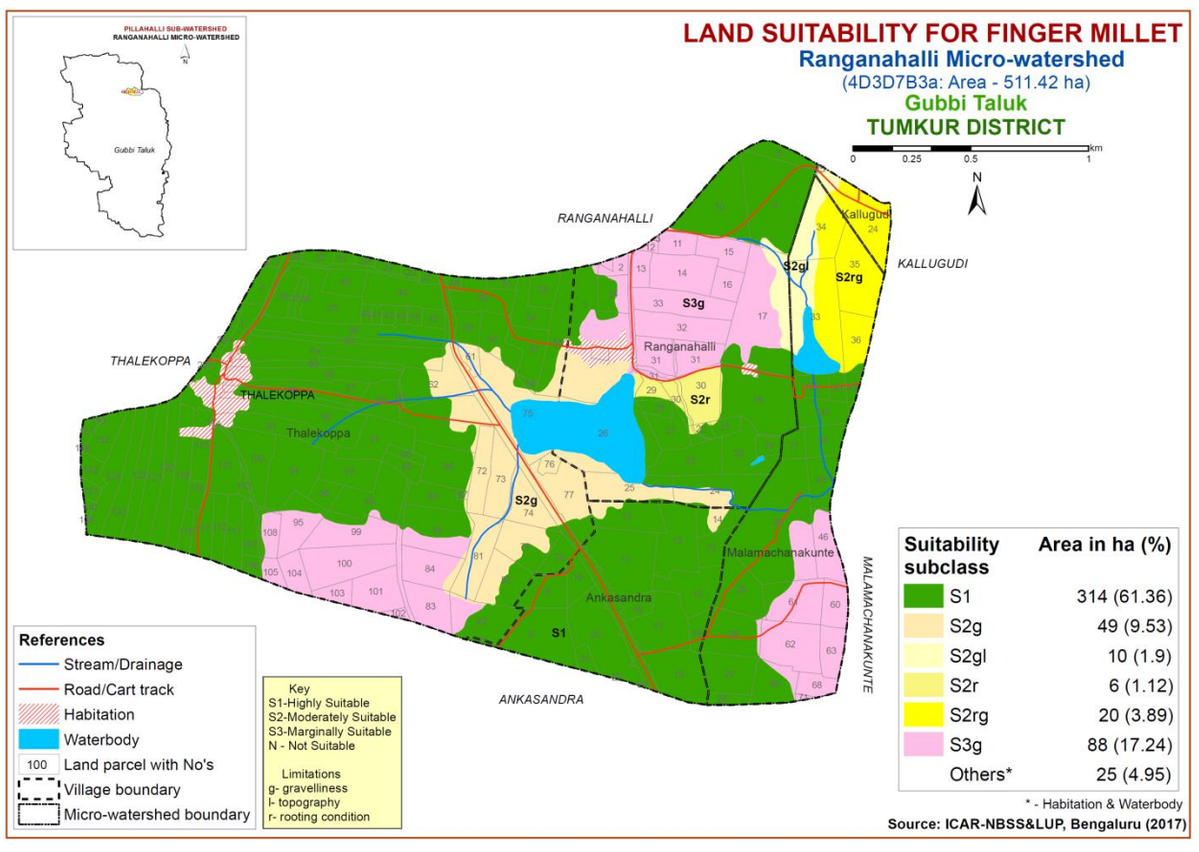

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR COCONUT
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S2rl
S3g
S3r
S3rg
S3rl
S2t
Nes
References
Stream/Drainage
Road/Cart track
Waterbody
50 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
l- topography
r- rooting condition
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 90 (25.58)
S2t 20 (5.58)
S2rl 12 (3.26)
S3g 48 (13.51)
S3r 23 (6.52)
S3rg 4 (1.15)
S3rl 3 (0.72)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

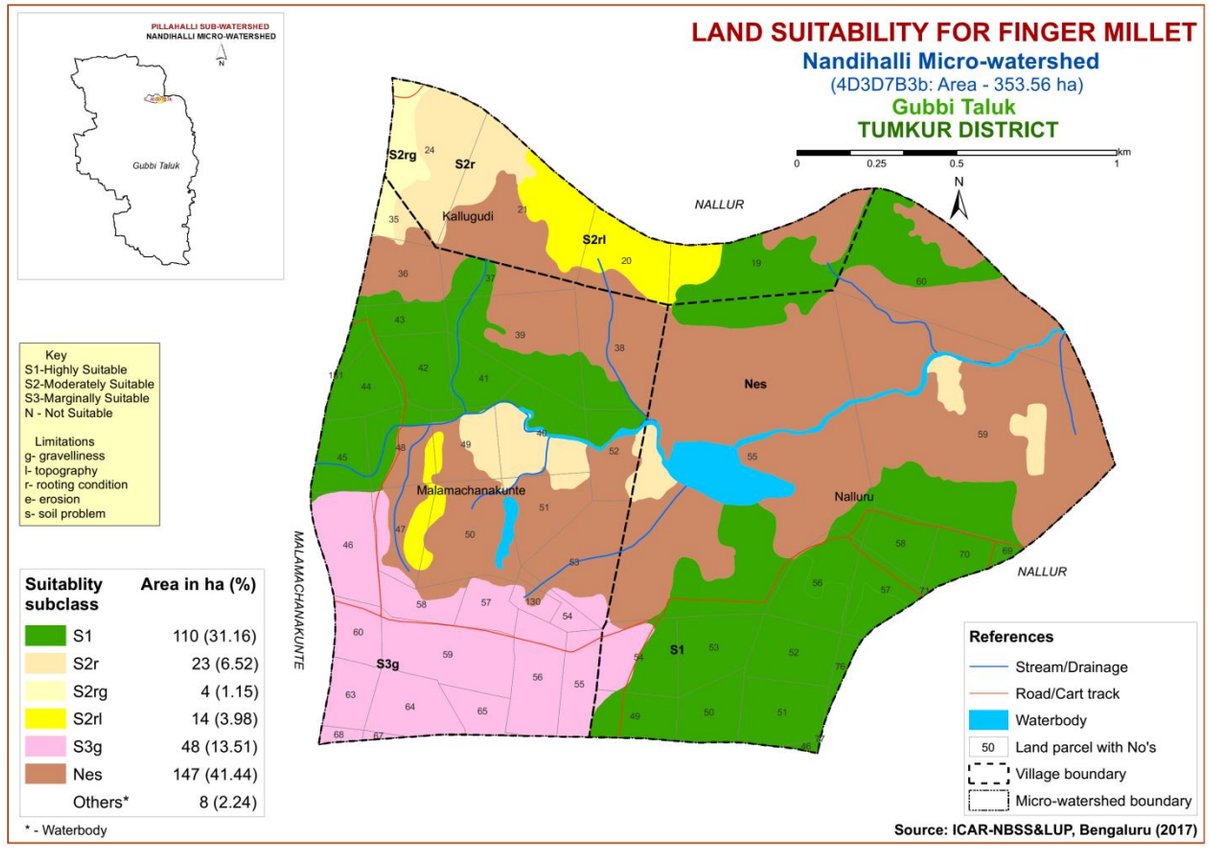

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR COWPEA
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Ranganahalli
Kallugudi
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2gl
S2rg
S3g
S3r
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
Suitability subclass
Area in ha (%)
S1 314 (61.36)
S2gl 10 (1.9)
S2rg 20 (3.89)
S3g 137 (26.78)
S3r 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

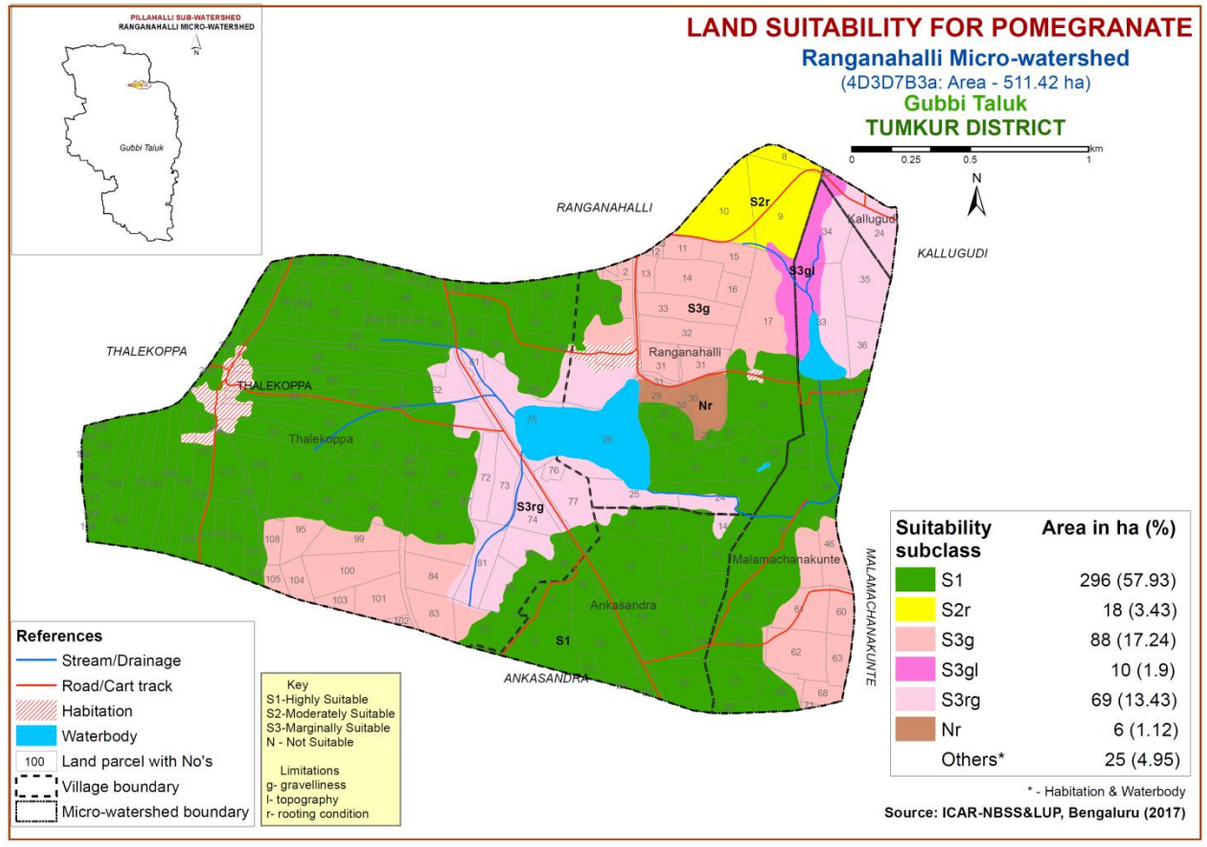

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR COWPEA
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S2r
S2rg
S2rl
S3g
Nes
References
Stream/Drainage
Road/Cart track
Waterbody
50 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
l- topography
r- rooting condition
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2r 23 (6.52)
S2rg 4 (1.15)
S2rl 14 (3.98)
S3g 48 (13.51)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

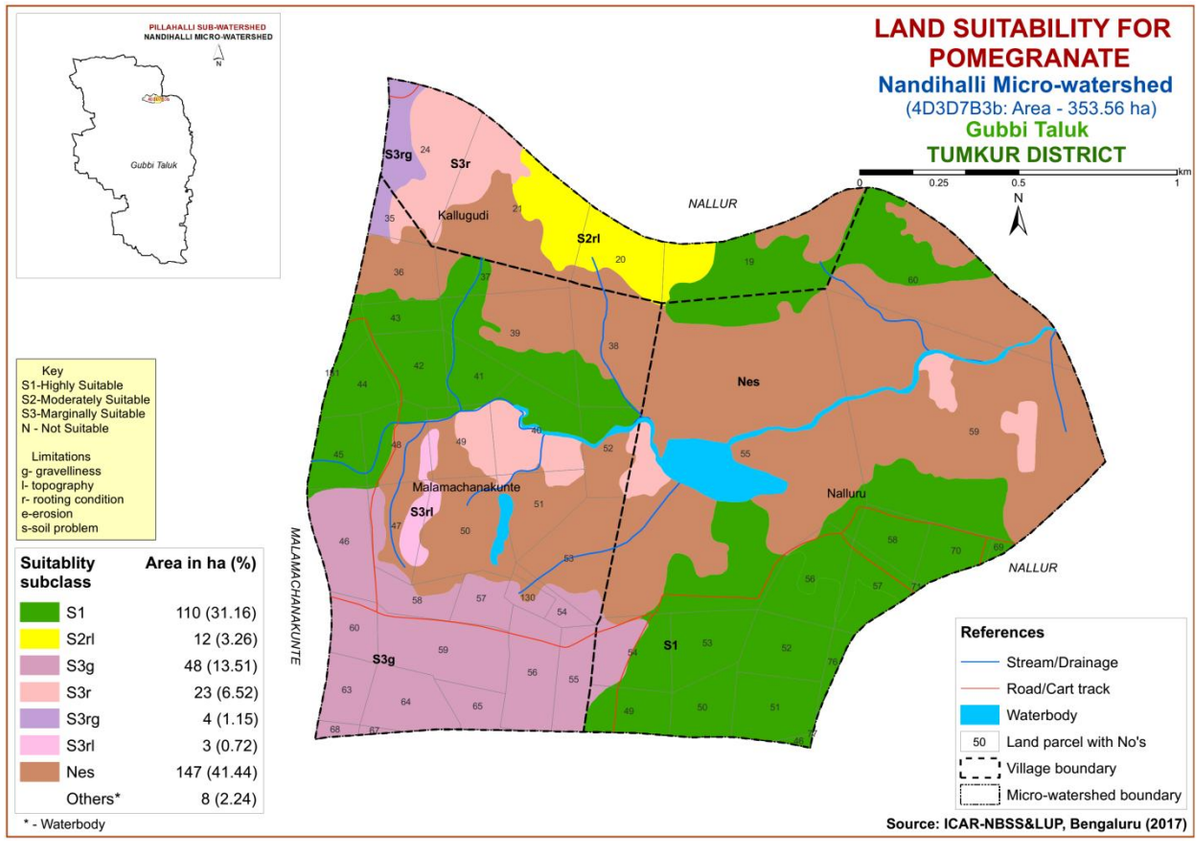

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR
FODDER SORGHUM
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
MALAMACHANAKUNTE
ANKASANDRA
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2gl
S2rg
S3g
S3r
S3rg
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
Suitability subclass
Area in ha (%)
S1 314 (61.36)
S2gl 10 (1.9)
S2rg 20 (3.89)
S3g 88 (17.24)
S3r 6 (1.12)
S3rg 49 (9.53)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

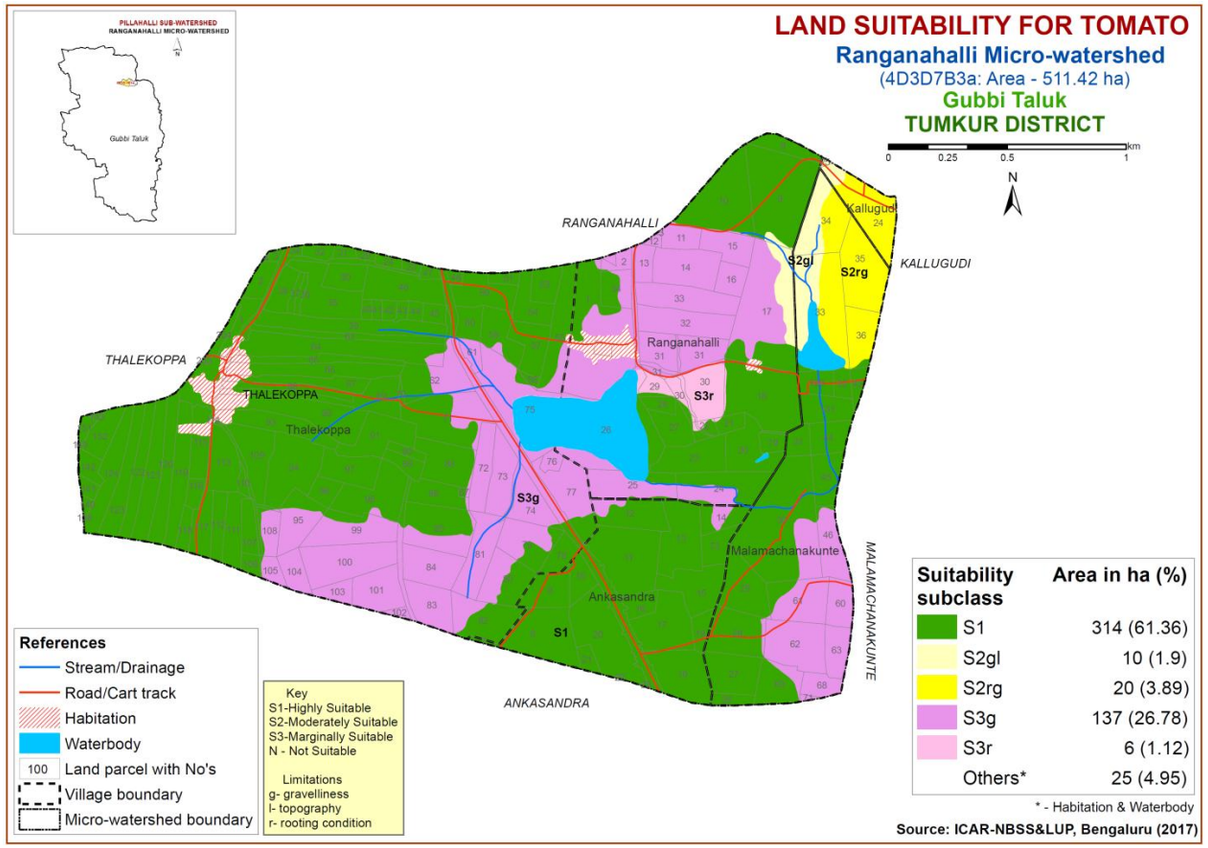

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR
FODDER SORGHUM
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
KALLUGUDI
MALAMACHANAKUNTE
Kallugudi
Nes
Malamachanakunte
Nalluru
S1
S2r
S2rg
S2rl
S3g
References
Stream/Drainage
Road/Cart track
Waterbody
50 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
l- topography
r- rooting condition
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2r 23 (6.52)
S2rg 4 (1.15)
S2rl 14 (3.98)
S3g 48 (13.51)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

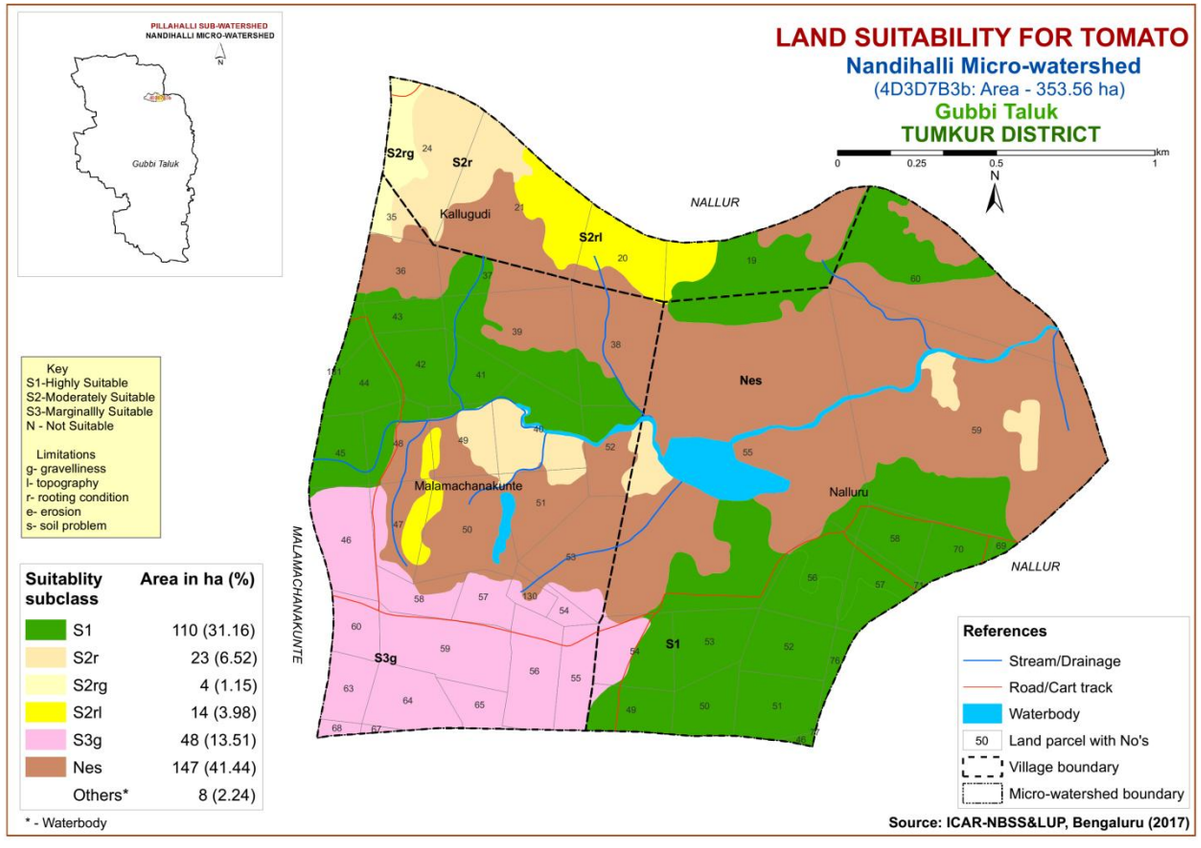

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR FINGER MILLET
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
MALAMACHANAKUNTE
ANKASANDRA
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2g
S2gl
S2r
S2rg
S3g
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
Suitability subclass
Area in ha (%)
S1 314 (61.36)
S2g 49 (9.53)
S2gl 10 (1.9)
S2r 6 (1.12)
S2rg 20 (3.89)
S3g 88 (17.24)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

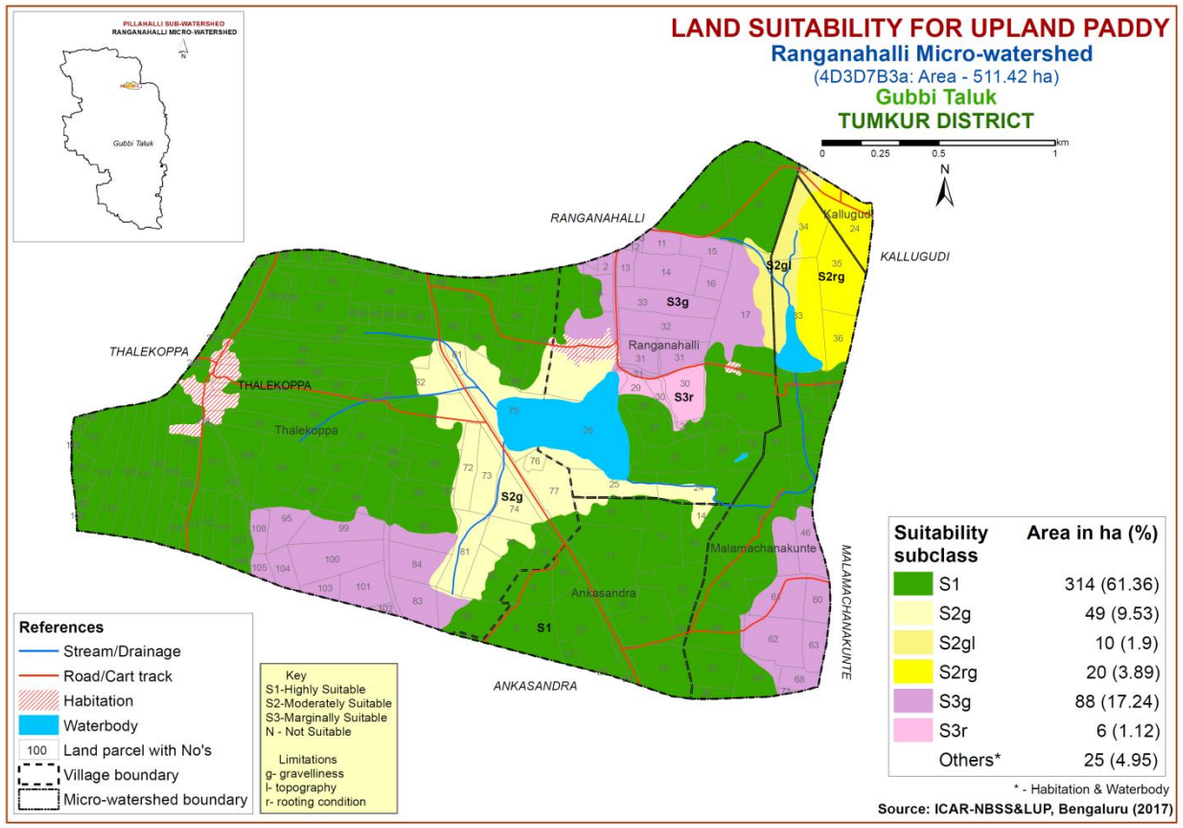

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR FINGER MILLET
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
KALLUGUDI
MALAMACHANAKUNTE
Kallugudi
Nes
Malamachanakunte
Nalluru
S1
S2r
S2rg
S2rl
S3g
References
Stream/Drainage
Road/Cart track
Waterbody
50 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
l- topography
r- rooting condition
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2r 23 (6.52)
S2rg 4 (1.15)
S2rl 14 (3.98)
S3g 48 (13.51)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

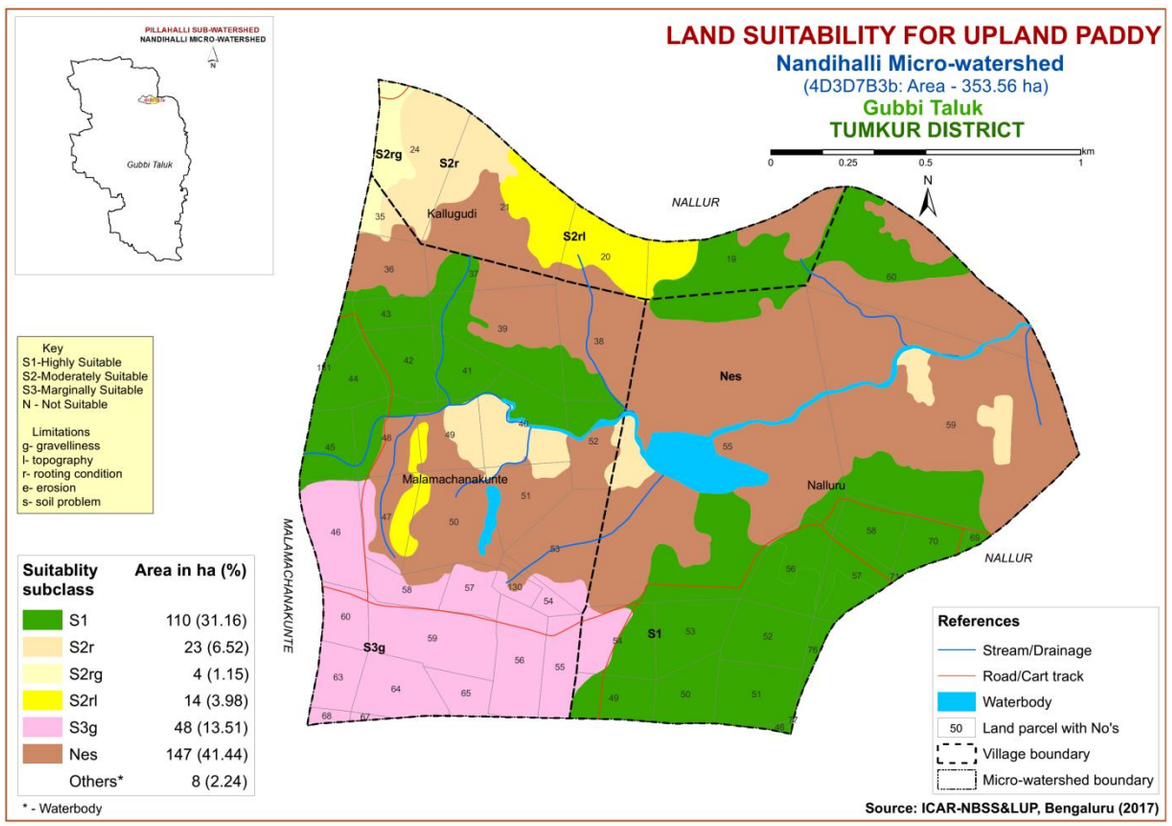

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR POMEGRANATE
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Ankasandra
Malamachanakunte
S1
S2r
S3g
S3gl
S3rg
Nr
Suitability subclass
Area in ha (%)
S1 296 (57.93)
S2r 18 (3.43)
S3g 88 (17.24)
S3gl 10 (1.9)
S3rg 69 (13.43)
Nr 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition

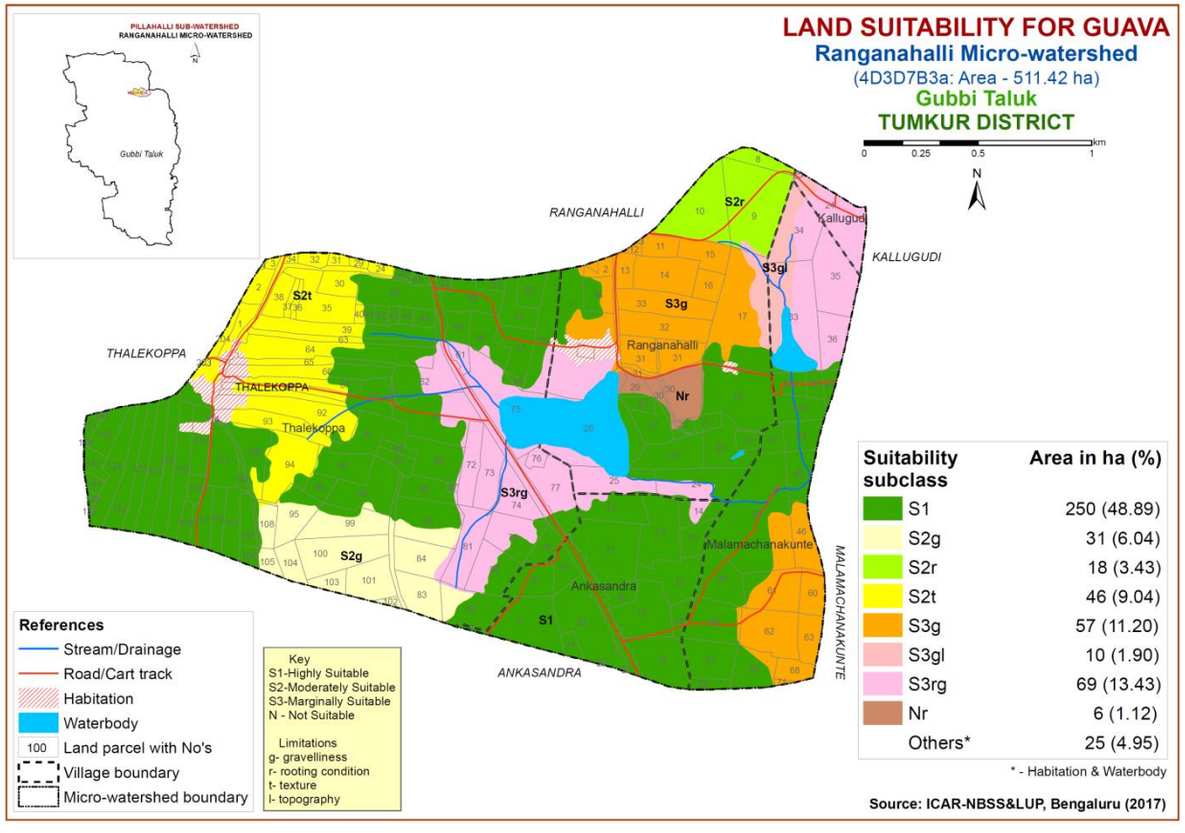

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR POMEGRANATE
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S2rl
S3g
S3r
S3rg
Nes
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2rl 12 (3.26)
S3g 48 (13.51)
S3r 23 (6.52)
S3rg 4 (1.15)
S3rl 3 (0.72)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)
References
Stream/Drainage
Road/Cart track
Waterbody
50 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
l- topography
r- rooting condition
e-erosion
s-soil problem

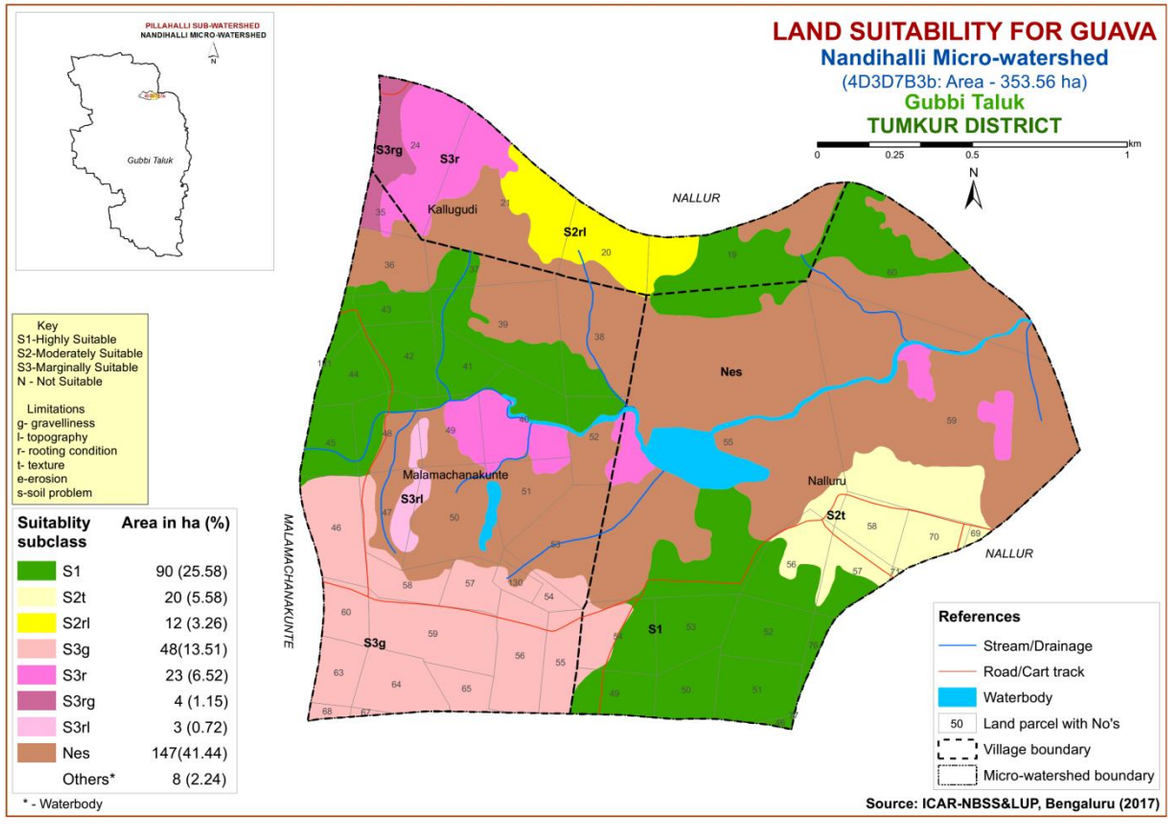

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR TOMATO
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Ankasandra
Malamachanakunte
S1
S2gl
S2rg
S3g
S3r
Suitability subclass
Area in ha (%)
S1 314 (61.36)
S2gl 10 (1.9)
S2rg 20 (3.89)
S3g 137 (26.78)
S3r 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition

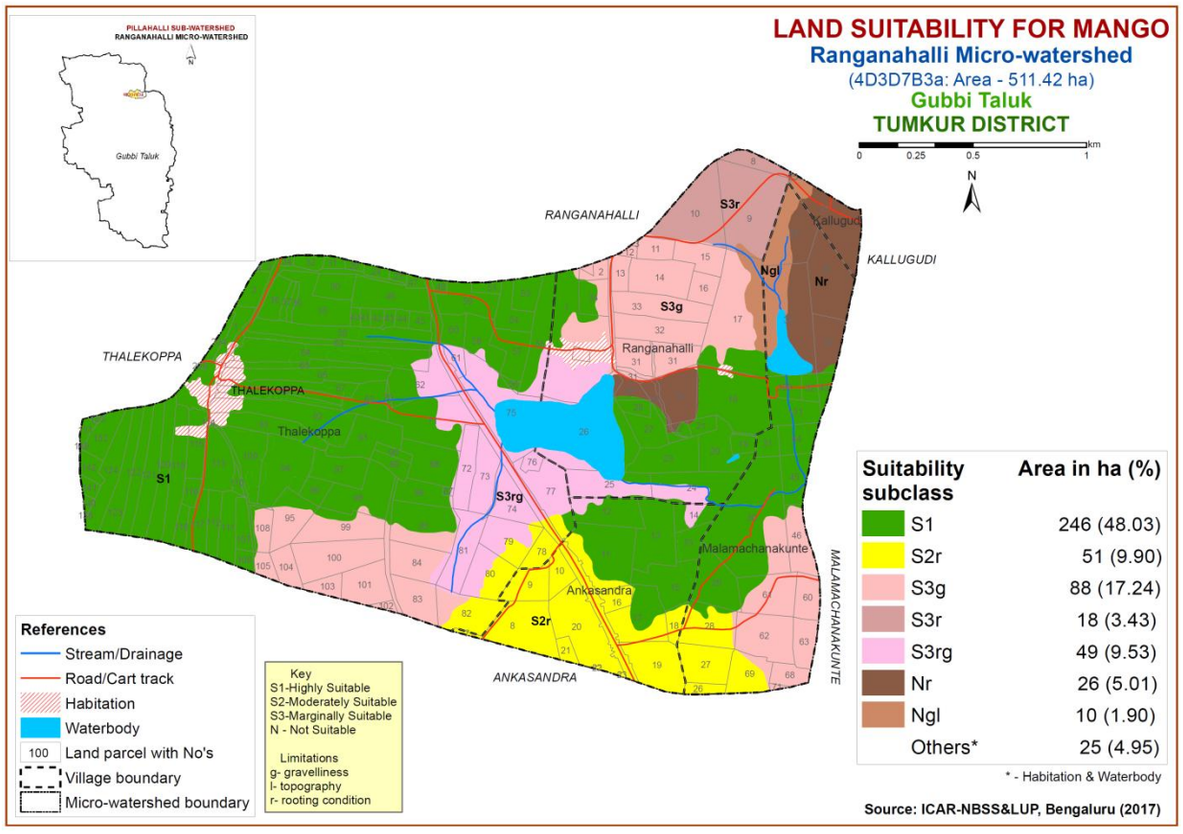

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR TOMATO
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S2r
S2rg
S2rl
S3g
Nes
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2r 23 (6.52)
S2rg 4 (1.15)
S2rl 14 (3.98)
S3g 48 (13.51)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginallly Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e- erosion
s- soil problem

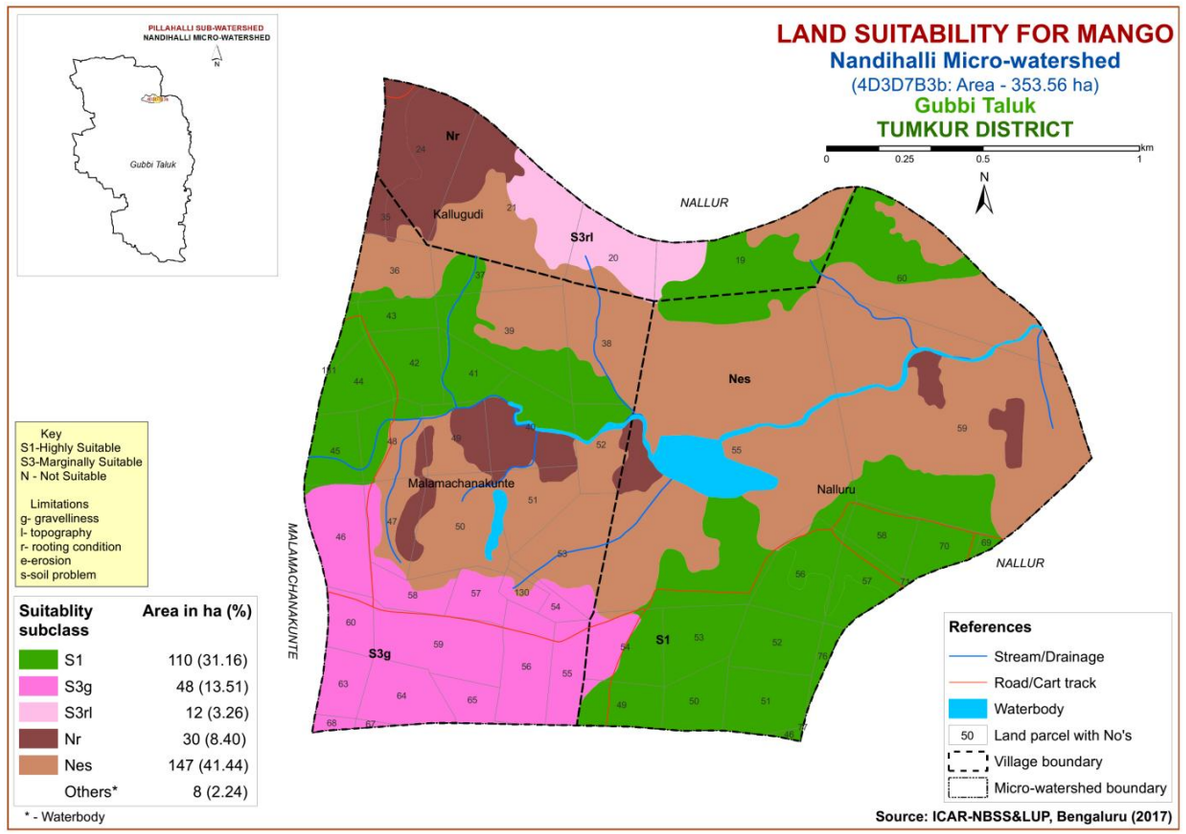

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR UPLAND PADDY
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2g
S2gl
S2rg
S3g
S3r
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
Suitability subclass
Area in ha (%)
S1 314 (61.36)
S2g 49 (9.53)
S2gl 10 (1.9)
S2rg 20 (3.89)
S3g 88 (17.24)
S3r 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

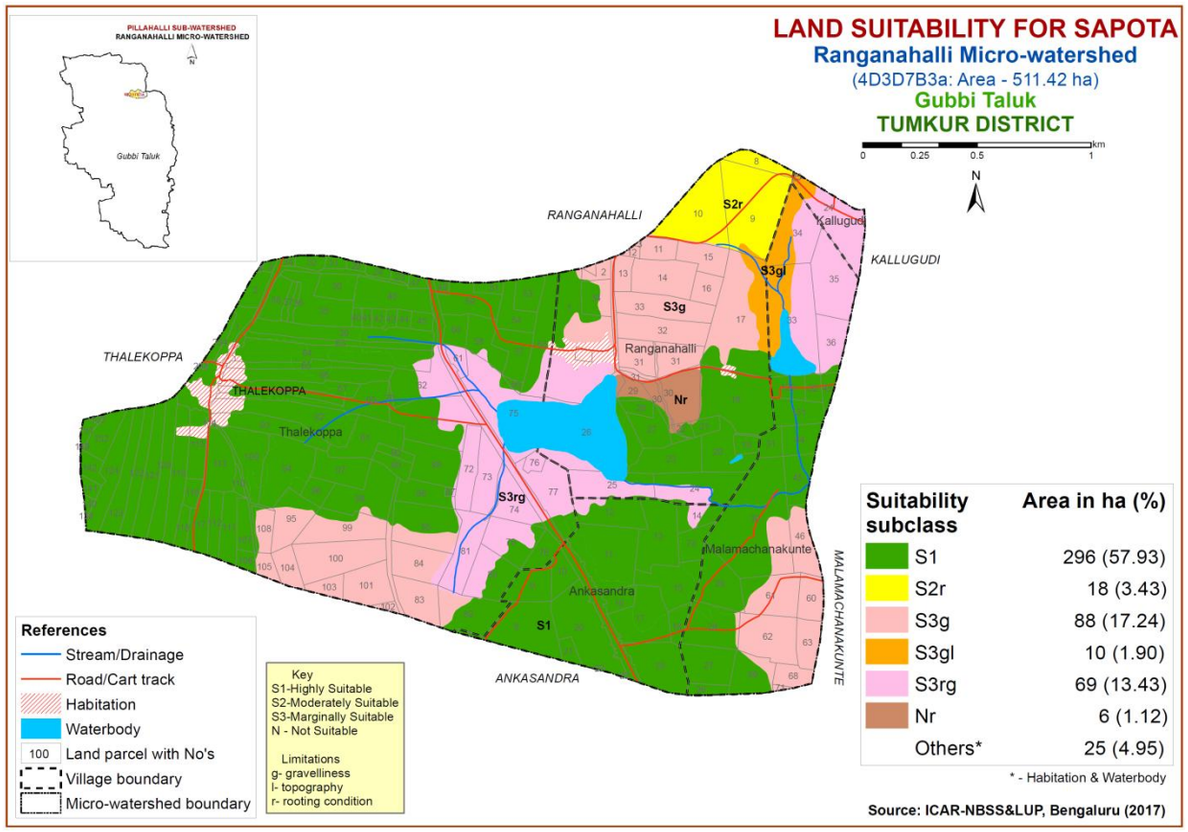

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR UPLAND PADDY
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nes
Nalluru
S1
S2r
S2rg
S2rl
S3g
References
Stream/Drainage
Road/Cart track
Waterbody
50 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
l- topography
r- rooting condition
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2r 23 (6.52)
S2rg 4 (1.15)
S2rl 14 (3.98)
S3g 48 (13.51)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

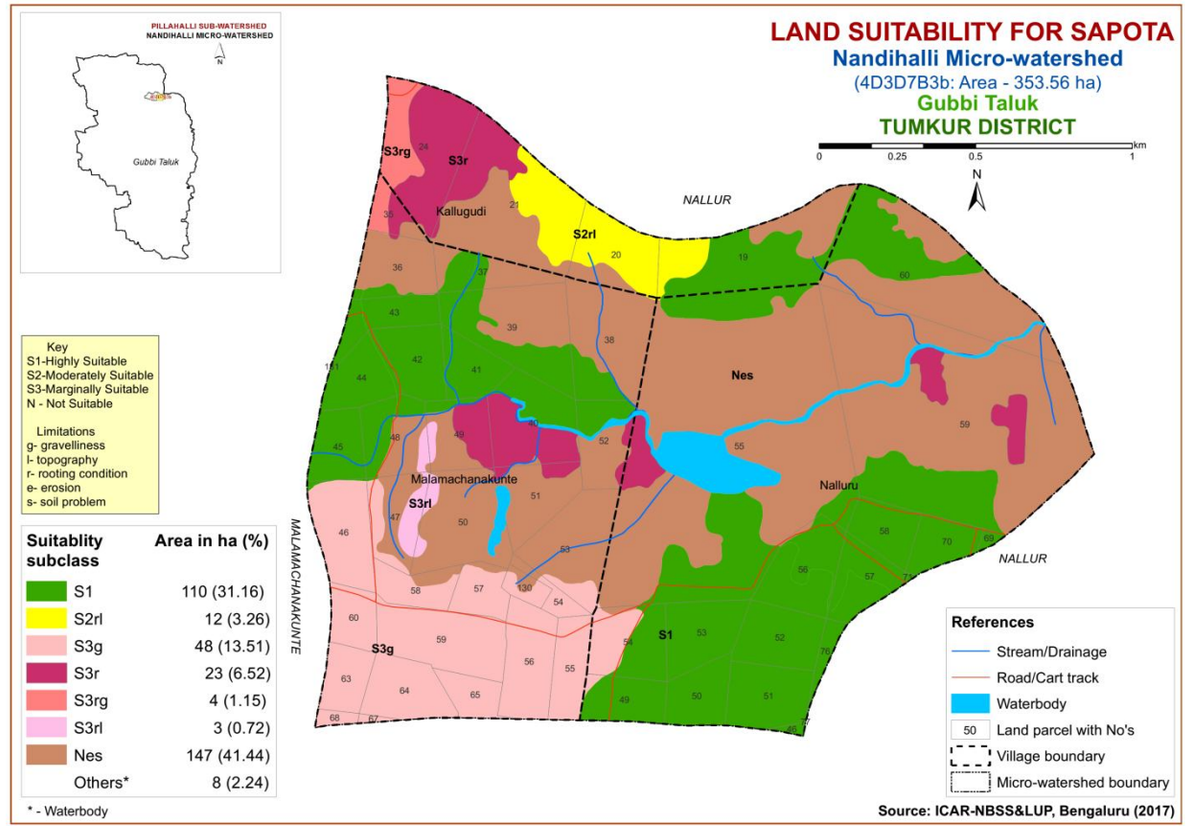

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR GUAVA
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2g
S2r
S2t
S3g
S3gl
S3rg
Nr
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
r- rooting condition
t- texture
l- topography
Suitability subclass
Area in ha (%)
S1 250 (48.89)
S2g 31 (6.04)
S2r 18 (3.43)
S2t 46 (9.04)
S3g 57 (11.20)
S3gl 10 (1.90)
S3rg 69 (13.43)
Nr 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

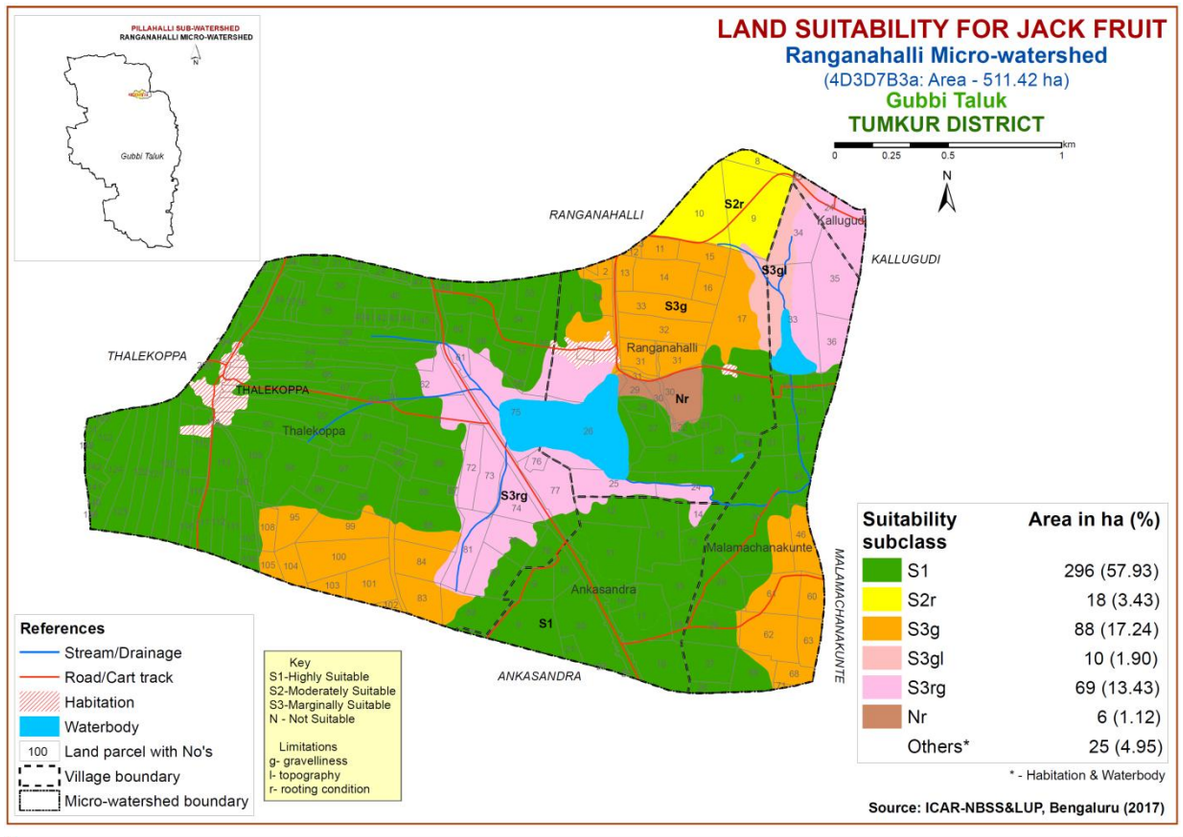

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR GUAVA
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nes
Nalluru
S1
S2rl
S2t
S3g
S3r
S3rg
S3rl
References
Stream/Drainage
Road/Cart track
Waterbody
50 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
l- topography
r- rooting condition
t- texture
e-erosion
s-soil problem
Suitablity subclass
Area in ha (%)
S1 90 (25.58)
S2t 20 (5.58)
S2rl 12 (3.26)
S3g 48(13.51)
S3r 23 (6.52)
S3rg 4 (1.15)
S3rl 3 (0.72)
Nes 147(41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

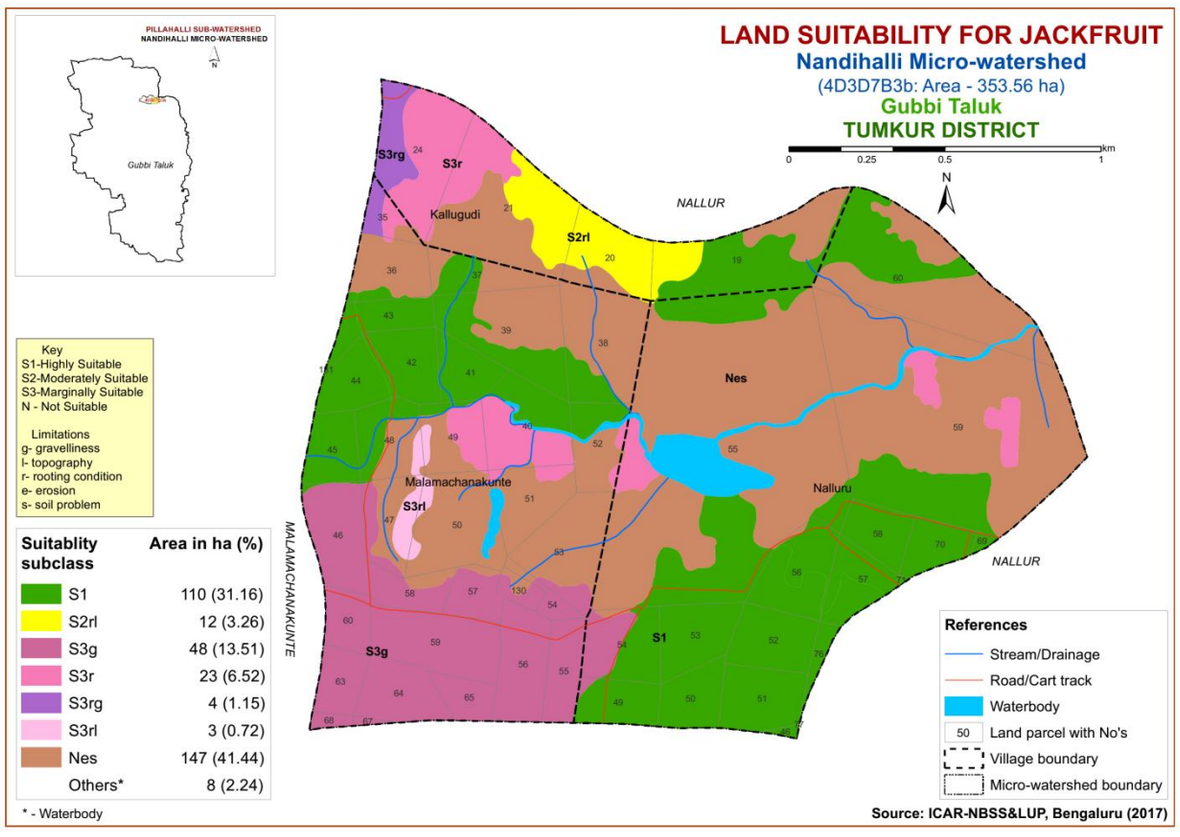

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR MANGO
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2r
S3g
S3r
S3rg
Ngl
Nr
Suitability subclass
Area in ha (%)
S1 246 (48.03)
S2r 51 (9.90)
S3g 88 (17.24)
S3r 18 (3.43)
S3rg 49 (9.53)
Nr 26 (5.01)
Ngl 10 (1.90)
Others* 25 (4.95)
* - Habitation & Waterbody
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

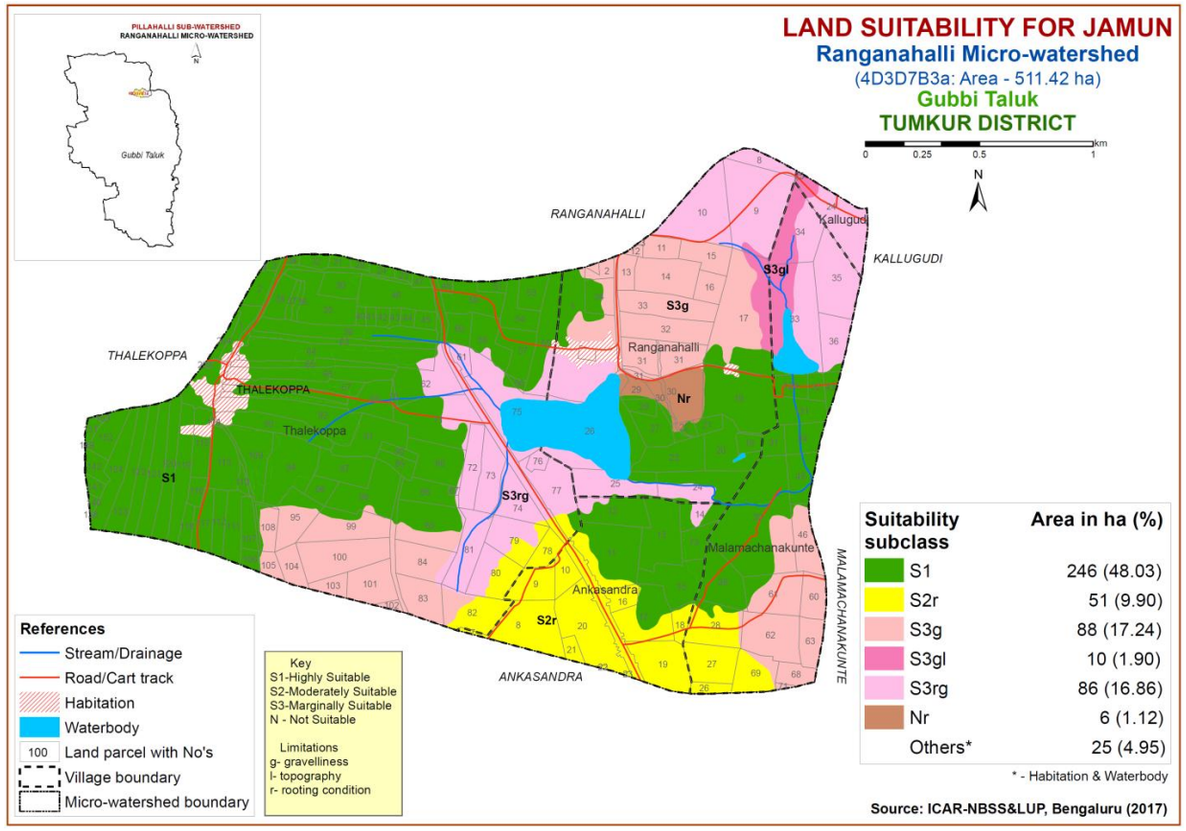

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR MANGO
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S3g
S3rl
Nr
Nes
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S3g 48 (13.51)
S3rl 12 (3.26)
Nr 30 (8.40)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Key
S1-Highly Suitable
S3-Marginally Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e-erosion
s-soil problem
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

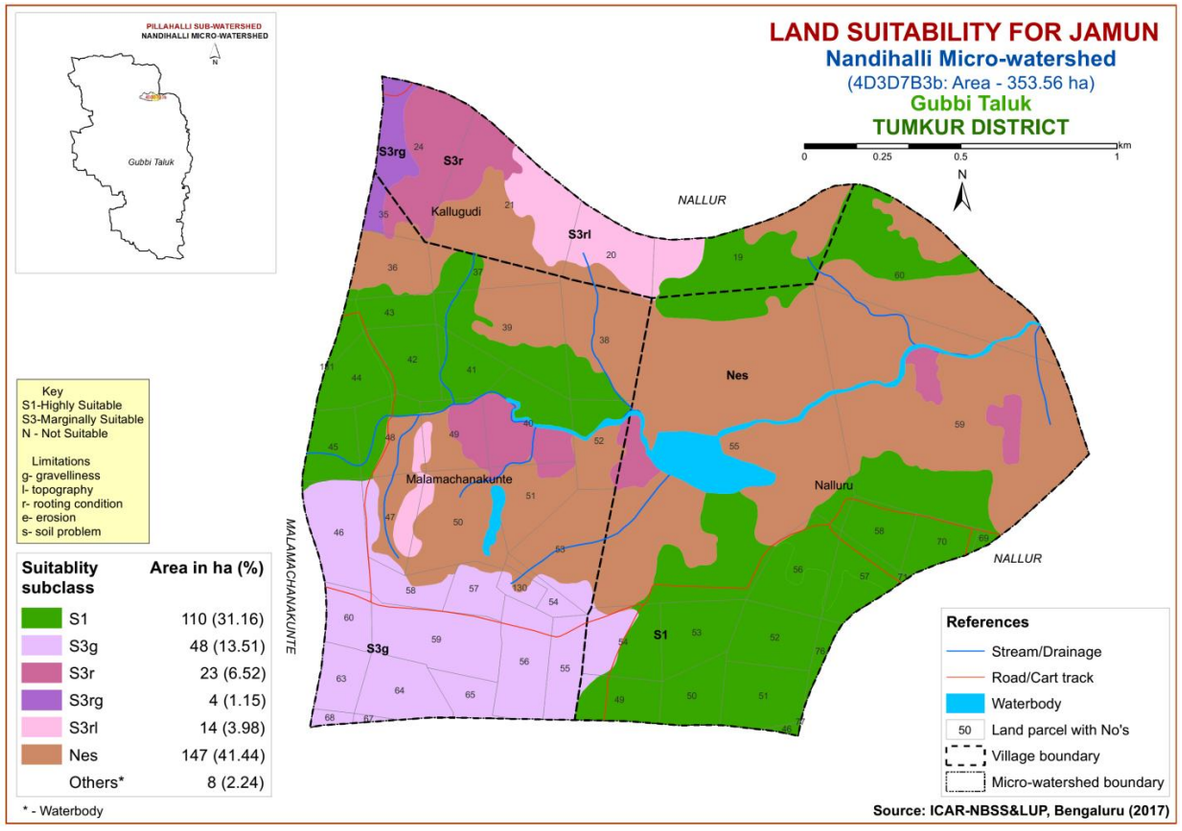

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR SAPOTA
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2r
S3g
S3gl
S3rg
Nr
Suitability subclass
Area in ha (%)
S1 296 (57.93)
S2r 18 (3.43)
S3g 88 (17.24)
S3gl 10 (1.90)
S3rg 69 (13.43)
Nr 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

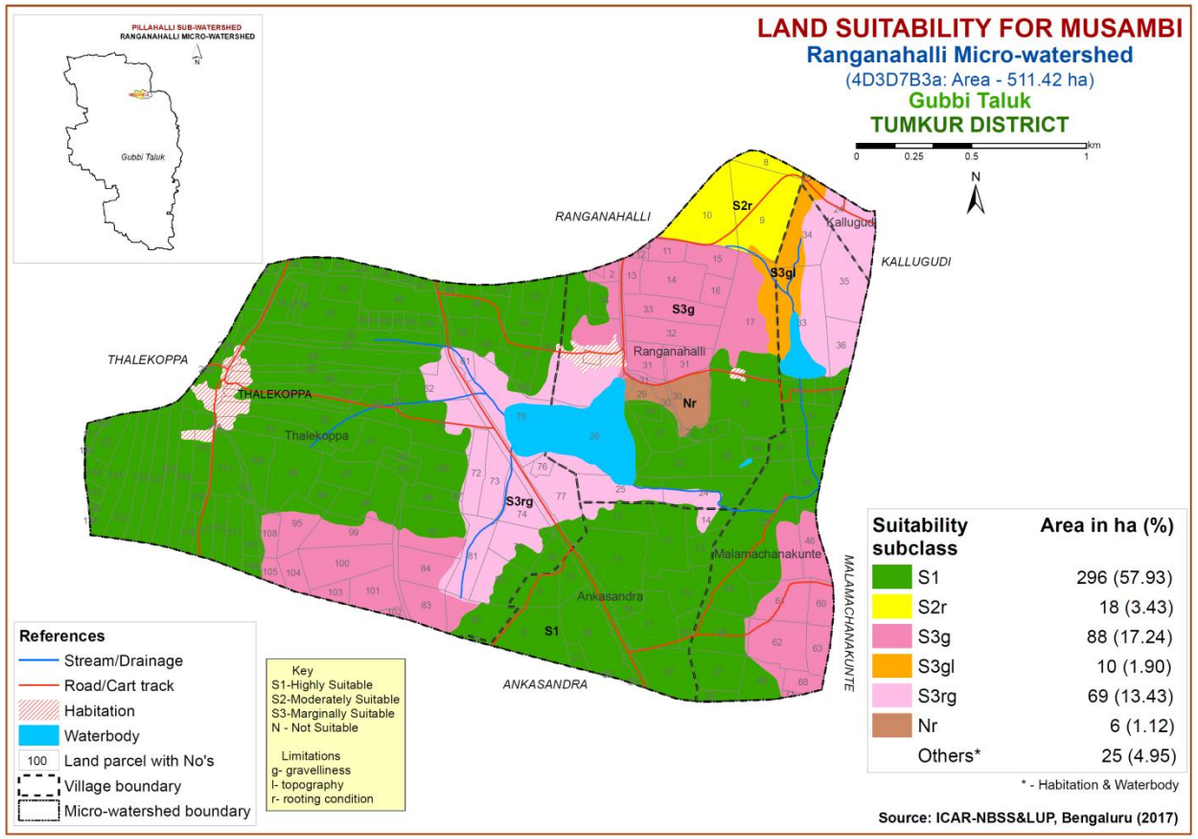

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR SAPOTA
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S2rl
S3g
S3r
S3rg
S3rl
Nes
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2rl 12 (3.26)
S3g 48 (13.51)
S3r 23 (6.52)
S3rg 4 (1.15)
S3rl 3 (0.72)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e- erosion
s- soil problem
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

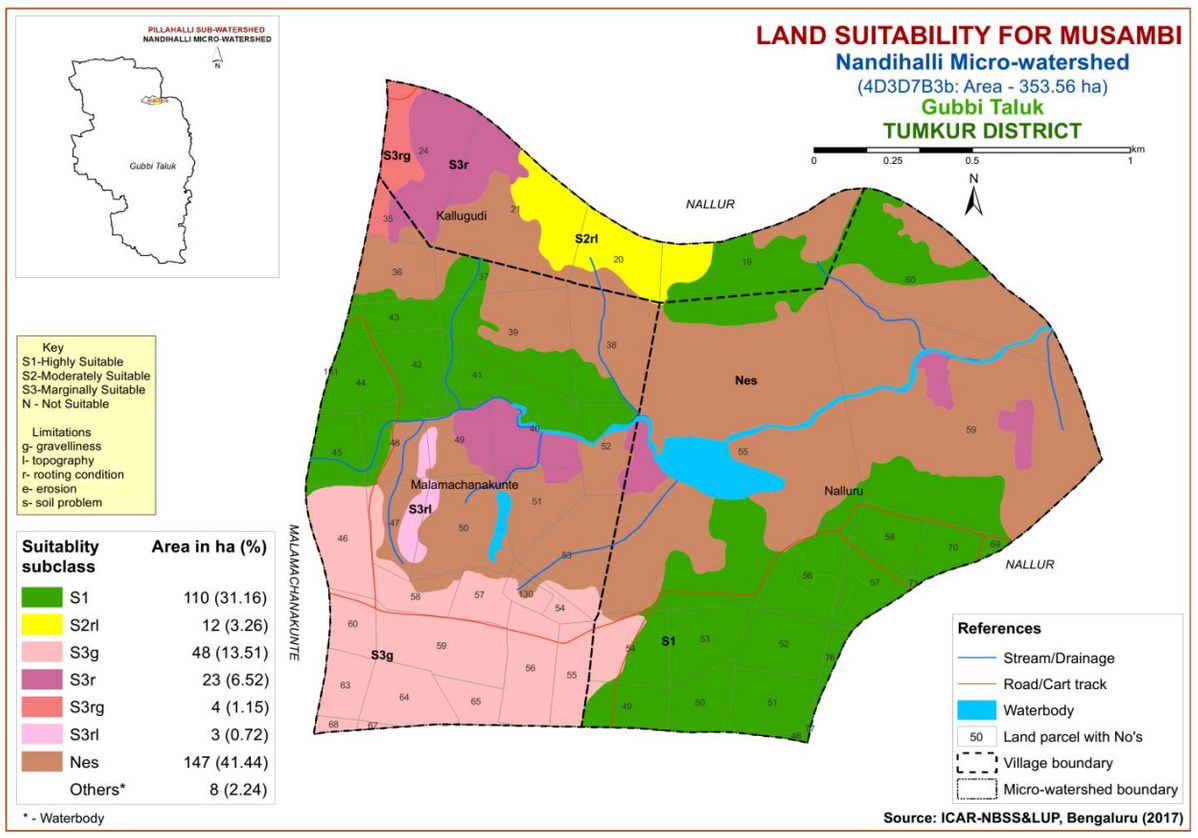

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR JACK FRUIT
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2r
S3g
S3gl
S3rg
Nr
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Suitability subclass
Area in ha (%)
S1 296 (57.93)
S2r 18 (3.43)
S3g 88 (17.24)
S3gl 10 (1.90)
S3rg 69 (13.43)
Nr 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

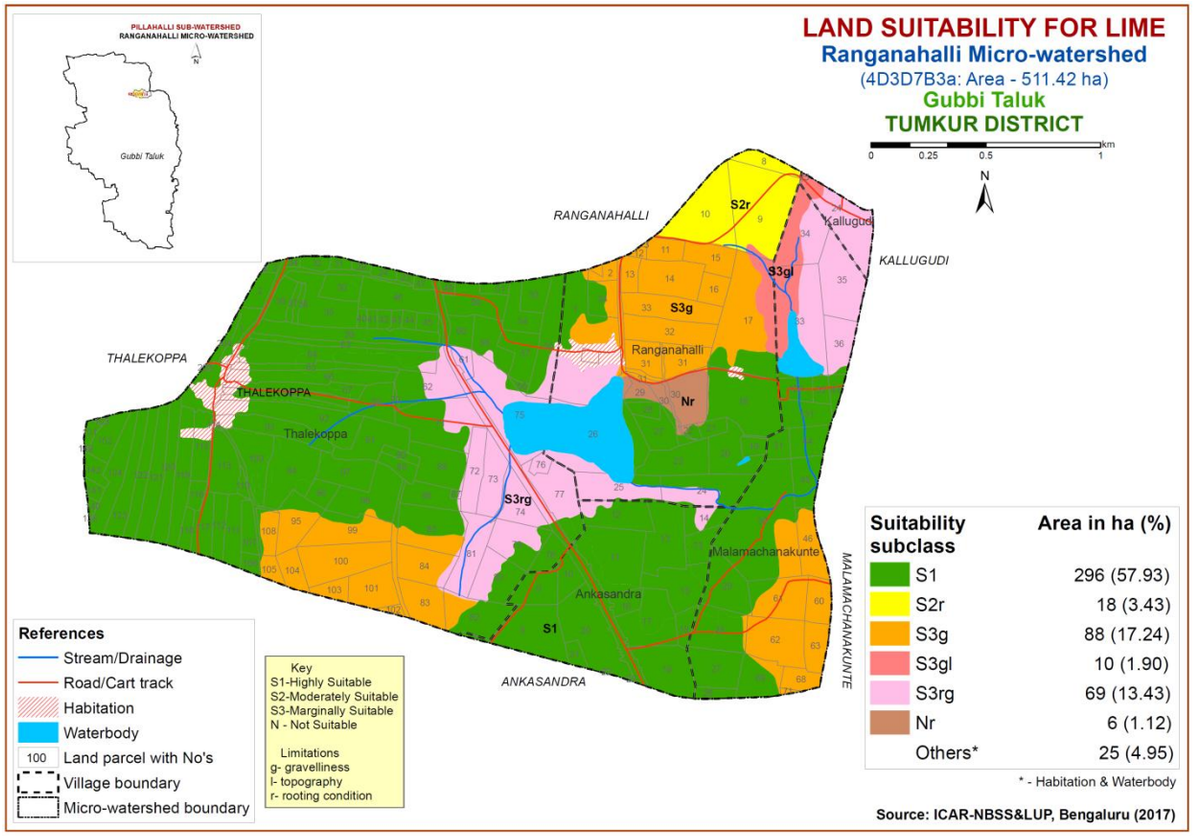

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR JACKFRUIT
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
NALLUR
Kallugudi
Malamachanakunte
Nes
Nalluru
S1
S2rl
S3g
S3r
S3rg
S3rl
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e- erosion
s- soil problem
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2rl 12 (3.26)
S3g 48 (13.51)
S3r 23 (6.52)
S3rg 4 (1.15)
S3rl 3 (0.72)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

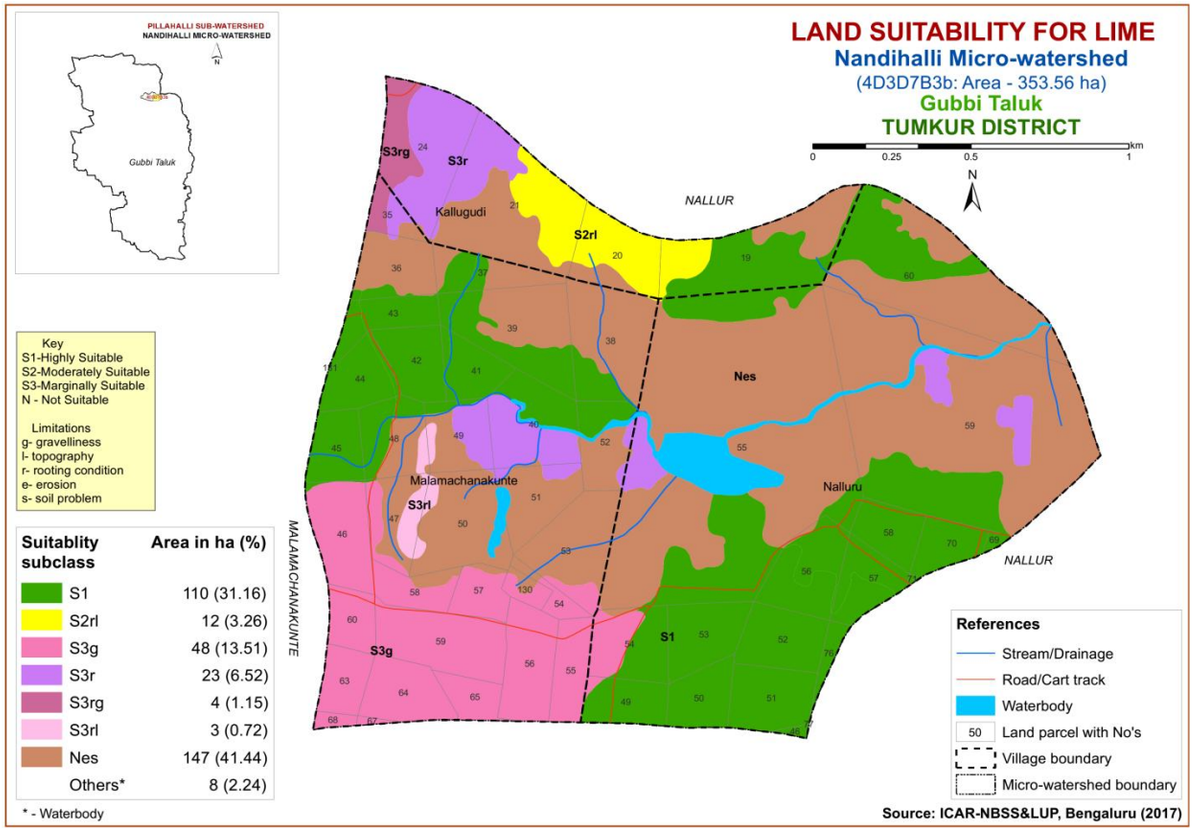

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR JAMUN
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2r
S3g
S3gl
S3rg
Nr
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Suitability subclass
Area in ha (%)
S1 246 (48.03)
S2r 51 (9.90)
S3g 88 (17.24)
S3gl 10 (1.90)
S3rg 86 (16.86)
Nr 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

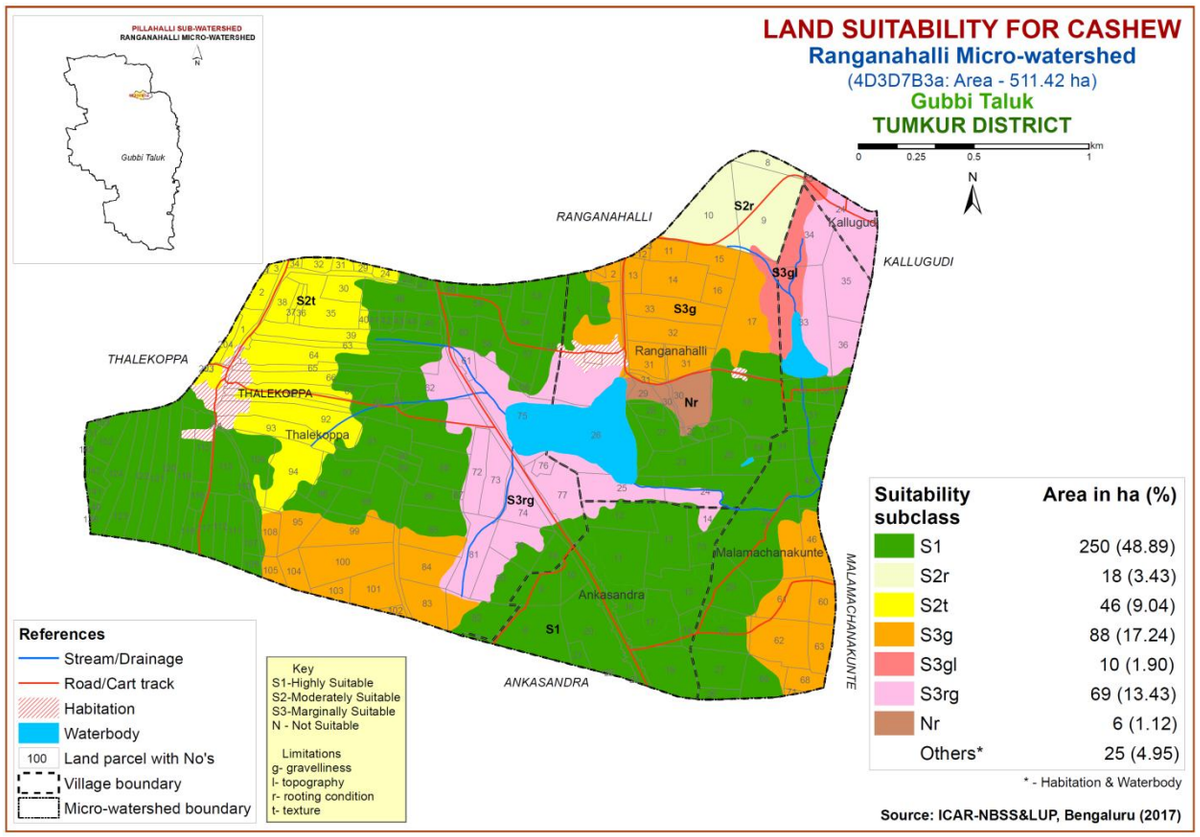

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR JAMUN
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
NALLUR
Kallugudi
Malamachanakunte
Nes
Nalluru
S1
S3g
S3r
S3rg
S3rl
Key
S1-Highly Suitable
S3-Marginally Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e- erosion
s- soil problem
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S3g 48 (13.51)
S3r 23 (6.52)
S3rg 4 (1.15)
S3rl 14 (3.98)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

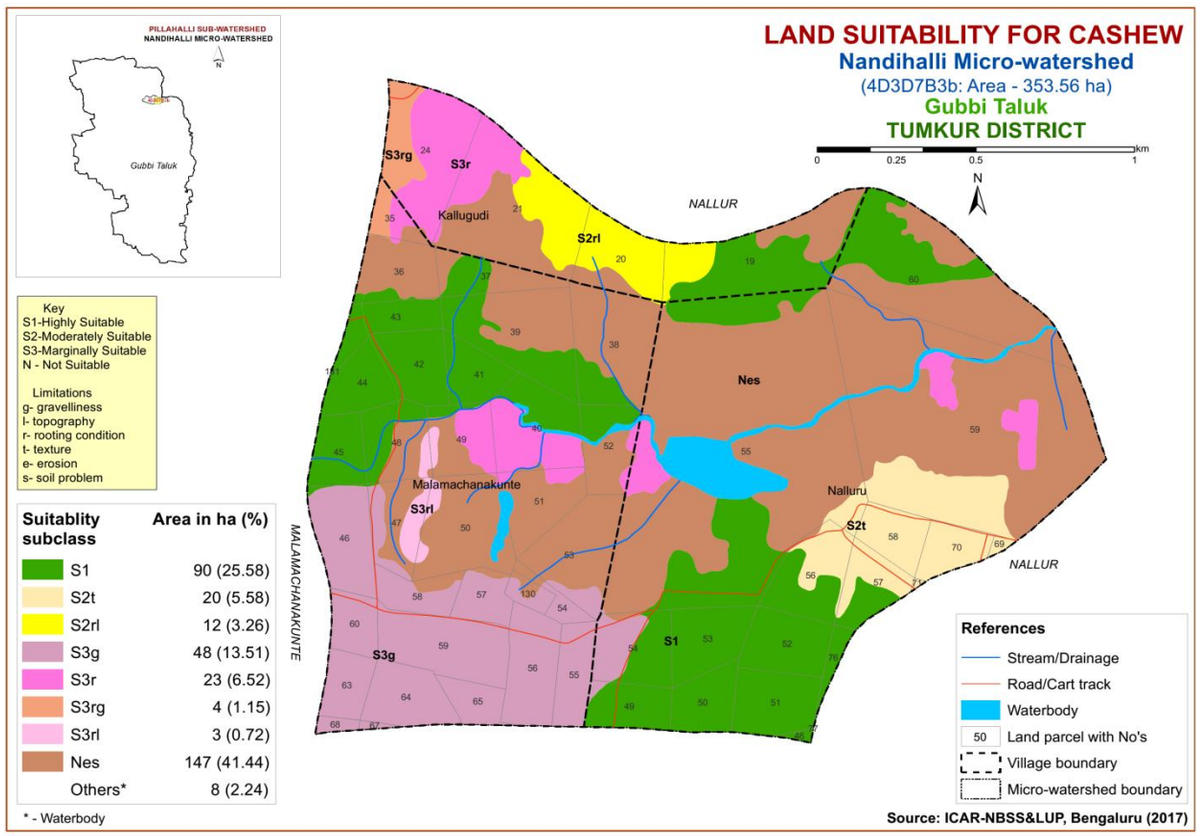

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR MUSAMBI
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
MALAMACHANAKUNTE
ANKASANDRA
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2r
S3g
S3gl
S3rg
Nr
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
Suitability subclass
Area in ha (%)
S1 296 (57.93)
S2r 18 (3.43)
S3g 88 (17.24)
S3gl 10 (1.90)
S3rg 69 (13.43)
Nr 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

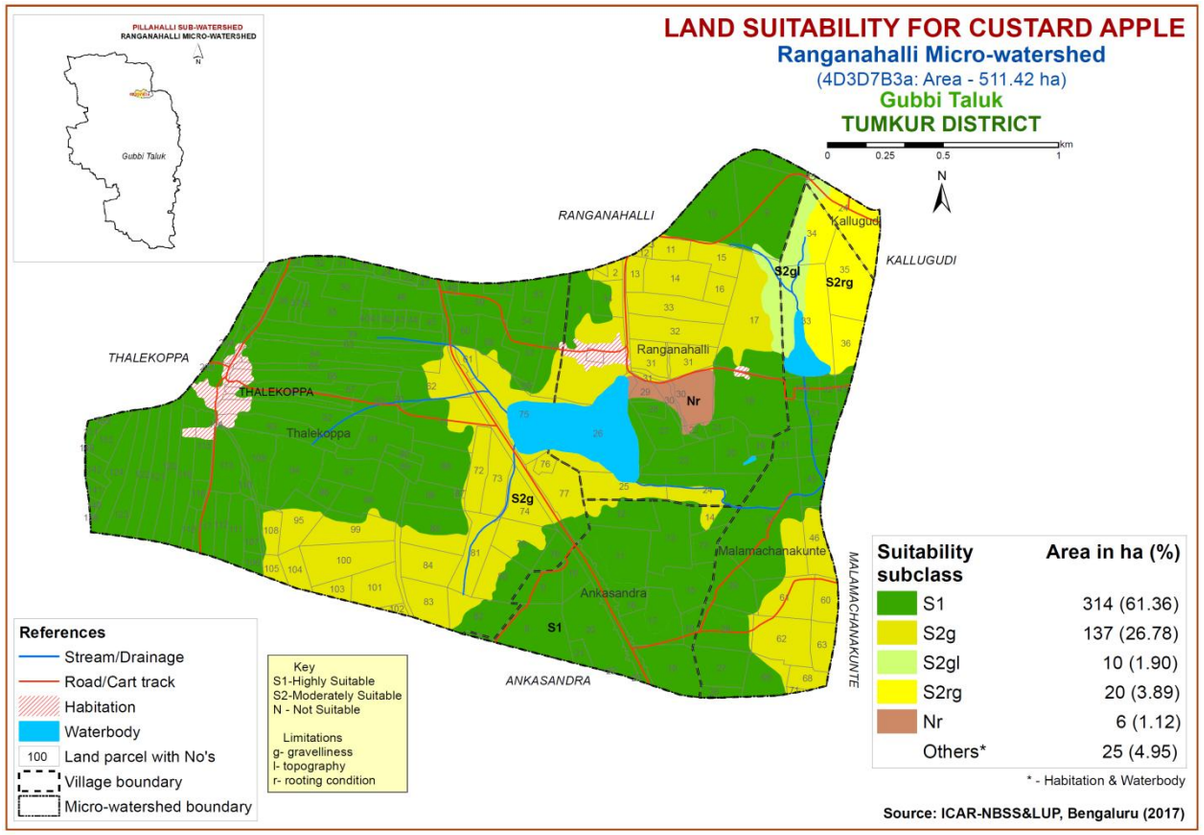

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR MUSAMBI
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S2rl
S3g
S3r
S3rg
S3rl
Nes
References
Stream/Drainage
Road/Cart track
Waterbody
50 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
l- topography
r- rooting condition
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2rl 12 (3.26)
S3g 48 (13.51)
S3r 23 (6.52)
S3rg 4 (1.15)
S3rl 3 (0.72)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

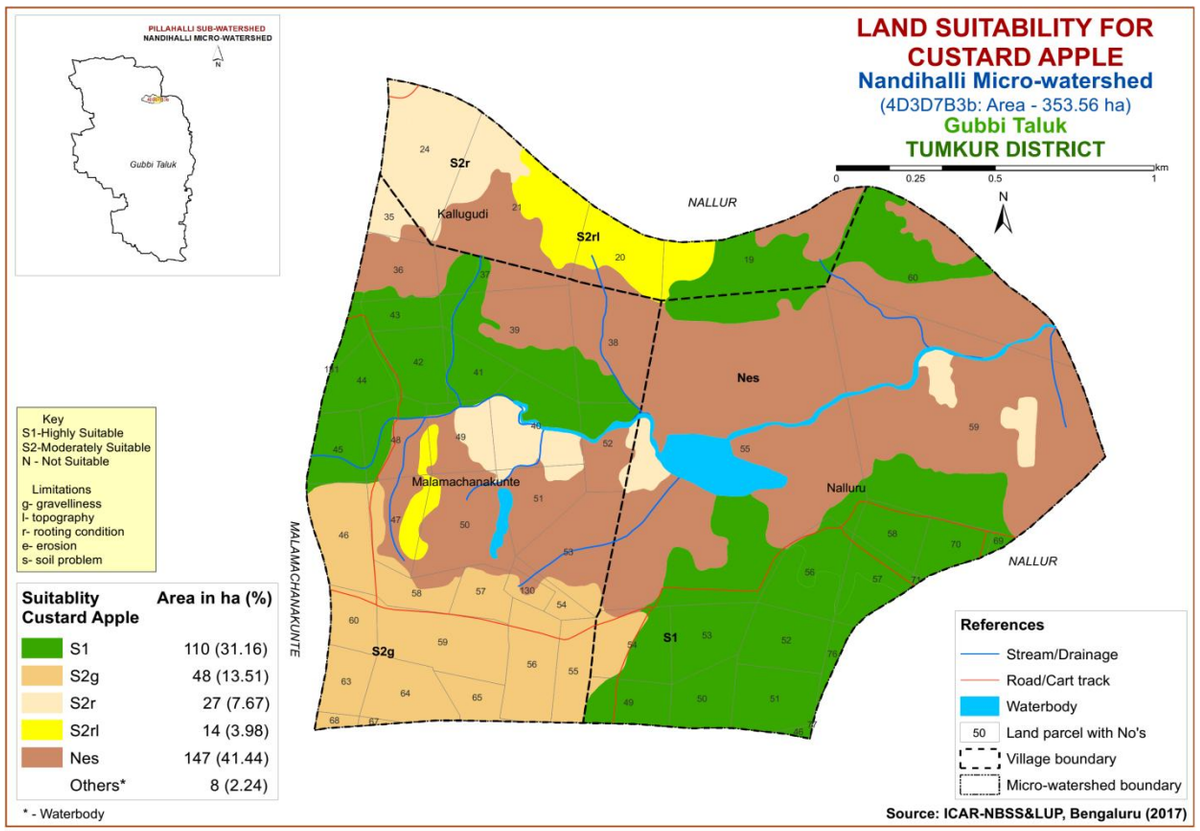

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR LIME
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
MALAMACHANAKUNTE
ANKASANDRA
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2r
S3g
S3gl
S3rg
Nr
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
Suitability subclass
Area in ha (%)
S1 296 (57.93)
S2r 18 (3.43)
S3g 88 (17.24)
S3gl 10 (1.90)
S3rg 69 (13.43)
Nr 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

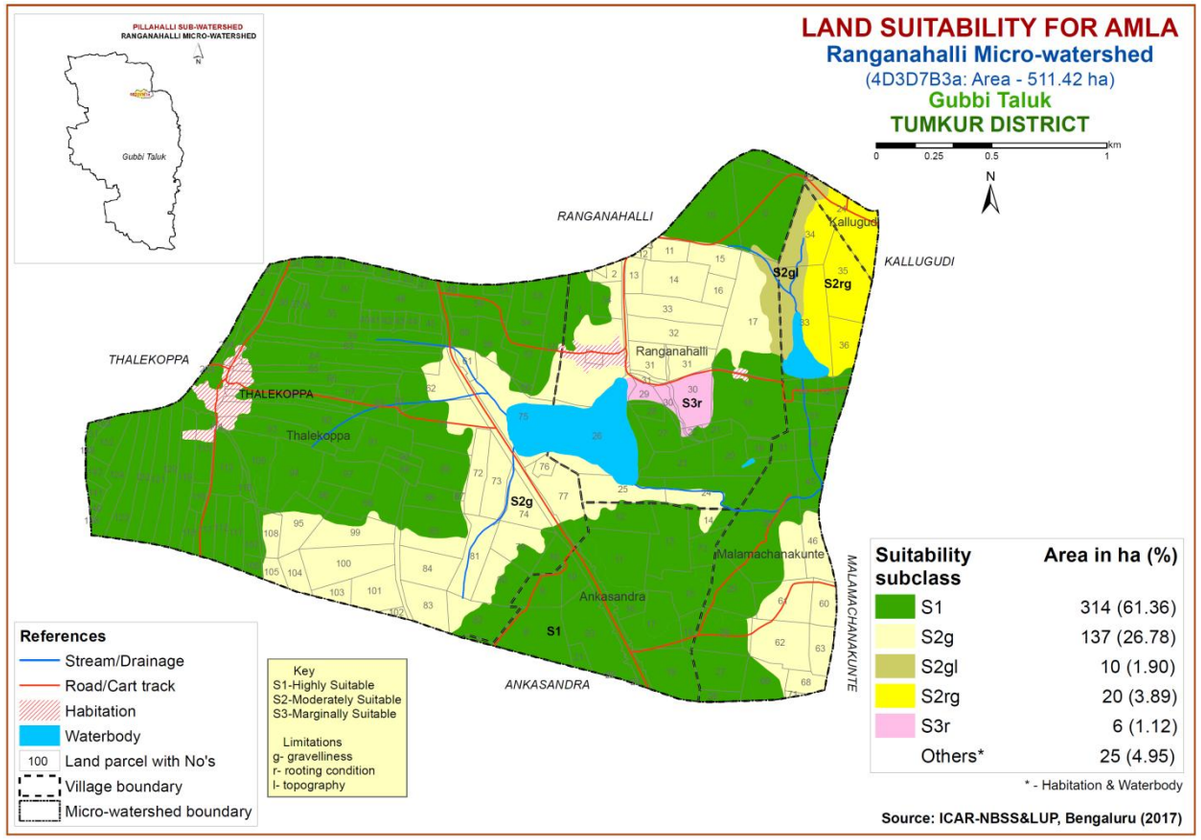

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR LIME
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S2rl
S3g
S3r
S3rg
S3rl
Nes
References
Stream/Drainage
Road/Cart track
Waterbody
50 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
l- topography
r- rooting condition
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2rl 12 (3.26)
S3g 48 (13.51)
S3r 23 (6.52)
S3rg 4 (1.15)
S3rl 3 (0.72)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

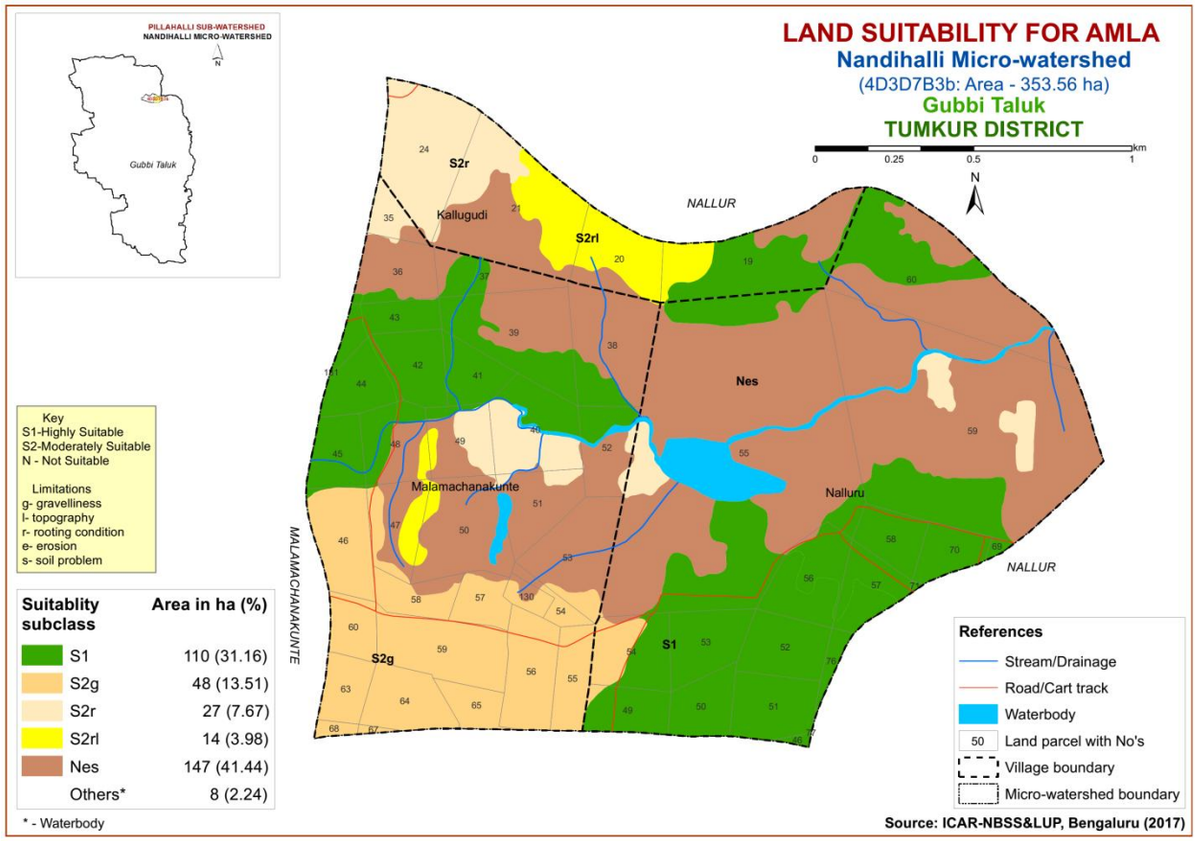

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR CASHEW
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2r
S2t
S3g
S3gl
S3rg
Nr
Suitability subclass
Area in ha (%)
S1 250 (48.89)
S2r 18 (3.43)
S2t 46 (9.04)
S3g 88 (17.24)
S3gl 10 (1.90)
S3rg 69 (13.43)
Nr 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
t- texture
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

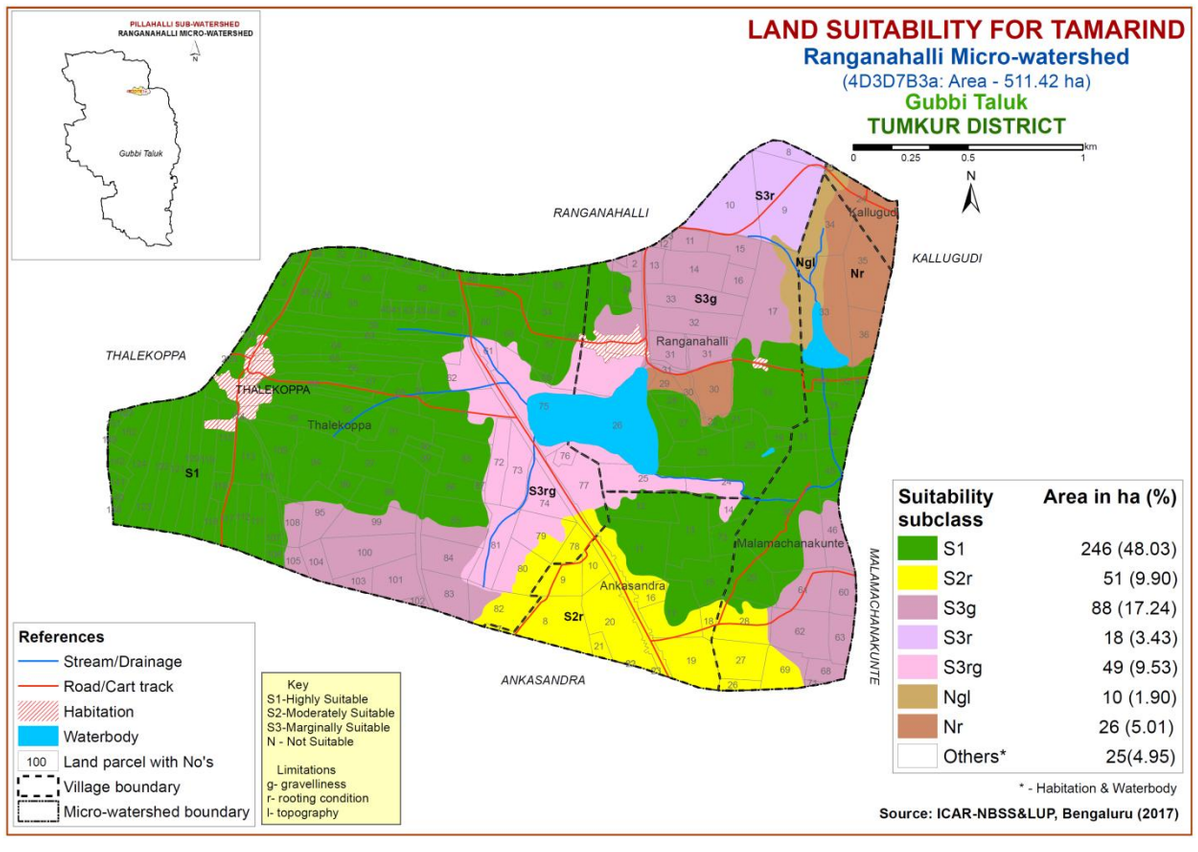

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR CASHEW
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S2rl
S2t
S3g
S3r
S3rg
S3rl
Nes
Suitablity subclass
Area in ha (%)
S1 90 (25.58)
S2t 20 (5.58)
S2rl 12 (3.26)
S3g 48 (13.51)
S3r 23 (6.52)
S3rg 4 (1.15)
S3rl 3 (0.72)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Key
S1-Highly Suitable
S2-Moderately Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e- erosion
s- soil problem
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

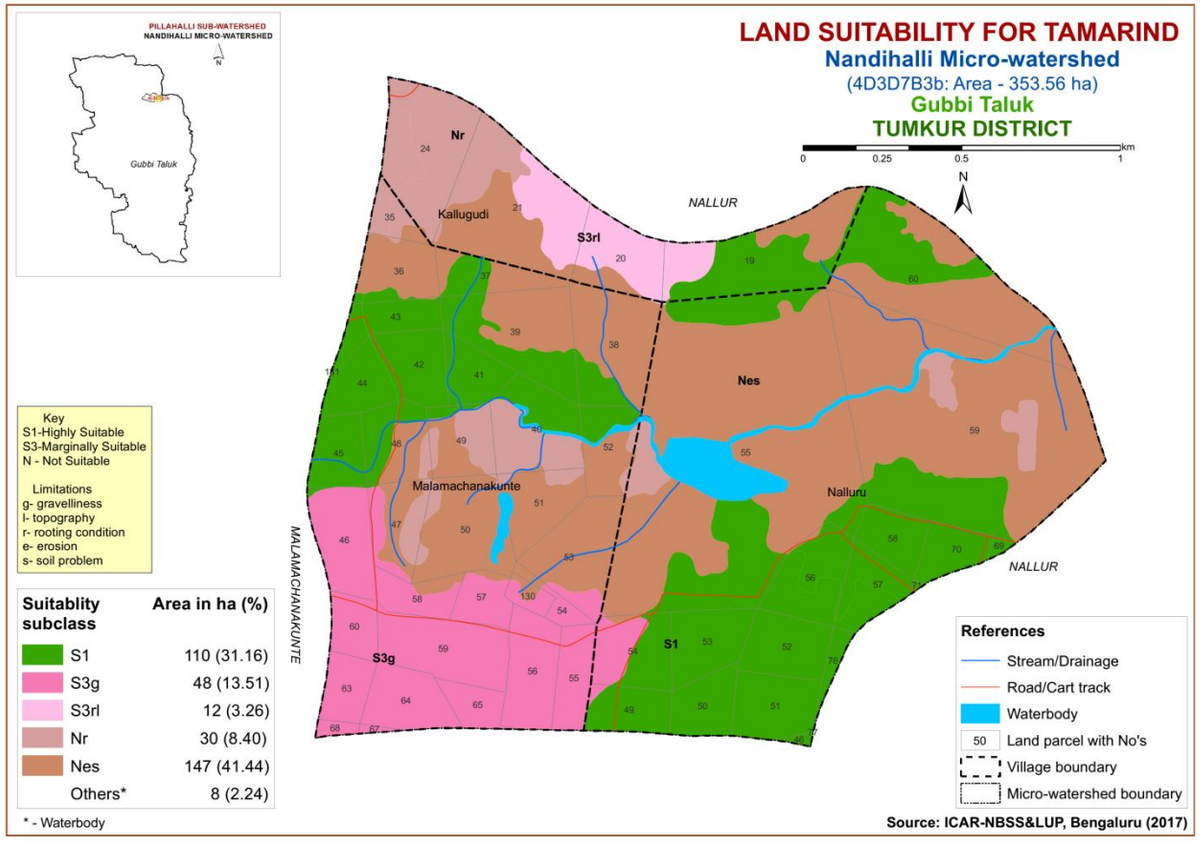

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR CUSTARD APPLE
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2g
S2gl
S2rg
Nr
Suitability subclass
Area in ha (%)
S1 314 (61.36)
S2g 137 (26.78)
S2gl 10 (1.90)
S2rg 20 (3.89)
Nr 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Key
S1-Highly Suitable
S2-Moderately Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

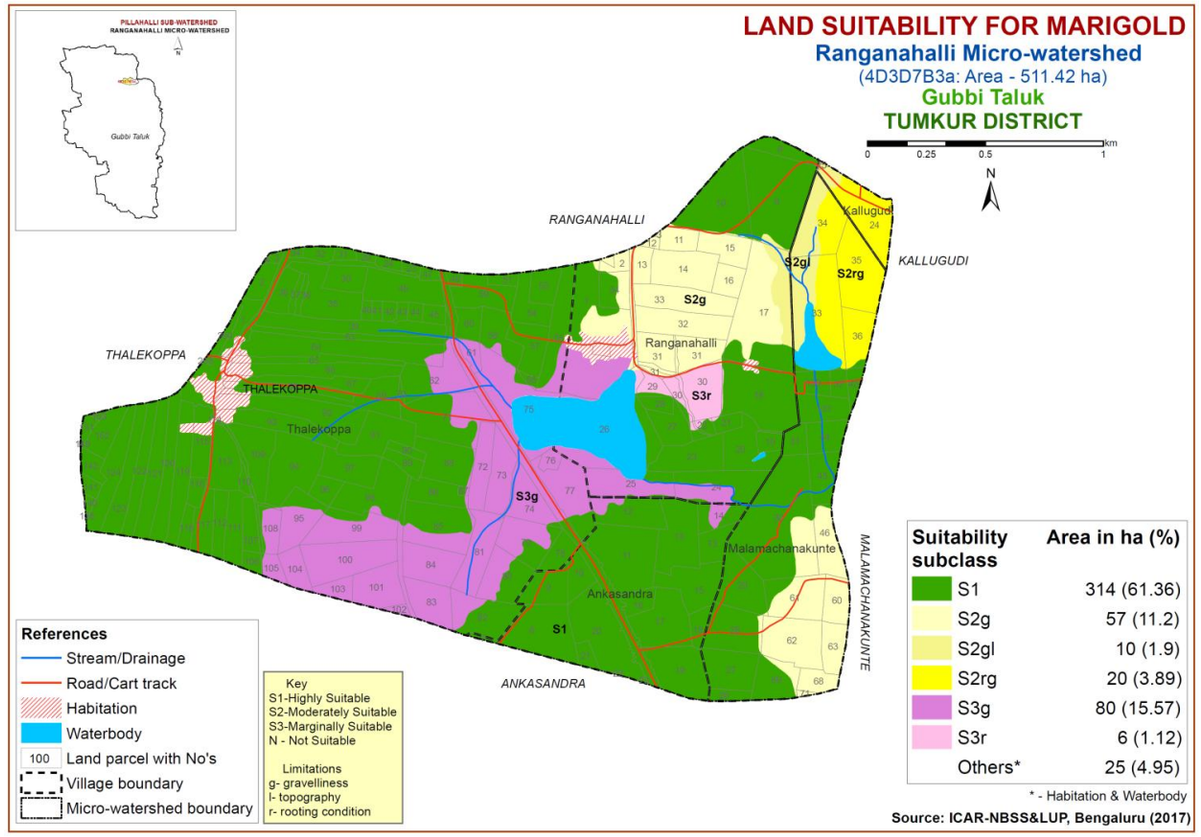

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR CUSTARD APPLE
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S2g
S2r
S2rl
Nes
Suitablity Custard Apple
Area in ha (%)
S1 110 (31.16)
S2g 48 (13.51)
S2r 27 (7.67)
S2rl 14 (3.98)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Key
S1-Highly Suitable
S2-Moderately Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e- erosion
s- soil problem
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

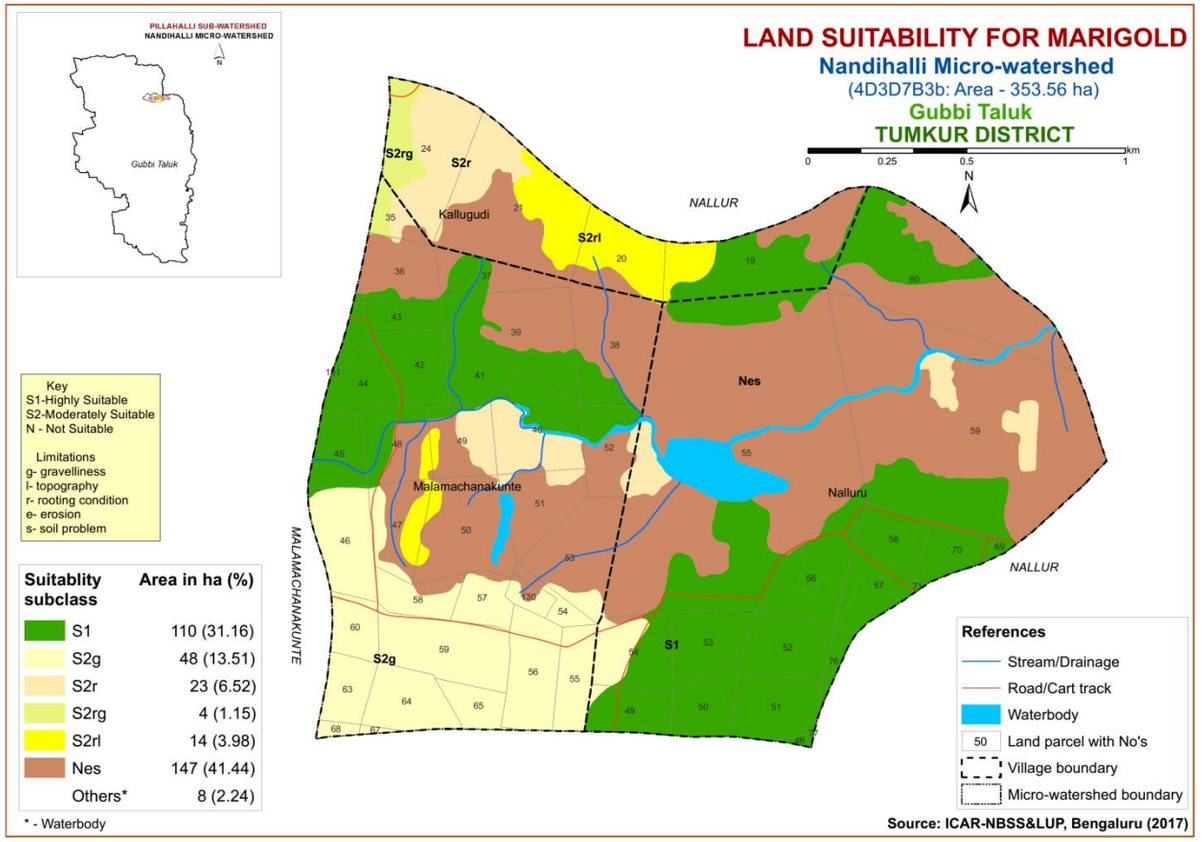

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR AMLA
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2g
S2gl
S2rg
S3r
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 Land parcel with No's
Village boundary
Micro-watershed boundary
Key
S1-Highly Suitable
S2-Moderately Suitable
S3-Marginally Suitable
Limitations
g- gravelliness
r- rooting condition
l- topography
Suitability subclass
Area in ha (%)
S1 314 (61.36)
S2g 137 (26.78)
S2gl 10 (1.90)
S2rg 20 (3.89)
S3r 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

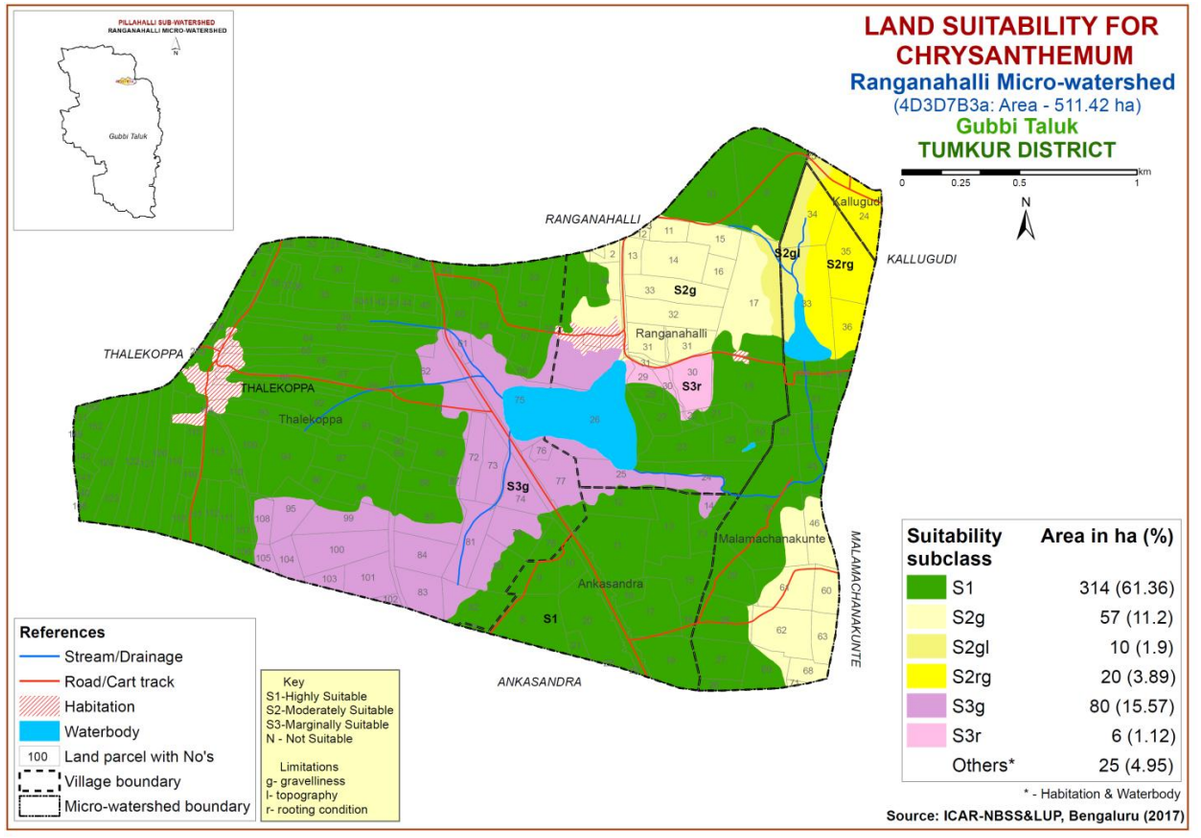

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR AMLA
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S2g
S2r
S2rl
Nes
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Key
S1-Highly Suitable
S2-Moderately Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2g 48 (13.51)
S2r 27 (7.67)
S2rl 14 (3.98)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

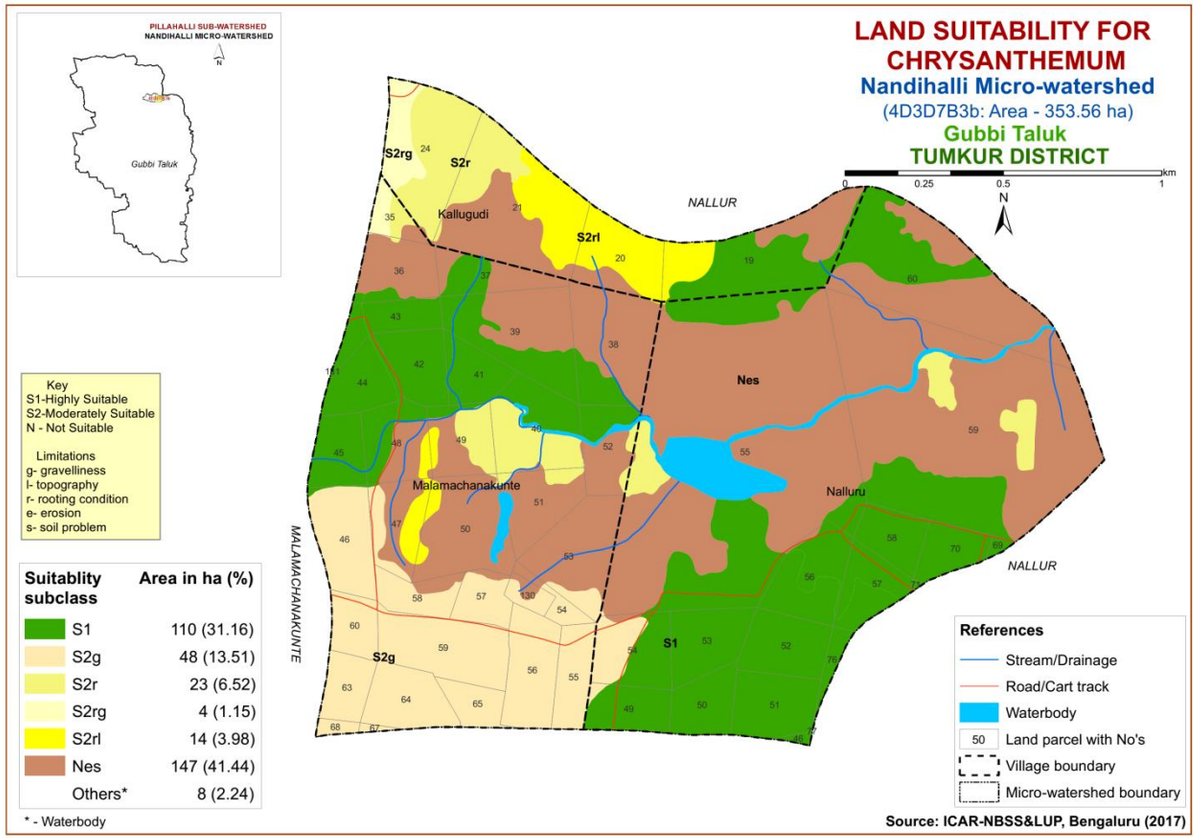

PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR TAMARIND
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2r
S3g
S3r
S3rg
Ngl
Nr
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
r- rooting condition
l- topography
Suitability subclass
Area in ha (%)
S1 246 (48.03)
S2r 51 (9.90)
S3g 88 (17.24)
S3r 18 (3.43)
S3rg 49 (9.53)
Ngl 10 (1.90)
Nr 26 (5.01)
Others* 25(4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)

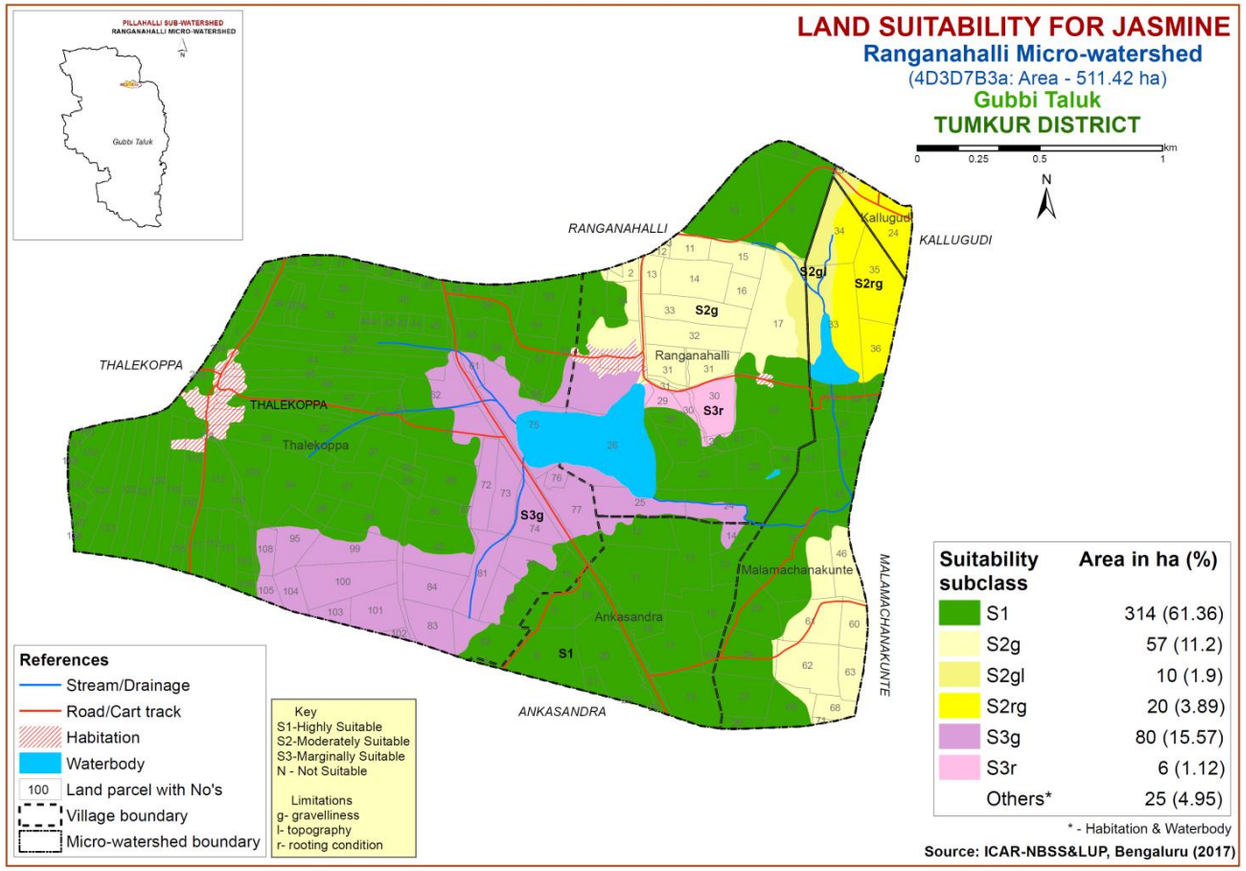

PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR TAMARIND
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S3g
S3rl
Nr
Nes
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Key
S1-Highly Suitable
S3-Marginally Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S3g 48 (13.51)
S3rl 12 (3.26)
Nr 30 (8.40)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)


PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR MARIGOLD
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Ankasandra
Malamachanakunte
S1
S2g
S2gl
S2rg
S3g
S3r
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
Suitability subclass
Area in ha (%)
S1 314 (61.36)
S2g 57 (11.2)
S2gl 10 (1.9)
S2rg 20 (3.89)
S3g 80 (15.57)
S3r 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)


PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR MARIGOLD
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nallur
S1
S2g
S2r
S2rg
S2rl
Nes
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Key
S1-Highly Suitable
S2-Moderately Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2g 48 (13.51)
S2r 23 (6.52)
S2rg 4 (1.15)
S2rl 14 (3.98)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)


PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR CHRYSANTHEMUM
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Ankasandra
Malamachanakunte
S1
S2g
S2gl
S2rg
S3g
S3r
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
Suitability subclass
Area in ha (%)
S1 314 (61.36)
S2g 57 (11.2)
S2gl 10 (1.9)
S2rg 20 (3.89)
S3g 80 (15.57)
S3r 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)


PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR CHRYSANTHEMUM
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nallur
S1
S2g
S2r
S2rg
S2rl
Nes
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Key
S1-Highly Suitable
S2-Moderately Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2g 48 (13.51)
S2r 23 (6.52)
S2rg 4 (1.15)
S2rl 14 (3.98)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)


PILLAHALLI SUB-WATERSHED
RANGANAHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR JASMINE
Ranganahalli Micro-watershed
(4D3D7B3a: Area - 511.42 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
RANGANAHALLI
KALLUGUDI
THALEKOPPA
ANKASANDRA
MALAMACHANAKUNTE
Kallugudi
Ranganahalli
Thalekoppa
Malamachanakunte
Ankasandra
S1
S2g
S2gl
S2rg
S3g
S3r
References
Stream/Drainage
Road/Cart track
Habitation
Waterbody
100 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
l- topography
r- rooting condition
Suitability subclass
Area in ha (%)
S1 314 (61.36)
S2g 57 (11.2)
S2gl 10 (1.9)
S2rg 20 (3.89)
S3g 80 (15.57)
S3r 6 (1.12)
Others* 25 (4.95)
* - Habitation & Waterbody
Source: ICAR-NBSS&LUP, Bengaluru (2017)


PILLAHALLI SUB-WATERSHED
NANDIHALLI MICRO-WATERSHED
Gubbi Taluk
LAND SUITABILITY FOR JASMINE
Nandihalli Micro-watershed
(4D3D7B3b: Area - 353.56 ha)
Gubbi Taluk
TUMKUR DISTRICT
0 0.25 0.5 1 km
N
NALLUR
MALAMACHANAKUNTE
Kallugudi
Malamachanakunte
Nalluru
S1
S2g
S2r
S2rg
S2rl
Nes
Key
S1-Highly Suitable
S2-Moderately Suitable
N - Not Suitable
Limitations
g- gravelliness
l- topography
r- rooting condition
e- erosion
s- soil problem
Suitablity subclass
Area in ha (%)
S1 110 (31.16)
S2g 48 (13.51)
S2r 23 (6.52)
S2rg 4 (1.15)
S2rl 14 (3.98)
Nes 147 (41.44)
Others* 8 (2.24)
* - Waterbody
References
Stream/Drainage
Road/Cart track
Waterbody
50 Land parcel with No's
Village boundary
Micro-watershed boundary
Source: ICAR-NBSS&LUP, Bengaluru (2017)

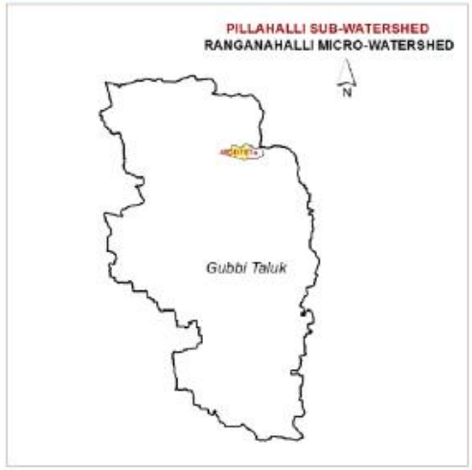
LAND MANAGEMENT UNITS

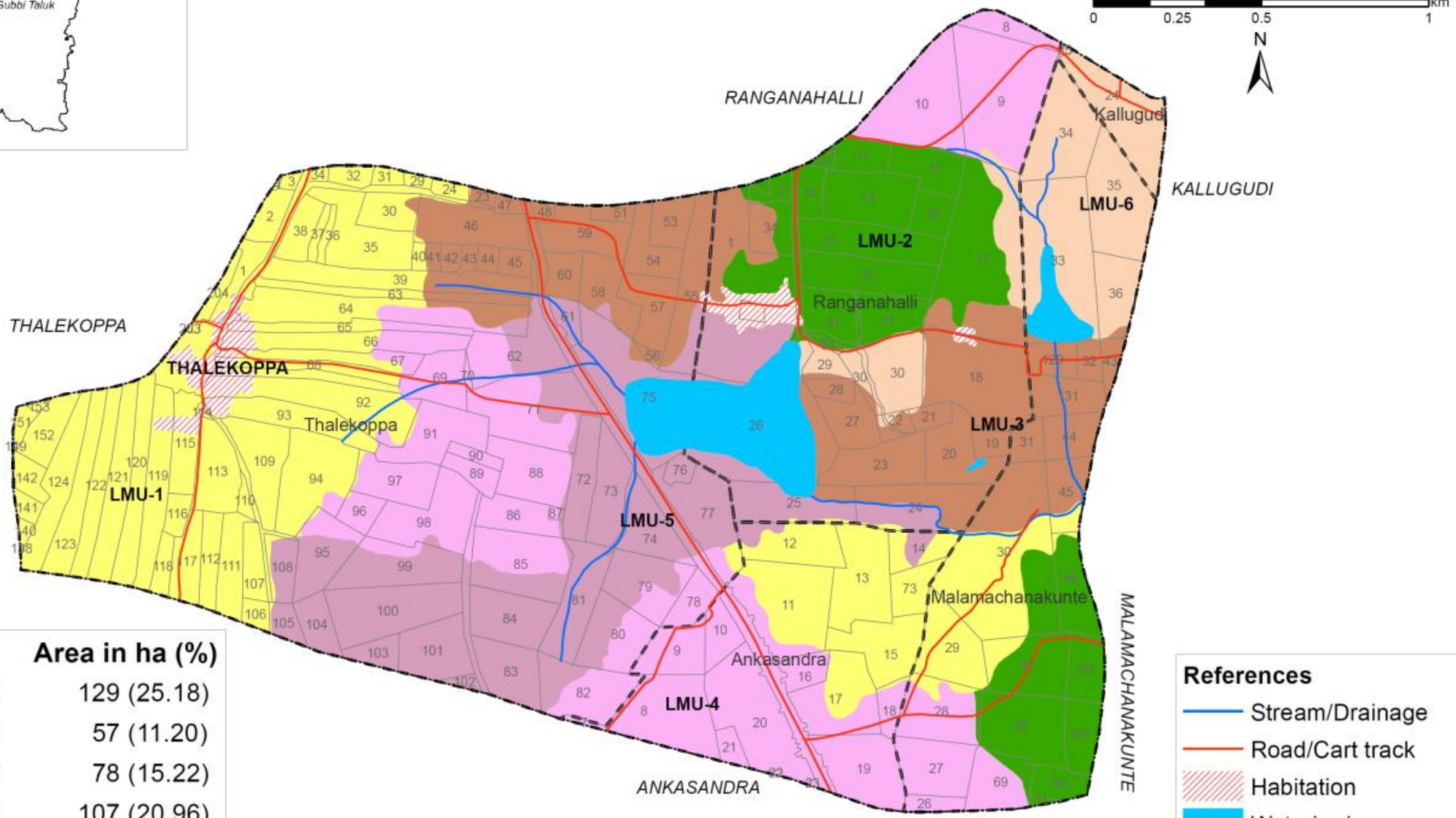
Ranganahalli Micro-watershed

(4D3D7B3a: Area - 511.42 ha)

Gubbi Taluk

TUMKUR DISTRICT





LMU	Area in ha (%)
LMU-1	129 (25.18)
LMU-2	57 (11.20)
LMU-3	78 (15.22)
LMU-4	107 (20.96)
LMU-5	80 (15.57)
LMU-6	35 (6.91)
Others*	25 (4.95)

* - Habitation & Waterbody

References

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

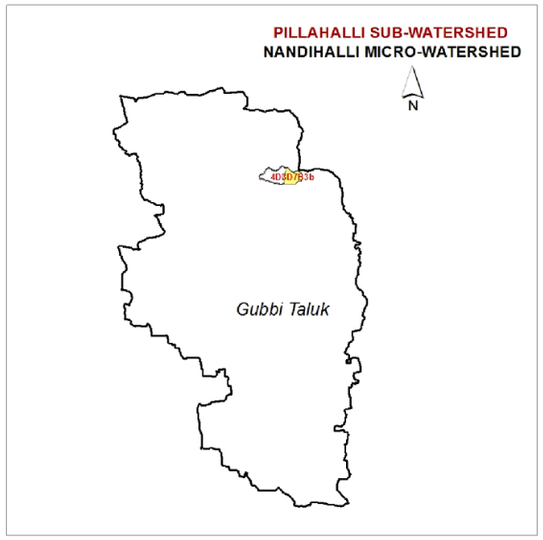
Source: ICAR-NBSS&LUP, Bengaluru (2017)

Table 3. Proposed Crop Plan for Ranganahalli Micro-watershed, Pillahalli Sub-watershed Gubbi Taluk, Tumkur District based on soil-site–crop suitability Assessment

LMU No	Mapping Units	Survey Number	Field Crops	Forestry/Grasses	Horticulture Crops with suitable interventions	Suitable Interventions
LMU1 (129 ha.)	10,11,12, 13, 14 Very deep (>150 cm), red clayey soils	Ankasandra: 11,12,13,14,15,73 Malamachanakunte: 29,30 Thalekoppa: 1,2,3,4,24,29,30,31,32,34,35,36,37, 38,39,40, 63,64,67,68,92,93,94, 106,107,109,110,111,112,113,114, 115,116,117,118,119,120,121,122, 123,124,138,140,141,142,149,151, 152,153, 203,204	**Sole crops:** Ragi, Upland paddy, Maize, Sorghum, Fodder sorghum, Sunflower, Groundnut, Redgram, Fieldbean, Cowpea **Intercropping:** Redgram+Fodder sorghum Ragi+Cowpea Ragi+Redgram Ragi+Fieldbean	Neem, Silver Oak **Grasses** *Styloxanthes hamata*, *Styloxanthes Scabra*, Hybrid Napier, Sesbania,	**Vegetables**: Onion, Tomato, Brinjal Chillies, Coriander, Drumstick **Flower crops:** Chrysanthemum, Jasmine, China aster, Marigold, Crossandra **Fruit crops/ Plantation crops:** Mango, Sapota, Guava, Cashew, Pomegranate Jackfruit, Musambi,Arecanut, Coconut	Summer ploughing, cultivation on raised beds with mulches, Drip irrigation and suitable conservation practices (Crescent Bunding with Catch Pit etc)
LMU 2 (57 ha.)	15, 16 Very deep (>150 cm), gravelly red clayey soils	Malamachanakunte: 46,60,61,62,63,68,71 Ranganahalli: 2,3,11,12,13,14,15,16,17,31,32,33	**Sole crops:** Ragi, Upland paddy, Maize, Sorghum,Fodder sorghum,Redgram, Fieldbean, Cowpea **Intercropping:** Redgram+Fodder sorghum Ragi+Cowpea Ragi+Redgram Ragi+Fieldbean	Neem, Silver Oak **Grasses** *Styloxanthes hamata*, *Styloxanthes Scabra*, Hybrid Napier, Sesbania,	**Vegetables**:Onion,Tomato,BrinjalChillies,Coriander,Drumstick **Flowercrops:** Chrysanthemum,Jasmine, China aster, Marigold **Fruit crops/ Plantation crops:**Mango,Sapota,Guava, Cashew,Custardapple,Amla,Pomegranate Jackfruit,Musambi, Arecanut,Coconut	Drip irrigation, Mulching, suitable conservation practises (Crescent Bunding with Catch Pit etc)
LMU 3 (78 ha.)	17,18 Very deep (>150 cm), black clayey soils	Malamachanakunte: 31,32,43,44,45,129,131 Ranganahalli: 18,19,20,21,22,23,24,27,28,34 Thalekoppa: 23,41,42,43,44,45,46,47,48,51,53, 54,55,56,57,58,59,60	**Sole crops**: Sorghum, Sunflower, Fodder sorghum, Redgram, Field bean, Horse gram **Intercropping:** Redgram+Fodder sorghum	Hebbevu, Silveroak **Grasses:** *Styloxanthes hamata*, *Styloxanthes scabra*, Hybrid napier	**Vegetables:** Brinjal, Tomato, chillies, Cucurbits **Flower crops:** Marigold, Chrysanthemum **Fruit crops:** Pomegranate, Tamarind, Custard Apple, Amla, Lime, Musambi Arecanut, Coconut	Application of FYM and micronutrients, drip irrigation, Mulching, suitable conservation practises

To be continued..

LMU No	Mapping Units	Survey Number	Field Crops	Forestry/Grasses	Horticulture Crops with suitable interventions	Suitable Interventions
LMU 4 (107 ha.)	7, 8, 4 Moderately deep to deep (75-150 cm), red clay to loamy soils	Ankasandra: 7,8,9,10,16,17,18,19,20,21,22, 23 Malamachanakunte: 26,27,28,69 Ranganahalli: 8,9,10 Thalekoppa: 65,66,69,70,71,78,82,85,86,87 ,88,89,90,91,96,97,98	**Sole crops**: Upland paddy, Ragi, Maize, Sorghum, Groundnut, Sunflower, Fieldbean, Cowpea, Fodder sorghum **Intercropping:** Redgram+Fodder sorghum Ragi+Cowpea Ragi+Redgram	Glyricidia, Subabul, Hebbevu **Grasses:** *Styloxanthes hamata, Styloxanthes scabra*, Hybrid napier	**Vegetables:** Onion, Tomato, chillies Brinjal, Cucurbits **Flower crops:** Chrysanthemum, Jasmine, Crossandra, China aster **Fruit crops/ Plantation crops:** Musambi, Sapota, Pomegranate,Banana,Amla,LimeArecanut,Coconut	Drip irrigation, Mulching, suitable conservation practises (Crescent Bunding with Catch Pit etc)
LMU 5 (80 ha.)	5,6,9 Moderately deep to deep (75-150 cm), red gravelly clayey soils	Ranganahalli: 1,25 Thalekoppa: 61,62,72,73,74,75,76,77,79,80 ,81,83,84,95,99,100,101,102, 103, 104,105,108	**Sole crops**: Upland paddy, Ragi, Maize, Sorghum, Groundnut, Fieldbean, Cowpea, Fodder sorghum, Horsegram	Glyricidia, **Grasses:** *Styloxanthes hamata, Styloxanthes scabra*, Hybrid Napier	**Vegetables:**Tomato,Brinjal,Drumstick, Chillies, Curry leaf **Flowercrops:** Chrysanthemum,Marigold,Crossandra **Fruitcrops/Plantationcrops:** Tamarind,CustardApple,Amla,Lime, Musambi	Drip irrigation, Mulching, suitable conservation practises (Crescent Bunding with Catch Pit etc)
LMU 6 (35 ha.)	1, 2, 3 Shallow to moderately shallow (25-75 cm), red loamy soils	Kallugudi: 24,25 Malamachanakunte: 33,34,35,36 Ranganahalli: 29,30	**Sole crops:** Maize, Ragi, Groundnut, Fodder sorghum, Cowpea, Horsegram	Glyricidia, **Grasses** *Styloxanthes hamata, Styloxanthes scabra*	**Vegetables:** Tomato, Onion, Chillies, Curryleaf, **Fruit crops:** Custard apple, Amla, Bael	Use of medium duration varieties, and deep rooted crops, sowing across the slope, drip irrigation and mulching is recommended



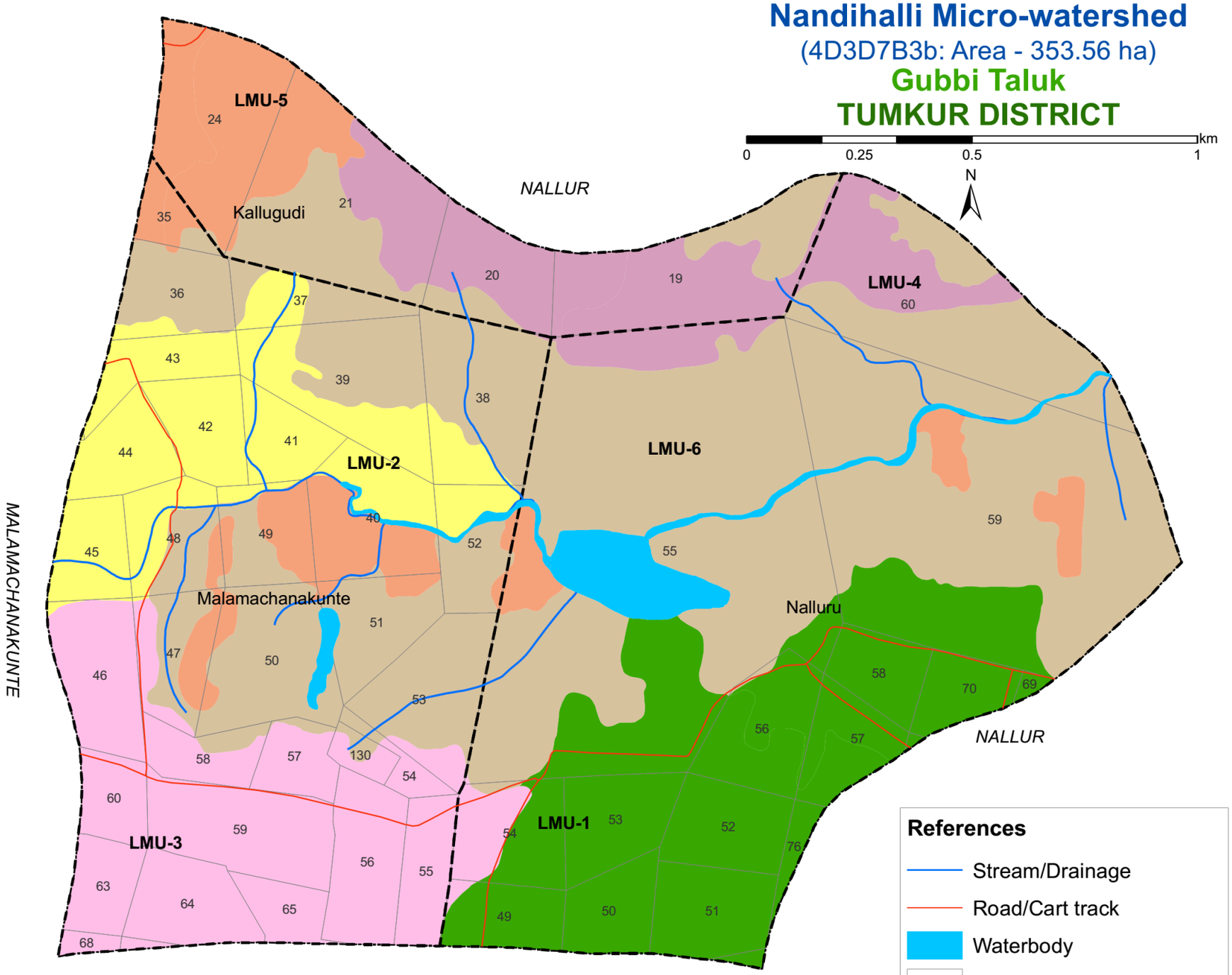
LAND MANAGEMENT UNITS

Nandihalli Micro-watershed

(4D3D7B3b: Area - 353.56 ha)

Gubbi Taluk

TUMKUR DISTRICT



LMU	Area in ha (%)
LMU-1	59 (16.67)
LMU-2	34 (9.71)
LMU-3	48 (13.51)
LMU-4	28 (8.03)
LMU-5	30 (8.40)
LMU-6	147 (41.44)
Others*	8 (2.24)

* - Waterbody

References

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

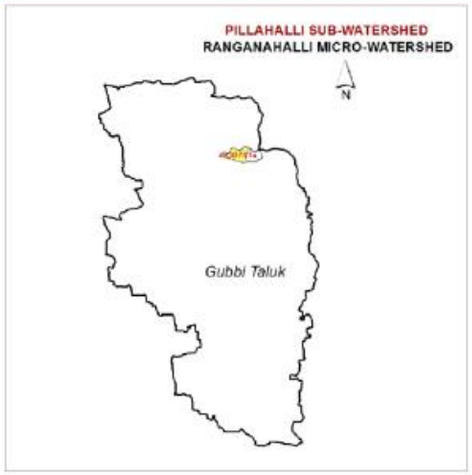
Source: ICAR-NBSS&LUP, Bengaluru (2017)

Table 4 . Proposed Crop Plan for Nandihalli Micro-watershed, Pillahalli Sub-watershed Gubbi Taluk, Tumkur District based on soil-site–crop suitability Assessment

LMU No	Mapping Units	Survey Number	Field Crops	Forestry/Grasses	Horticulture Crops with suitable interventions	Suitable Interventions
LMU1 (59 ha.)	7,8 Very deep (>150 cm), red clayey soils	Nalluru: 46,49,50,51,52,53,54,56 ,57,58,69,70,71,76,77	**Sole Crops:** Ragi, Upland paddy, Maize, Sorghum, Fodder sorghum, Sunflower, Groundnut, Redgram, Fieldbean, Cowpea **Intercropping:** Redgram+Fodder sorghum, Ragi +Cowpea Ragi+Redgram Ragi+Fieldbean	Neem, Silver Oak **Grasses** *Styloxanthes hamata, Styloxanthes Scabra*, Hybrid Napier, Sesbania,	**Vegetables**: Onion, Tomato, Brinjal Chillies, Coriander, Drumstick **Flower crops:** Chrysanthemum, Jasmine, China aster, Marigold, Crossandra **Fruit crops/ Plantation crops:** Mango, Sapota, Guava, Cashew, Pomegranate, Jackfruit, Musambi, Arecanut, Coconut	Drip irrigation, Mulching, suitable conservation practices (Crescent Bunding with Catch Pit etc)
LMU 2 (34 ha.)	10,11,12 Very deep (>150cm), black clayey soils	Malamachanakunte: 41,42,43,44,45,48,131	**Sole crops**: Sorghum, Sunflower, Fodder sorghum, Redgram, Field bean, Horse gram **Intercropping:** Redgram+Fodder sorghum	Hebbevu, Silveroak **Grasses:** *Styloxanthes hamata*, *Styloxanthes scabra*, Hybrid napier	**Vegetables:** Brinjal, Tomato, chillies, Cucurbits **Flower crops:** Marigold, Chrysanthemum **Fruit crops:** Pomegranate, Tamarind, Custard Apple, Amla, Lime, Musambi Arecanut, Coconut	Application of FYM and micronutrients, drip irrigation, mulching, use of medium duration varieties, suitable conservation practises
LMU 3 (48 ha.)	9 Very deep (>150 cm), gravelly red clayey soils	Malamachanakunte: 46,54,55,56,57,58,59,60 ,63,64,65,67,68,130	**Sole Crops:** Ragi, Upland paddy, Maize, Sorghum, Fodder sorghum, Groundnut, Redgram, Fieldbean, Cowpea **Intercropping:** Redgram+Fodder sorghum Ragi+Cowpea Ragi+Redgram Ragi+Fieldbean	Neem, Silver Oak **Grasses** *Styloxanthes hamata, Styloxanthes Scabra*, Hybrid Napier, Sesbania,	**Vegetables**: Onion, Tomato, Brinjal Chillies, Coriander, Drumstick **Flower crops:** Chrysanthemum, Jasmine, China aster, Marigold **Fruit crops/ Plantation crops:** Mango, Sapota, Guava, Cashew, Custard apple, Amla, Pomegranate Jackfruit, Musambi, Arecanut, Coconut	Drip irrigation, Mulching, suitable conservation practices (Crescent Bunding with Catch Pit etc)

To be continued..

LMU No	Mapping Units	Survey Number	Field Crops	Forestry/Grasses	Horticulture Crops with suitable interventions	Suitable Interventions
LMU 4 (28 ha.)	5, 6 Moderately deep to deep (75-150 cm), red clayey soils	Kallugudi: 19,20	**Sole crops**: Upland paddy, Ragi, Maize, Sorghum, Groundnut, Sunflower, Fieldbean, Cowpea, Fodder sorghum **Intercropping:** Redgram+Fodder sorghum Ragi+Cowpea Ragi+Redgram	Glyricidia, Subabul, Hebbevu **Grasses:** *Styloxanthes hamata*, *Styloxanthes scabra*, Hybrid napier	**Vegetables:** Onion, Tomato, chillies Brinjal, Cucurbits **Flower crops:** Chrysanthemum, Jasmine, Crossandra, China aster **Fruit crops/ Plantation crops:** Musambi, Sapota, Pomegranate, Banana, Amla, Lime Arecanut, Coconut	Drip irrigation, Mulching, suitable conservation practices (Crescent Bunding with Catch Pit etc)
LMU 5 (30 ha.)	1, 2, 3, 4 Moderately shallow (50-75 cm), sandy clay to sandy clay loam soils	Kallugudi: 24 Malamachanakunte: 35,40,49	**Sole crops:** Ragi, Groundnut, Fodder sorghum, Cowpea, Horsegram	Glyricidia, **Grasses** *Styloxanthes hamata, Styloxanthes scabra*	**Vegetables:** Tomato, Onion, Chillies, Curryleaf **Fruit crops:** Custard apple, Amla, Bael	Use of short duration varieties, application of tank silt, sowing across slope and drip irrigation is recommended
LMU 6 (147 ha.)	13	Kallugudi: 21 Malamachanakunte: 36,37,38,39,47,50,51,52,53 Nalluru: 55,59,60	Gully area			Gully plugging with live hedges and earth boulders, levelling, sowing across the slope, contour bunding



SOIL & WATER CONSERVATION PLAN

Ranganahalli Micro-watershed

(4D3D7B3a: Area - 511.42 ha)

Gubbi Taluk

TUMKUR DISTRICT

0 0.25 0.5 1 km

N

RANGANAHALLI

KALLUGUDI

THALEKOPPA

ANKASANDRA

MALAMACHANAKUNTE

Kallugudi

Ranganahalli

THALEKOPPA

Thalekoppa

Malamachanakunte

Ankasandra

Legend	Area in ha (%)
Trench cum bunding	444 (86.77)
Bunding/ Strengthening of Exiting Bunds	42 (8.28)
Others*	25 (4.95)

* - Habitation & Waterbody

References

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

Source: ICAR-NBSS&LUP, Bengaluru (2017)

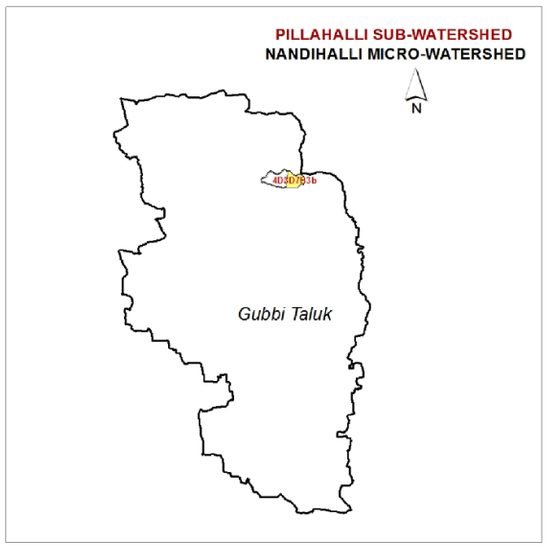
SOIL & WATER CONSERVATION PLAN

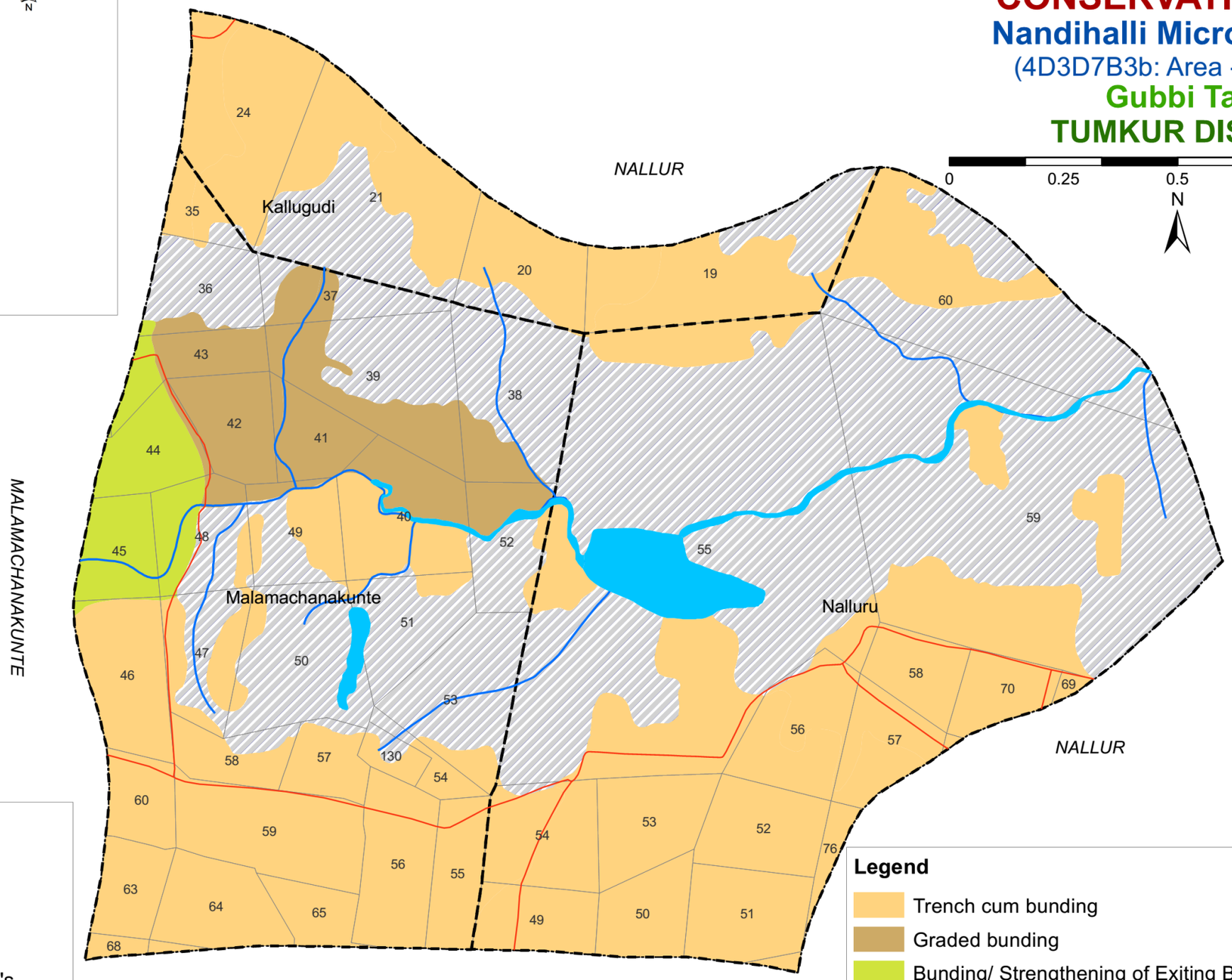
Nandihalli Micro-watershed

(4D3D7B3b: Area - 353.56 ha)

Gubbi Taluk

TUMKUR DISTRICT





References

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

Legend	Area in ha (%)
Trench cum bunding	165 (46.61)
Graded bunding	24 (6.73)
Bunding/ Strengthening of Exiting Bunds	11 (2.98)
Gully	147 (41.44)
Others*	8 (2.24)

* - Waterbody

Source: ICAR-NBSS&LUP, Bengaluru (2017)

PART - B

Hydrological Inventory of Pillahalli Sub-watershed, Sub-watershed ,Gubbi Taluk, Tumkur 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 Pillahalli Sub-watershed,Gubbi Taluk, Tumkur 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

Phone:080-23412242 **E-mail:nbssrcb@gmail.com**

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Dr. S. Srinivas	Principal Scientist
Dr. K .V. Niranjana	Chief Technical Officer
Sh. R.S.Reddy	Consultant
Sh. A.G.Devendra Prasad	Consultant
Smt. K.Karunya Lakshmi	Research Associate
Ms. Seema, K.V.	Senior Research Fellow
Dr. Sekhar Muddu (Reviewed and approved)	Professor & Lead Scientist, Dept. of Civil Engineering & ICWaR, IISc, Bangalore
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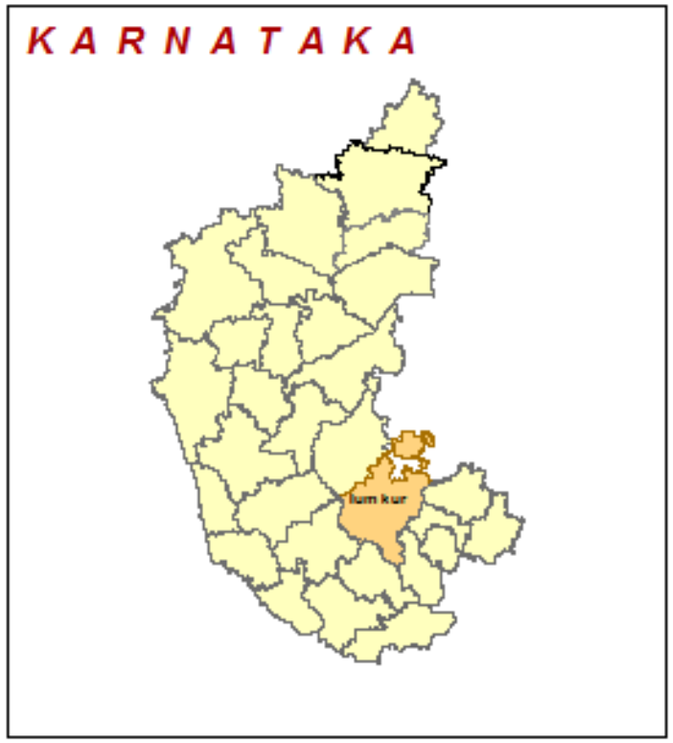
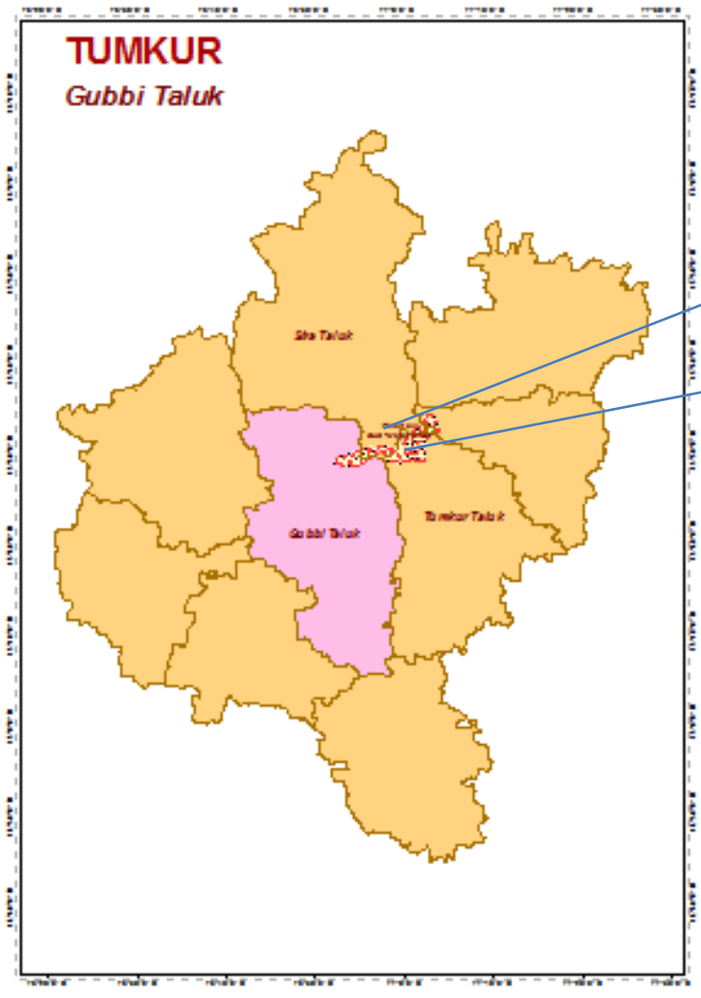
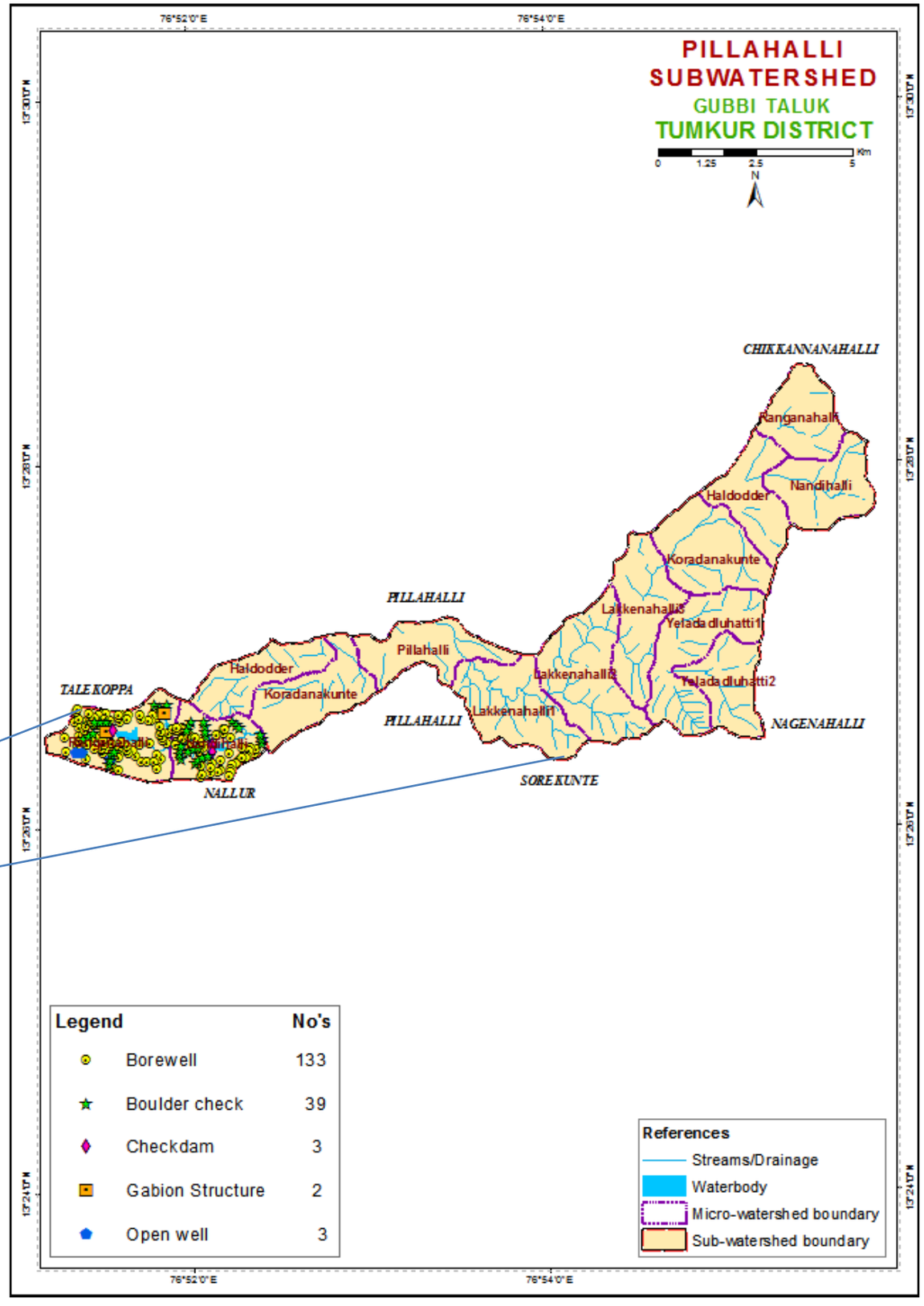
INTRODUCTION

- The inventory and documentation of spatial and temporal changes in hydrological components of Pillahalli sub-watershed (4D3D7B) in Gubbi Taluk, Tumkur District, has been undertaken for integrated planning, development and management.
- Pillahalli sub-watershed (Gubbi Taluk, Tumkur District) is located between $13^0$28’ 38”–$13^0$34’ 11” North latitudes and 76^0 52’26”- 77^0 4’22” East longitudes, covering an area of about 6428 ha.
- This sub-watershed encompasses of 14 MWs namely Haldodder (4D3D7B1c), Haldodder (4D3D7B3c), Koradanakunte (4D3D7B1d), Koradanakunte (4D3D7B3d), Lakkenahalli-1 (4D3D7B2e), Lakkenahalli-2 (4D3D7B2d), Lakkenahalli-3 (4D3D7B2c), Nandihalli (4D3D7B1b), Nandihalli (4D3D7B3b), Pillahalli (4D3D7B3e), Ranganahalli (4D3D7B1a), Ranganahalli (4D3D7B3a), Yeladadluhatti-1 (4D3D7B2b) and Yeladadluhatti-2 (4D3D7B2a). Land Resource Inventory (LRI) was generated for two among fourteen micro-watersheds .
- Average annual rainfall (1960-2014) of the Hobli (Block) pertaining to the sub-watershed is 789 mm.
- In this sub-watershed major *kharif* crops are Maize, Finger millet, Redgram , Groundnut , Sunflower, Paddy and major *rabi* crops are Sorghum.
- 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 PILLAHALLI SUB-WATERSHED

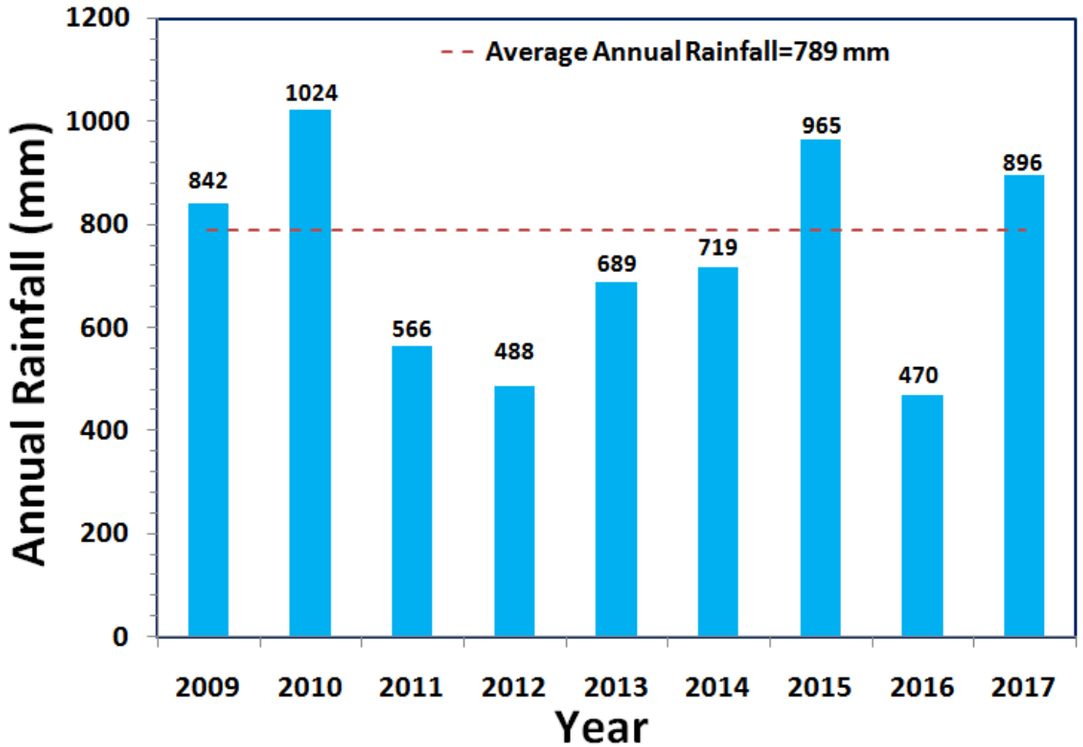






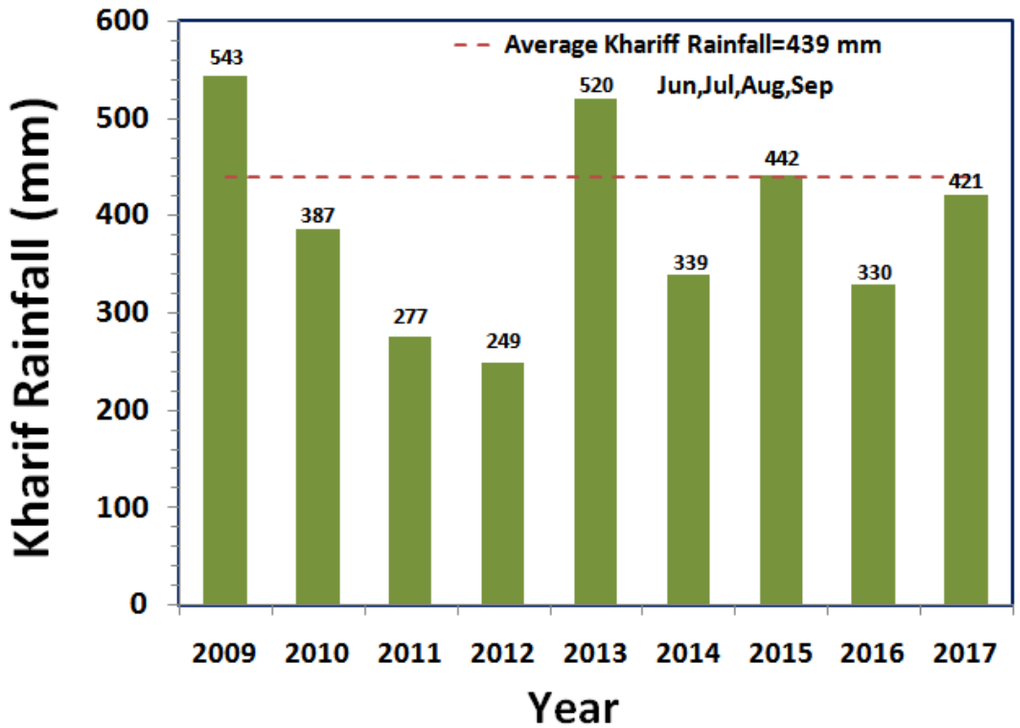
Soil & Water Conservation Structures in Pillahalli Sub-watershed, Gubbi Taluk, Tumkur District

RAINFALL INDEX

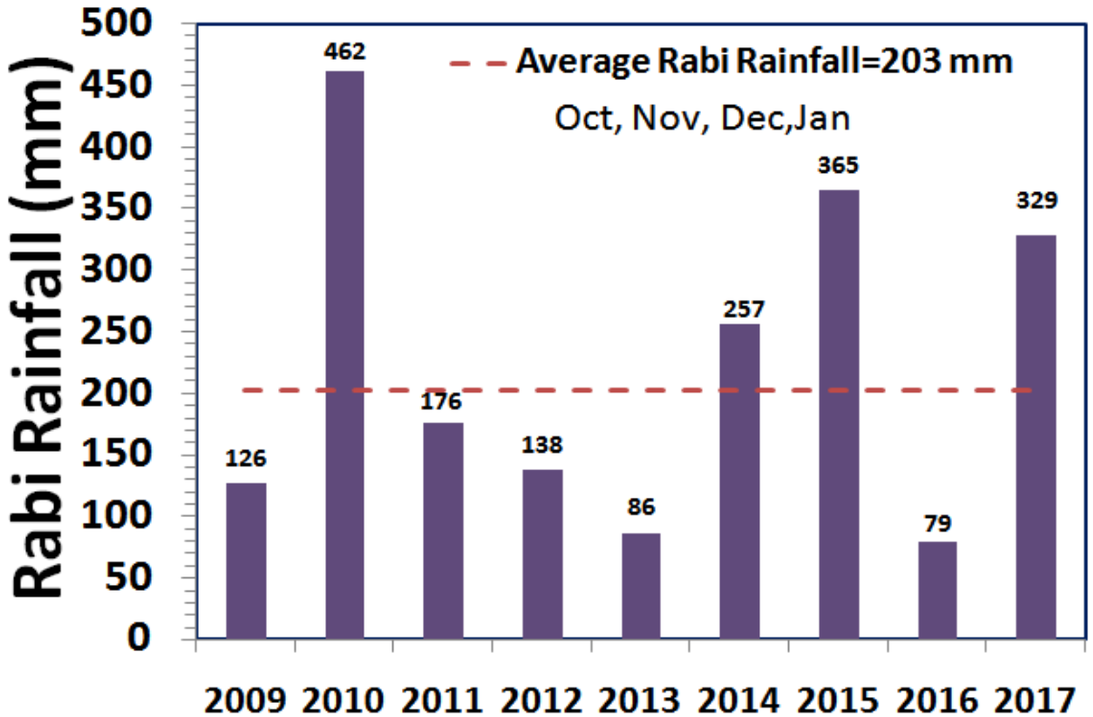


The average annual rainfall (1960-2014) recorded at the Gubbi station in Gubbi taluk of Tumkur district is 789 mm. The annual rainfall at Chellur station (Hobli H.Q.) is presented. During the years 2011, 2012, 2013, 2014 and 2016 the annual rainfall was deficient by 28%, 38%, 13%, 9% and 40% respectively.

The *kharif* rainfall (Jun–Sep) is an average about 54% of the annual rainfall and it typically follows the annual rainfall patterns.

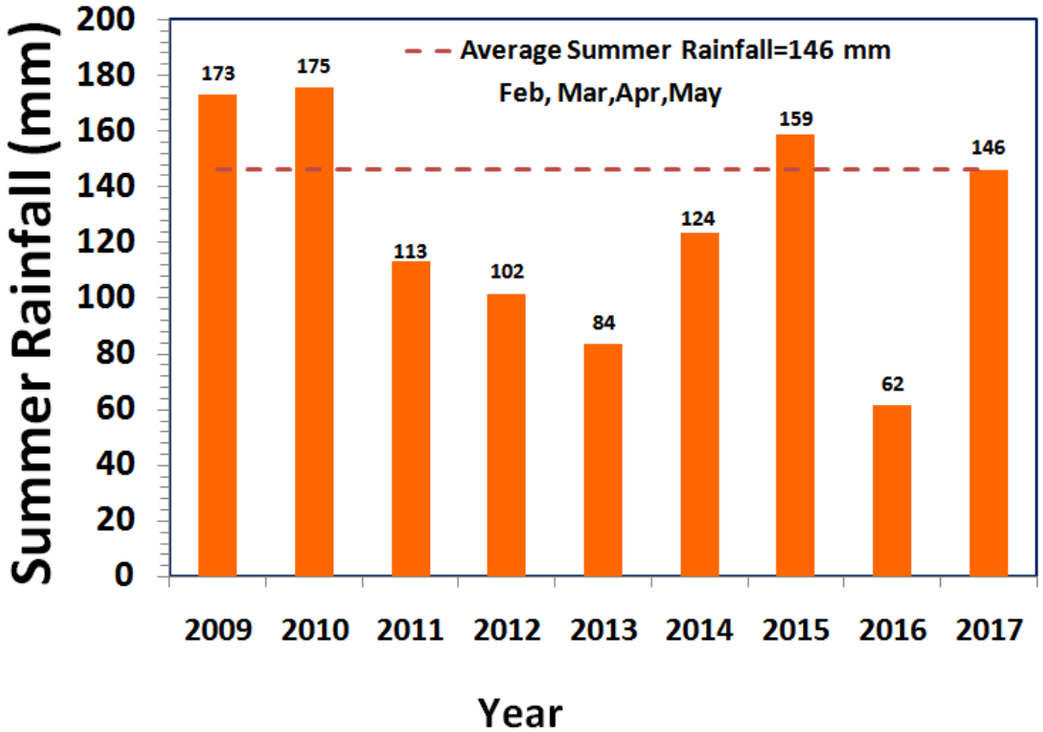


RAINFALL INDEX

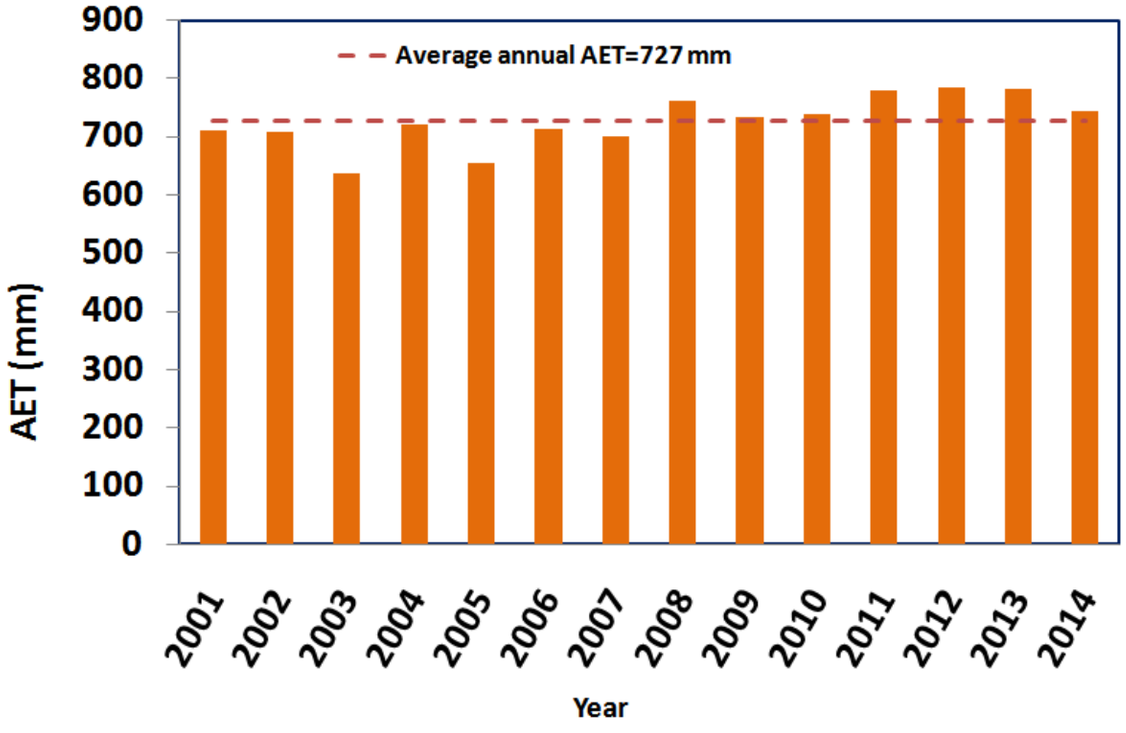


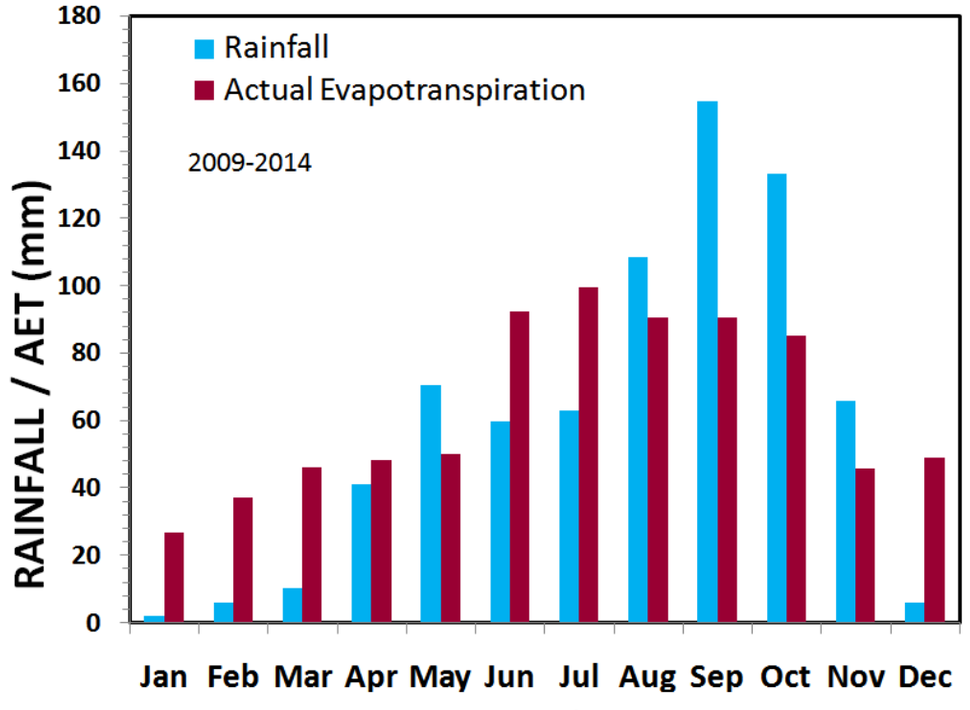
The average *rabi* rainfall (Oct-Jan) is about 29% of the Average annual rainfall. During the years 2010,2014,2015 and 2017 high rabi rainfall was received, where as other years showed deficient rainfall.

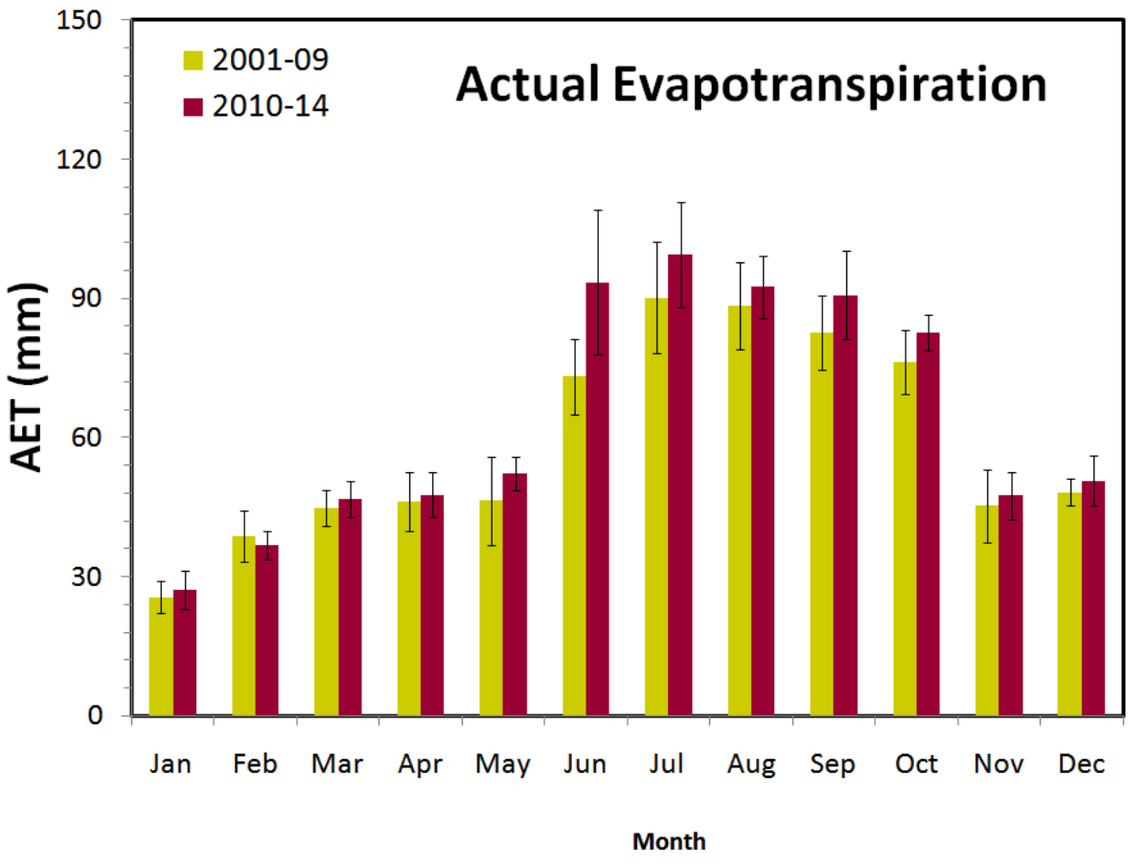
The average summer rainfall (Feb-May) is about 17% of the average annual rainfall.



EVAPOTRANSPIRATION

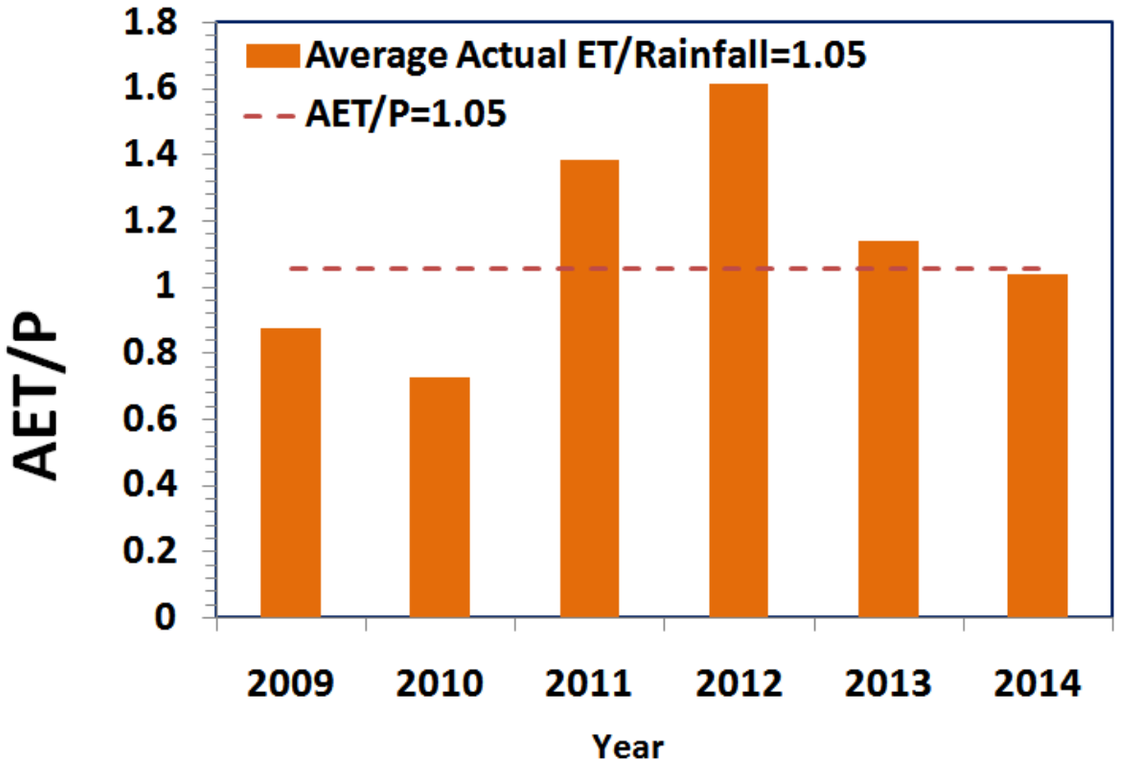


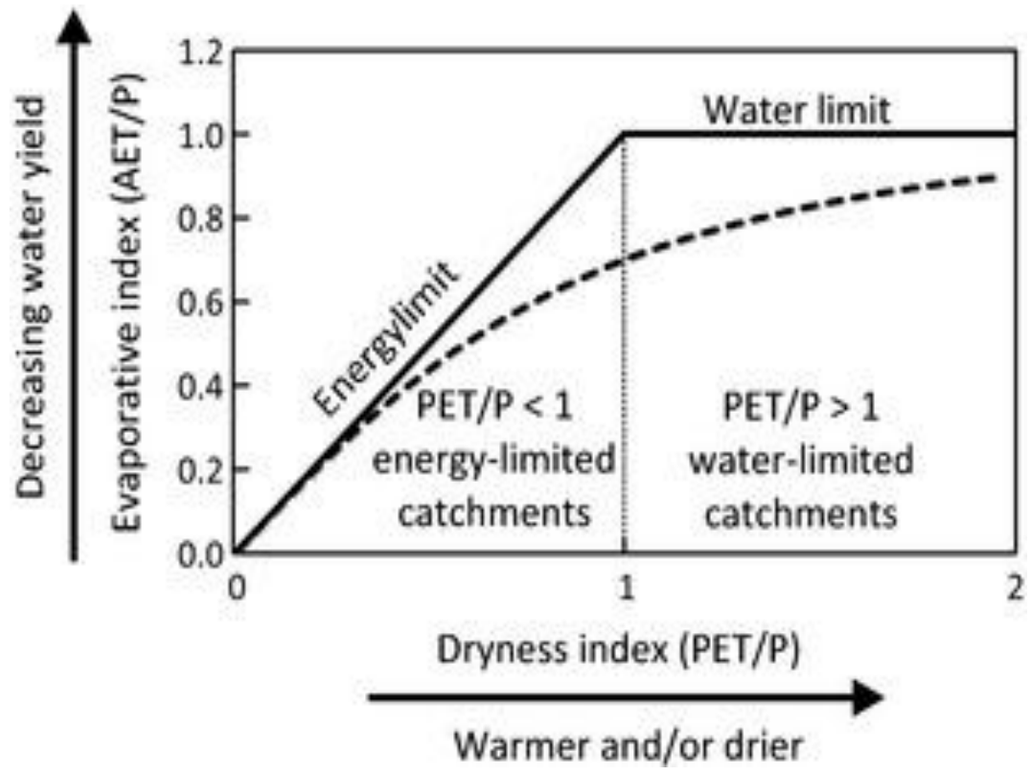




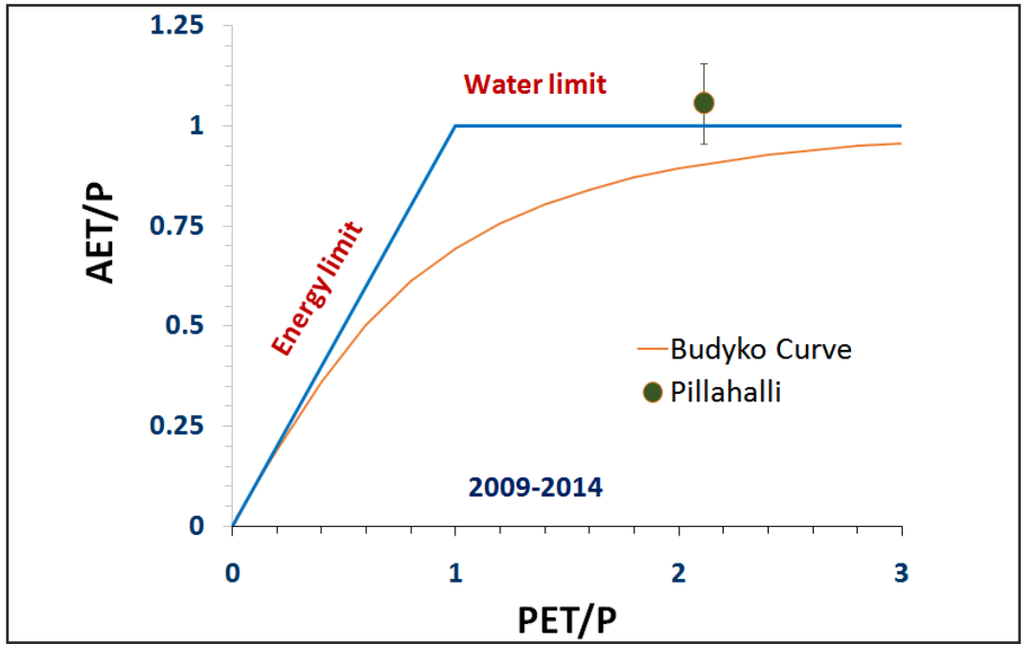
The average annual actual ET is lower than the average rainfall. During *kharif*, average rainfall and AET was found to be 439 mm and 373 mm respectively, whereas in *rabi* it was about 203 mm and 207 mm. The annual ET increased by 8% during 2010-2014 compared to 2001-2009 .

EVAPOTRANSPIRATION INDEX

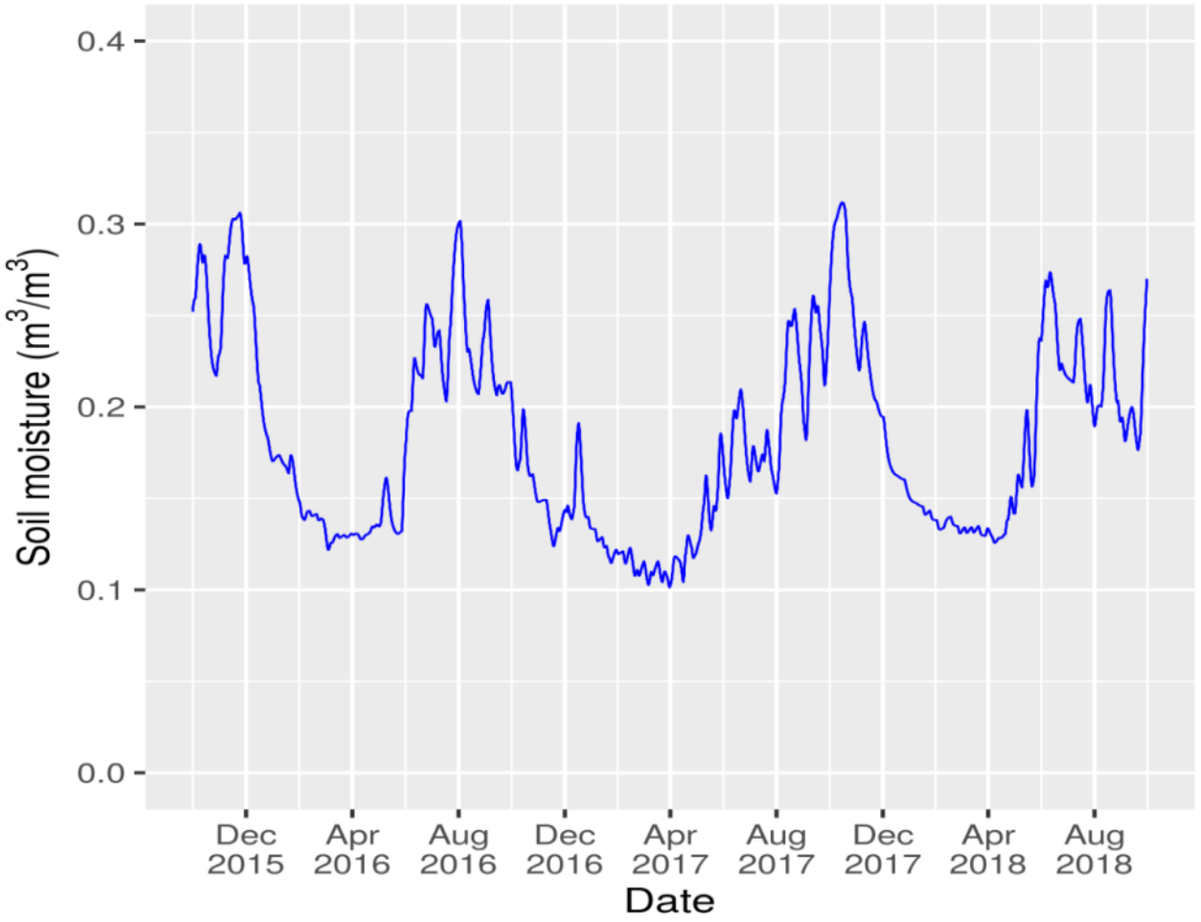




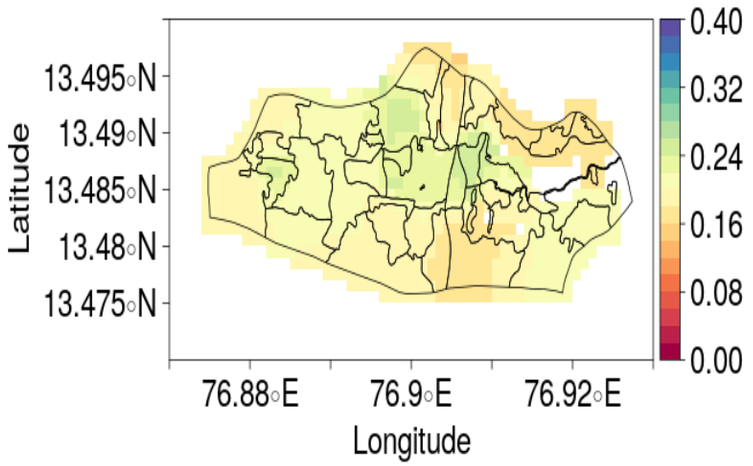
The average AET/P ratio was about 105%, which is higher than the sustainable limit of about 80%. Even during extremely lower rainfall year of 2012, AET was 730 mm. This suggests the presence of water storage and utilization from other sources such as groundwater, which buffered the lower rainfall.



SATELLITE RETRIEVED SOIL MOISTURE

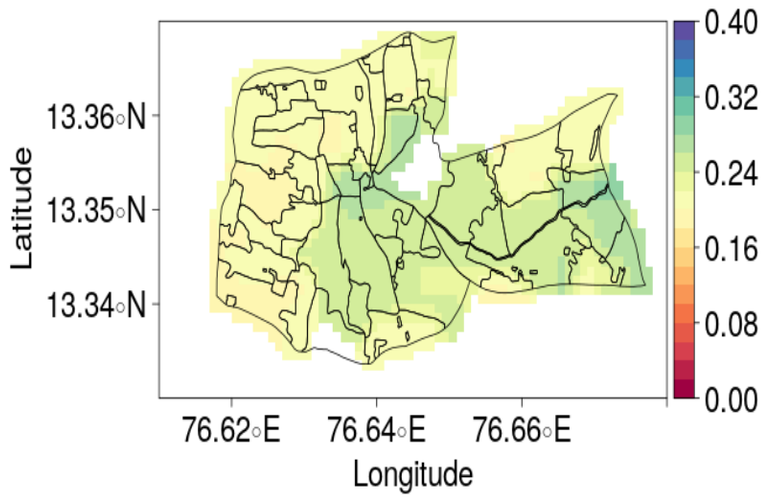


Pillahalli– *rabi* Soil Moisture



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 19-21 % in *kharif* and 18-22% in *rabi* seasons of 2016 and 18-26 % in *Kharif* and 14-30% in *rabi* seasons of 2017.

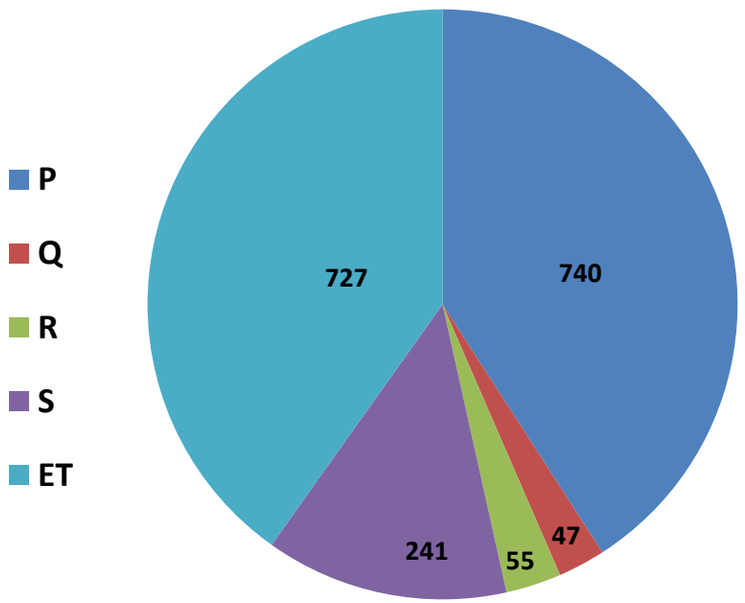
Pillahalli– *kharif* Soil Moisture



WATER BALANCE

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

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

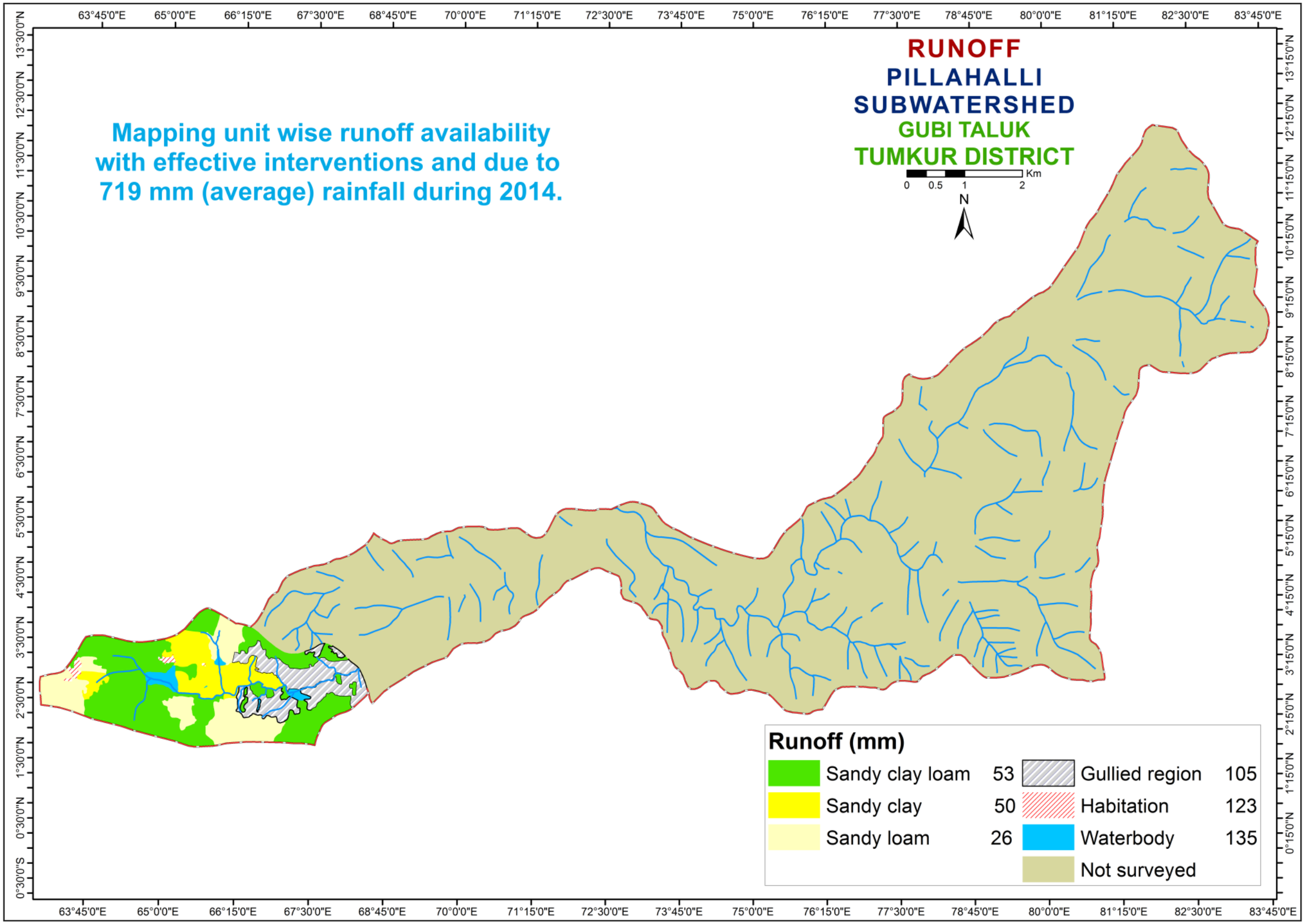


During August-November months, Precipitation is higher than Evapotranspiration, hence Runoff can occur in the watershed.

P = 740 mm (average of 2009-2017) ET = 727 mm R = 55 mm S = 241 mm Q = 47 mm

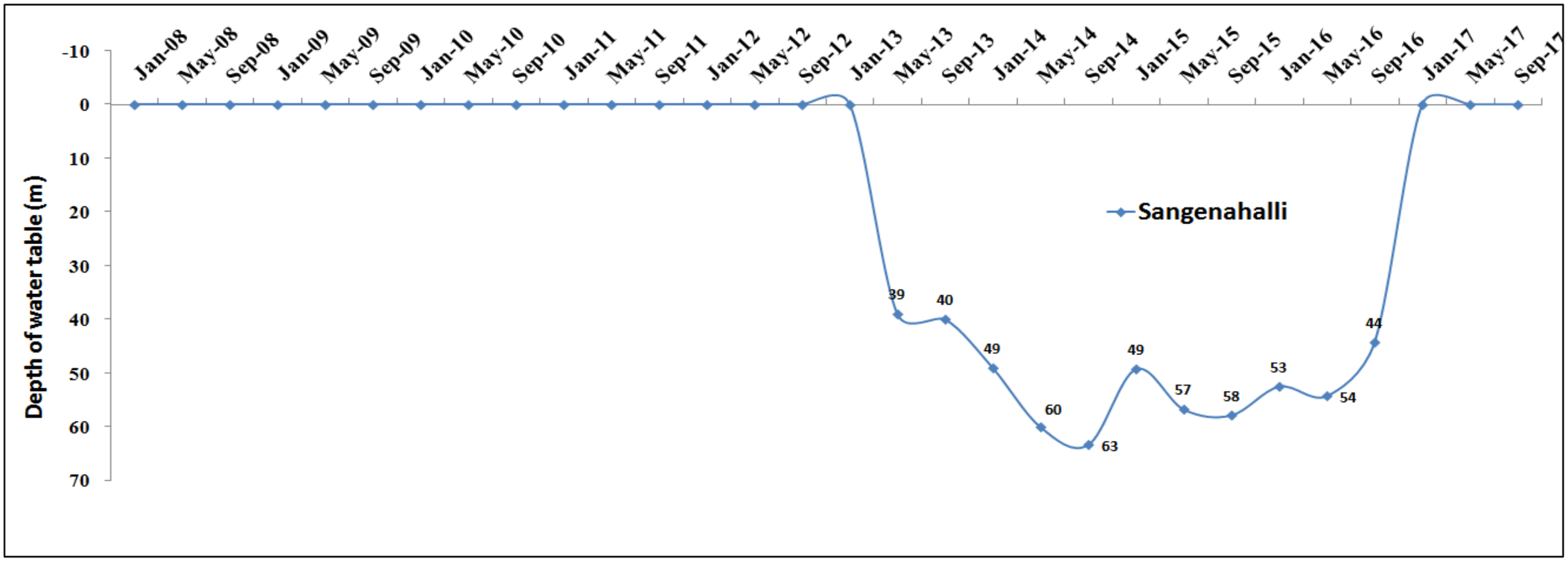
Sl. No.	Parameters	Average_ 2014 (mm)
1.	Rainfall	719
2.	Runoff availability with existing conditions	92
3.	Runoff availability with effective interventions	59
4.	Runoff allowed as environmental flow at the outlet	12
5.	Runoff excess for harvesting by construction of structures	47

RUNOFF


RUNOFF
PILLAHALLI
SUBWATERSHED
GUBI TALUK
TUMKUR DISTRICT
Km
0 0.5 1 2
N
Mapping unit wise runoff availability with effective interventions and due to 719 mm (average) rainfall during 2014.
Runoff (mm)
Sandy clay loam 53
Sandy clay 50
Sandy loam 26
Gullied region 105
Habitation 123
Waterbody 135
Not surveyed
63°45'0"E
65°0'0"E
66°15'0"E
67°30'0"E
68°45'0"E
70°0'0"E
71°15'0"E
72°30'0"E
73°45'0"E
75°0'0"E
76°15'0"E
77°30'0"E
78°45'0"E
80°0'0"E
81°15'0"E
82°30'0"E
83°45'0"E
13°30'0"N
12°30'0"N
11°30'0"N
10°30'0"N
9°30'0"N
8°30'0"N
7°30'0"N
6°30'0"N
5°30'0"N
4°30'0"N
3°30'0"N
2°30'0"N
1°30'0"N
0°30'0"N
0°30'0"S

GROUND WATER STATUS

SANGENAHALLI STATION



The total number of wells present in Pillahalli Sub-watershed as per LRI data is 136 (133-Borewells and 3-Open wells). The groundwater level shown above is from the data obtained from Dept. of Mines & Geology for the nearest station Sangenahalli. The graph depicts the groundwater levels during the years 2008-2012 and 2017 were constant, where as during the years 2013-2016 were slightly varying.

SUMMARY

- The average annual rainfall of 789 mm in the Pillahalli sub-watershed as recorded from the Chellur station data.

- 54%, 29% and 17% 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 47 mm for an average annual rainfall of 740 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 (241 mm) and utilizable runoff plus recharge is 326 (=241+47+38)

- The average actual evapotranspiration estimated in the watershed based on the current land use and irrigation practices for the kharif and rabi seasons is 580 mm. Hence the amount of water use for kharif and rabi seasons may be estimated as 725 mm (i.e. 125% of AET). This demand for the two seasons is higher by 399 mm, i.e. (725-326). The AET in June-Sept months is 97% of rainfall. Hence, there is slightly less opportunity to harvest the excess water through watershed management practices for utilizing during rabi season.

- The total number of wells present in Pillahalli Sub-watershed as per LRI data is 136 (133-Borewells and 3-Open wells). The groundwater level shown above is from the data obtained from Dept. of Mines & Geology for the nearest station Sangenahalli.