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

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

ICAR - National Bureau of Soil Survey and Land Use Planning, 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 optimizing land use on different kinds of soils in the country.

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

Citation: Rajendra Hegde, B.A. Dhanorkar, S. Srinivas, K.V. Niranjana, R.S.Reddy and S.K. Singh (2019). “Land Resource and Hydrological Inventory of Ajalapur Sub-watershed for Watershed Planning and Development, Yadgir Taluk, Yadgir District, Karnataka”, Sujala SWs-LRI Atlas No. 16, ICAR – NBSS & LUP, RC, Bangalore. p.63.

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PART-A

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

Yadgir Taluk, Yadgir District, Karnataka (AESR 6.2)

CONTENTS

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How to read and use the Atlas

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

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

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

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

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

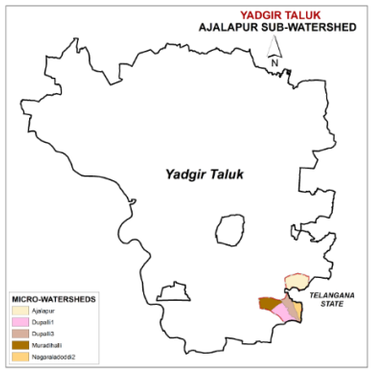
For easy map reading and understanding the information contain in different maps, the physical, cultural and scientific symbols used in the maps are illustrated in the form of colors, graphics and tables.

Physical, Cultural and Scientific symbols used in the Atlas

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

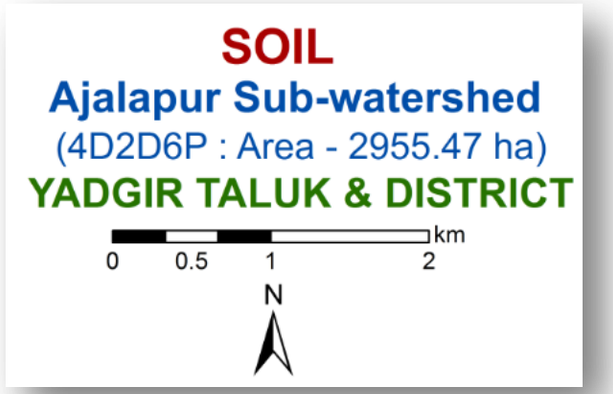
Inset map

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



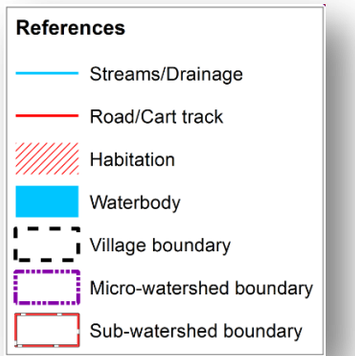
Map title

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



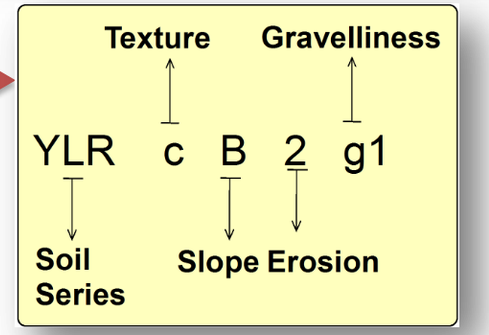
Legends and symbols

*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.*



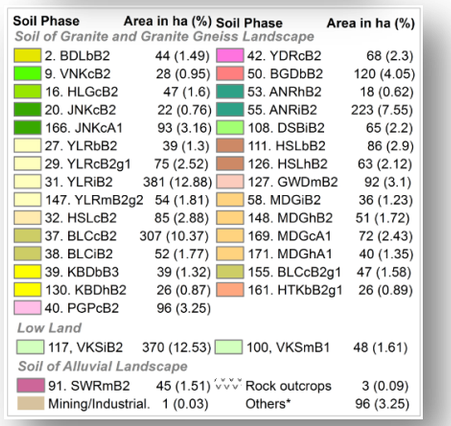
Soil Units

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 (%)	Soil Phase	Area in ha (%)
Soil of Granite and Granite Gneiss Landscape			
2. BDLbB2	44 (1.49)	42. YDRcB2	68 (2.3)
9. VNKcB2	28 (0.95)	50. BGDbB2	120 (4.05)
16. HLGcB2	47 (1.6)	53. ANRhB2	18 (0.62)
20. JNKcB2	22 (0.76)	55. ANRiB2	223 (7.55)
166. JNKcA1	93 (3.16)	108. DSBiB2	65 (2.2)
27. YLRbB2	39 (1.3)	111. HSLbB2	86 (2.9)
29. YLRcB2g1	75 (2.52)	126. HSLhB2	63 (2.12)
31. YLRiB2	381 (12.88)	127. GWDmB2	92 (3.1)
147. YLRmB2g2	54 (1.81)	58. MDGiB2	36 (1.23)
32. HSLcB2	85 (2.88)	148. MDGhB2	51 (1.72)
37. BLCcB2	307 (10.37)	169. MDGcA1	72 (2.43)
38. BLCiB2	52 (1.77)	171. MDGhA1	40 (1.35)
39. KBDbB3	39 (1.32)	155. BLCcB2g1	47 (1.58)
130. KBDhB2	26 (0.87)	161. HTKbB2g1	26 (0.89)
40. PGPcB2	96 (3.25)		
Low Land			
117, VKSiB2	370 (12.53)	100, VKSmB1	48 (1.61)
Soil of Alluvial Landscape			
91. SWRmB2	45 (1.51)	Rock outcrops	3 (0.09)
Mining/Industrial.	1 (0.03)	Others*	96 (3.25)

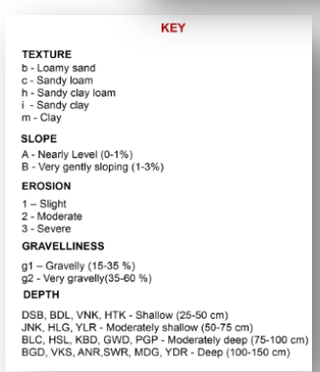
Land Management Units (LMU)

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	819 (27.71)
LMU-2	199 (6.72)
LMU-3	445 (15.05)
LMU-4	455 (15.4)
LMU-5	65 (2.19)
LMU-6	547 (18.52)
LMU-7	163 (5.51)
LMU-8	164 (5.53)
Mining/Industrial	1 (0.03)
Rock outcrops	3 (0.09)
Others*	96 (3.25)

Map key

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

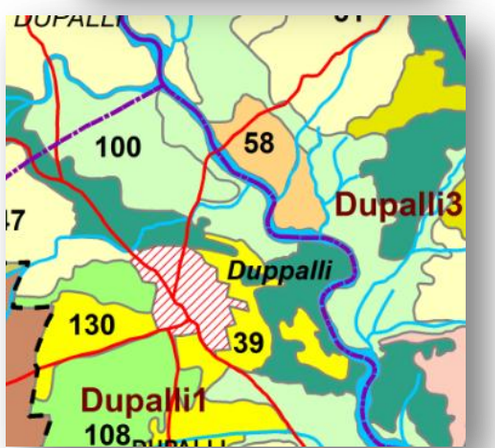


Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

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.



1. 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.

The major landforms identified in the Sub-watershed are uplands and low lands. The database was generated by using cadastral map of the village as a base along with high resolution satellite imagery (IRS LISS IV and Cartosat-1). The objectives of the land resource survey, carried out in the Ajalapur Sub-watershed covering an area of 2955.47 ha 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.

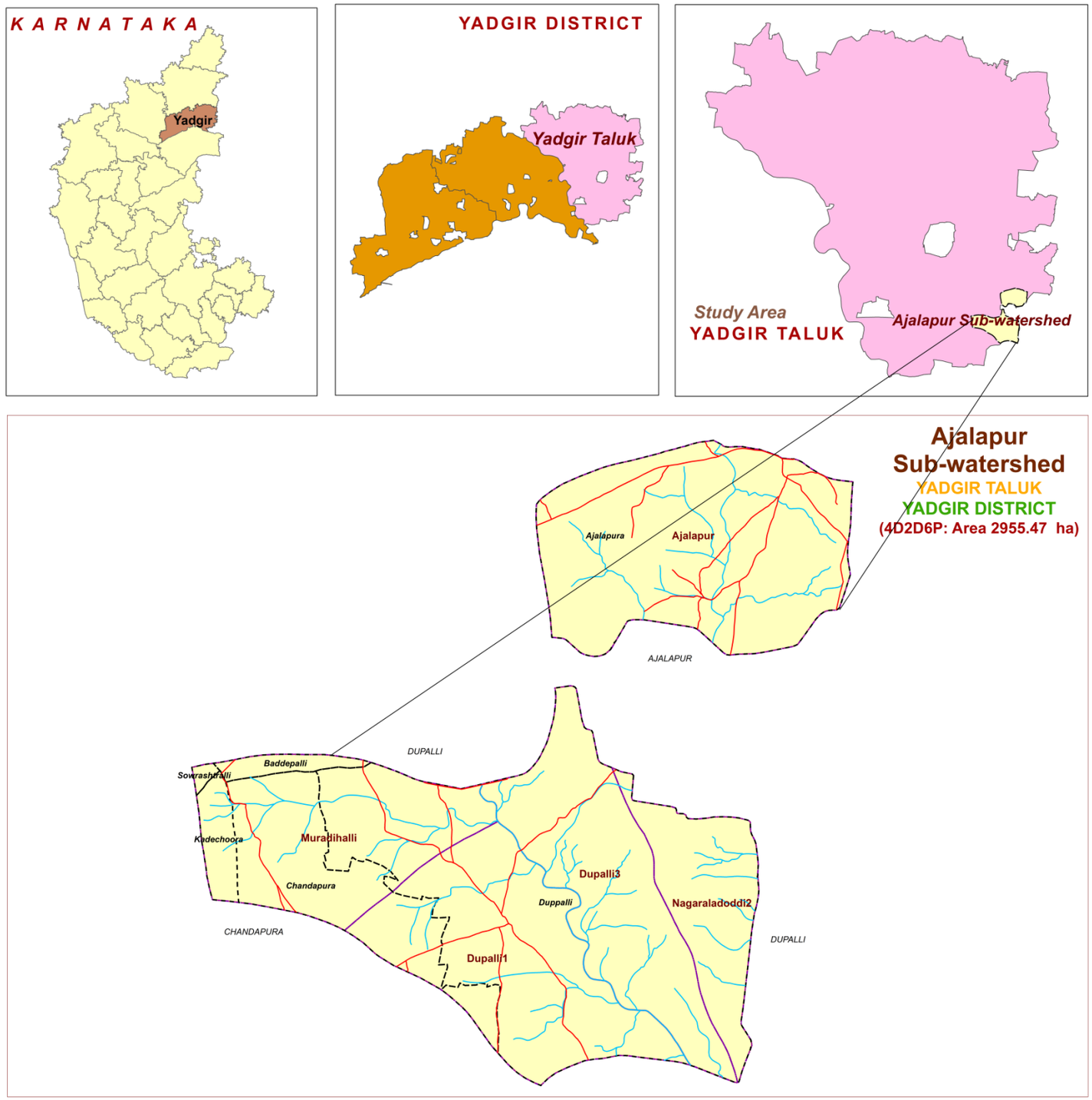
2. General Description of Sub-watershed

The Yadgir, popularly called as “Yadavagiri” by the local people, district came to existence on 30th Dec 2009 by carving out of erst-while Kalaburagi district of Karnataka with a geographical area of 5234.4 square kilometers, located in the northern part of the state. It lies between north latitudes’ $16^0$57’ – $16^0$59’ and east longitudes 77^0 12’ – 77^0 13’. The climate of the district is very hot and dry. The district has an average annual rainfall of 636 mm. Soils are well drained red sandy loam to medium deep black soils. This may be the weathering product of gneissic and granite terrain. Agriculture in Yadgir district is dependent upon rainfall, irrigation tanks, wells, streams etc. The major agricultural crops grown are Jowar, Groundnut, Cotton, Red gram, Bengal gram etc.

As a pilot study, **ICAR-NBSS&LUP, Bangalore** carried out the generation of SWs-LRI for the Ajalapur Sub-watershed in Yadgir taluk, Yadgir district. It was selected for data base generation under Sujala III project. Ajalapur Sub-watershed (code– 4D2D6P) is covering an area of 2955.47 ha and spread across Ajalapur, Dupalli and Chandapura Villages.

2.1. Location and Extent

LOCATION MAP OF AJALAPUR SUB-WATERSHED

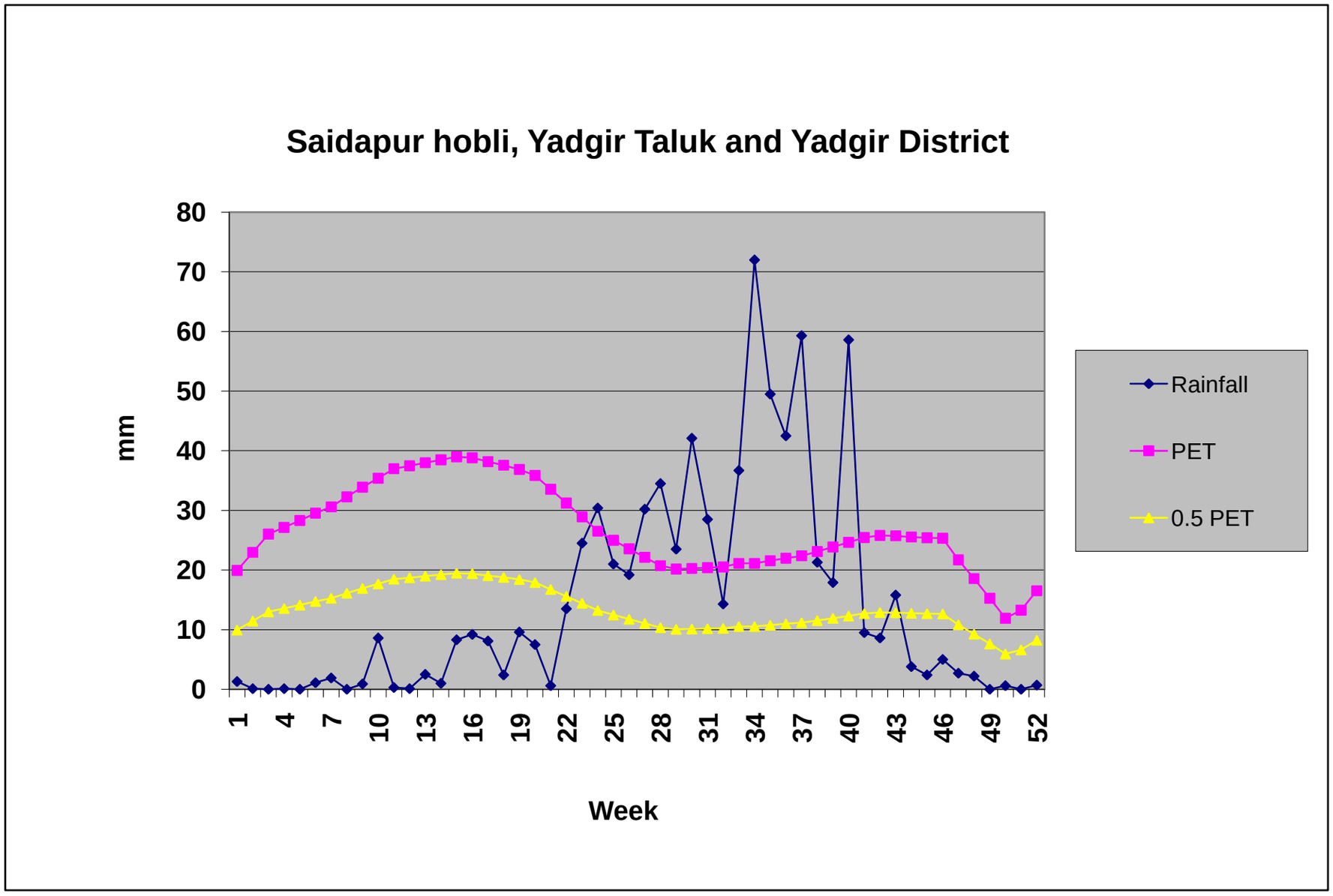


The Ajalapur Sub-watershed (Yadgir taluk, Yadgir district) is located in between 1161' – 1165' North latitudes and $77^0$21' – $77^0$25' East longitudes, covering an area of about 2955.47 ha, bounded by Ajalapur, Dupalli and Chandapura Villages.

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

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

Climate

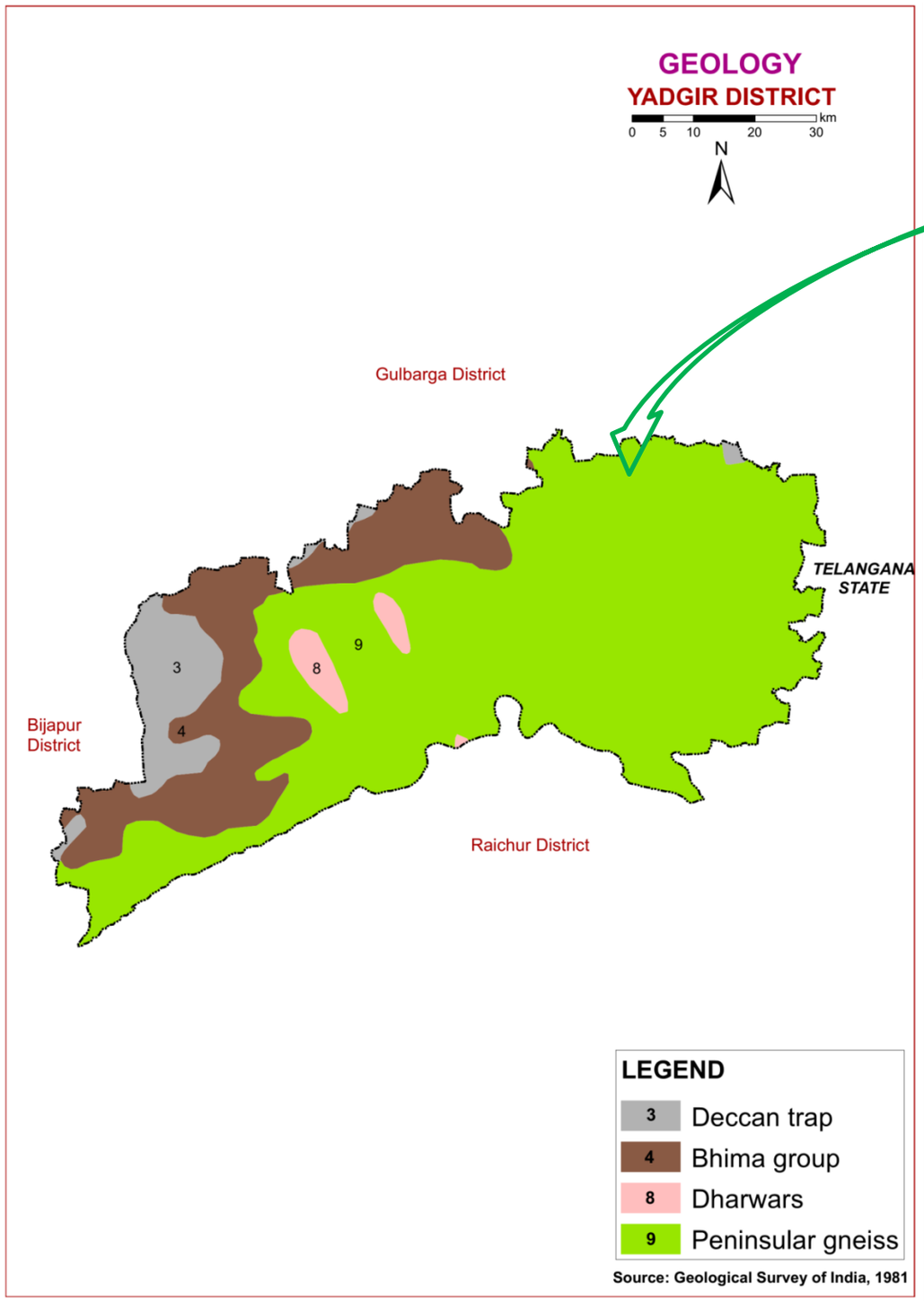


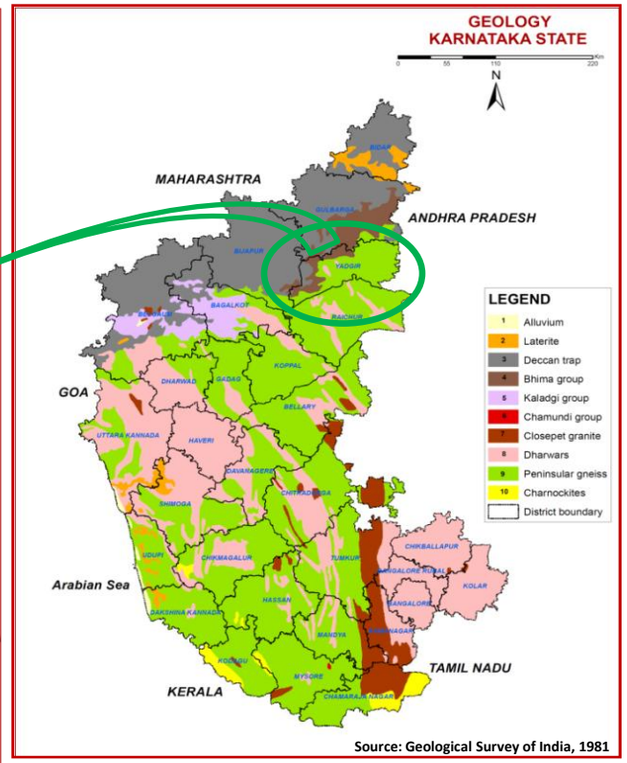
Length of Growing Period (LGP) is varying from June 1st week to 4th week of October (120 - 150 days)

Annual Rainfall : 754mm. in the Saidapur Hobli, Yadgir Taluk & District

Source: KSNDMC (1980-2011)

2.3. 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 - YADGIR DISTRICT

Mesozoic Group

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

Deccan Trap: The Deccan Trap covers an area of 25,000 sq. km. Eight lava flows have been identified in Karnataka, horizontally overlying the older formations. The thickness of the individual flows averages about five metres. The Deccan Trap is relatively uniform in petrographic character. The most common type is augite basalt. Dominant colour is greyish green; texture ranges from cryptocrystalline to glassy. The rock is often visicular and scoriaceous.

Upper Proterozoic Group

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

Bhima series

This series, equivalent to the Kurnool formations, is named after the Bhima river and occurs in Bijapur and Gulbarga districts. It covers an area of about 4200 sq. km and is overlain by the Deccan trap. The group consists of horizontal, unfossiliferous, unmetamorphosed sedimentary rocks such as sandstones, green, purple and black shales, and cream and bluish limestones. The thickness is about 477 metres.

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.

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

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.

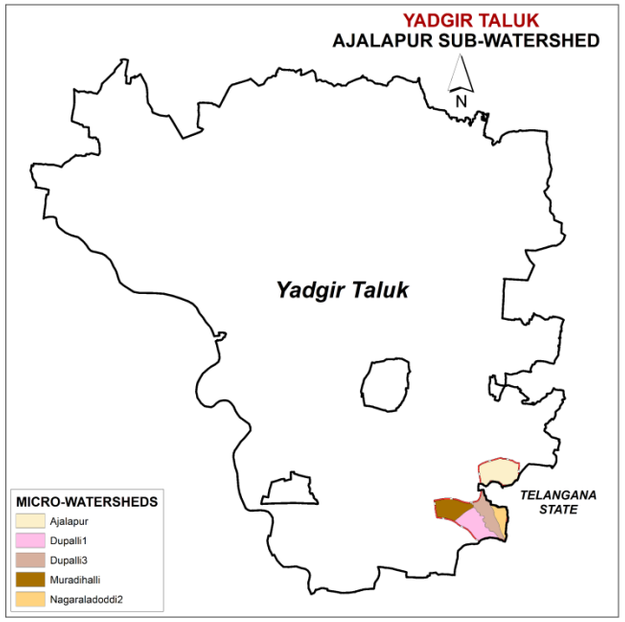
3. Survey Methodology

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

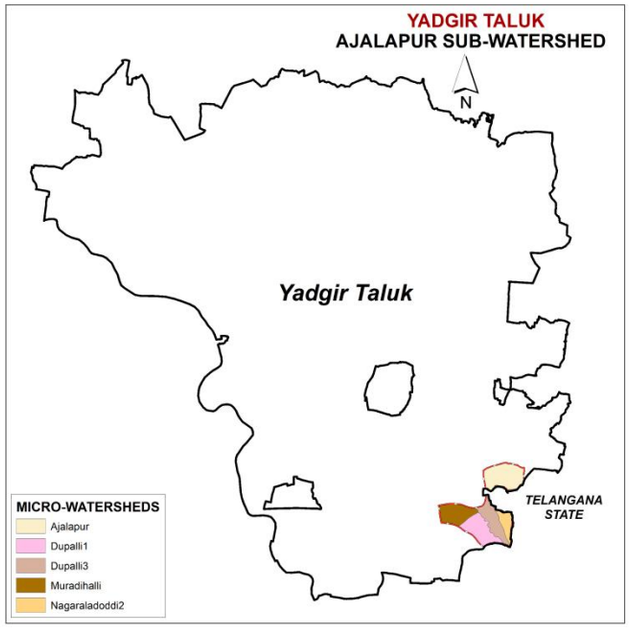
The required site and soil characteristics are described and recorded on a standard proforma by following the protocols and guidelines given in the soil survey manual and field guide. Collection of soil samples from representative pedons for laboratory characterization and collection of surface soil samples from selected fields covering most of the management units for macro and micro-nutrient analysis is being carried out (320m 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.

3.1. Database Used - Cadastral map



Source: ICAR-NBSS&LUP, Bengaluru

3.2. Database Used - Satellite Image



SATELLITE IMAGE

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

0 0.5 1 2 km

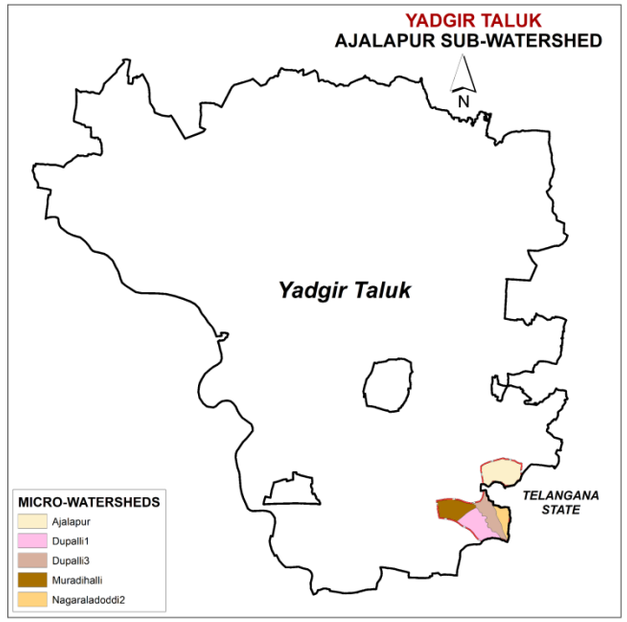
N

References

- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Land parcel's
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

Source: Cartosat 1 Imagery

3.3. Current Landuse

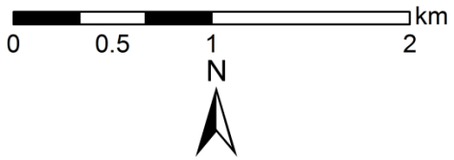


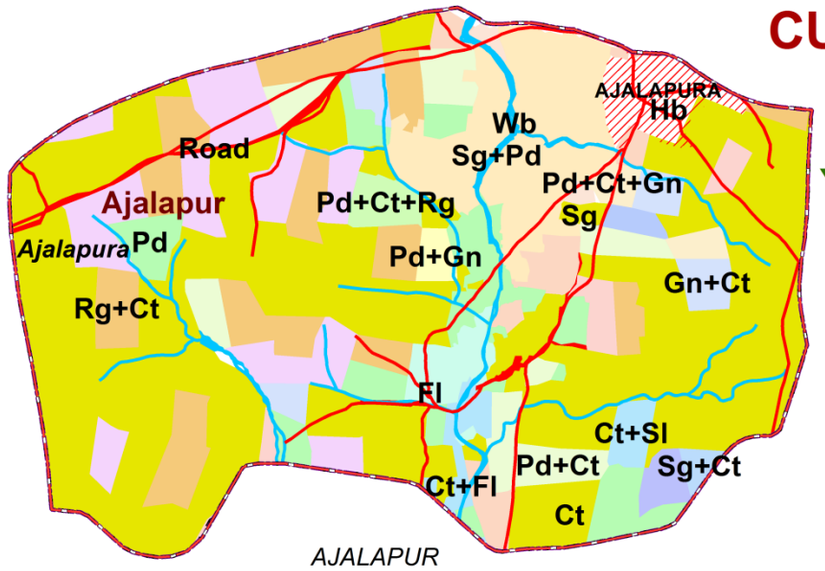
CURRENT LANDUSE (2018)

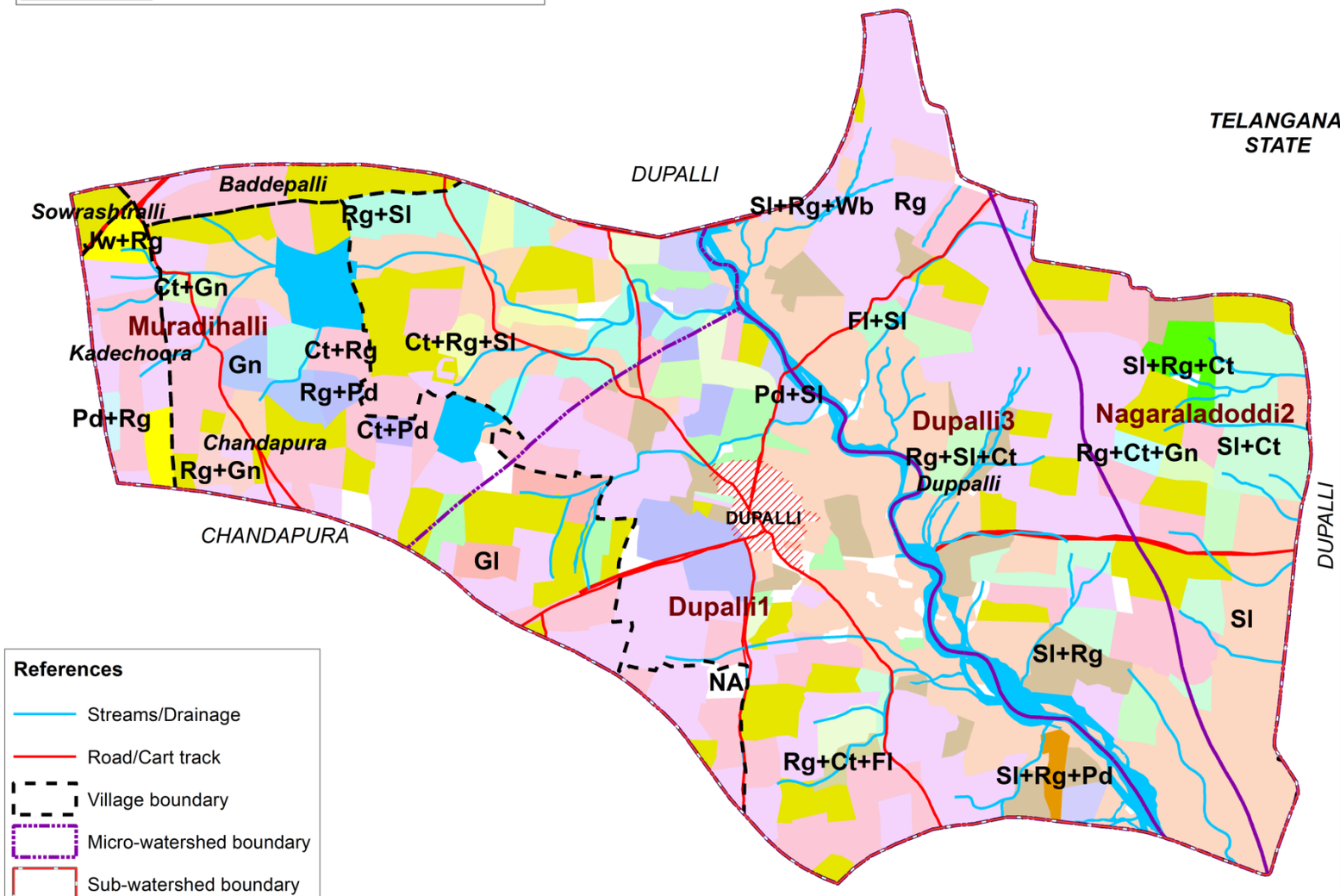
Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT







References

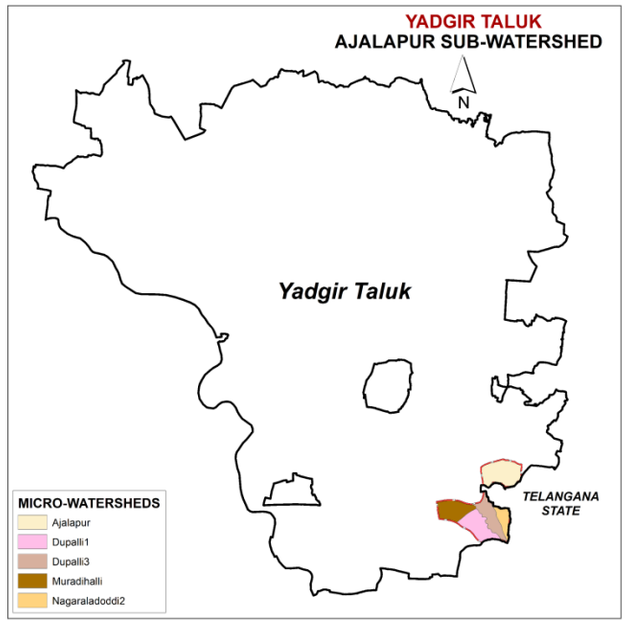
- Streams/Drainage
- Road/Cart track
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

Current LandUse

- Fallow land (Fl)
- Cotton (Ct)
- Grass land (Gl)
- Groundnut (Gn)
- Paddy (Pd)
- Redgram (Rg)
- Sorghum (Sg)
- Cotton+ Fallow land (Ct+Fl)
- Cotton+Groundnut (Ct+Gn)
- Cotton+Paddy (Ct+Pd)
- Cotton+Redgram (Ct+Rg)
- Cotton+Scrub land (Ct+Sl)
- Fallow land+Scrub land (Fl+Sl)
- Groundnut+Cotton (Gn+Ct)
- Jowar+Redgram (Jw+Rg)
- Paddy+ Cotton (Pd+Ct)
- Paddy+Groundnut (Pd+Gn)
- Paddy+Redgram (Pd+Rg)
- Paddy+Scrub land (Pd+Sl)
- Redgram+Cotton (Rg+Ct)
- Redgram+Groundnut (Rg+Gn)
- Redgram+Paddy (Rg+Pd)
- Redgram+Scrub land (Rg+Sl)
- Sorghu+Cotton (Sg+Ct)
- Sorghum+Paddy (Sg+Pd)
- Cotton+Redgram+Scrub land (Ct+Rg+Sl)
- Paddy+Cotton+Groundnut (Pd+Ct+Gn)
- Paddy+Cotton+Redgram (Pd+Ct+Rg)
- Redgram+Cotton+Fallow land (Rg+Ct+Fl)
- Redgram+Cotton+Groundnut (Rg+Ct+Gn)
- Redgram+Scrub land+Cotton (Rg+Sl+Ct)
- Scrub land (Sl)
- Scrub land+Cotton (Sl+Ct)
- Scrub land+Redgram (Sl+Rg)
- Scrub land+Redgram+Cotton (Sl+Rg+Ct)
- Scrub land+Redgram+Paddy (Sl+Rg+Pd)
- Scrub land+Redgram+Waterbody (Sl+Rg+Wb)
- Road
- Habitation (Hb)
- Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

3.4. Location of Wells



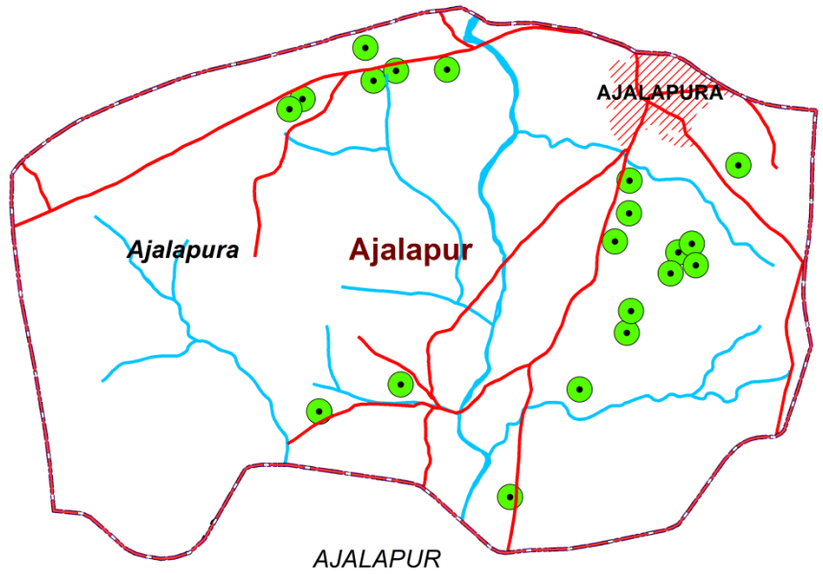
LOCATION OF WELLS

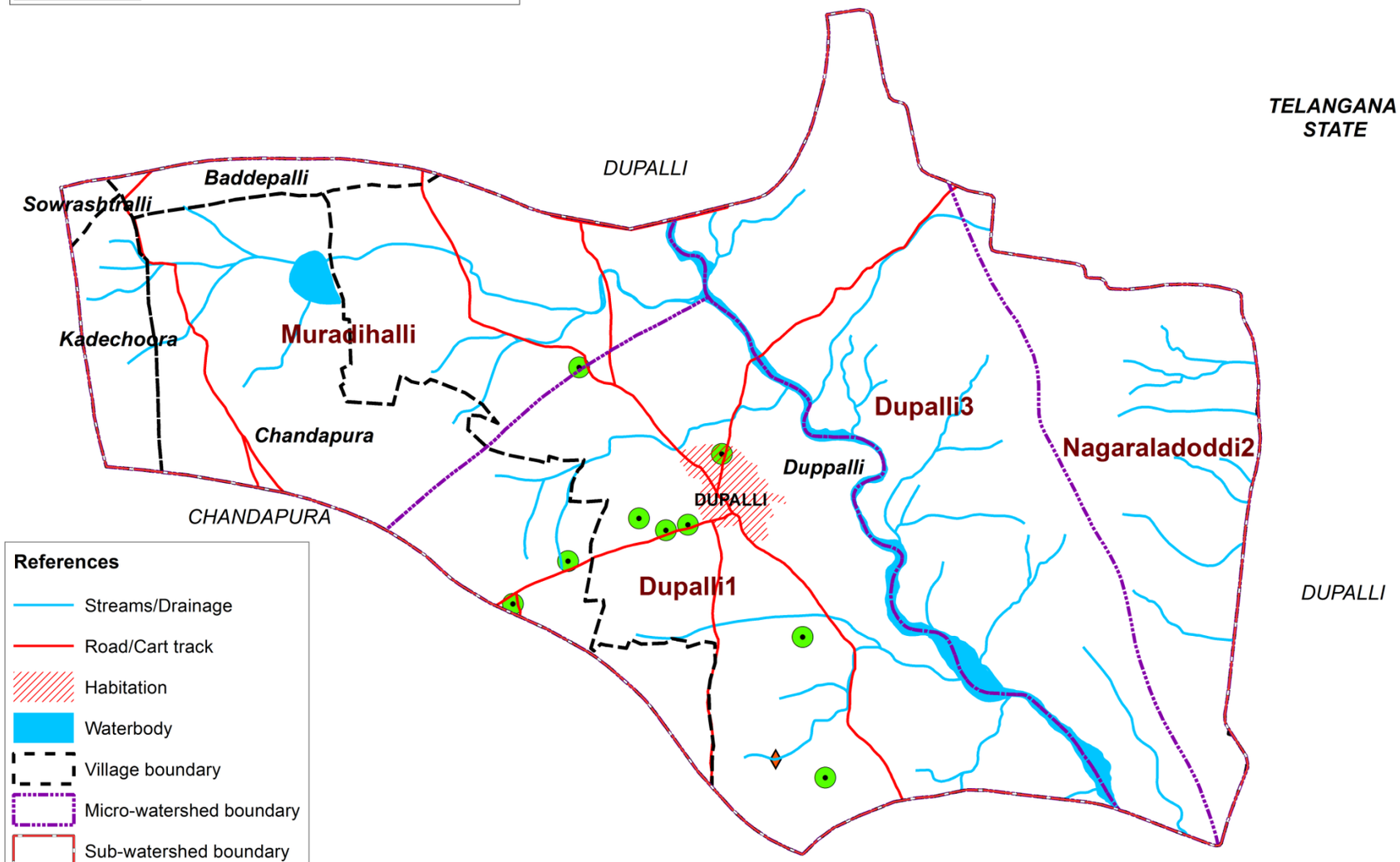
Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N

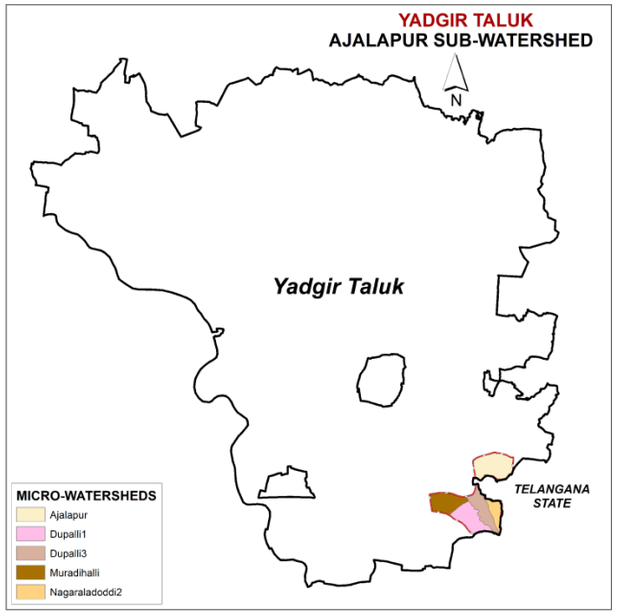


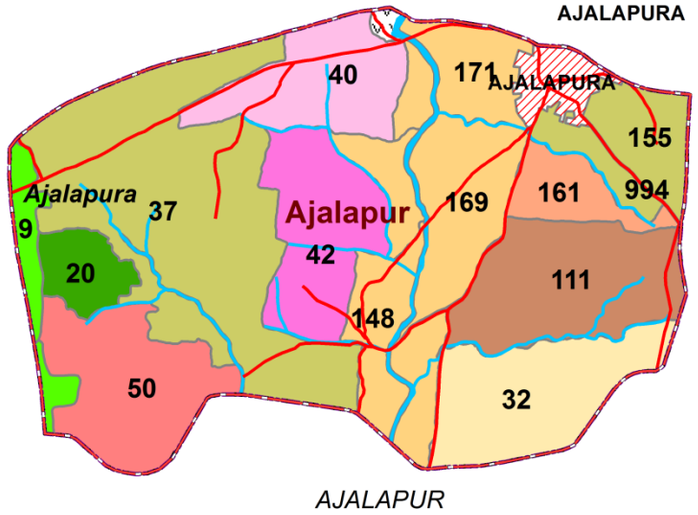


Legend	No's
Bore well	30
Check Dam	1

Source: ICAR-NBSS&LUP, Bengaluru

4. The Soils

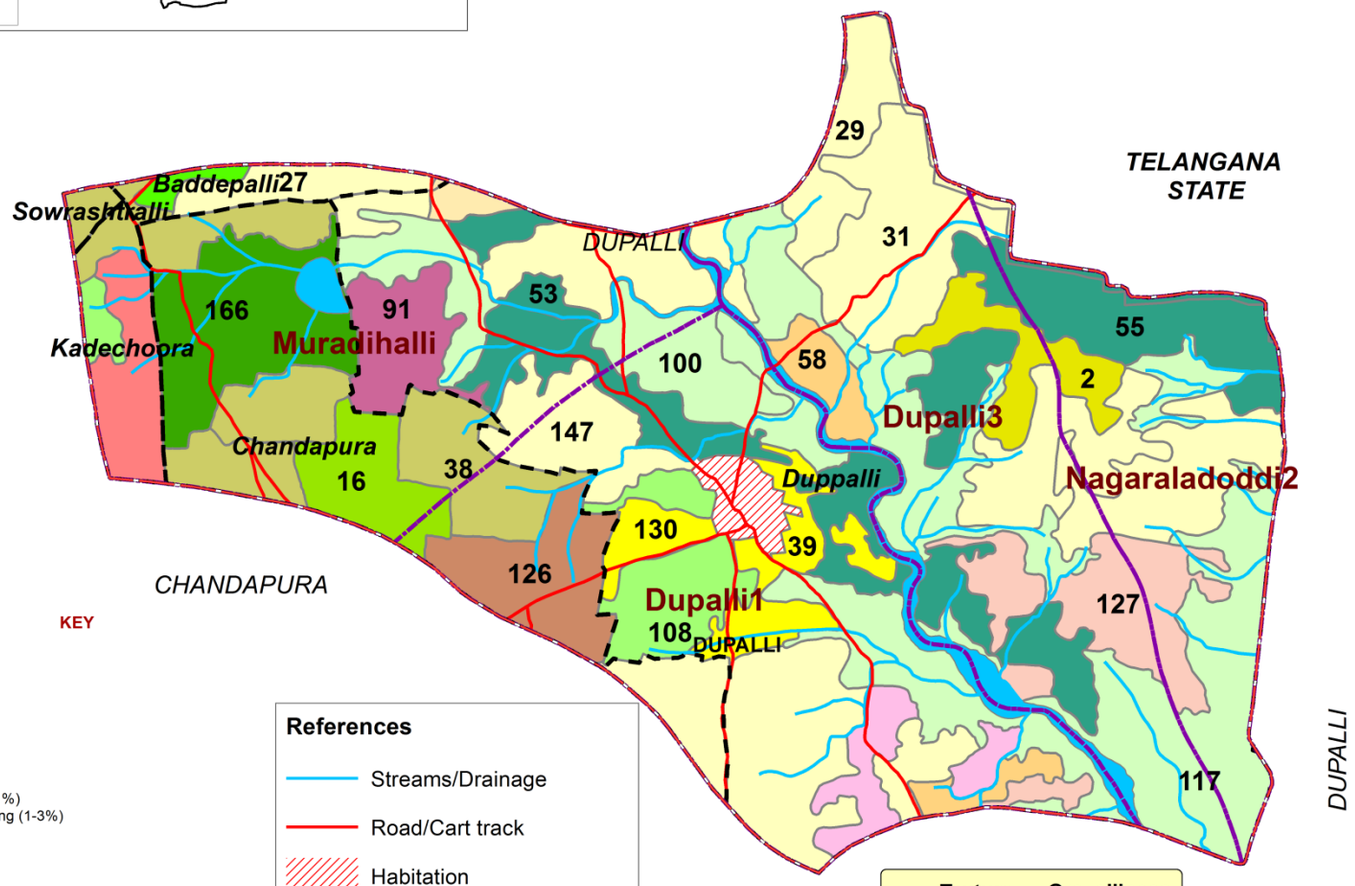




SOIL
Ajalapur Sub-watershed
(4D2D6P : Area - 2955.47 ha)
YADGIR TALUK & DISTRICT

0 0.5 1 2 km

N



KEY

TEXTURE
b - Loamy sand
c - Sandy loam
h - Sandy clay loam
i - Sandy clay
m - Clay

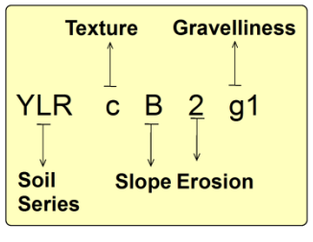
SLOPE
A - Nearly Level (0-1%)
B - Very gently sloping (1-3%)

EROSION
1 – Slight
2 - Moderate
3 - Severe

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

DEPTH
DSB, BDL, VNK, HTK - Shallow (25-50 cm)
JNK, HLG, YLR - Moderately shallow (50-75 cm)
BLC, HSL, KBD, GWD, PGP - Moderately deep (75-100 cm)
BGD, VKS, ANR,SWR, MDG, YDR - Deep (100-150 cm)

References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary



Soil Phase	Area in ha (%)	Soil Phase	Area in ha (%)
Soil of Granite and Granite Gneiss Landscape			
2. BDLbB2	44 (1.49)	42. YDRcB2	68 (2.3)
9. VNKcB2	28 (0.95)	50. BGDbB2	120 (4.05)
16. HLGcB2	47 (1.6)	53. ANRhB2	18 (0.62)
20. JNKcB2	22 (0.76)	55. ANRiB2	223 (7.55)
166. JNKcA1	93 (3.16)	108. DSBiB2	65 (2.2)
27. YLRbB2	39 (1.3)	111. HSLbB2	86 (2.9)
29. YLRcB2g1	75 (2.52)	126. HSLhB2	63 (2.12)
31. YLRiB2	381 (12.88)	127. GWDmB2	92 (3.1)
147. YLRmB2g2	54 (1.81)	58. MDGiB2	36 (1.23)
32. HSLcB2	85 (2.88)	148. MDGhB2	51 (1.72)
37. BLCcB2	307 (10.37)	169. MDGcA1	72 (2.43)
38. BLCiB2	52 (1.77)	171. MDGhA1	40 (1.35)
39. KBDbB3	39 (1.32)	155. BLCcB2g1	47 (1.58)
130. KBDhB2	26 (0.87)	161. HTKbB2g1	26 (0.89)
40. PGPcB2	96 (3.25)		
Low Land			
117, VKSiB2	370 (12.53)	100, VKSmB1	48 (1.61)
Soil of Alluvial Landscape			
91. SWRmB2	45 (1.51)	Rock outcrops	3 (0.09)
Mining/Industrial.	1 (0.03)	Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

4.1 Mapping unit description of Ajalapur (4D2D6P) Sub-watershed in Yadgir Taluk, Yadgir district

Soil map unit No*	Soil Series	Soil Phase Symbol	Mapping Unit Description	Area in ha (%)
Soils of Granite and Granite gneiss Landscape				
	YDR	Yadgir soils are deep (100-150 cm), well drained, have brown to dark yellowish brown and olive brown, sodic sandy loam soils occurring on very gently sloping uplands under cultivation		**68 (2.3)**
42		YDRcB2	Sandy loam surface, slope 1-3%, moderate erosion	68 (2.3)
	ANR	Anur soils are deep (100-150 cm), moderately well drained, have dark gray to dark brown, calcareous sodic clay soils occurring on very gently to gently sloping uplands under cultivation		**241 (8.17)**
53		ANRhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	18 (0.62)
55		ANRiB2	Sandy clay surface, slope 1-3%, moderate erosion	223 (7.55)
	MDG	Mundargi soils are deep (100-150 cm), well drained, have brown to dark yellowish brown, sandy clay loam strongly alkaline soils occurring on very gently sloping uplands under cultivation		**199 (6.73)**
58		MDGiB2	Sandy clay surface, slope 1-3%, moderate erosion	36 (1.23)
148		MDGhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	51 (1.72)
169		MDGcA1	Sandy loam surface, slope 0-1%, slight erosion	72 (2.43)
171		MDGhA1	Sandy clay loam surface, slope 0-1%, slight erosion	40 (1.35)
	BGD	Belagundi soils are deep (100-150 cm) well drained, have brown to dark yellowish brown, slightly calcareous clayey soils occurring on nearly level to very gently sloping uplands under cultivation		**120 (4.05)**
50		BGDbB2	Loamy sand surface, slope 1-3%, moderate erosion	120 (4.05)
	GWD	Gowdagera soils are moderately deep (75-100 cm), moderately well drained, have dark grayish brown to very dark grayish brown, calcareous sodic sandy clay loam soils occurring on very gently sloping uplands under cultivation		**92 (3.1)**
127		GWDmB2	Clay surface, slope 1-3%, moderate erosion	92 (3.1)
	HSL	Hosalli soils are moderately deep (75-100 cm), moderately well drained, have yellowish brown to dark yellowish brown, slightly calcareous sandy clay soils occurring on very gently sloping uplands under cultivation		**234 (7.9)**
32		HSLcB2	Sandy loam surface, slope 1-3%, moderate erosion	85 (2.88)
111		HSLbB2	Loamy sand surface, slope 1-3%, moderate erosion	86 (2.9)
126		HSLhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	63 (2.12)

To be continued….

Soil map unit No*	Soil Series	Soil Phase Symbol	Mapping Unit Description	Area in ha (%)
	BLC	Balichakra soils are moderately deep (75-100 cm), well drained, have reddish brown to dark reddish brown, sandy clay loam red soils occurring on very gently sloping uplands under cultivation		**406 (13.72)**
155		BLCcB2g1	Sandy loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	47 (1.58)
37		BLCcB2	Sandy loam surface, slope 1-3%, moderate erosion	307 (10.37)
38		BLCiB2	Sandy clay surface, slope 1-3%, moderate erosion	52 (1.77)
	PGP	Poglapur soils are moderately deep (75-100 cm), well drained, have dark brown, dark reddish brown to yellowish red sandy clay soils occurring on very gently sloping uplands under cultivation		**96 (3.25)**
40		PGPcB2	Sandy loam surface, slope 1-3%, moderate erosion	96 (3.25)
	KBD	Kalabelagundi soils are moderately deep (75-100 cm), well drained, have reddish brown to dark reddish brown and dark reddish gray, gravelly sandy clay loam soils occurring on very gently sloping uplands under cultivation		**65 (2.19)**
39		KBDbB3	Loamy sand surface, slope 1-3%, severe erosion	39 (1.32)
130		KBDhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	26 (0.87)
	YLR	Yalleri soils are moderately shallow (50-75 cm), well drained, have brown to reddish brown and dark reddish brown, clay red soils occurring on very gently to gently sloping uplands under cultivation		**549 (18.51)**
27		YLRbB2	Loamy sand surface, slope 1-3%, moderate erosion	39 (1.3)
29		YLRcB2g1	Sandy loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	75 (2.52)
31		YLRiB2	Sandy clay surface, slope 1-3%, moderate erosion	381 (12.88)
147		YLRmB2g2	Clay surface, slope 1-3%, moderate erosion, very gravelly (35-60%)	54 (1.81)
	HLG	Halagera soils are moderately shallow (50-75 cm), well drained, have very dark grayish brown to dark yellowish brown, calcareous sandy clay loam soils occurring on very gently sloping uplands under cultivation.		**47 (1.6)**
16		HLGcB2	Sandy loam surface, slope 1-3%, moderate erosion	47 (1.6)
	JNK	Jinkera soils are moderately shallow (50-75 cm), well drained, have dark brown to very dark grayish brown, slightly calcareous sandy clay loam soils occurring on very gently sloping uplands under cultivation		**115 (3.92)**

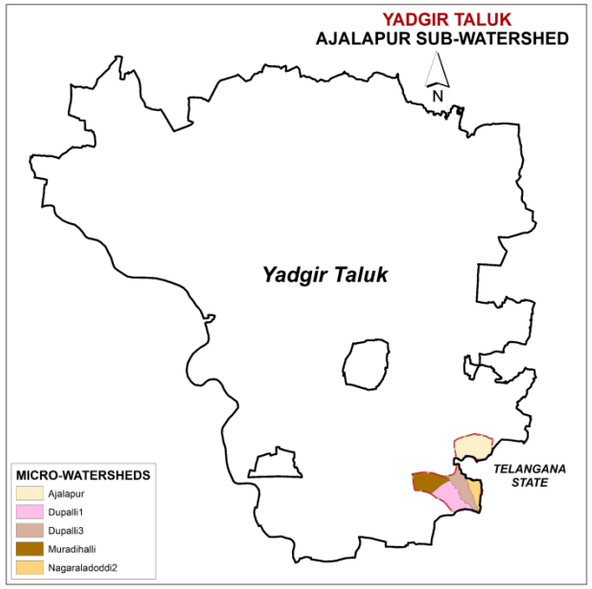
To be continued….

Soil map unit No*	Soil Series	Soil Phase Symbol	Mapping Unit Description	Area in ha (%)
20		JNKcB2	Sandy loam surface, slope 1-3%, moderate erosion	22 (0.76)
166		JNKcA1	Sandy loam surface, slope 0-1%, slight erosion	93 (3.16)
	BDL	Badiyala soils are shallow (25-50 cm), well drained, have dark brown to very dark brown and dark yellowish brown, slightly calcareous sandy loam soils occurring on very gently to gently sloping uplands under cultivation		**44 (1.49)**
2		BDLbB2	Loamy sand surface, slope 1-3%, moderate erosion	44 (1.49)
	VNK	Vanakanahalli soils are shallow (25-50 cm), well drained, have dark reddish brown, sandy clay red soils occurring on very gently to moderately sloping uplands under cultivation		**28 (0.95)**
9		VNKcB2	Sandy loam surface, slope 1-3%, moderate erosion	28 (0.95)
	DSB	Dastharabad soils are shallow (25-50 cm), well drained, have dark brown to very dark brown, gravelly clay soils occurring on very gently to gently sloping uplands under cultivation		**65 (2.2)**
108		DSBiB2	Sandy clay surface, slope 1-3%, moderate erosion	65 (2.2)
	HTK	Hattikuni soils are shallow (25-50 cm), well drained, have dark yellowish brown sandy loam soils occurring on very gently sloping uplands under cultivation		**26 (0.89)**
161		HTKbB2g1	Loamy sand surface, slope 1-3%, moderate erosion, gravelly (15-35%)	26 (0.89)
	VKS	Vankasambar soils are deep (100-150 cm), well drained, very dark brown to brown, sodic calcareous sandy clay loam soils occurring on very gently to gently sloping lowlands under cultivation		**418 (14.14)**
100		VKSmB1	Clay surface, slope 1-3%, slight erosion	48 (1.61)
117		VKSiB2	Sandy clay surface, slope 1-3%, moderate erosion	370 (12.53)
Soils of Alluvial Landscape				
	SWR	Sowrashtrahalli soils are deep (100-150 cm), moderately well drained, have very dark gray to dark gray, calcareous cracking clay soils occurring on very gently sloping plains under cultivation		**45 (1.51)**
91		SWRmB2	Clay surface, slope 1-3%, moderate erosion	45 (1.51)
994		Mining/Industrial	Mining/Industrial area	1 (0.03)
999		Rock outcrops	Rock lands, both massive and bouldery with little or no soil	3 (0.09)
1000		Others	Waterbody & Habitation	96 (3.25)

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

5. Soil Survey Interpretations

5.1. Land Capability Classification

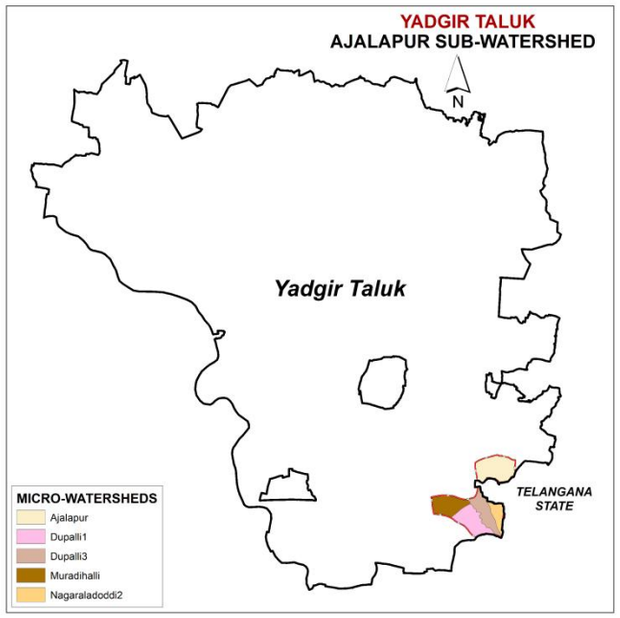


Capability subclass	Area in ha (%)
IIs	205 (6.93)
IIes	1629 (55.13)
IIIes	203 (6.86)
IVs	48 (1.61)
IVes	771 (26.1)
Mining/Industrial	1 (0.03)
Rock outcrops	3 (0.09)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

5.2. Soil Depth

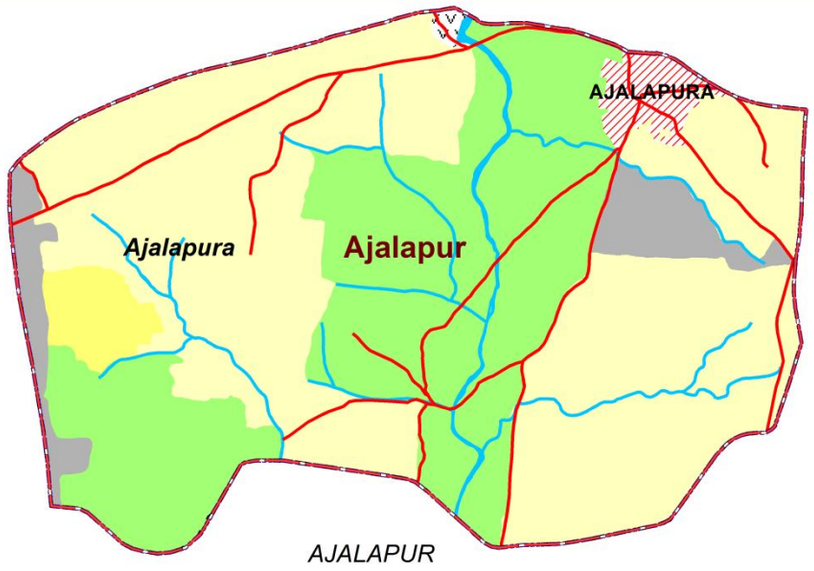


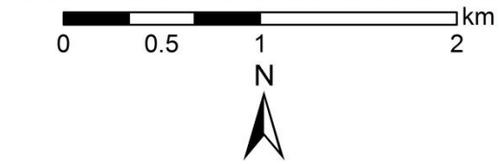
SOIL DEPTH

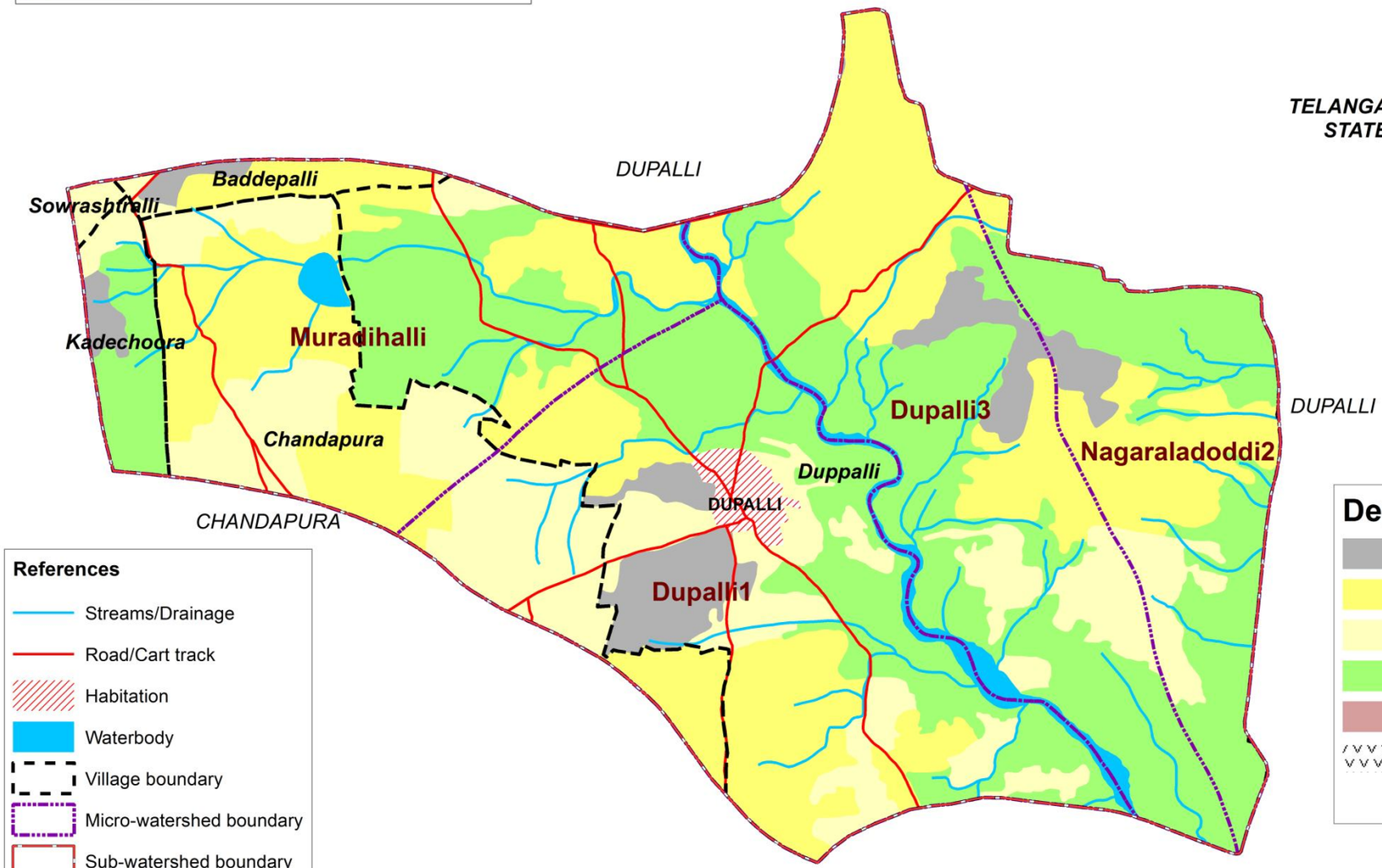
Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT





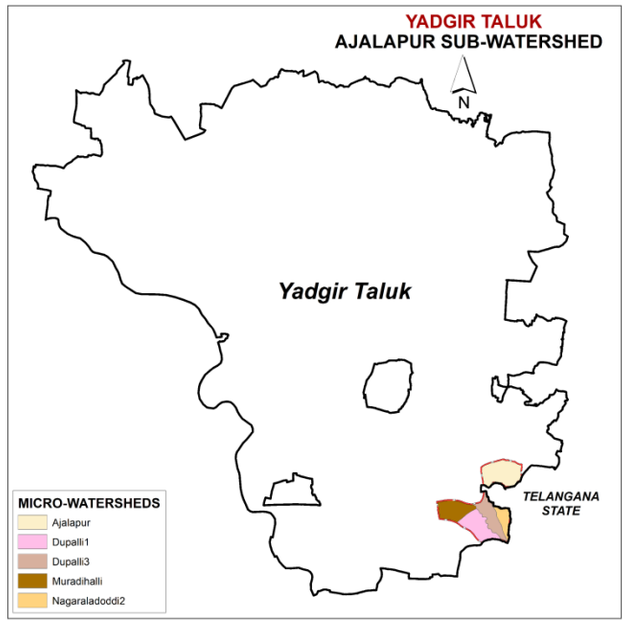


Depth Class	Area in ha (%)
Shallow (25-50 cm)	164 (5.53)
Moderately shallow (50-75 cm)	710 (24.03)
Moderately deep (75-100 cm)	892 (30.18)
Deep (100-150 cm)	1090 (36.89)
Mining/Industrial	1 (0.03)
Rock outcrops	3 (0.09)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

5.3. Surface Soil Texture



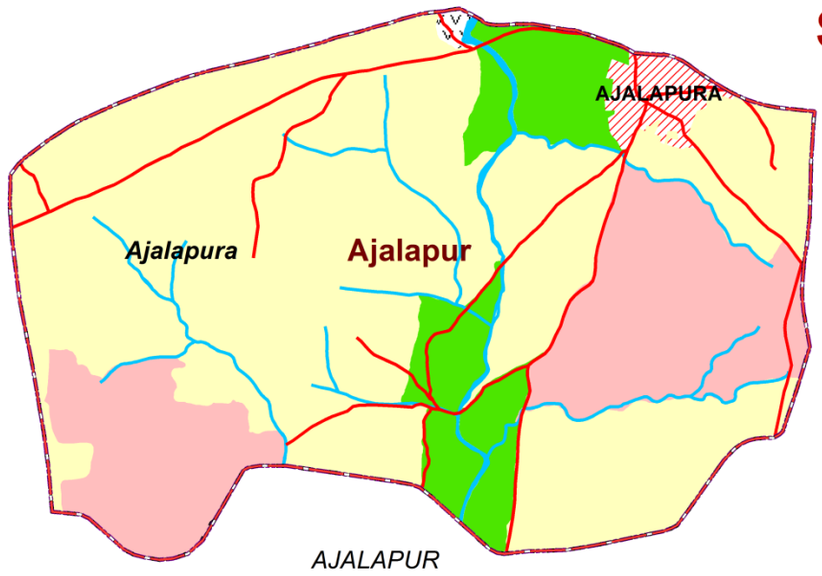
SURFACE SOIL TEXTURE

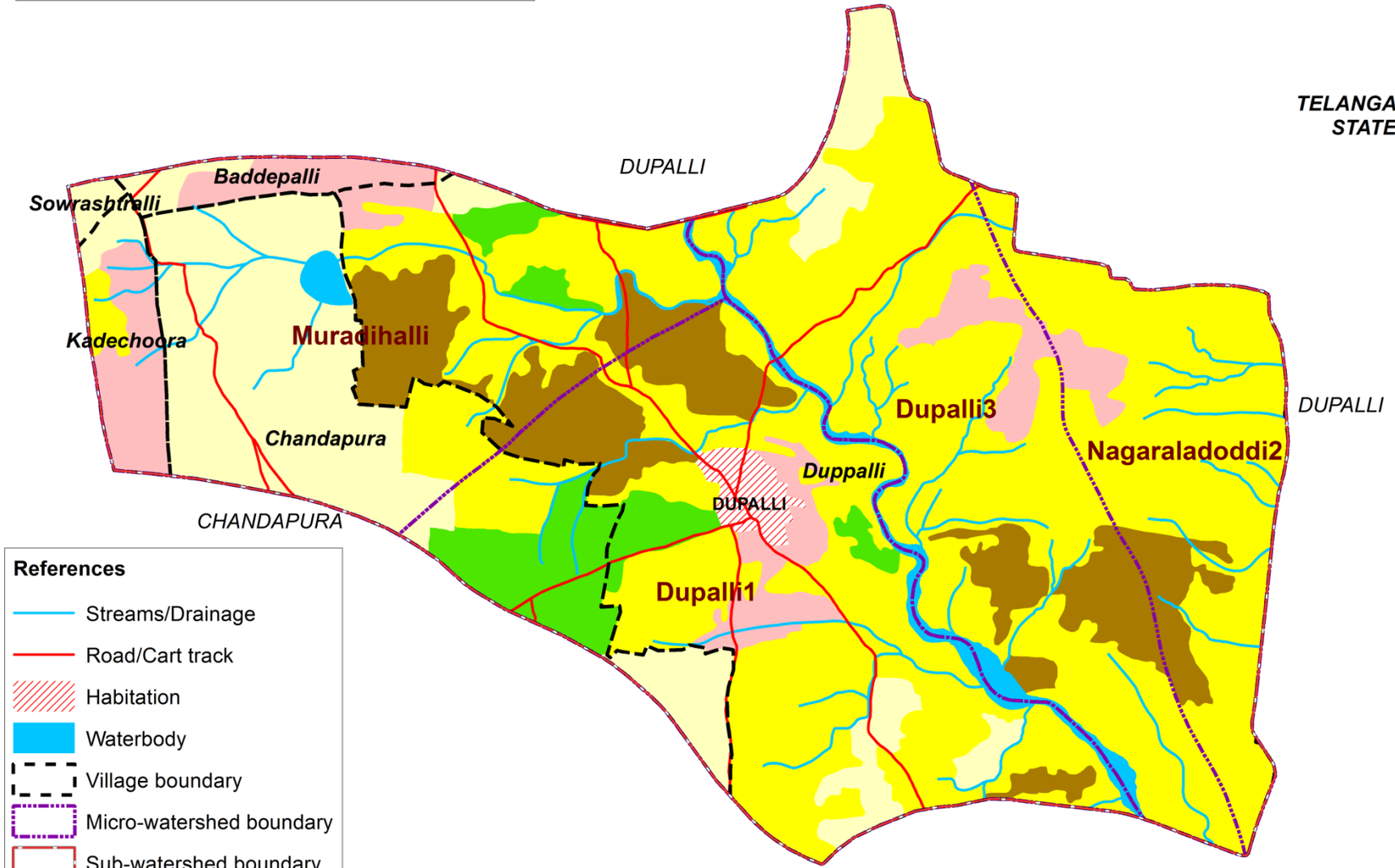
Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N





References

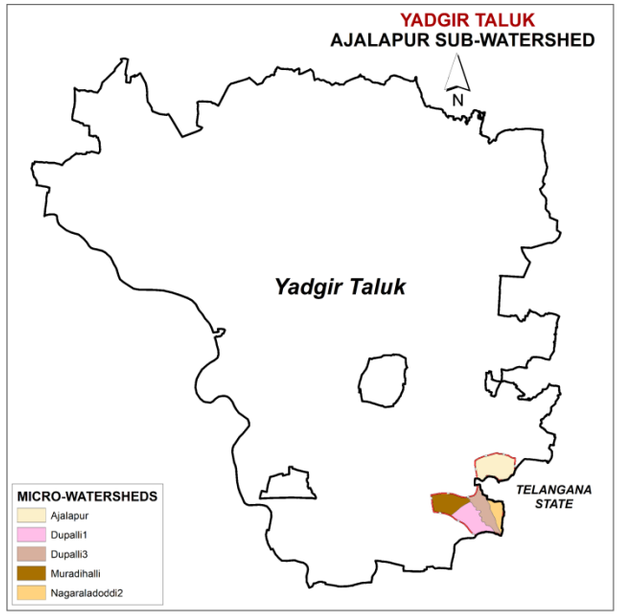
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

Texture Class	Area in ha(%)
Loamy sand	354 (11.96)
Sandy loam	940 (31.81)
Sandy clay loam	197 (6.67)
Sandy clay	1128 (38.15)
Clay	237 (8.03)
Mining/Industrial	1 (0.03)
Rock outcrops	3 (0.09)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

5.4. Surface Soil Gravelliness



SOIL GRAVELLINESS

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N

AJALAPURA
Ajalapura
Ajalapur
AJALAPUR
TELANGANA STATE
DUPALLI
Baddepalli
Sowrashtralli
Kadechoora
Muradihalli
Chandapura
CHANDAPURA
Dupalli3
Nagaraladoddi2
Duppalli
DUPALLI
Dupalli1
DUPALLI

References

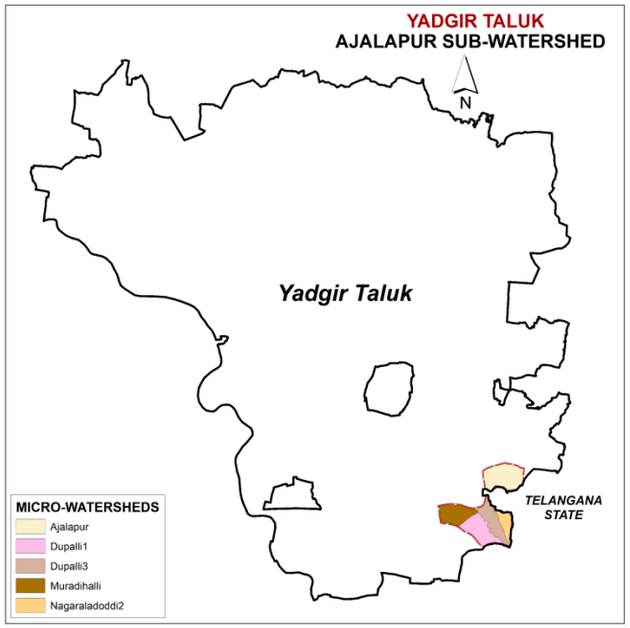
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

Gravelly Class	Area in ha (%)
Non gravelly (<15%)	2655 (89.82)
Gravelly (15-35%)	148 (5.0)
Very gravelly (35-60%)	54 (1.81)
Mining/Industrial	1 (0.03)
Rock outcrops	3 (0.09)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

5.5. Available Water Capacity

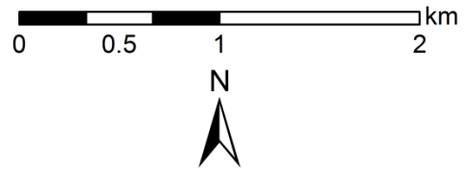


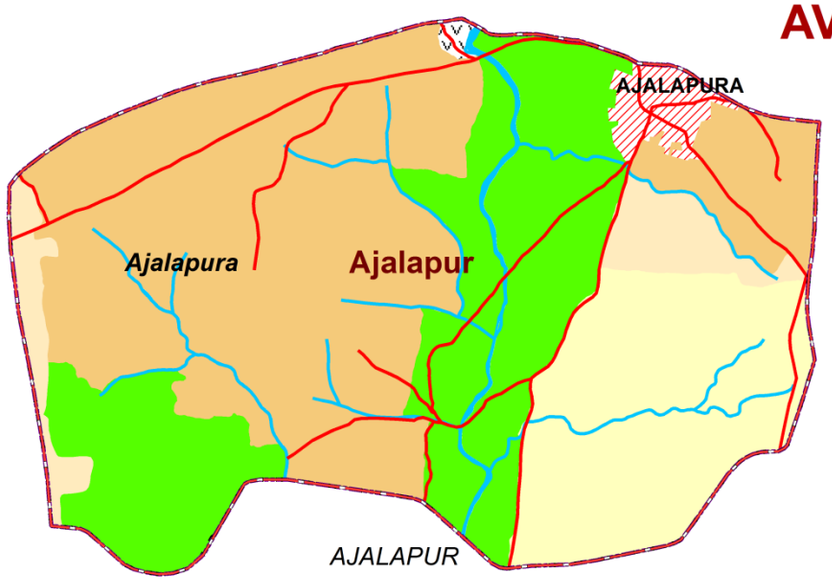
AVAILABLE WATER CAPACITY

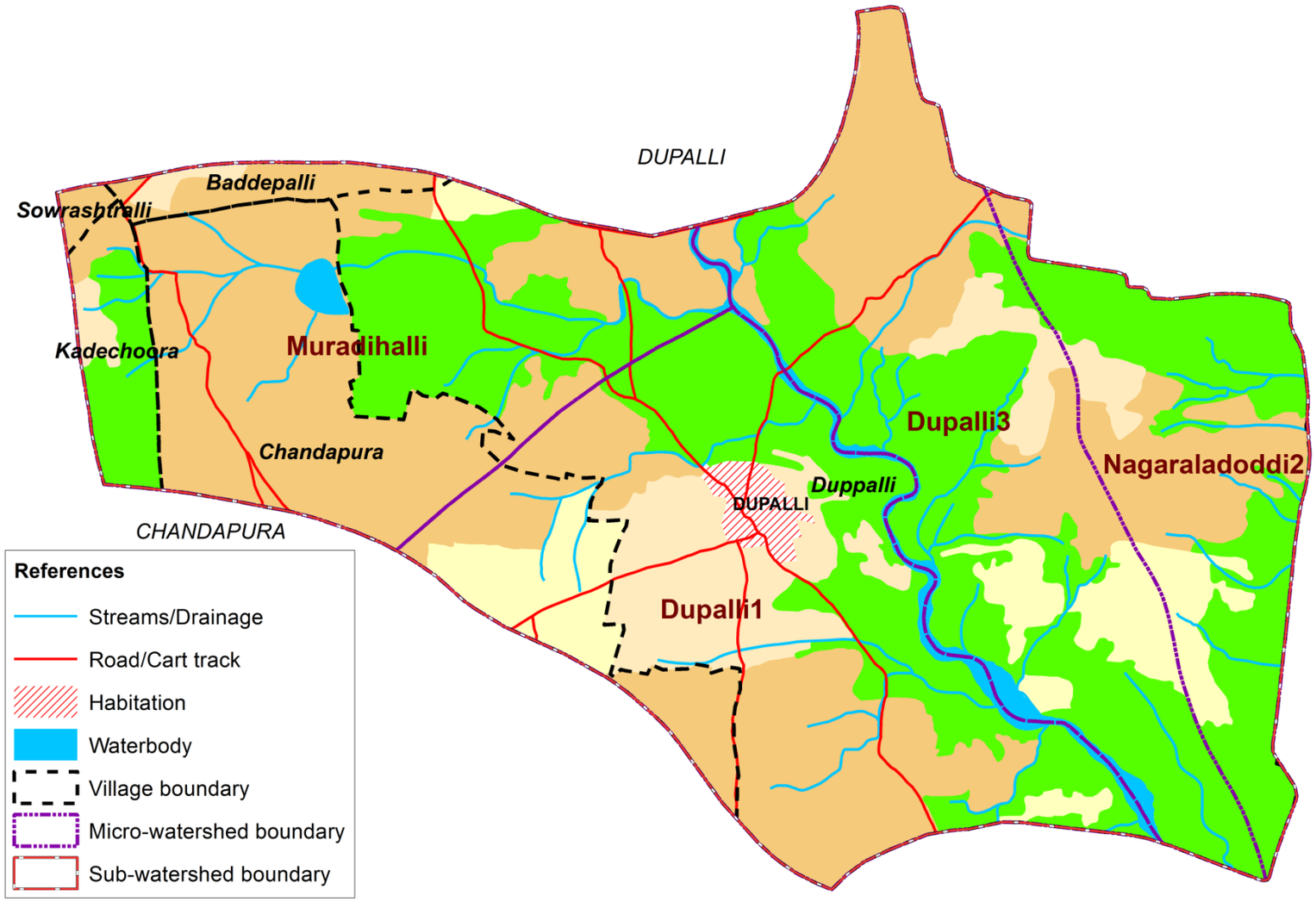
Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT





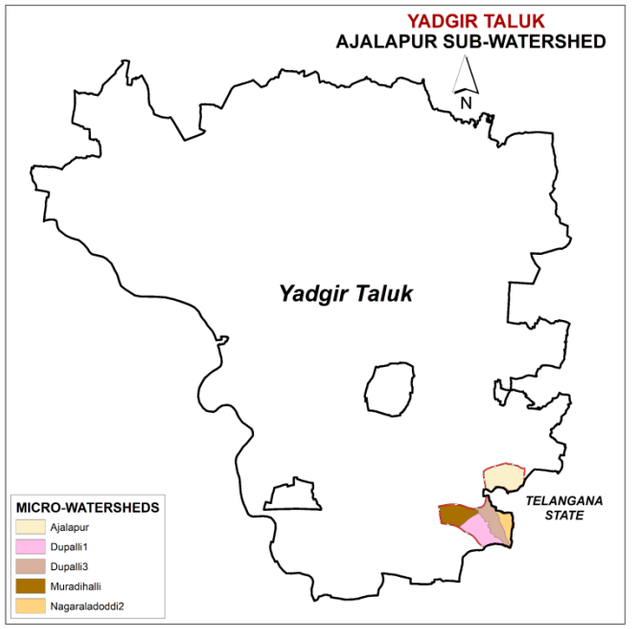


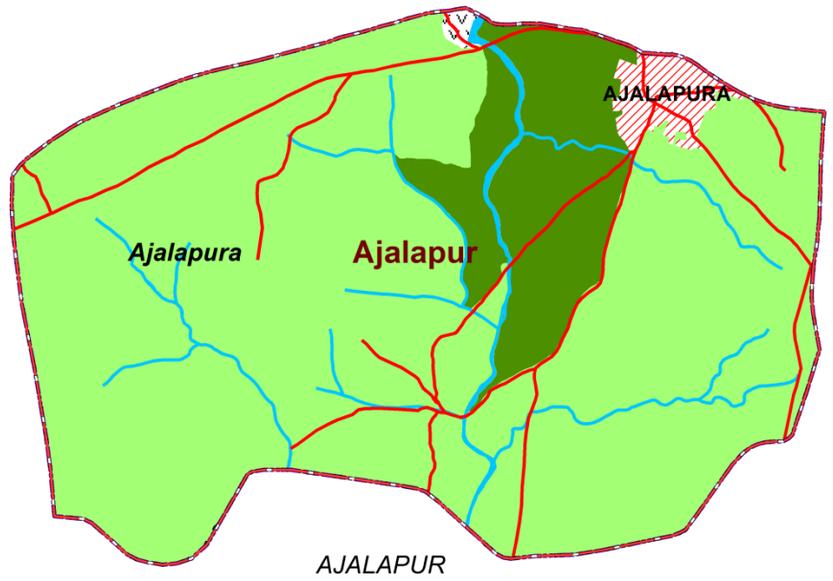
Available Water Capacity	Area in ha (%)
Very low (<50 mm/m)	228 (7.72)
Low (51-100 mm/m)	1280 (43.31)
Medium (101-150 mm/m)	325 (11.01)
Very high (>200 mm/m)	1022 (34.59)
Mining/Industrial	1 (0.03)
Rock outcrops	3 (0.09)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

5.6.Slope





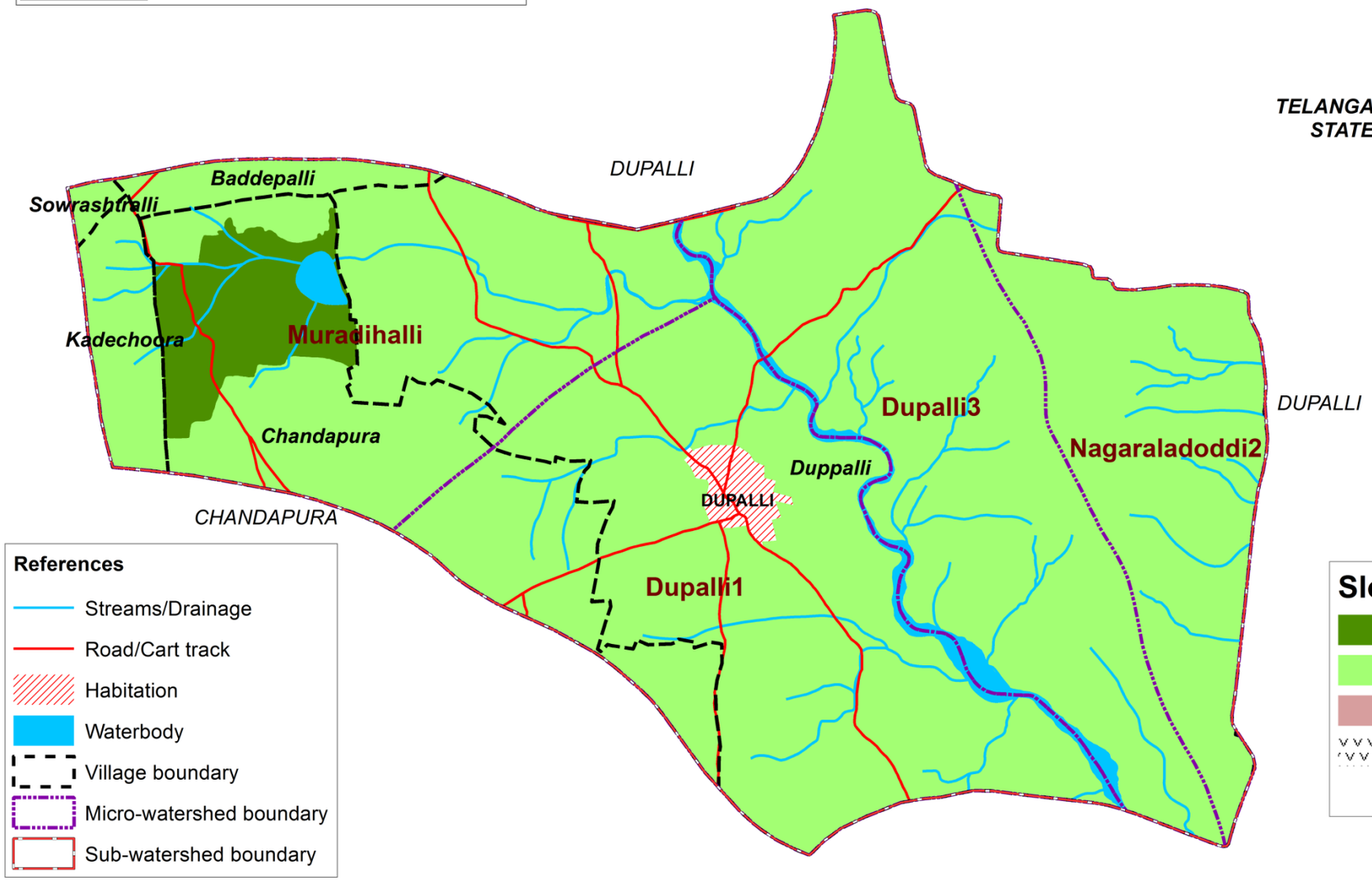
SLOPE

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N



References

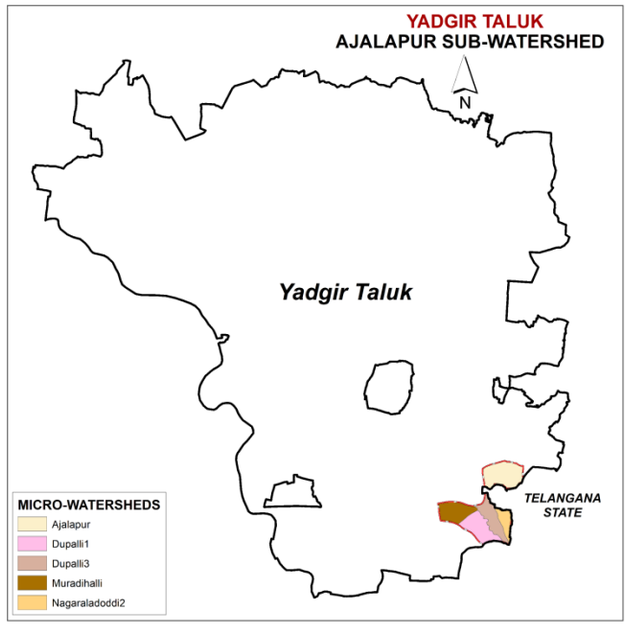
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

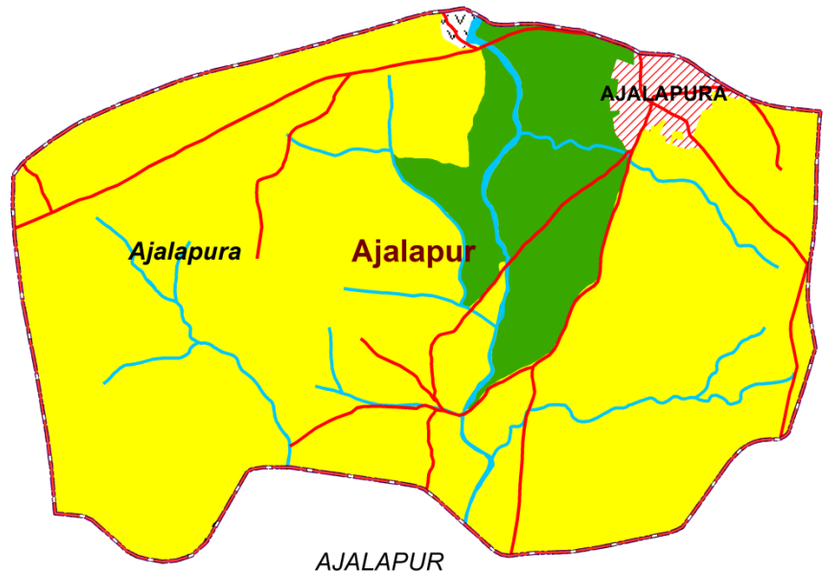
Slope Class	Area in ha (%)
Nearly level (0-1%)	205 (6.93)
Very gently sloping (1-3%)	2651 (89.7)
Mining/Industrial	1 (0.03)
Rock outcrops	3 (0.09)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

5.7.Soil Erosion





SOIL EROSION

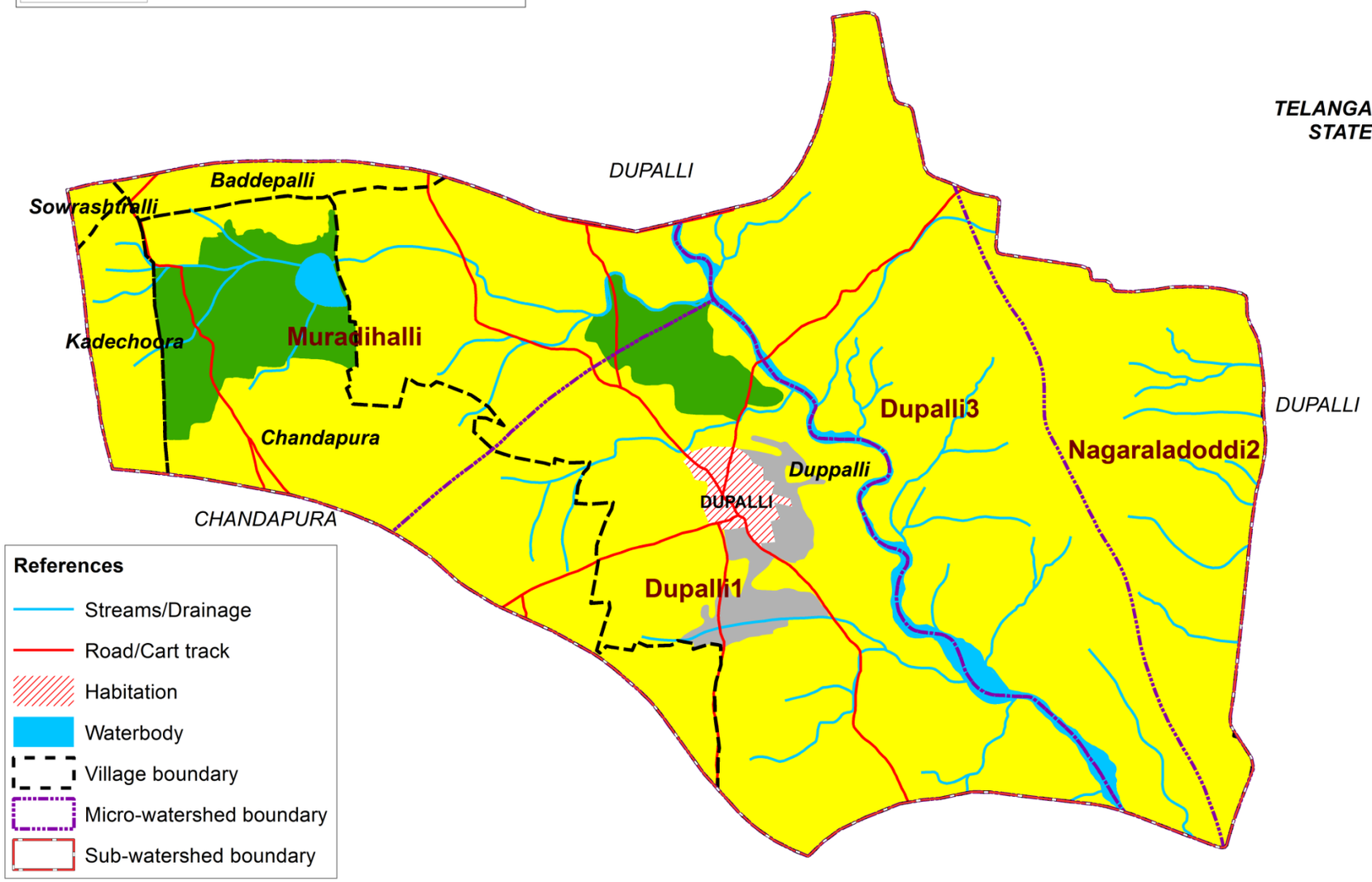
Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

0 0.5 1 2 km

N



References

- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

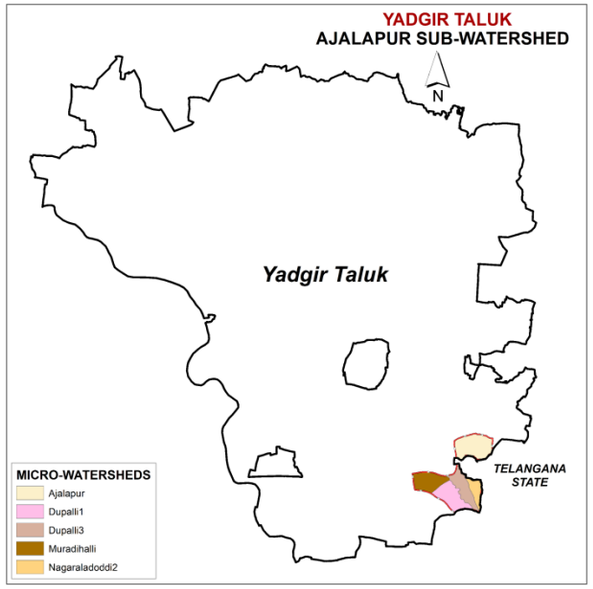
Erosion Class	Area in ha(%)
Slight	252 (8.54)
Moderate	2564 (86.77)
Severe	39 (1.32)
Mining/Industrial	1 (0.03)
Rock outcrops	3 (0.09)
Others*	96 (3.25)

* - Habitation & Waterbody

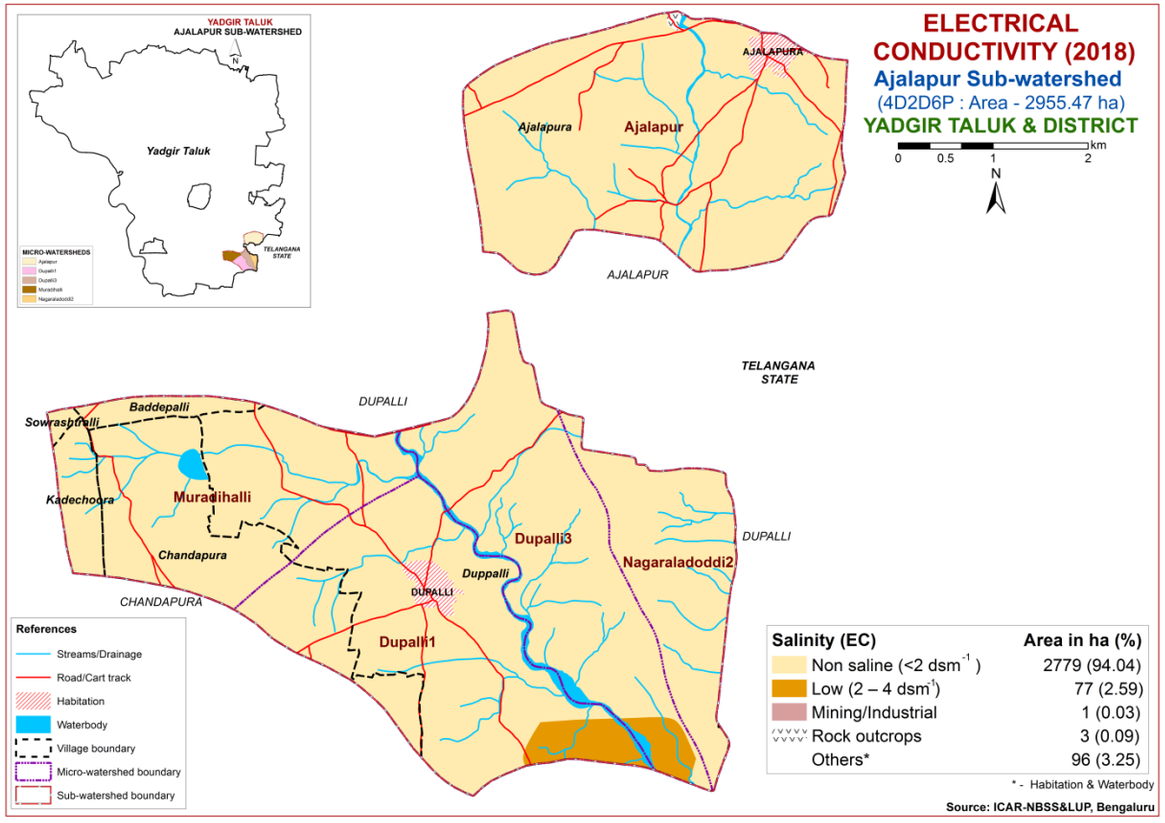
Source: ICAR-NBSS&LUP, Bengaluru

6. Soil Fertility Status

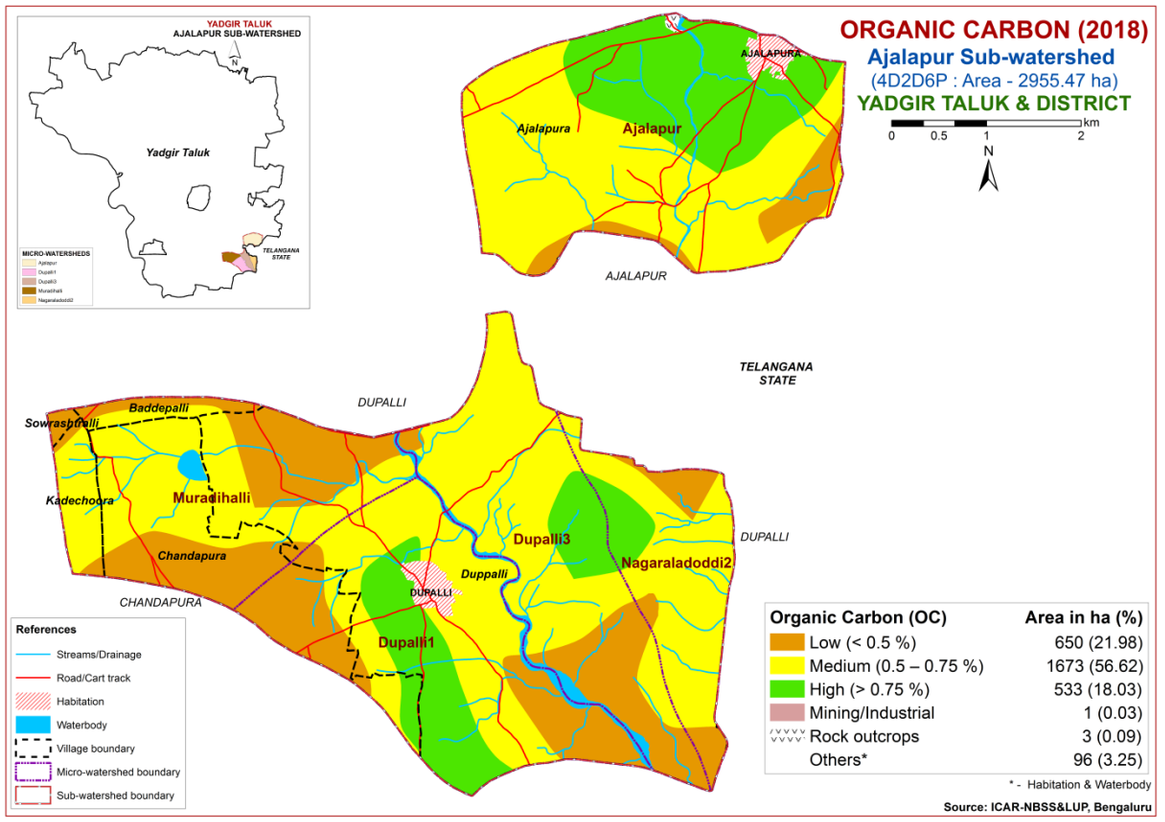
6.1. Soil Reaction (pH)



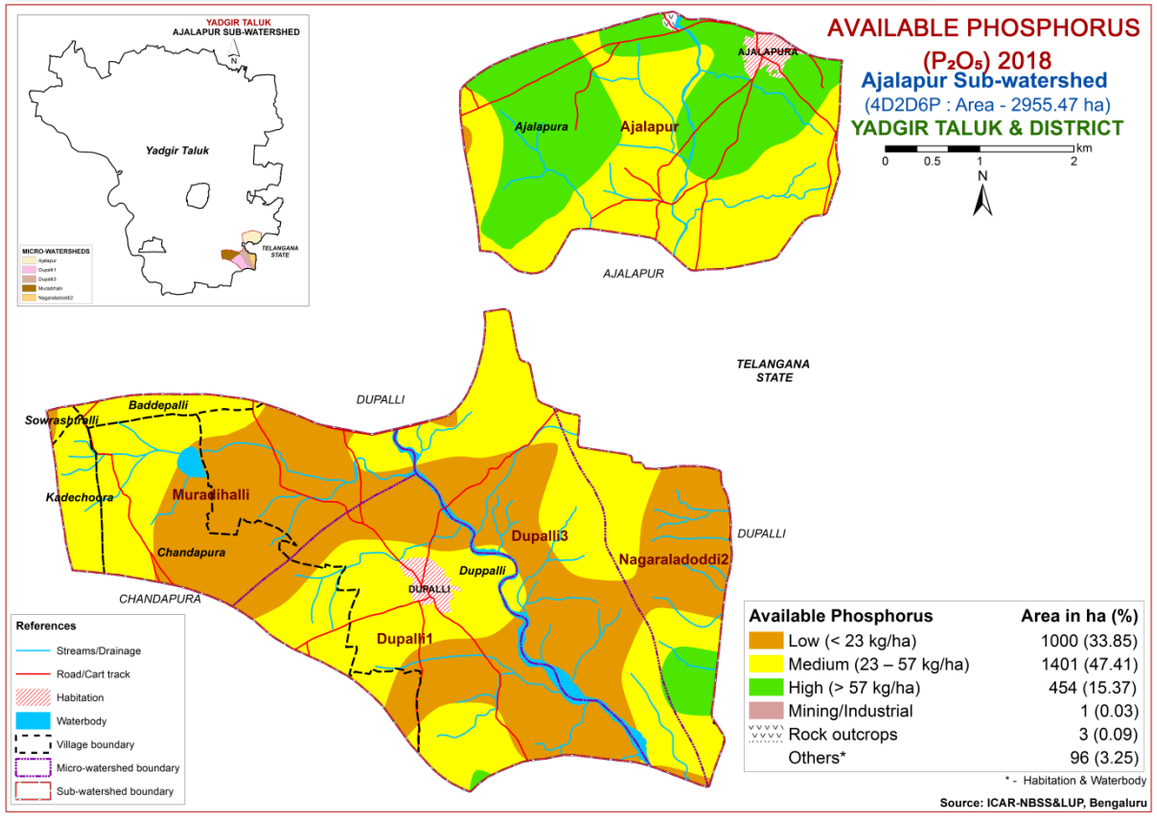
6.2. Electrical Conductivity (EC)



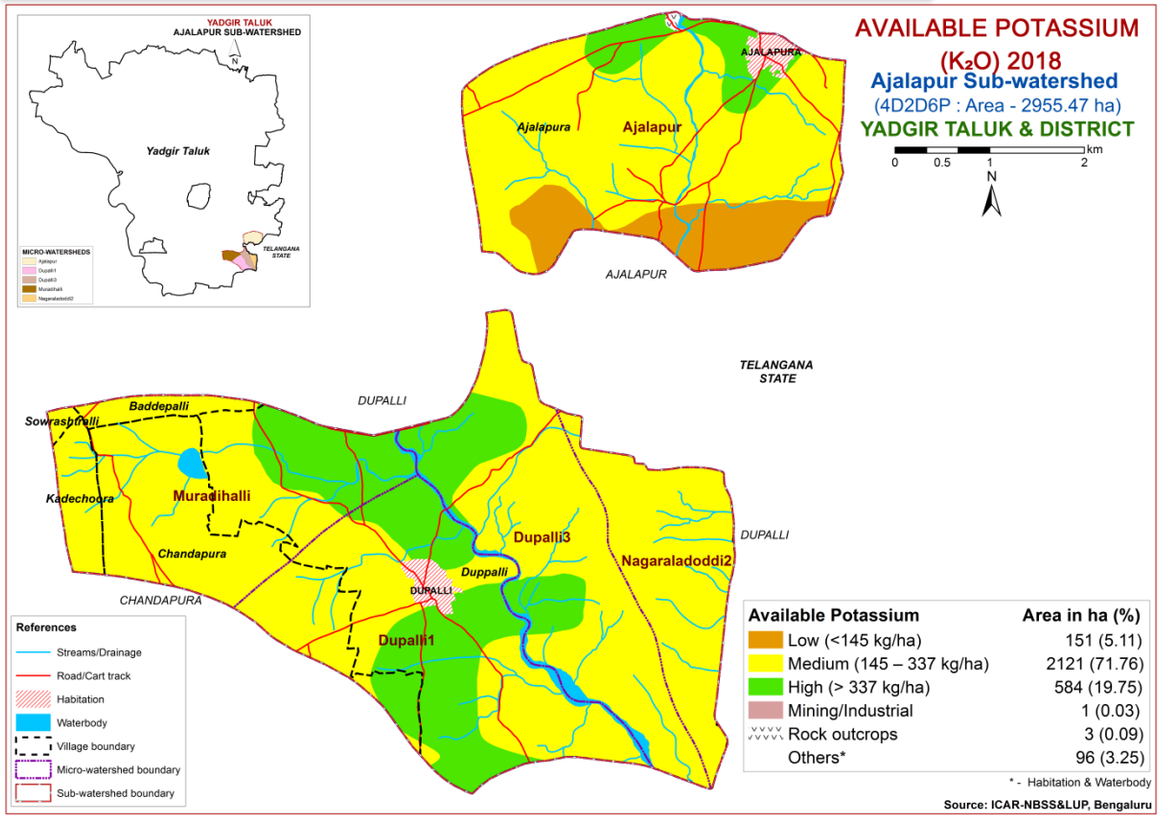
6.3. Organic Carbon



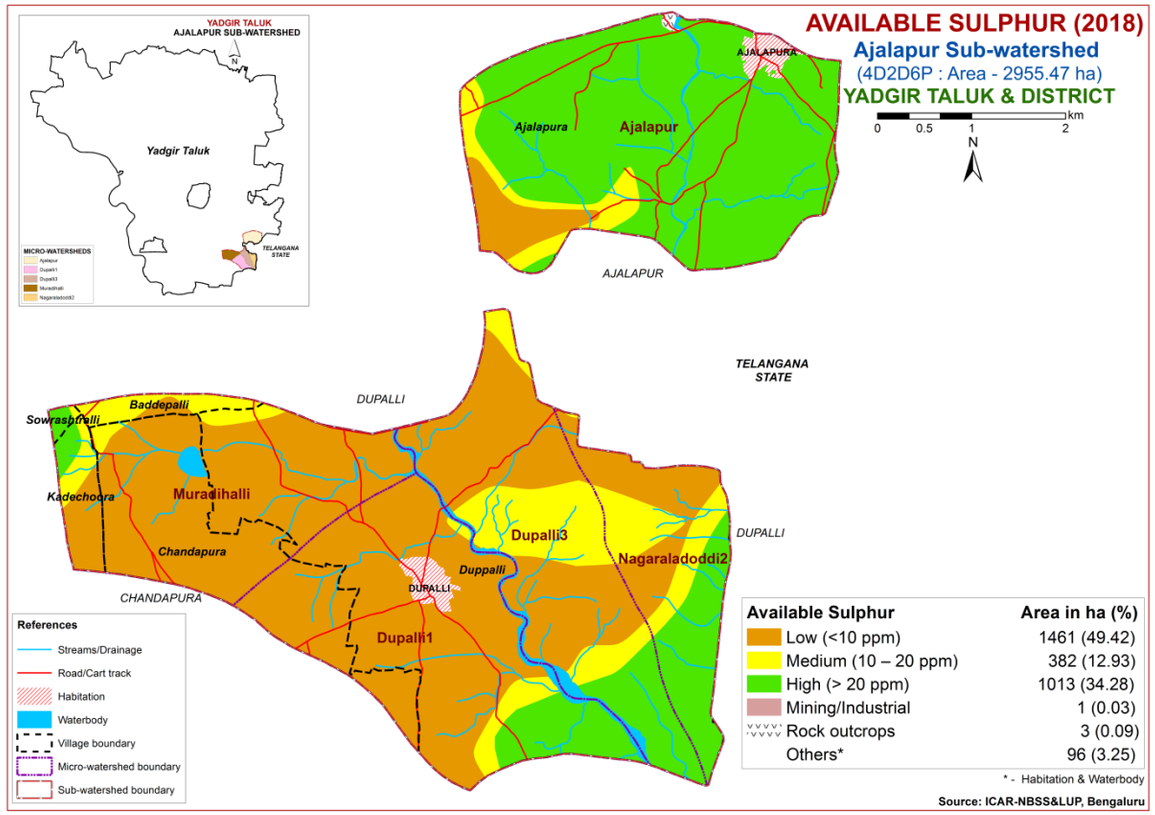
6.4. Available Phosphorus (P_2O_5)



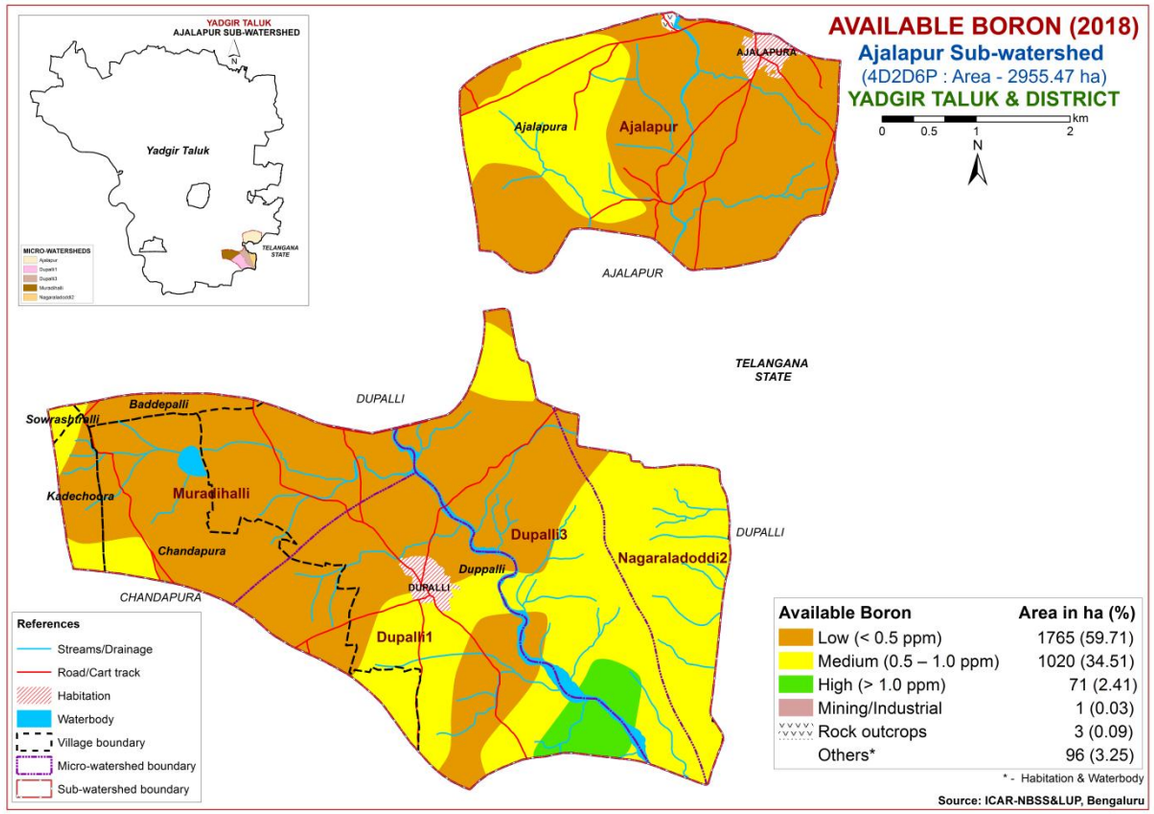
6.5. Available Potassium (K_2O)



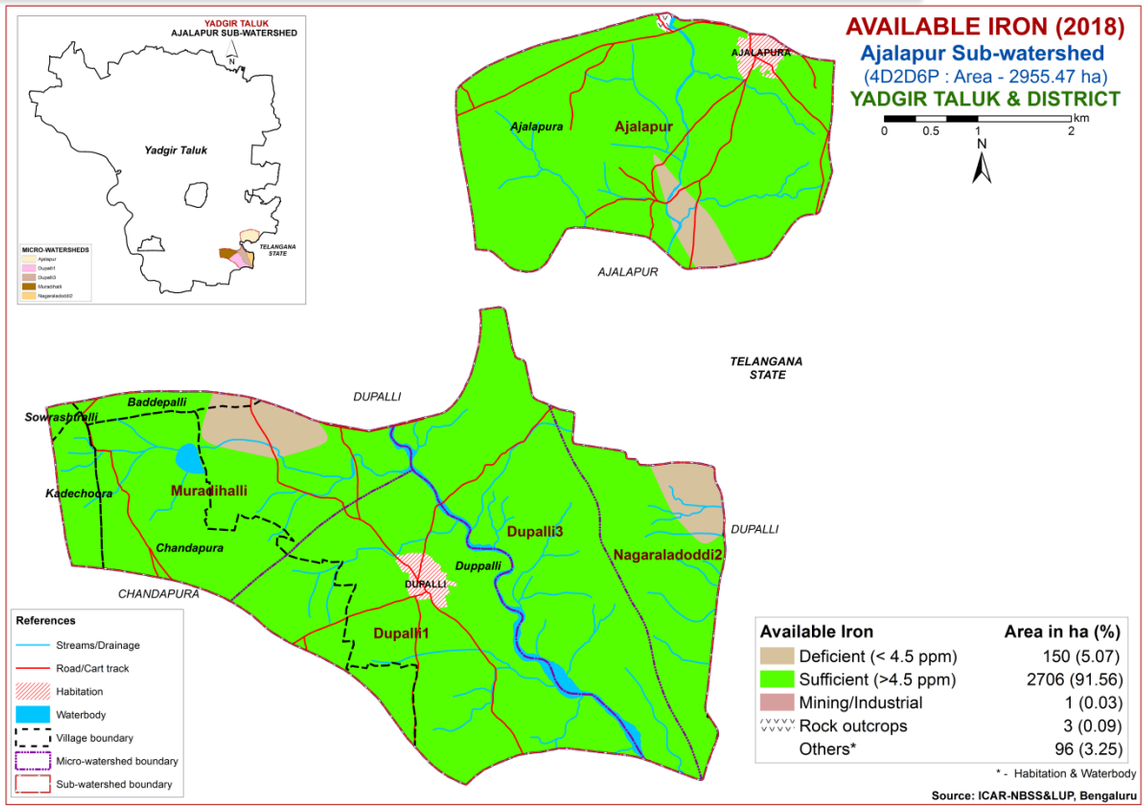
6.6. Available Sulphur



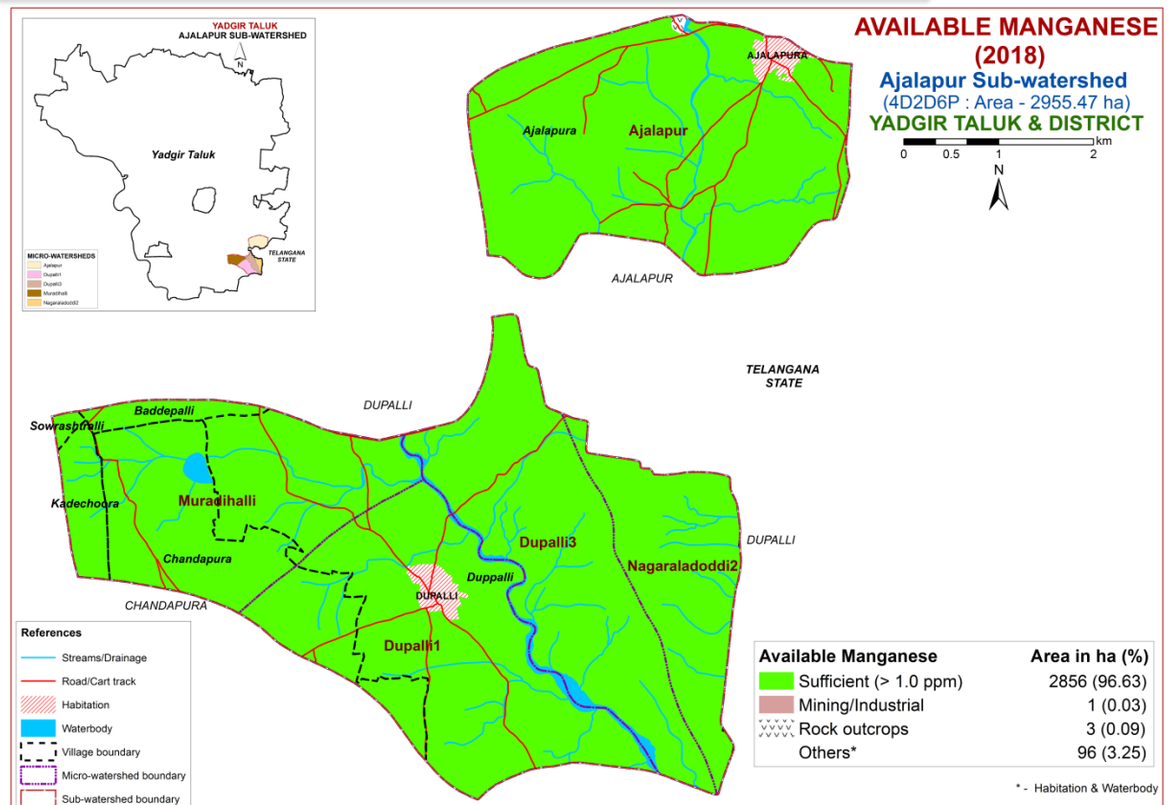
6.7. Available Boron



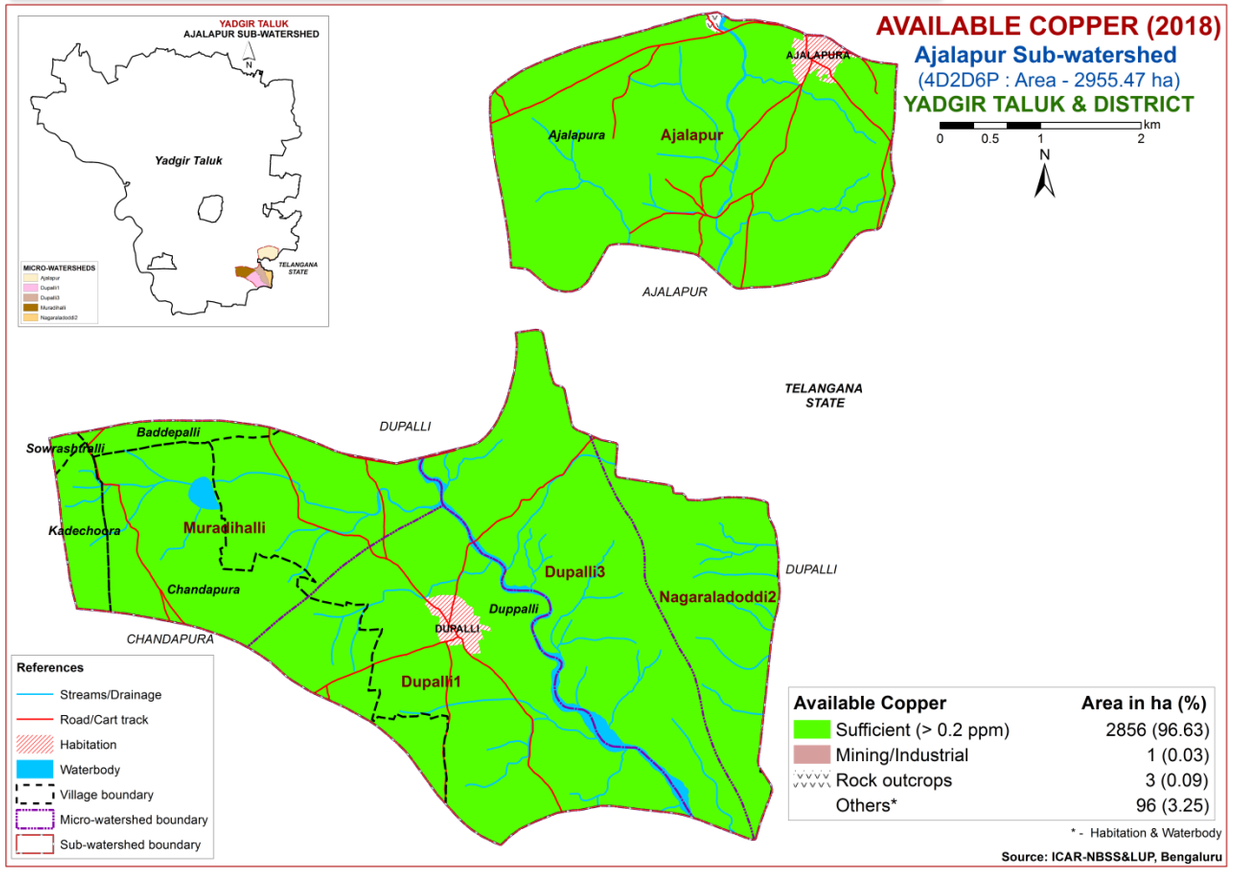
6.8. Available Iron



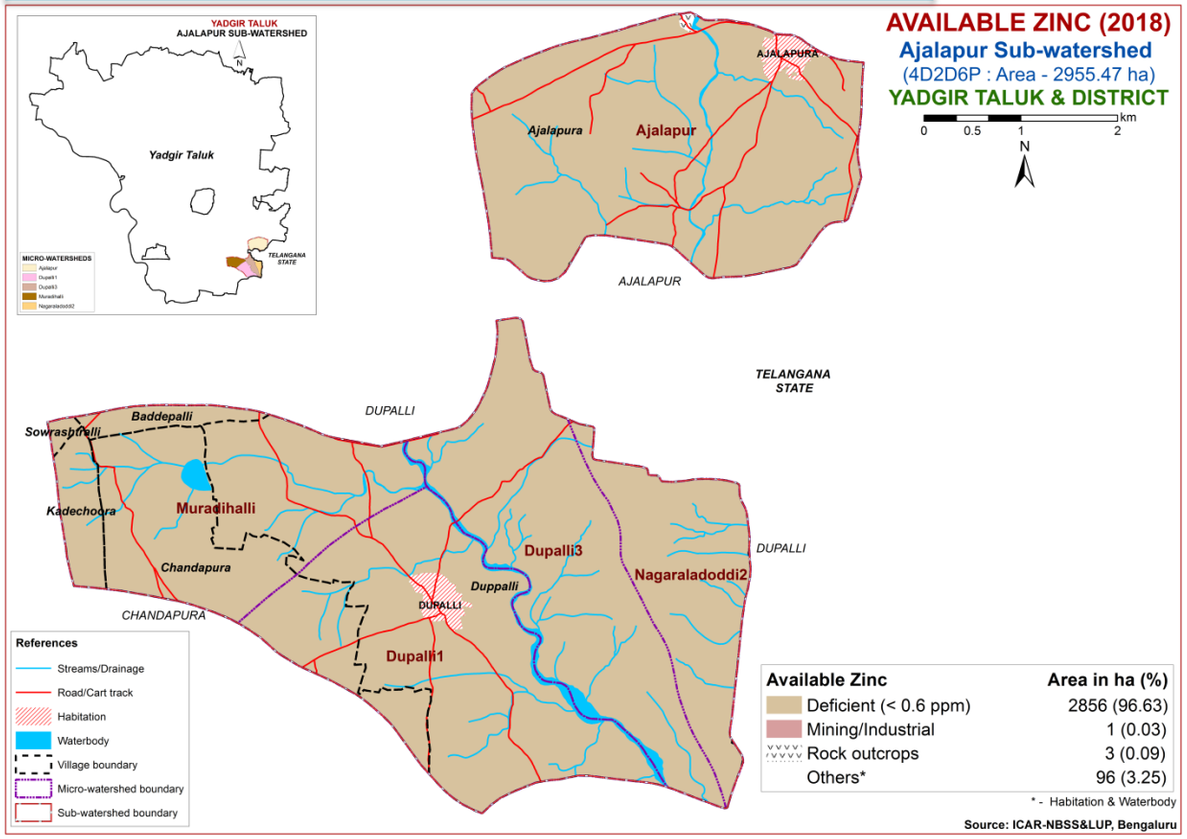
6.9. Available Manganese



6.10. Available Copper



6.11. Available Zinc



6.12. Correcting the Soil Nutrient Deficiencies

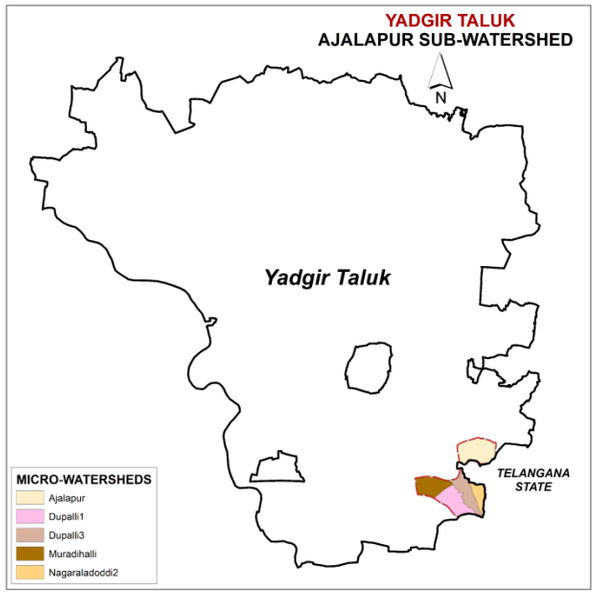
1. Reclamation of Salt affected soils
   a) When the soil is having neutral pH (6.5-7.5), no need of adding amendments (lime or gypsum)
   b) If the soil pH is <6.5, apply burnt lime to soil as per specifically recommended dosage and again after 2 years proper change has to be made based on soil test results.
   c) If the soil pH is 7.5-8.5 due to excess calcium content, drain out the excess calcium form the soil with good quality irrigation water.
   d) If the soil pH is more than 8.5 due to higher sodium content in soil, apply specifically recommended dose of gypsum & drain out the excess salts with good quality irrigation water.

2. In case of low & high content of major nutrients in the soil, follow the modifications as given bellow:
   - N: P: K (N: P_2O_5: K_2O) **For low N content**, add 25 % extra to the Recommended Dose of Fertilisers (RDF).
     For high N content, reduce 25% from the RDF and apply to soil.
     Eg:- if 100kg N, then we have to apply
     100+25% for deficient soil.
     100% for medium available N content soil.
     100-25% for higher N content soil.
   - Follow the same in case of P & K.

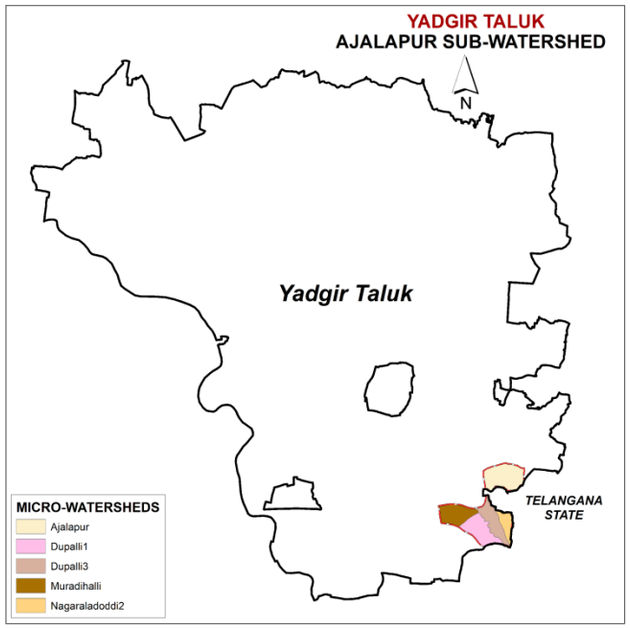
3. Use or Incorporation of biofertilizers like Rhizobium, Azotobacter, Azospirillum, Phosphate Solubilizing Bacteria and mycorrhiza enhances normal available nutrients in soil to the plants and also reduce the input cost of cultivation.
4. For calcium deficient soil, apply N-fertilizers like calcium ammonium nitrate; Gypsum can also supply calcium ($CaSO_4.2H_2O$)
5. Apply 405kg $MgSO_4$ per ha to the magnesium deficient soil. In case of perennial horticulture crops apply 150-200g/ plant.
6. In sulphur deficient acid soils (Humid region) apply phosphorus (in the form of) through SSP & use sulphur coated urea to the crops.
7. Apply 30-50kg ferrous sulfate ($FeSO_4$) per ha to the iron deficient soils. In case of perennial Horticulture crops apply 3-5g/ litre $FeSo_4$ /plant as foliar spray.
8. Apply 30-40kg/ha – manganese sulfate ($MnSO_4$) as soil application to the manganese deficient soils. In case of perennial Horticulture crops apply 3-5 g/litre $MnSO_4$ /plant as foilar application.
9. Apply Zinc – 10-25 kg/ha –$ZnSO_4$ – soil application to the Zinc deficient soils. In case of perennial Horticulture crops apply 3-5g/ litre – foliar application.
10. Apply Copper – 5-10 kg /ha – copper sulfate ($CuSO_4$) soil application for the copper deficient soils and for Perennial horticultural crops 3-5g/ litre – $CuSO_4$/plant as foliar application.
11. Apply borax 8-10 kg/ha in boron deficient soils and for Perennial horticultural crops as foliar application – 1g / litre.
12. Apply molybdenum – ammonium molybdate 200-250 gm/ha for Molybdenum deficient soils or dissolve 1g / litre ammonium molybdate for Foliar spray.
13. Soil sampling and testing needs to be done at every 2-3 years interval.

7. Land Suitability for Major Crops

7.1. Land Suitability for Sorghum



7.2. Land Suitability for Maize



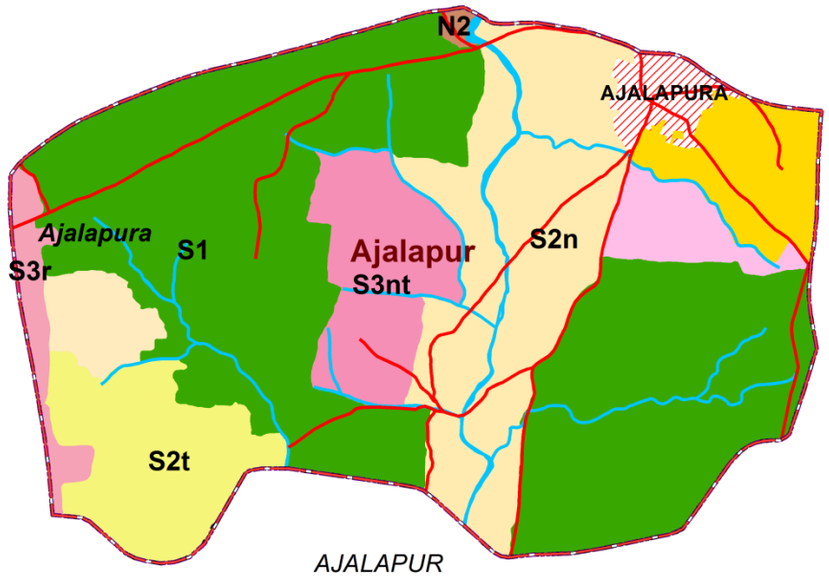
LAND SUITABILITY FOR MAIZE

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

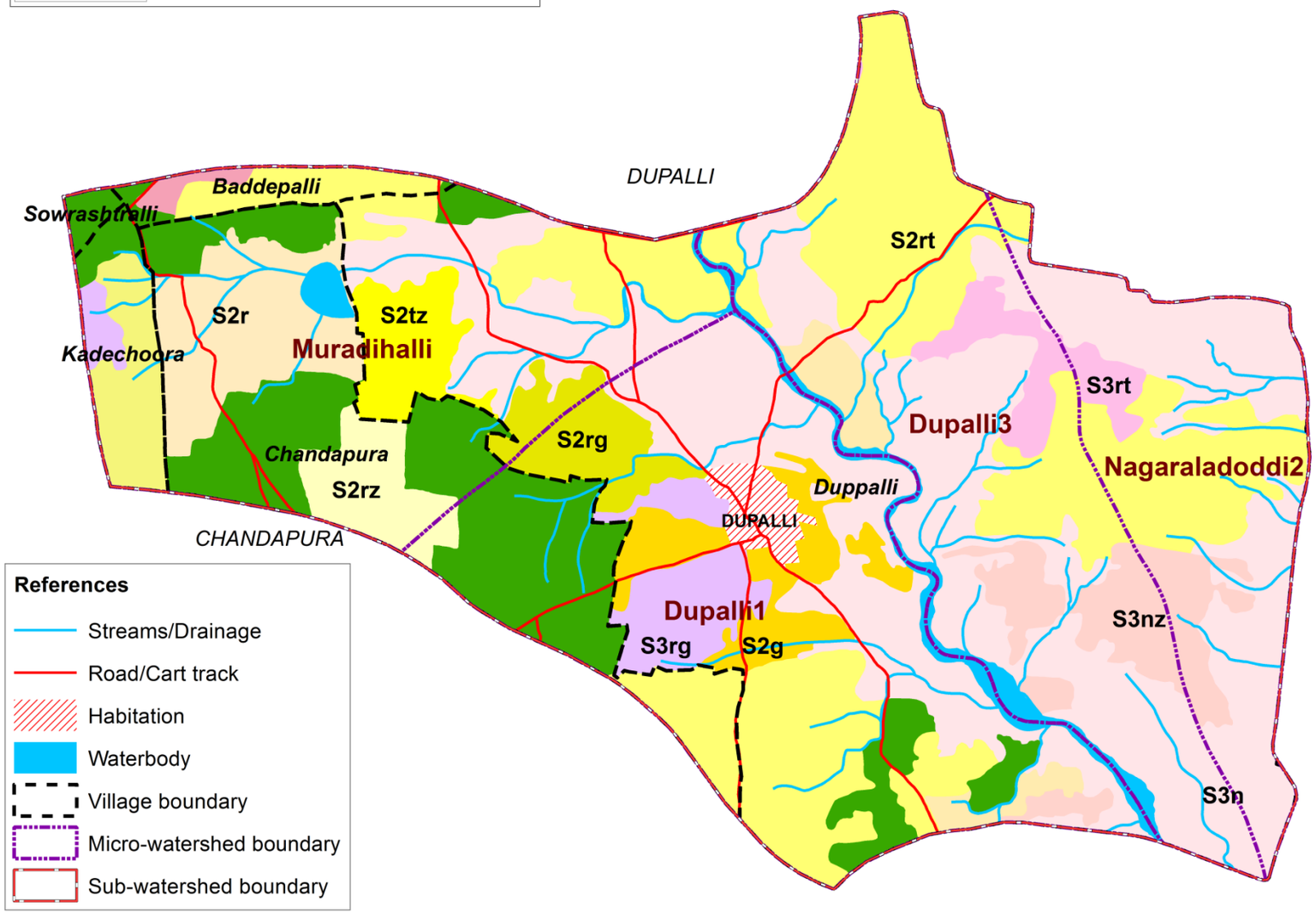
YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N



Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness



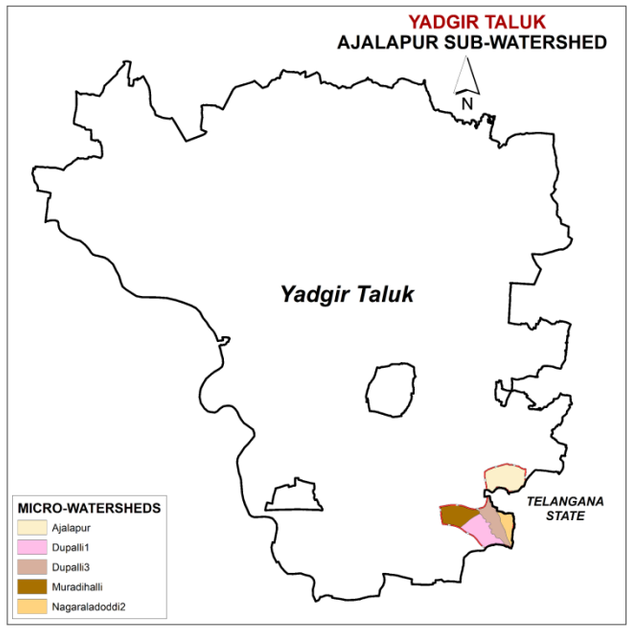
References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

Suitability subclass	Area in ha (%)
S1	689 (23.3)
S2g	112 (3.78)
S2n	199 (6.72)
S2r	116 (3.92)
S2t	120 (4.05)
S2rg	54 (1.81)
S2rt	494 (16.71)
S2rz	47 (1.6)
S2tz	45 (1.51)
S3n	659 (22.31)
S3r	28 (0.95)
S3nt	68 (2.3)
S3nz	92 (3.1)
S3rg	65 (2.2)
S3rt	70 (2.38)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.3. Land Suitability for Redgram



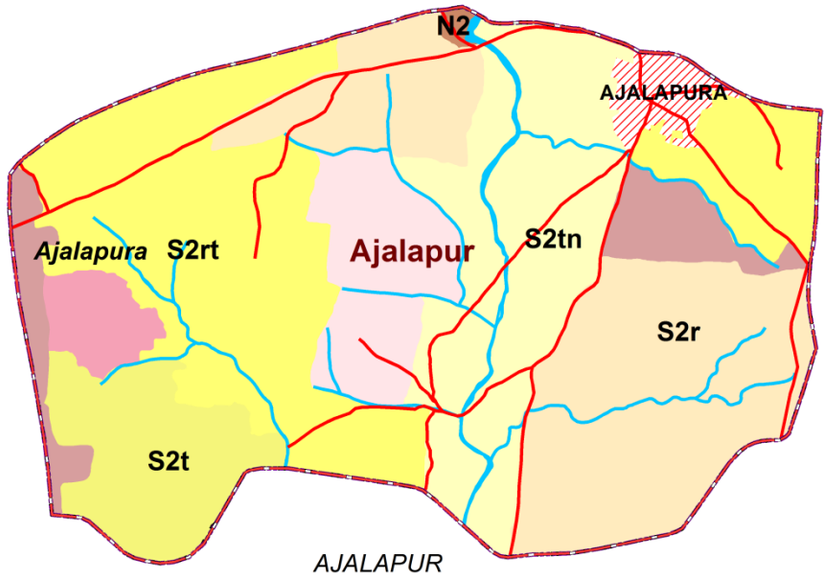
LAND SUITABILITY FOR REDGRAM

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

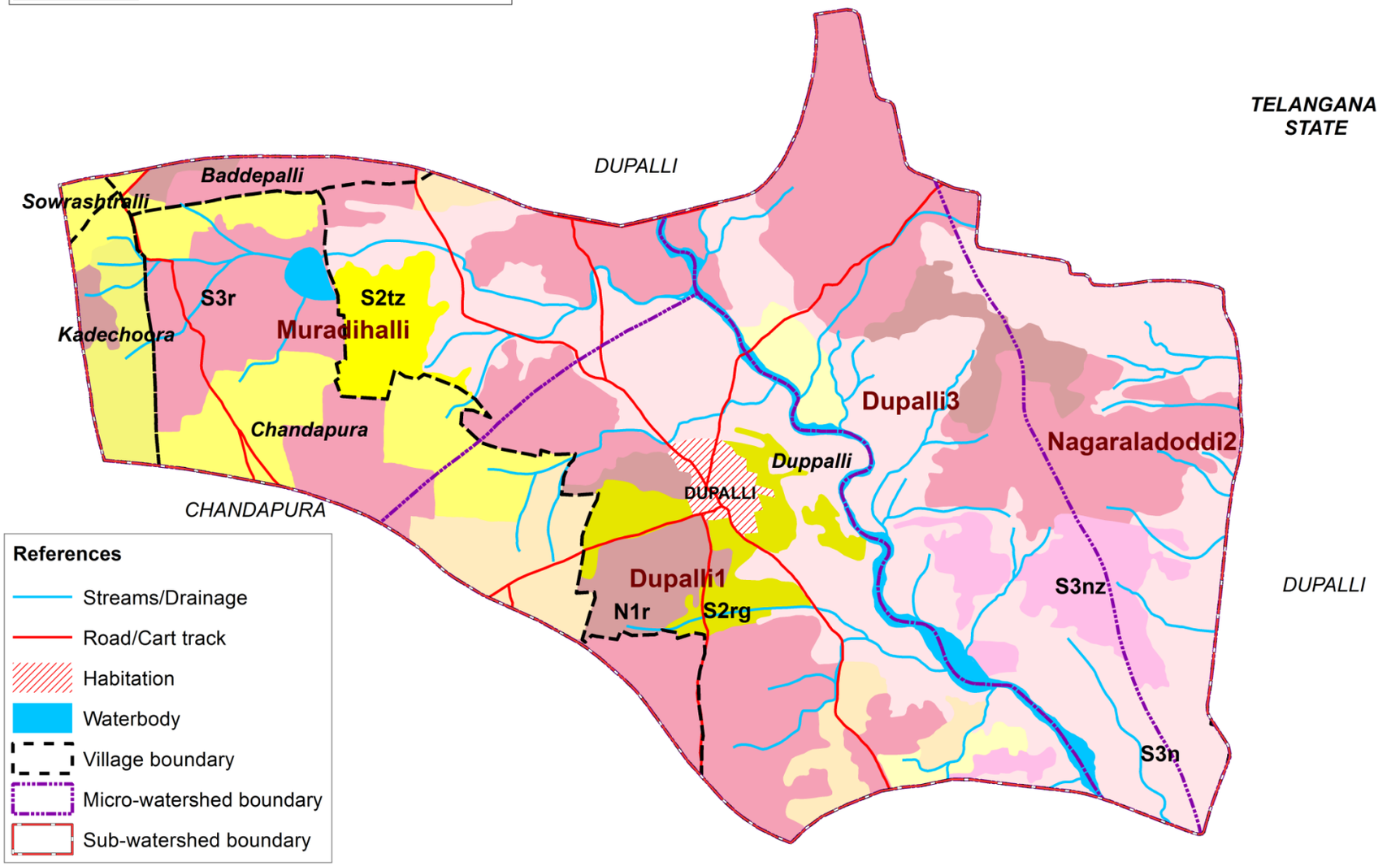
YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N



Key
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness



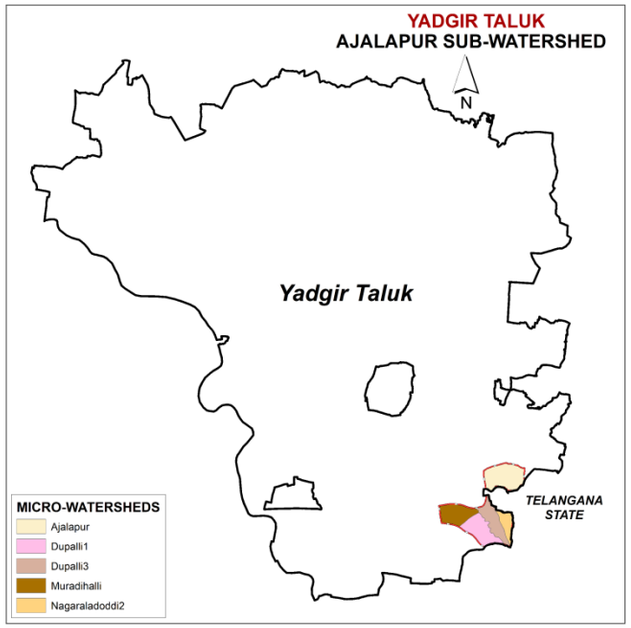
References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

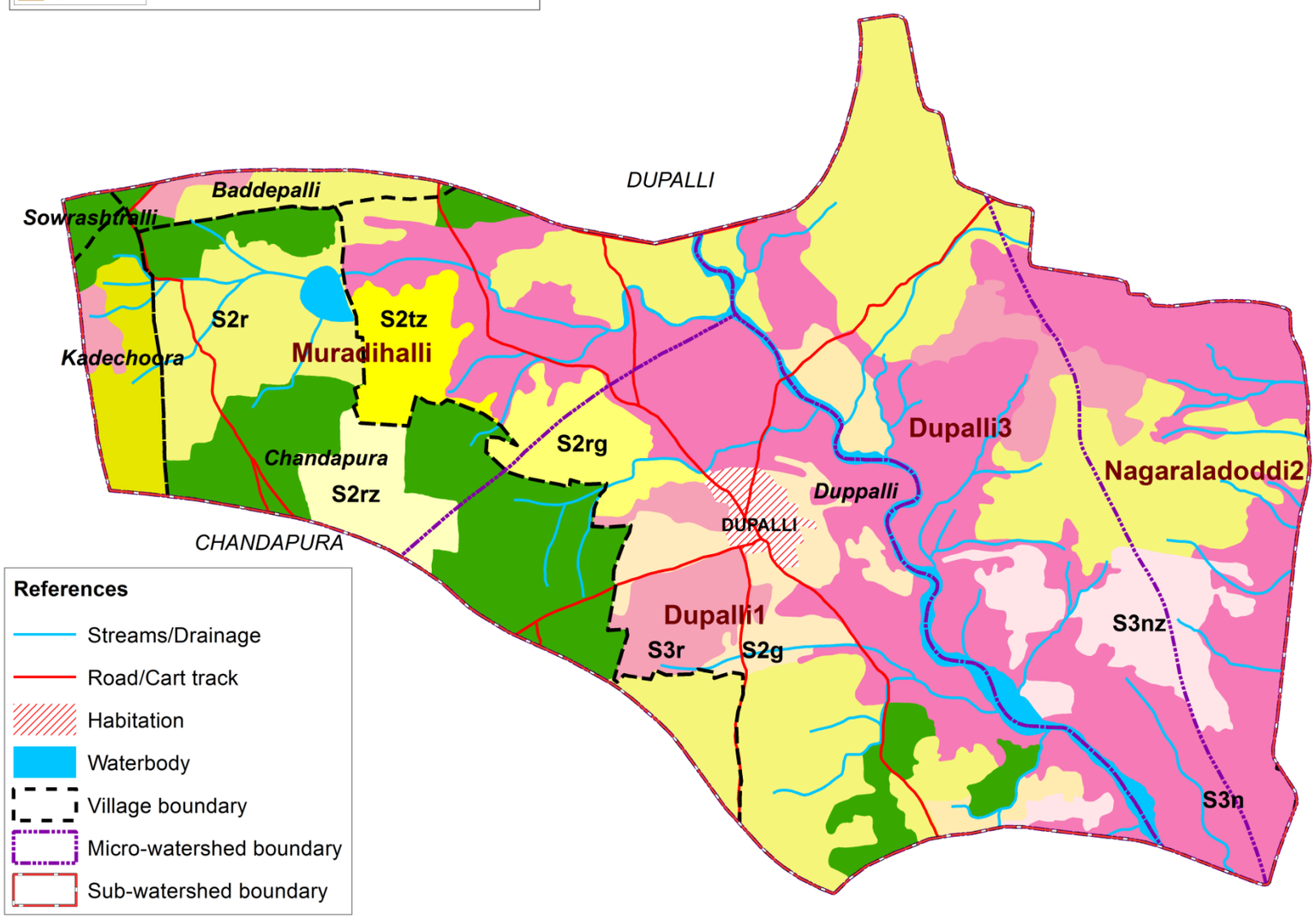
Suitability subclass	Area in ha (%)
S2r	330 (11.15)
S2t	120 (4.05)
S2rg	65 (2.19)
S2rt	406 (13.73)
S2tn	199 (6.72)
S2tz	45 (1.51)
S3n	727 (24.61)
S3r	710 (24.03)
S3nz	92 (3.1)
N1r	164 (5.53)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.4. Land Suitability for Bajra





LAND SUITABILITY FOR BAJRA

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N

Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N2- Permanently Not Suitable

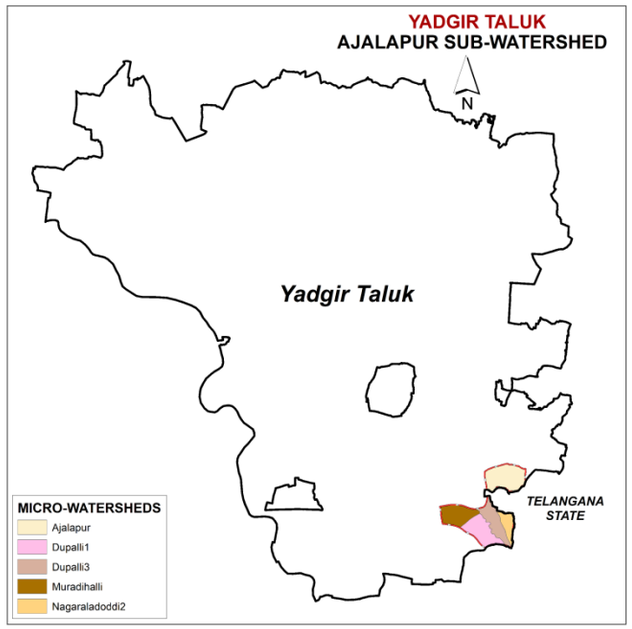
Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

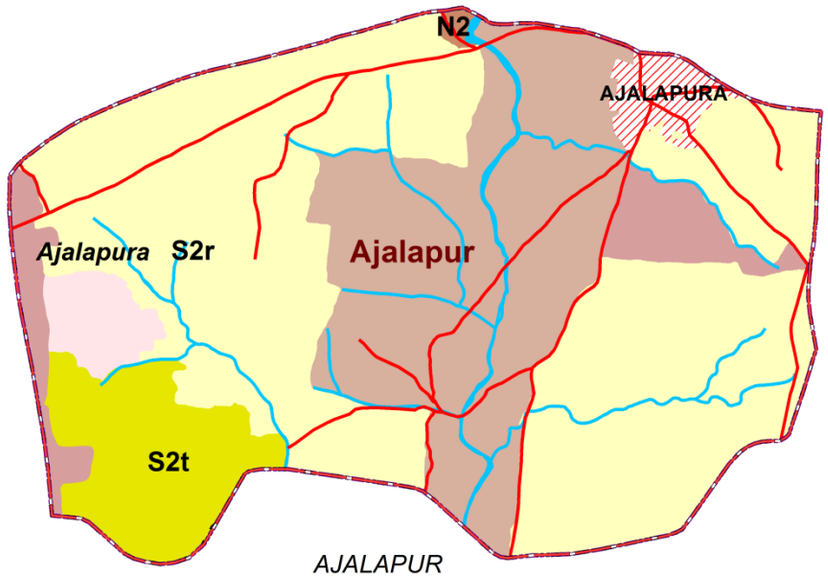
Suitability subclass	Area in ha (%)
S1	735 (24.88)
S2g	65 (2.19)
S2n	199 (6.72)
S2r	610 (20.62)
S2t	120 (4.05)
S2rg	54 (1.81)
S2rz	47 (1.6)
S2tz	45 (1.51)
S3n	727 (24.61)
S3r	137 (4.64)
S3nz	92 (3.1)
S3rt	26 (0.89)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.5. Land Suitability for Drumstick





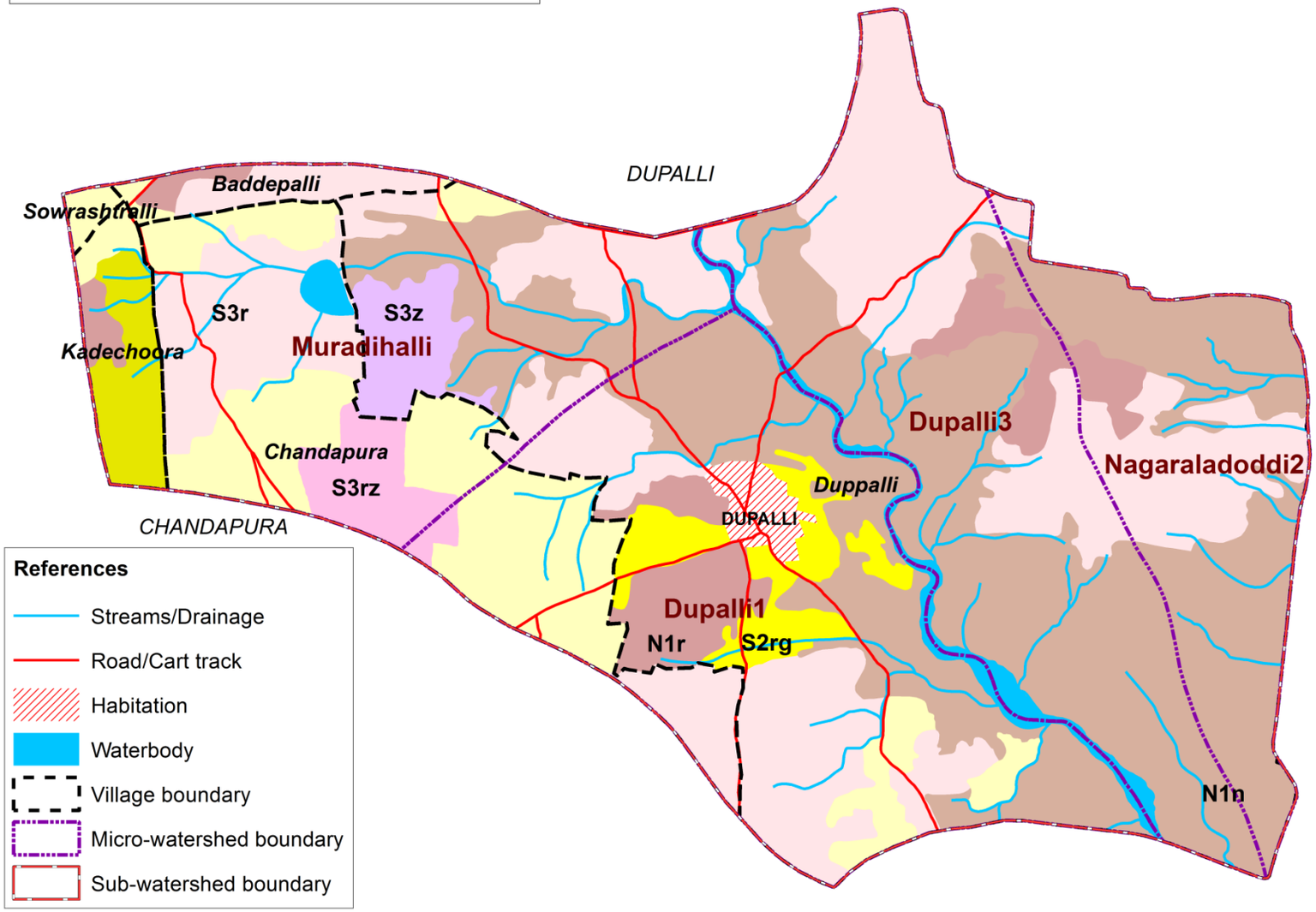
LAND SUITABILITY FOR DRUMSTICK

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N



Key
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

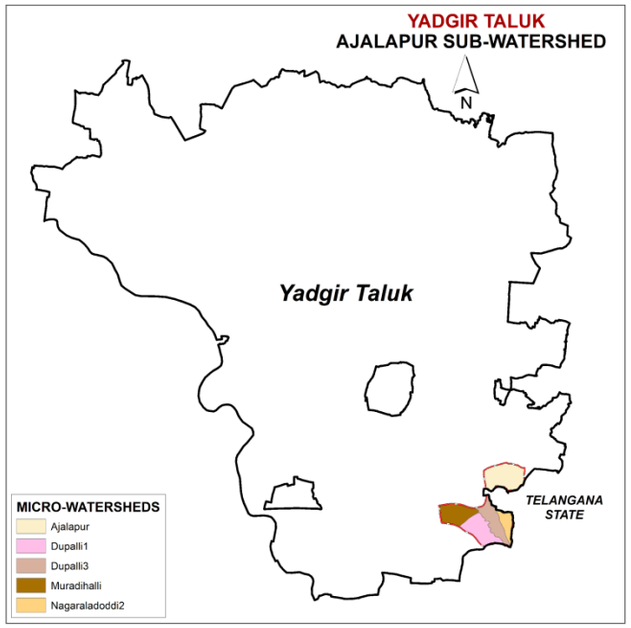
Suitability subclass	Area in ha (%)
S2r	735 (24.88)
S2t	120 (4.05)
S2rg	65 (2.19)
S3r	663 (22.44)
S3z	45 (1.51)
S3rz	47 (1.6)
N1n	1018 (34.43)
N1r	164 (5.53)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

Source: ICAR-NBSS&LUP, Bengaluru

7.6. Land Suitability for Sunflower



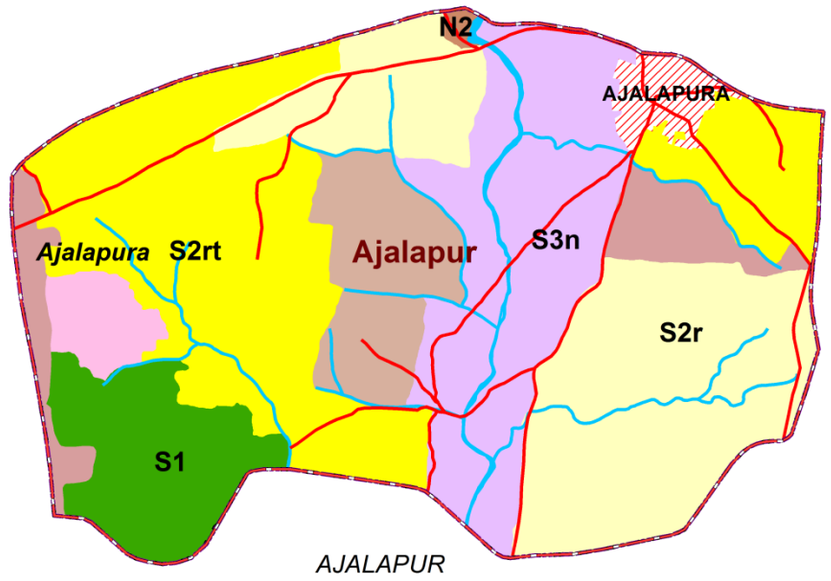
LAND SUITABILITY FOR SUNFLOWER

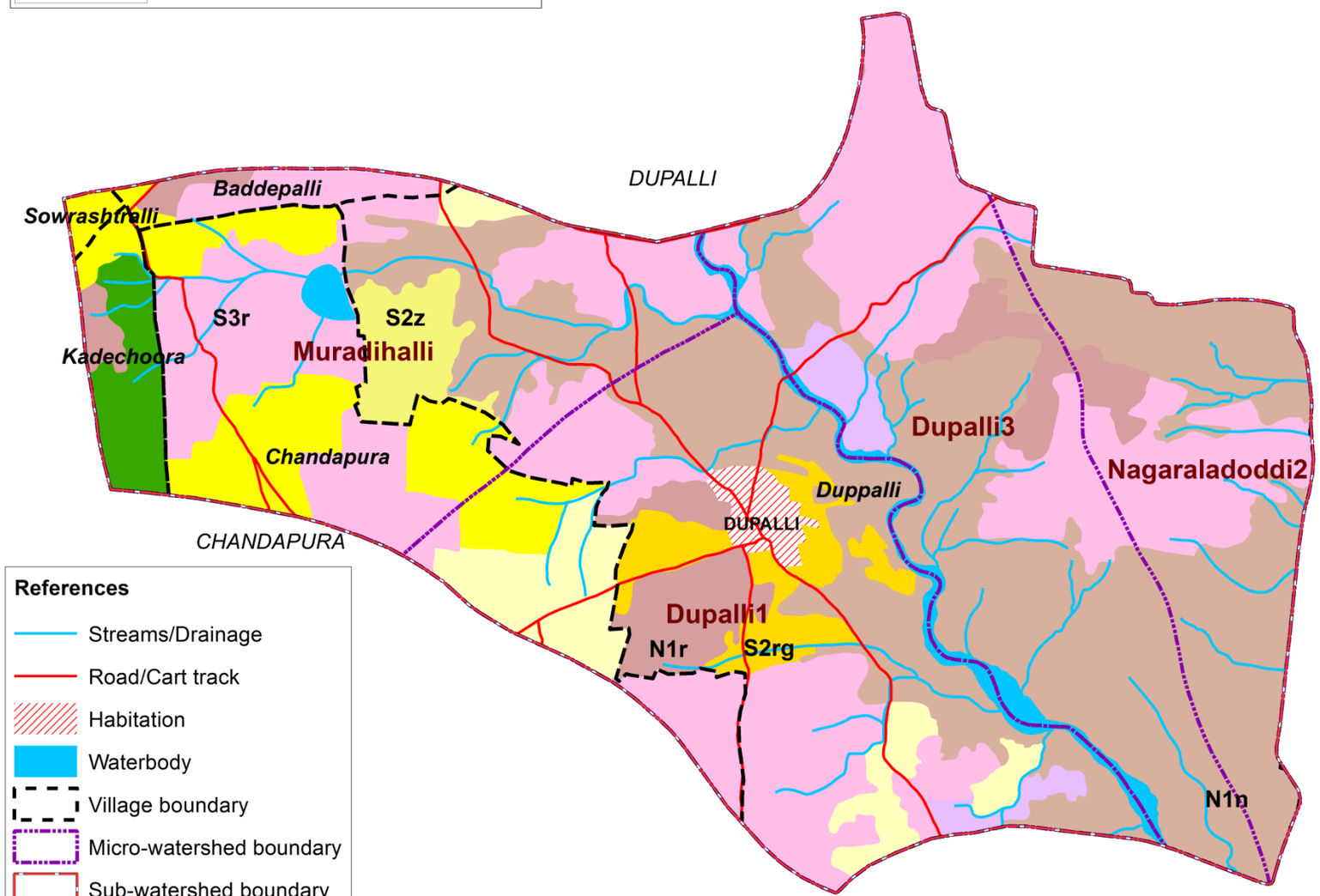
Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N





Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

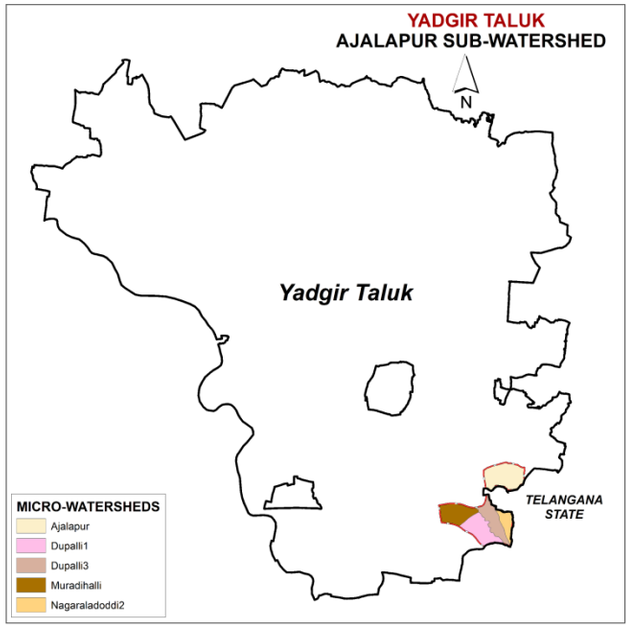
Suitability subclass	Area in ha (%)
S1	120 (4.05)
S2r	330 (11.15)
S2z	45 (1.51)
S2rg	65 (2.19)
S2rt	406 (13.73)
S3n	199 (6.72)
S3r	710 (24.03)
N1n	819 (27.71)
N1r	164 (5.53)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

Source: ICAR-NBSS&LUP, Bengaluru

7.7. Land Suitability for Cotton



LAND SUITABILITY FOR COTTON

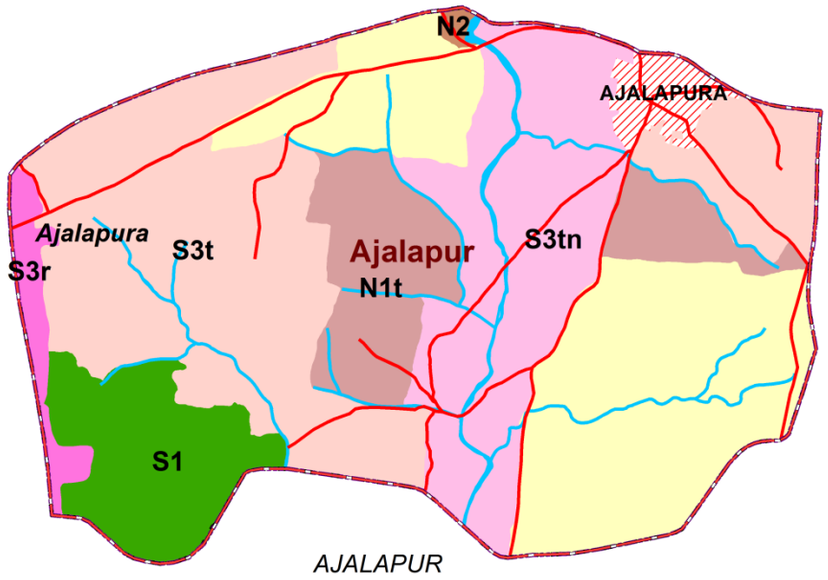
Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

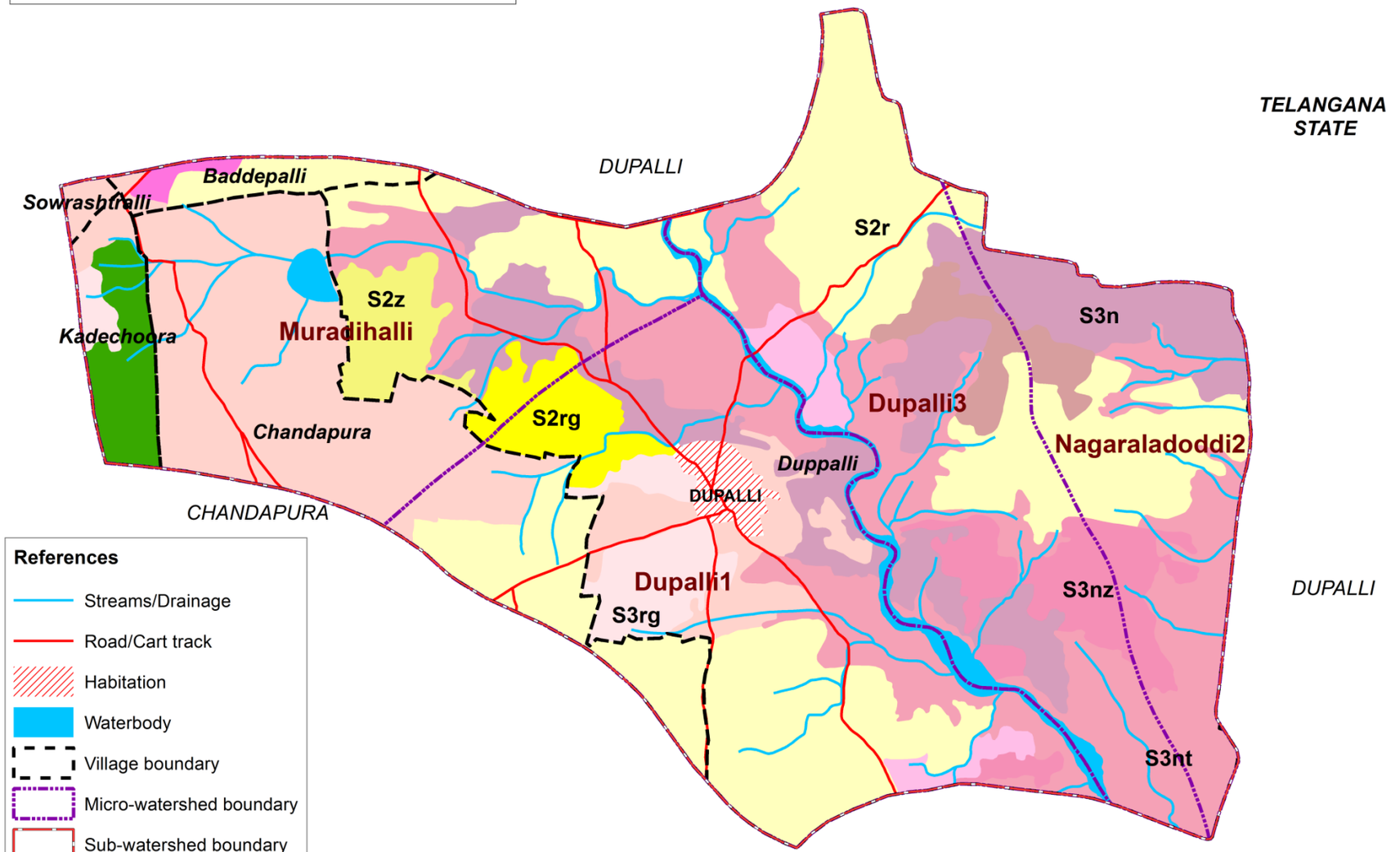
0 0.5 1 2 km

N



Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

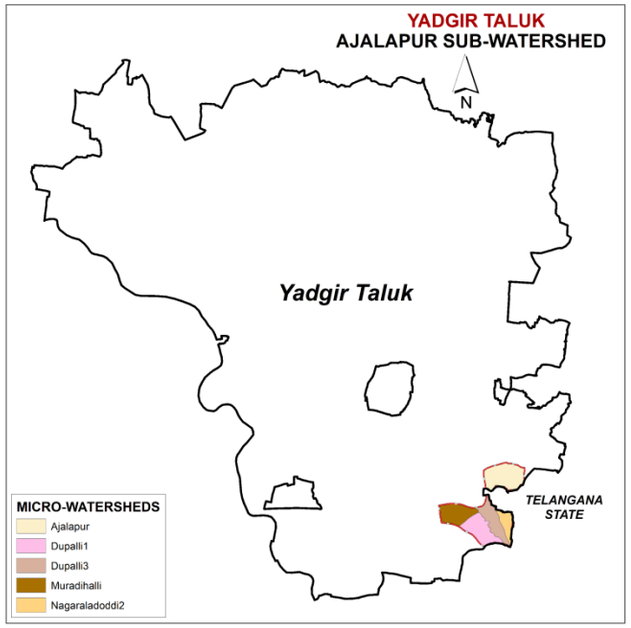


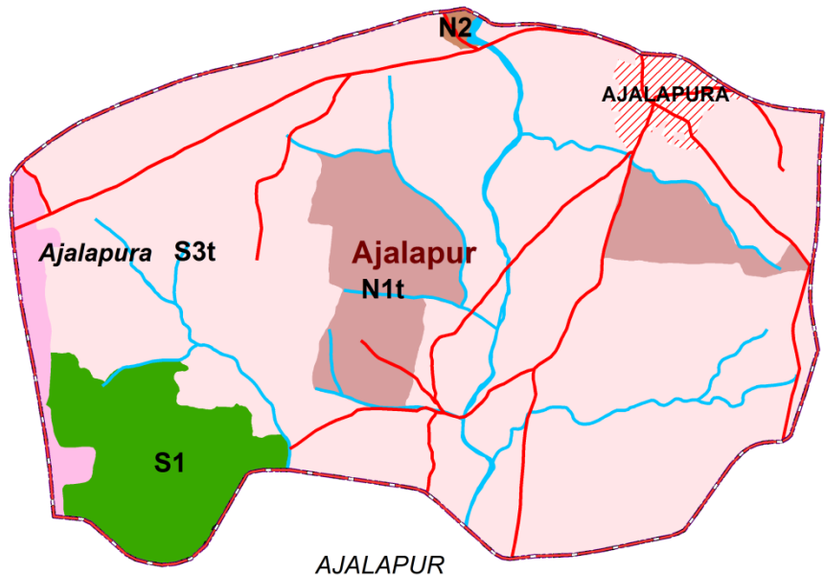
Suitability subclass	Area in ha (%)
S1	120 (4.05)
S2r	823 (27.86)
S2z	45 (1.51)
S2rg	54 (1.81)
S3n	241 (8.17)
S3r	28 (0.95)
S3t	633 (21.43)
S3nt	418 (14.14)
S3nz	92 (3.1)
S3rg	65 (2.2)
S3tn	199 (6.72)
N1t	138 (4.68)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.8. Land Suitability for Bengalgram





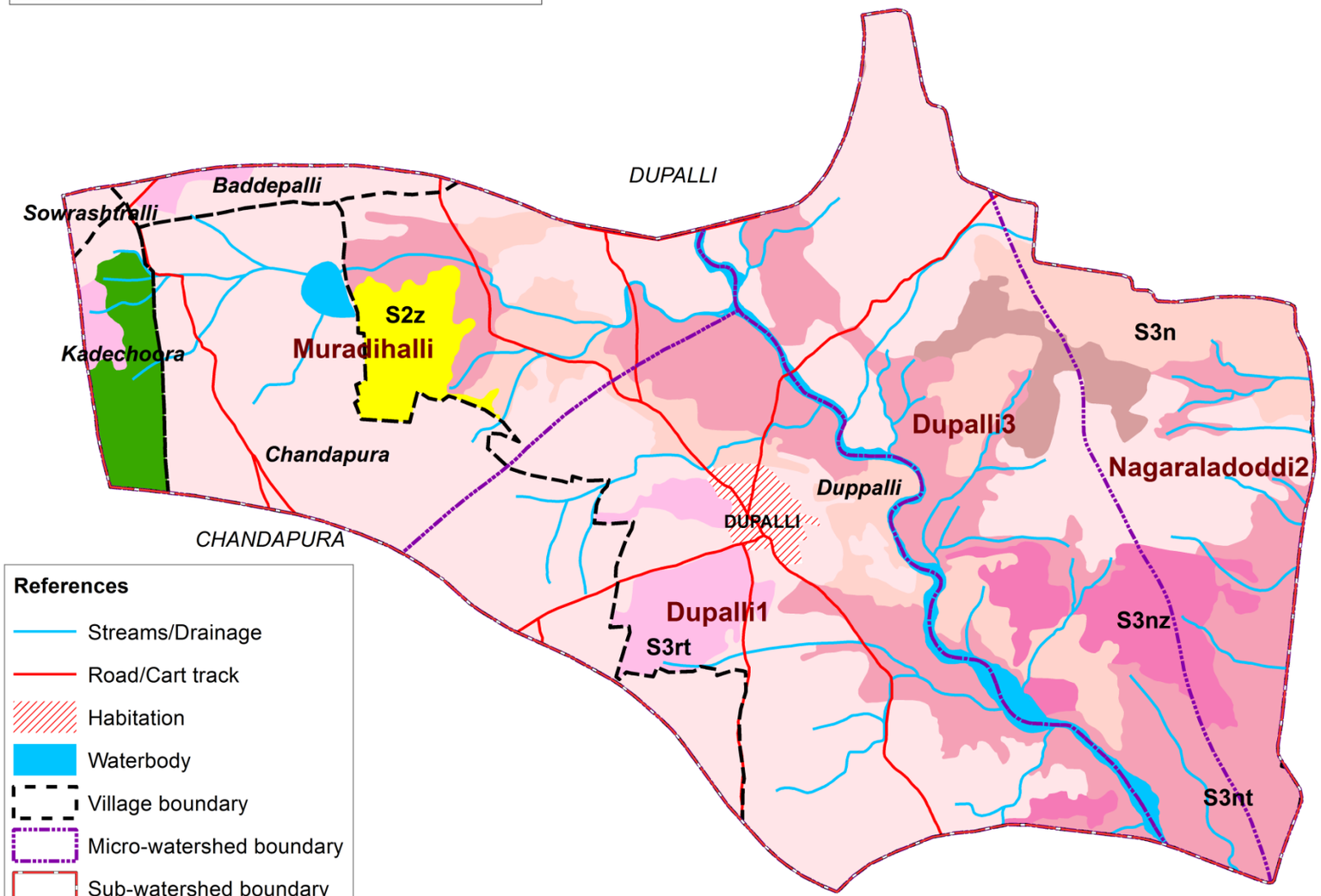
LAND SUITABILITY FOR BENGALGRAM

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N



Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

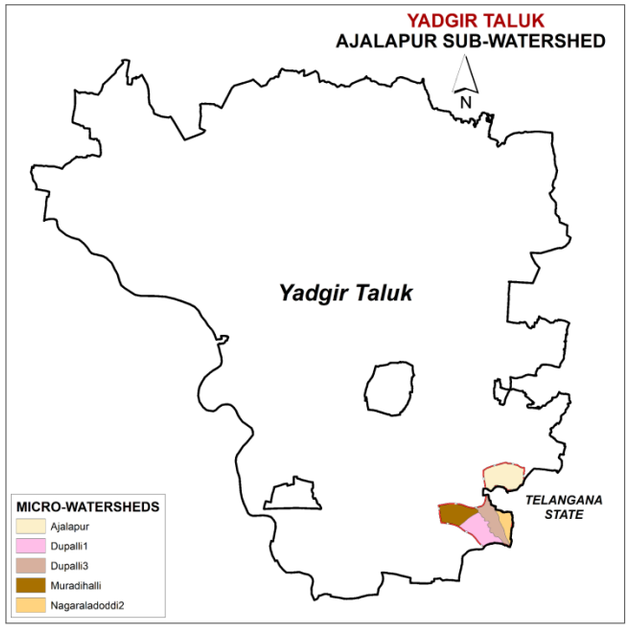
Suitability subclass	Area in ha (%)
S1	120 (4.05)
S2z	45 (1.51)
S3n	241 (8.17)
S3t	1709 (57.82)
S3nt	418 (14.14)
S3nz	92 (3.1)
S3rt	93 (3.15)
N1t	138 (4.68)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

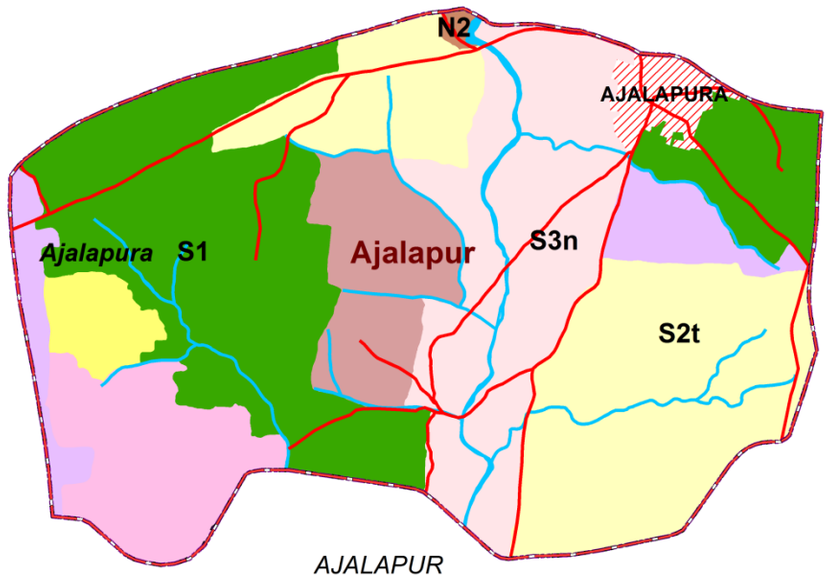
* - Habitation & Waterbody

References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

Source: ICAR-NBSS&LUP, Bengaluru

7.9. Land Suitability for Groundnut





LAND SUITABILITY FOR GROUNDNUT

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N

TELANGANA STATE

Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

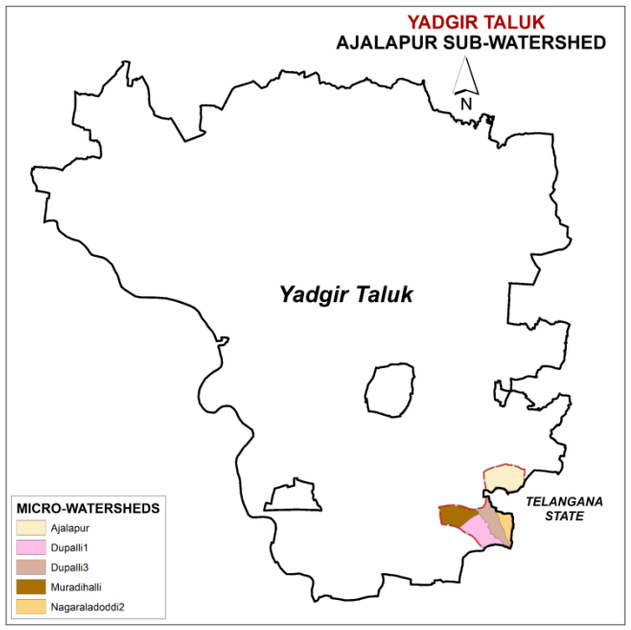
Suitability subclass	Area in ha (%)
S1	406 (13.73)
S2g	65 (2.19)
S2r	116 (3.92)
S2t	330 (11.15)
S2rz	47 (1.6)
S3n	199 (6.72)
S3r	164 (5.53)
S3t	712 (24.08)
N1n	819 (27.71)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

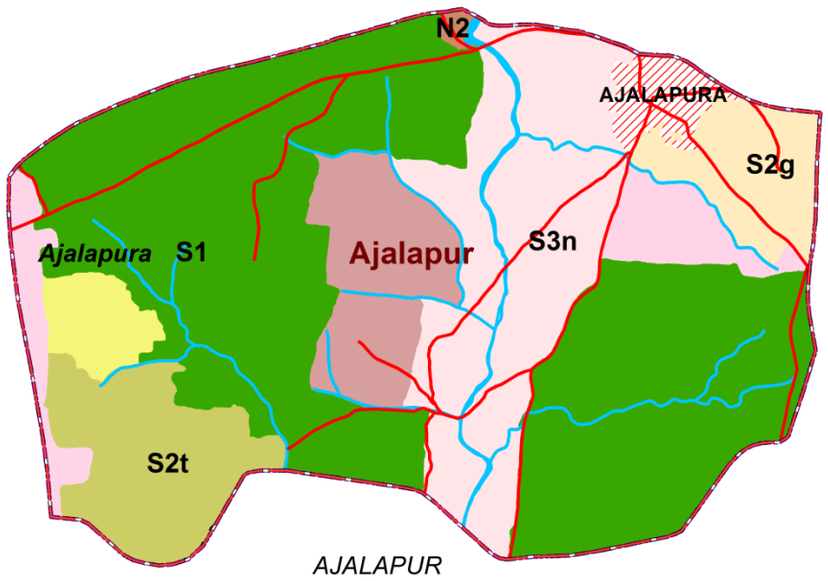
* - Habitation & Waterbody

References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

Source: ICAR-NBSS&LUP, Bengaluru

7.10. Land Suitability for Chilli





LAND SUITABILITY FOR CHILLI

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

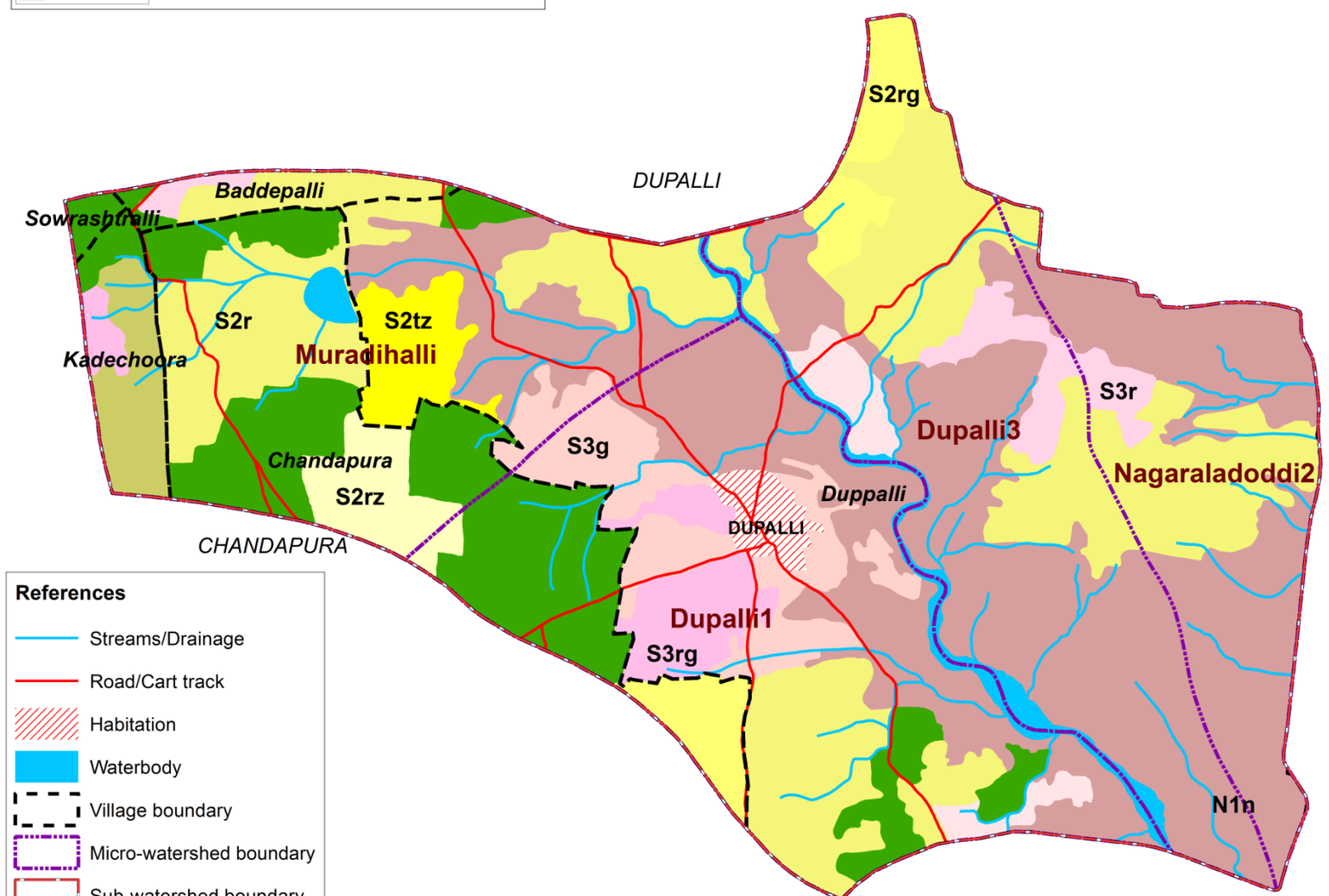
YADGIR TALUK & DISTRICT

0 0.5 1 2 km

N

Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

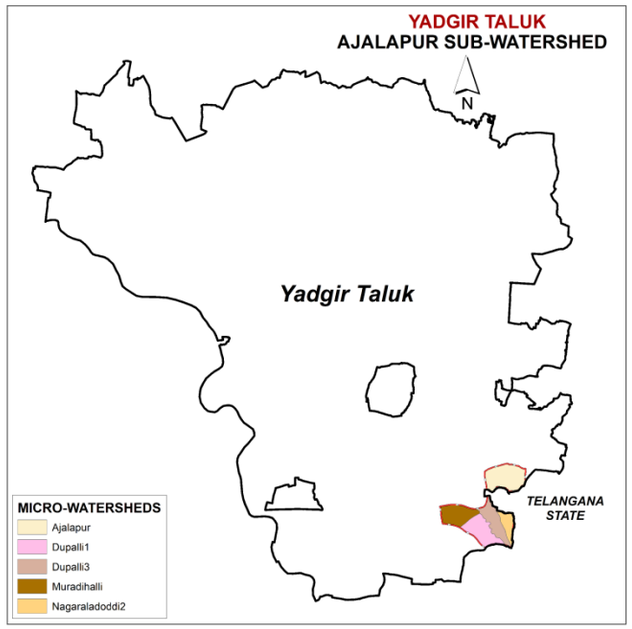


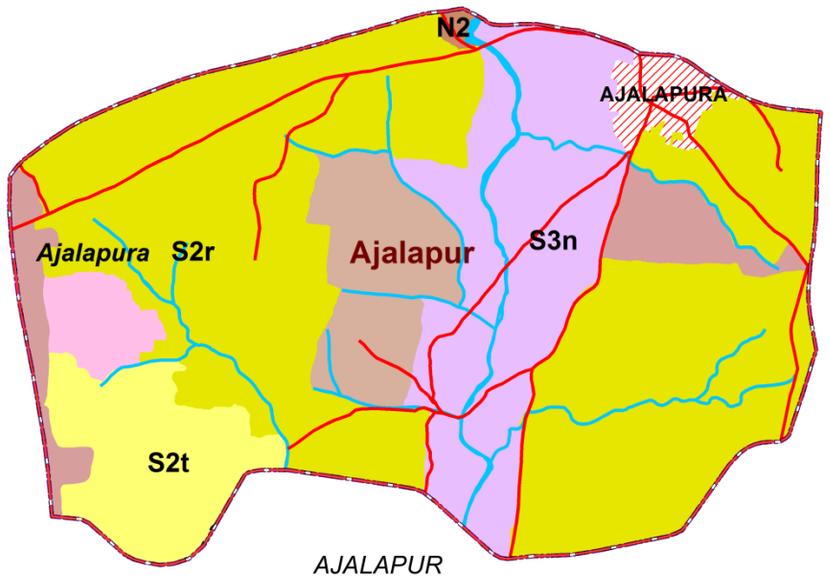
Suitability subclass	Area in ha (%)
S1	689 (23.3)
S2g	47 (1.58)
S2r	535 (18.1)
S2t	120 (4.05)
S2rg	75 (2.52)
S2rz	47 (1.6)
S2tz	45 (1.51)
S3g	118 (4.0)
S3n	199 (6.72)
S3r	99 (3.34)
S3rg	65 (2.2)
N1n	819 (27.71)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.11. Land Suitability for Pomegranate





LAND SUITABILITY FOR POMEGRANATE

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N

TELANGANA STATE

DUPALLI

Key
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

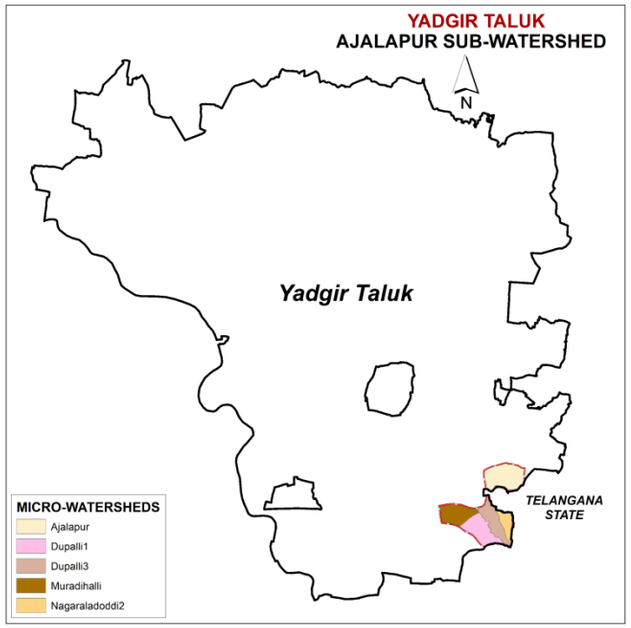
References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

Suitability subclass	Area in ha (%)
S2r	735 (24.88)
S2t	120 (4.05)
S2rg	65 (2.19)
S2tz	45 (1.51)
S3n	199 (6.72)
S3r	710 (24.03)
N1n	819 (27.71)
N1r	164 (5.53)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.12. Land Suitability for Tomato

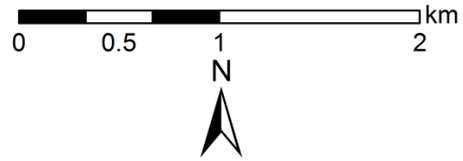


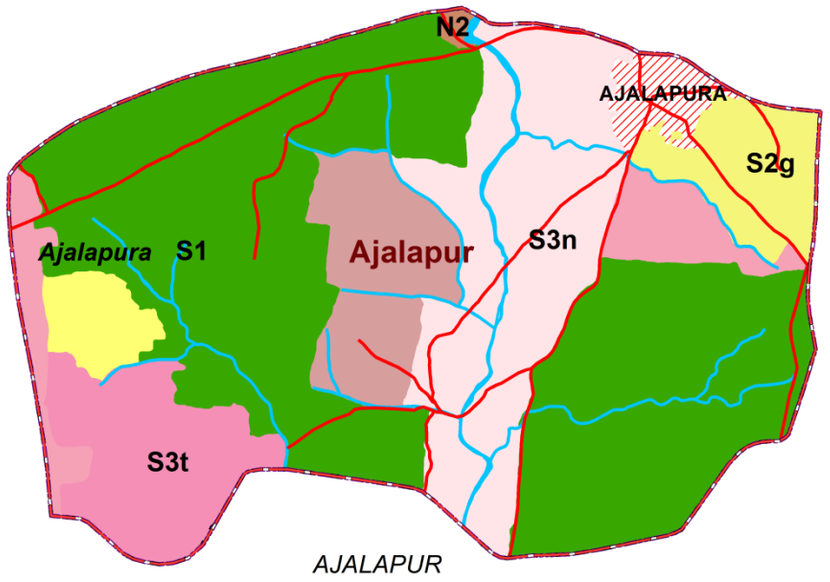
LAND SUITABILITY FOR TOMATO

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

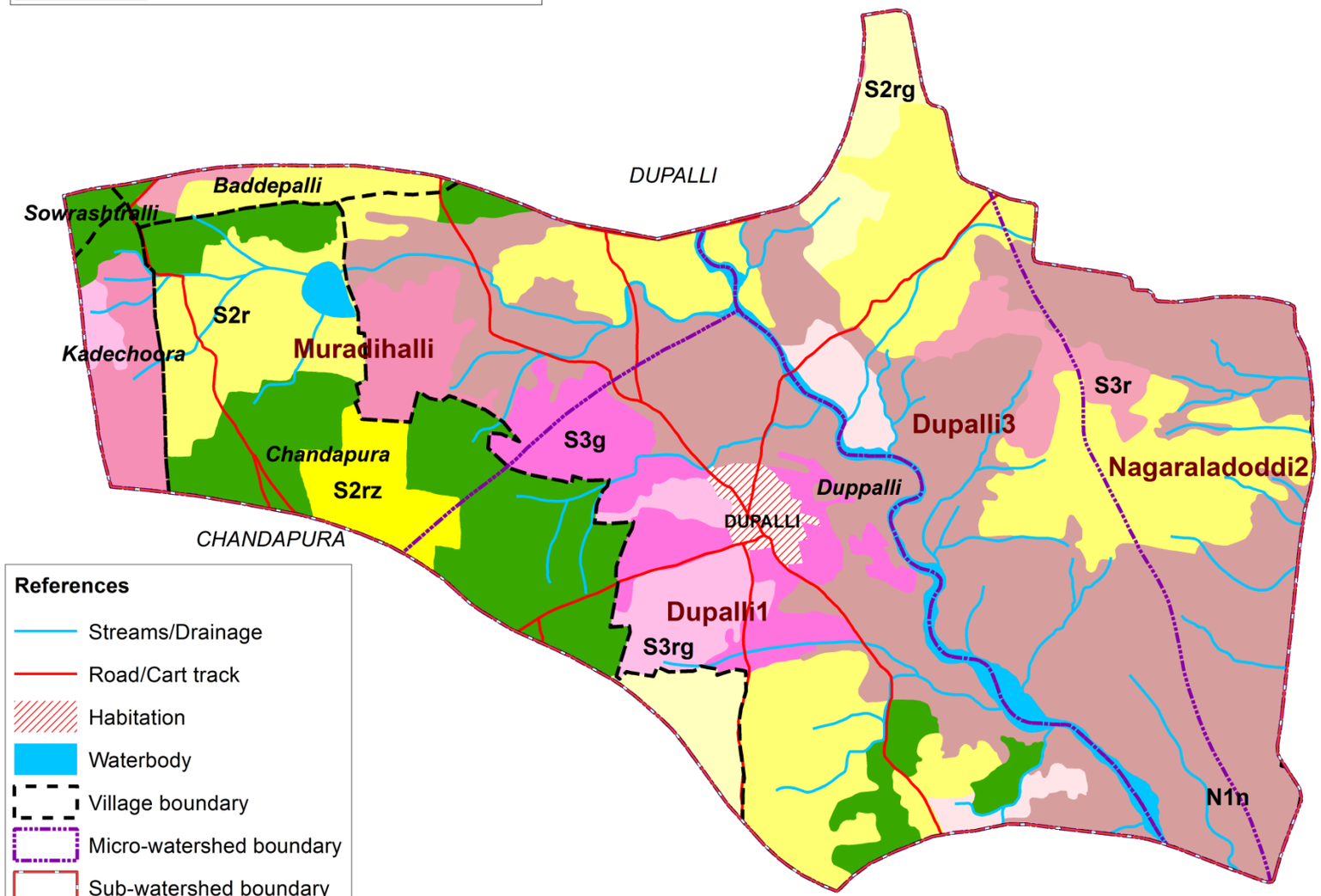
YADGIR TALUK & DISTRICT





Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness



TELANGANA STATE

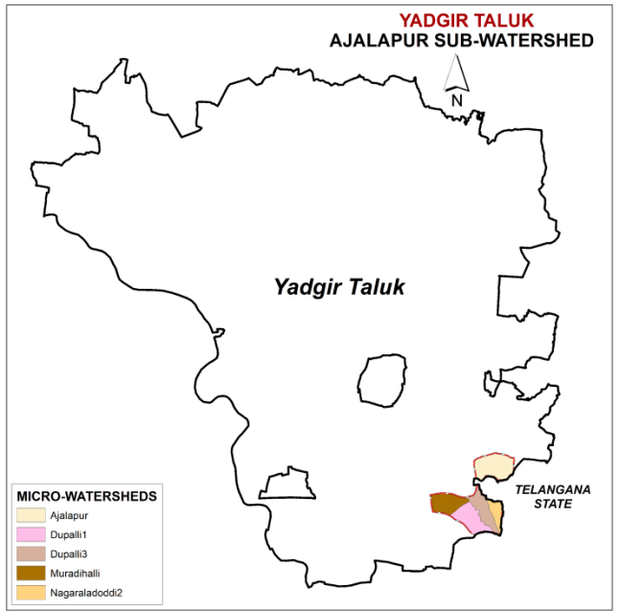
DUPALLI

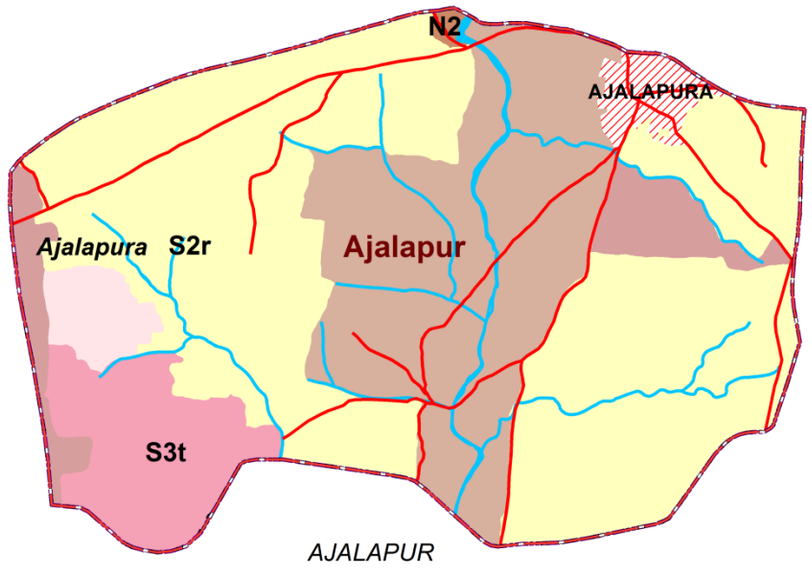
Suitability subclass	Area in ha (%)
S1	689 (23.3)
S2g	47 (1.58)
S2r	535 (18.1)
S2rg	75 (2.52)
S2rz	47 (1.6)
S3g	118 (4.0)
S3n	199 (6.72)
S3r	99 (3.34)
S3t	164 (5.56)
S3rg	65 (2.2)
N1n	819 (27.71)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.13. Land Suitability for Mulberry





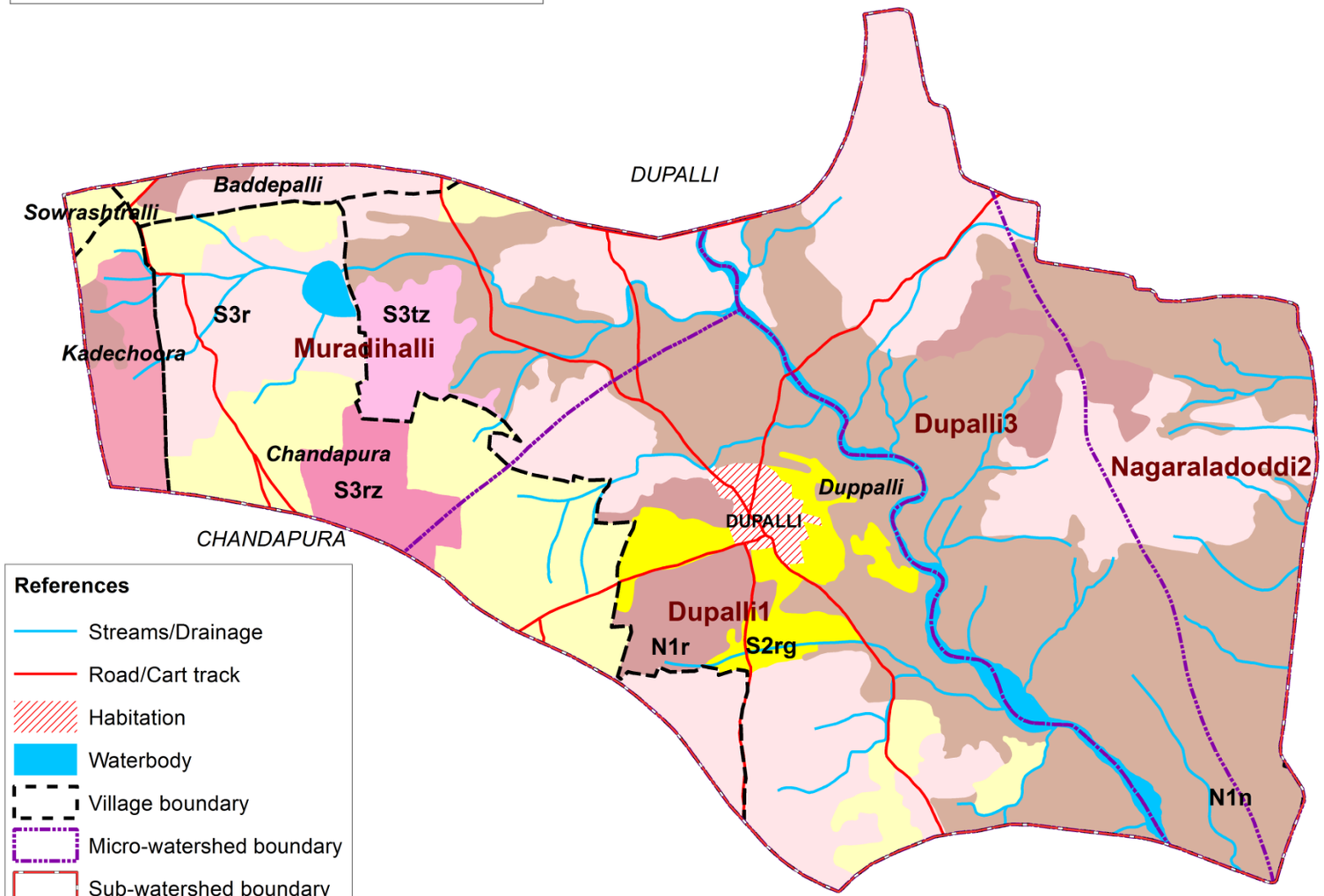
LAND SUITABILITY FOR MULBERRY

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N



References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

Key
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

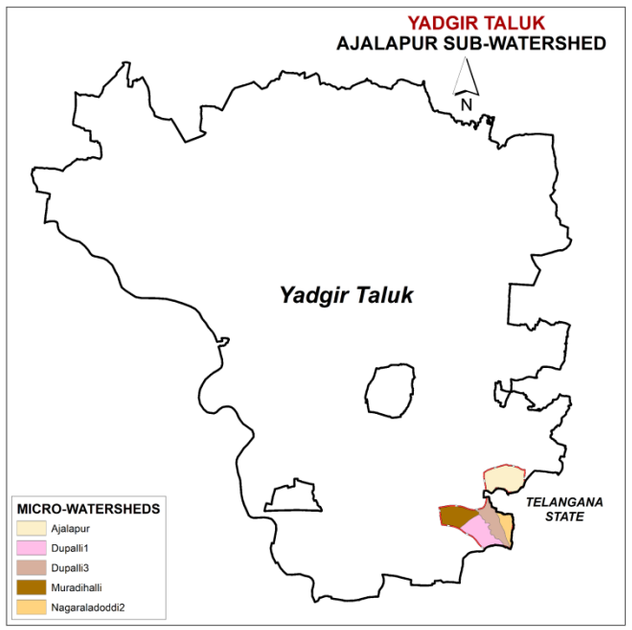
Suitability subclass	Area in ha (%)
S2r	735 (24.88)
S2rg	65 (2.19)
S3r	663 (22.44)
S3t	120 (4.05)
S3rz	47 (1.6)
S3tz	45 (1.51)
N1n	1018 (34.43)
N1r	164 (5.53)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

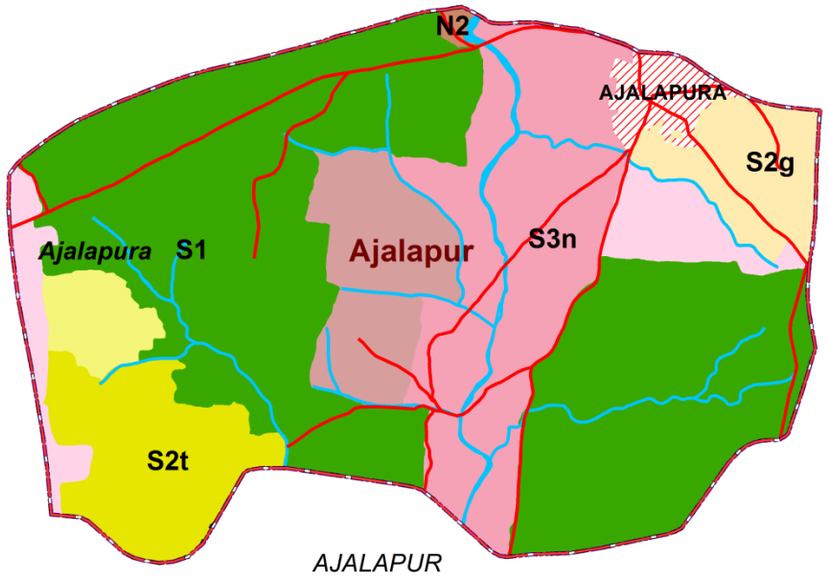
* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

NOTE: Mulberry suitability evaluation only for mulberry leaf, not for silkworm rearing

7.14. Land Suitability for Bhendi





LAND SUITABILITY FOR BHENDI

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

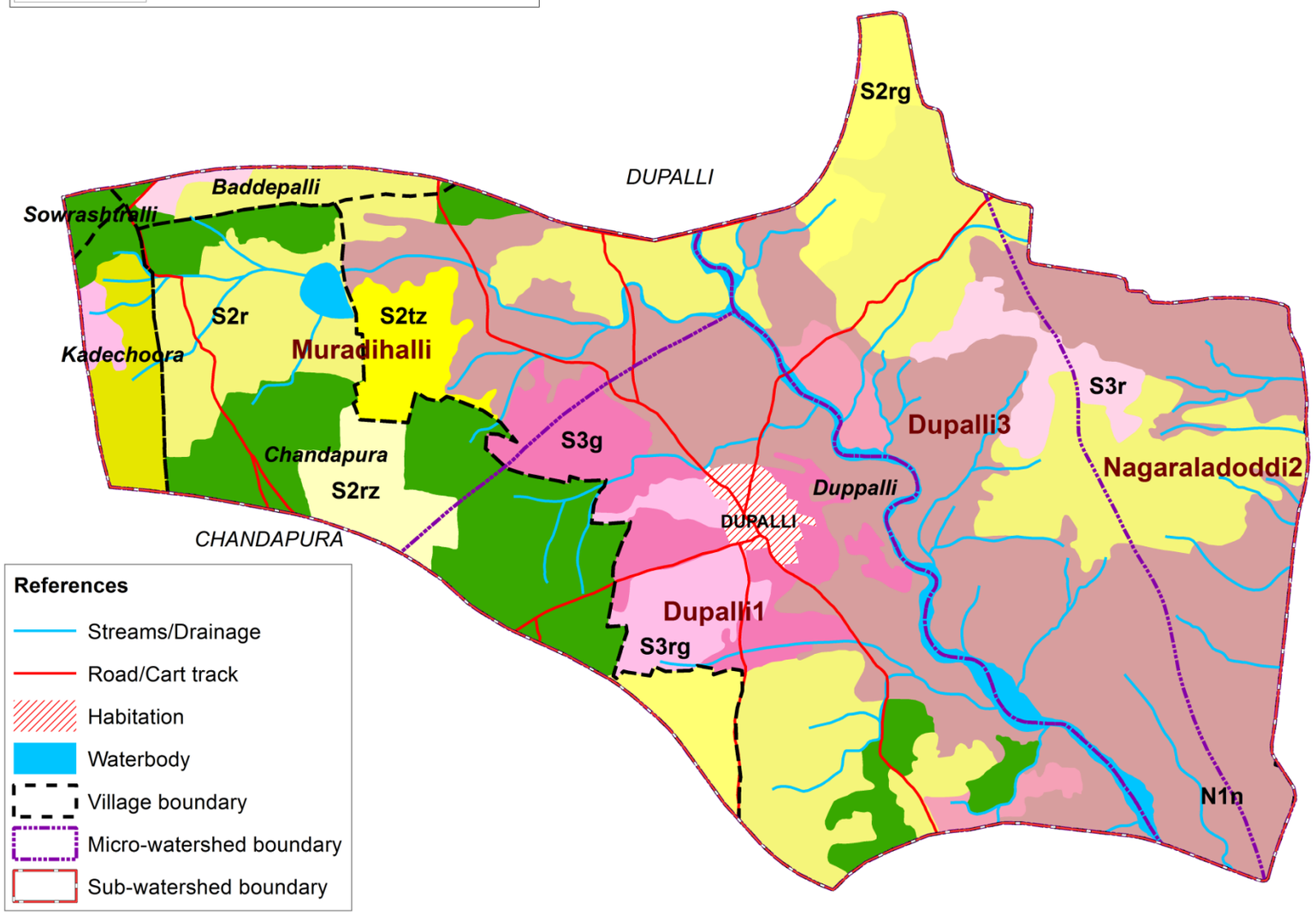
YADGIR TALUK & DISTRICT

0 0.5 1 2 km

N

Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

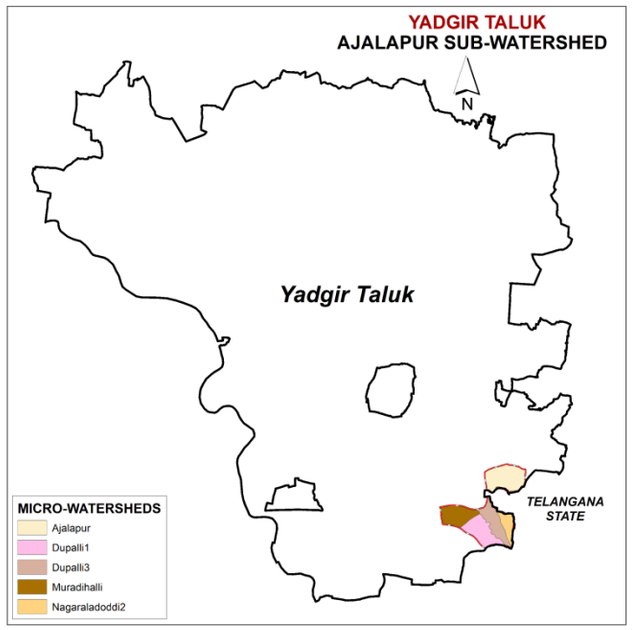


Suitability subclass	Area in ha (%)
S1	689 (23.3)
S2g	47 (1.58)
S2r	535 (18.1)
S2t	120 (4.05)
S2rg	75 (2.52)
S2rz	47 (1.6)
S2tz	45 (1.51)
S3g	118 (4.0)
S3n	199 (6.72)
S3r	99 (3.34)
S3rg	65 (2.2)
N1n	819 (27.71)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.15. Land Suitability for Guava



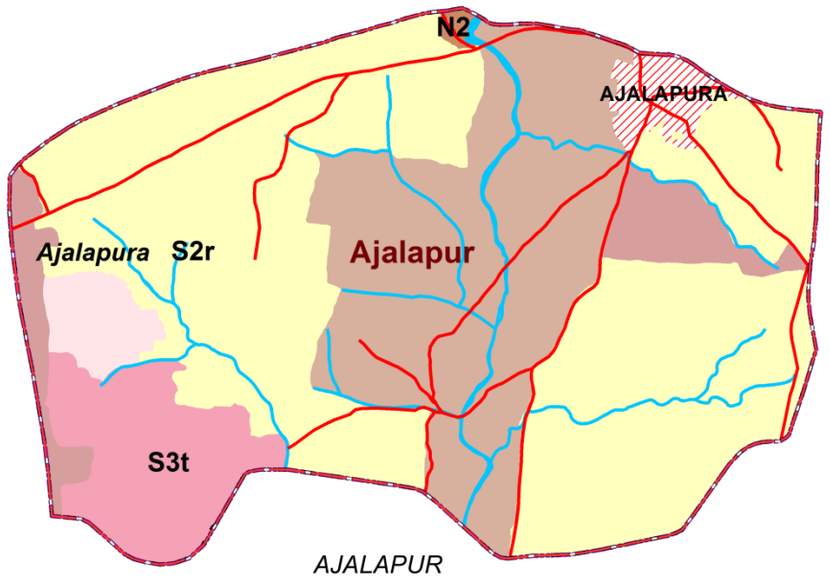
LAND SUITABILITY FOR GUAVA

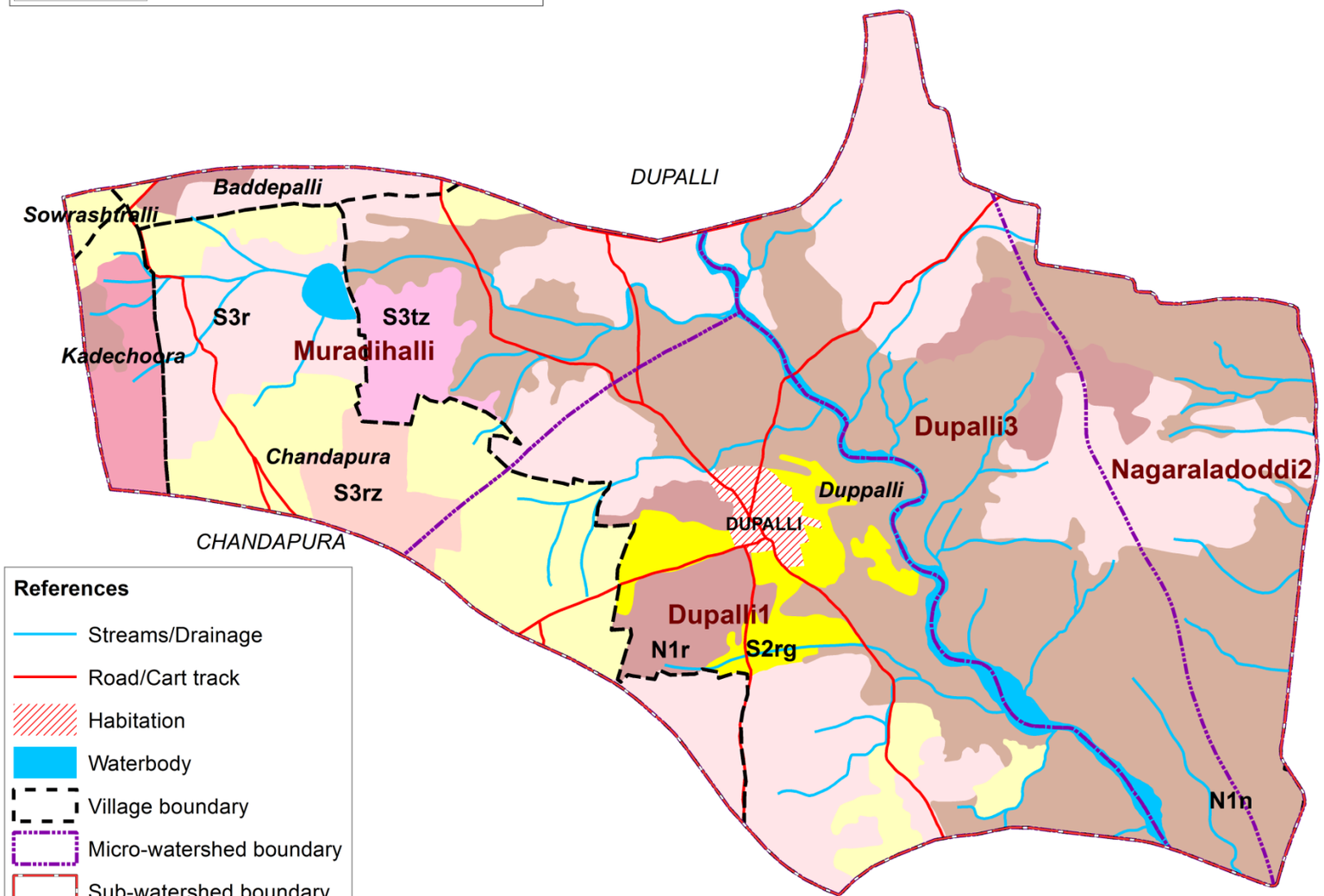
Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N





TELANGANA STATE

DUPALLI

Key
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

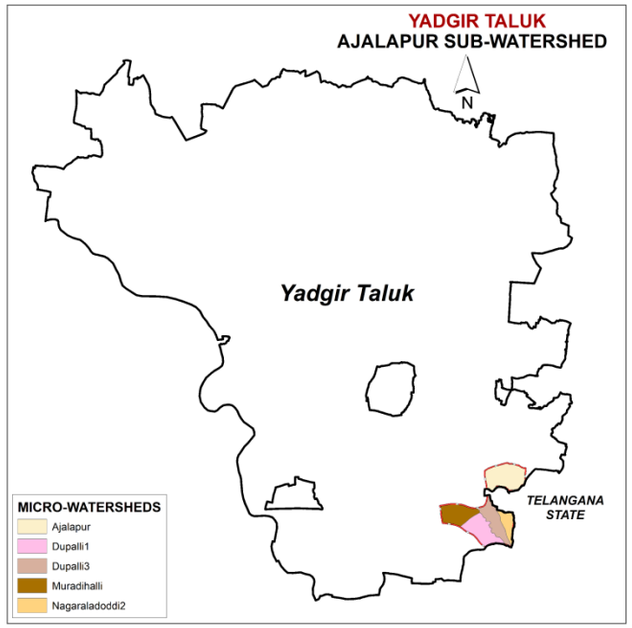
References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

Suitability subclass	Area in ha (%)
S2r	735 (24.88)
S2rg	65 (2.19)
S3r	663 (22.44)
S3t	120 (4.05)
S3rz	47 (1.6)
S3tz	45 (1.51)
N1n	1018 (34.43)
N1r	164 (5.53)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.16. Land Suitability for Mango



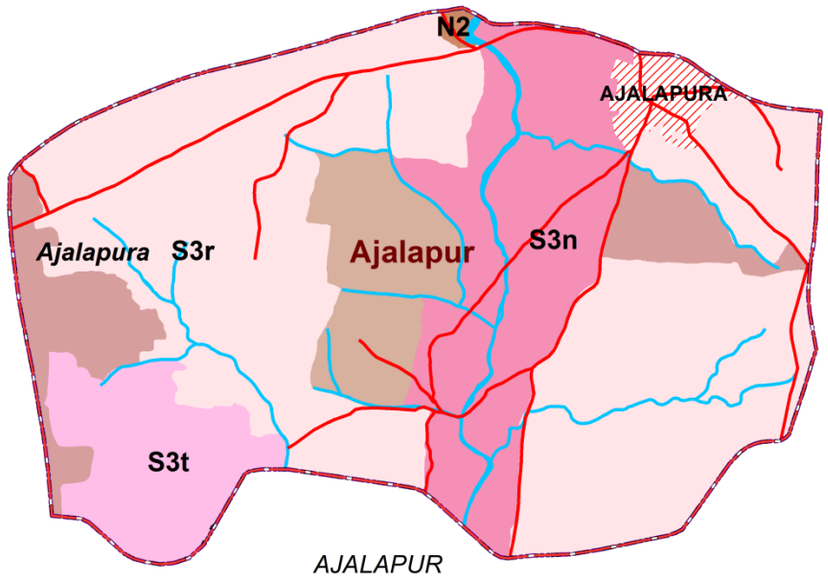
LAND SUITABILITY FOR MANGO

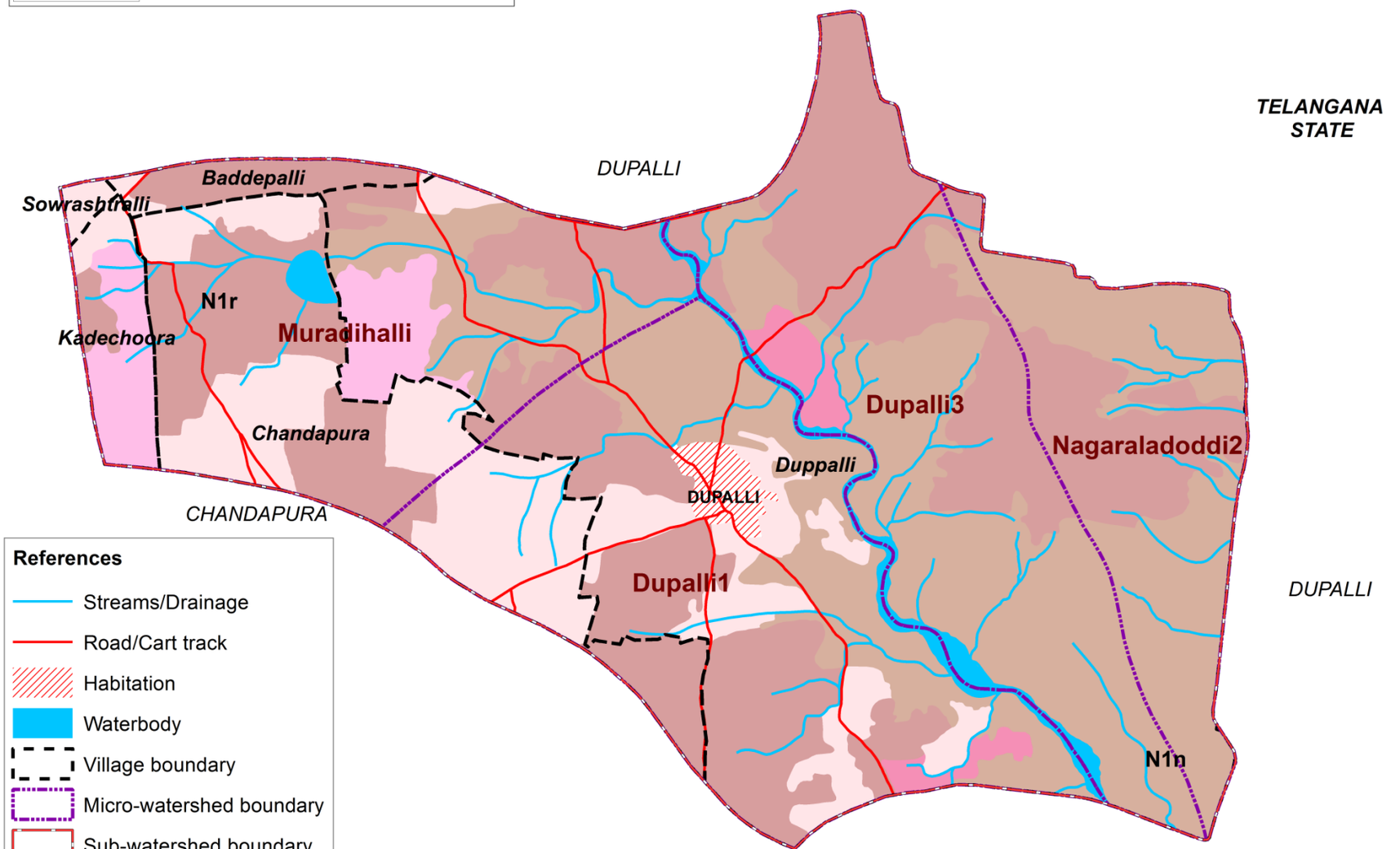
Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N





Key
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
n- nutrient availability
r- rooting condition
t- texture

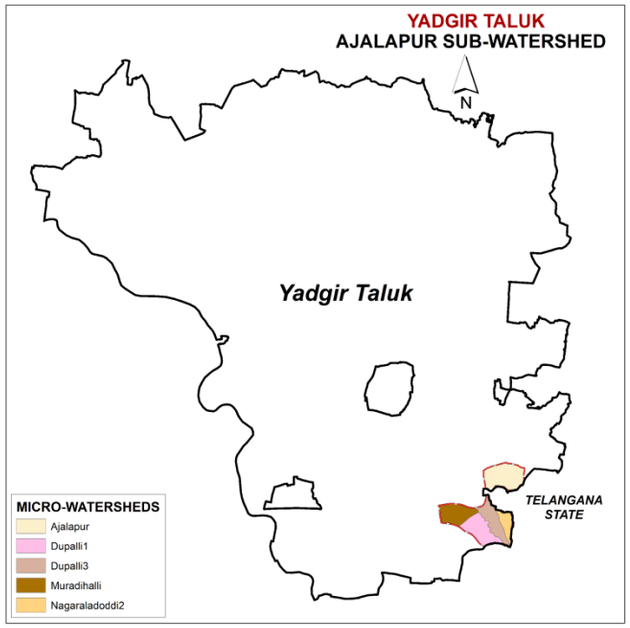
References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

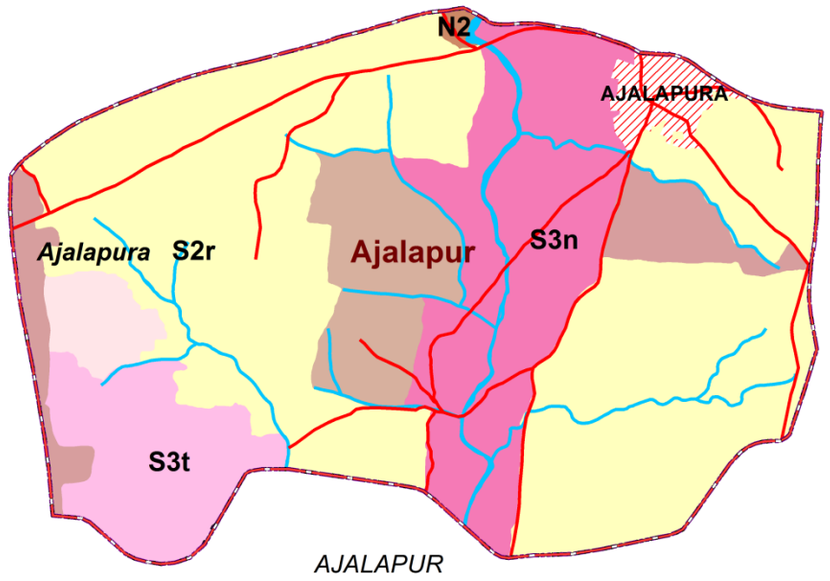
Suitability subclass	Area in ha (%)
S3n	199 (6.72)
S3r	800 (27.07)
S3t	164 (5.56)
N1n	819 (27.71)
N1r	874 (29.57)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.17. Land Suitability for Sapota





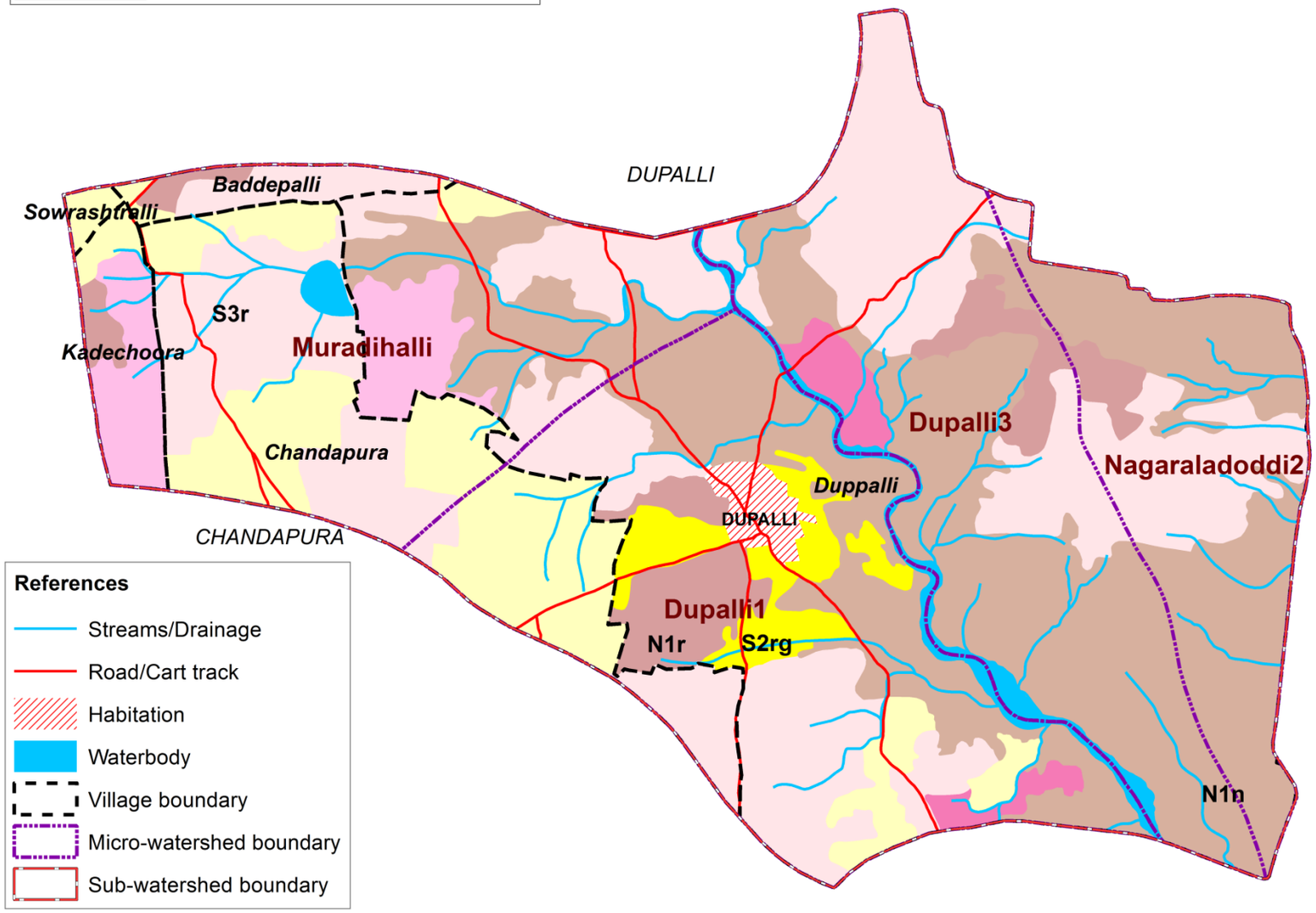
LAND SUITABILITY FOR SAPOTA

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N



Key
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture

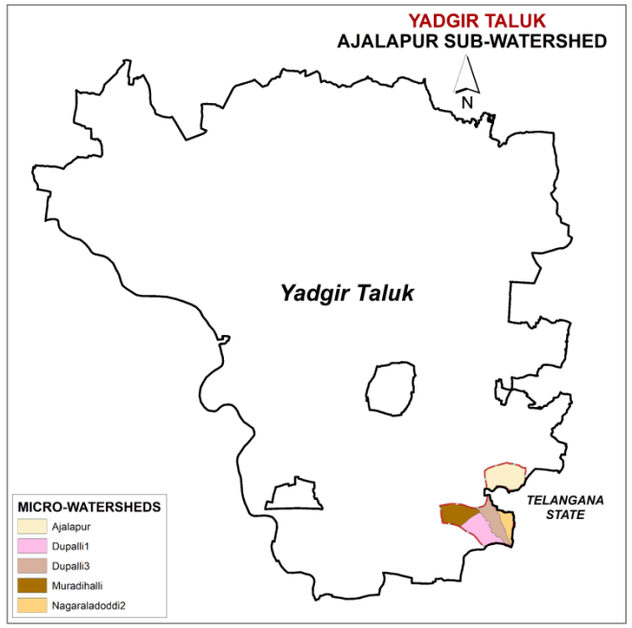
Suitability subclass	Area in ha (%)
S2r	735 (24.88)
S2rg	65 (2.19)
S3n	199 (6.72)
S3r	710 (24.03)
S3t	164 (5.56)
N1n	819 (27.71)
N1r	164 (5.53)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

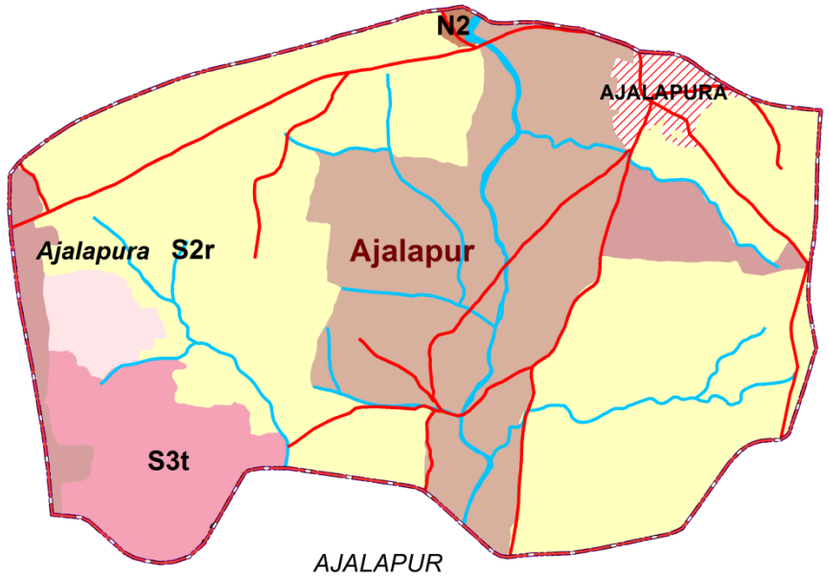
* - Habitation & Waterbody

References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

Source: ICAR-NBSS&LUP, Bengaluru

7.18. Land Suitability for Jackfruit





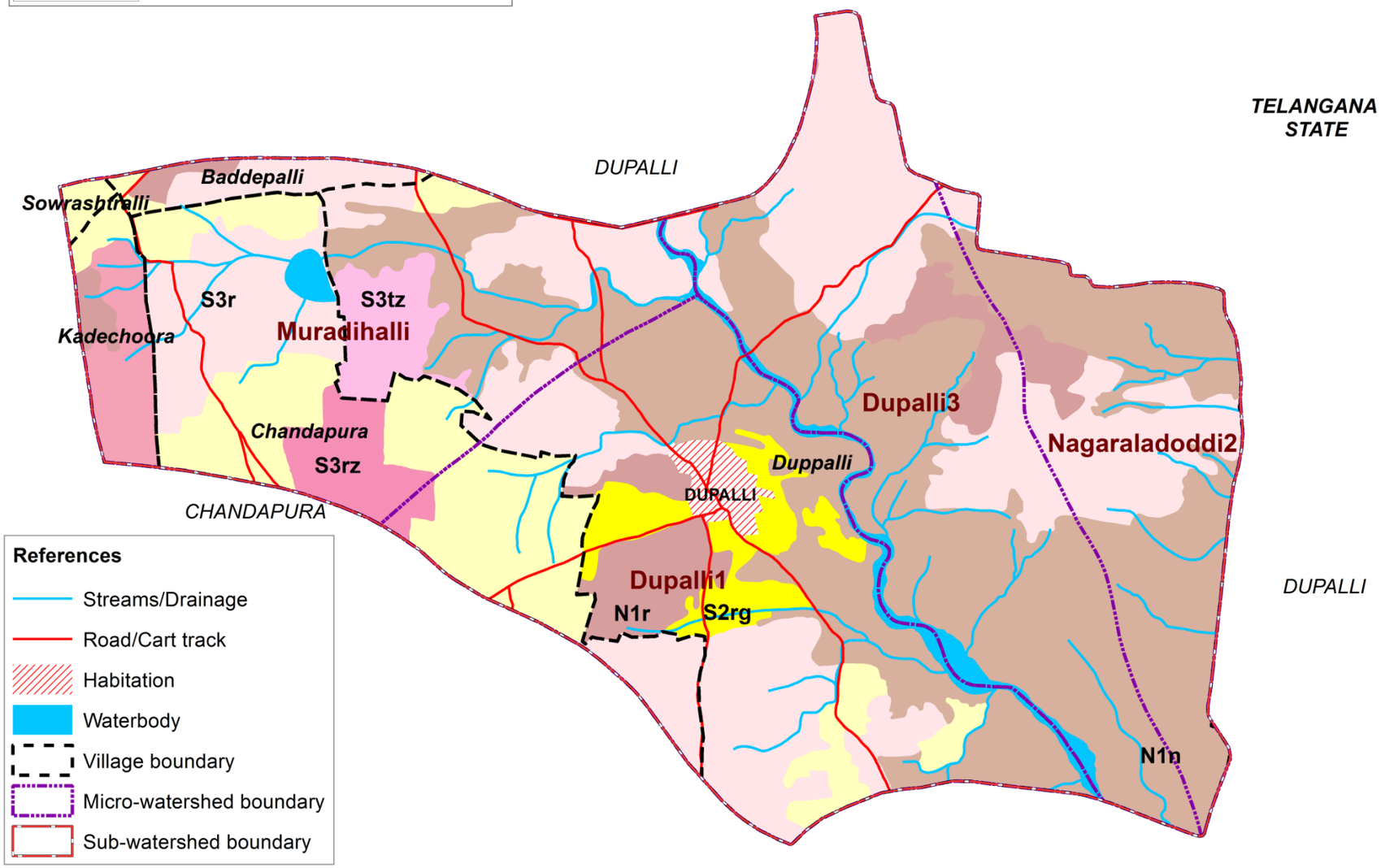
LAND SUITABILITY FOR JACKFRUIT

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N



Key
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

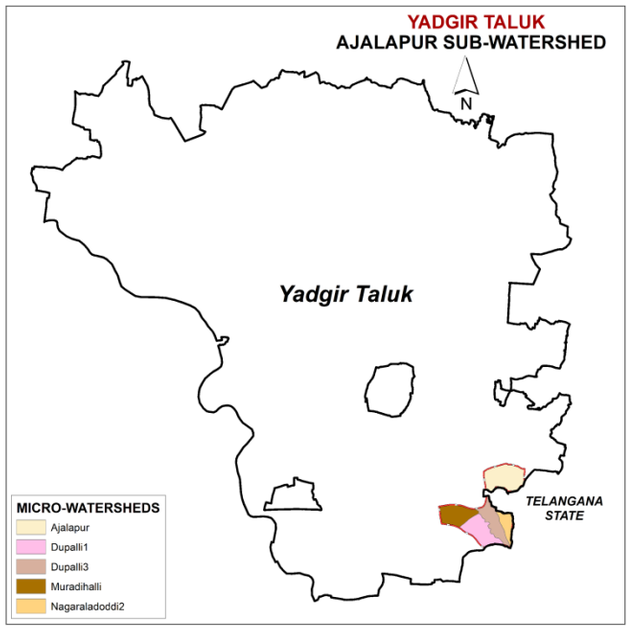
References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

Suitability subclass	Area in ha (%)
S2r	735 (24.88)
S2rg	65 (2.19)
S3r	663 (22.44)
S3t	120 (4.05)
S3rz	47 (1.6)
S3tz	45 (1.51)
N1n	1018 (34.43)
N1r	164 (5.53)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.19. Land Suitability for Jamun



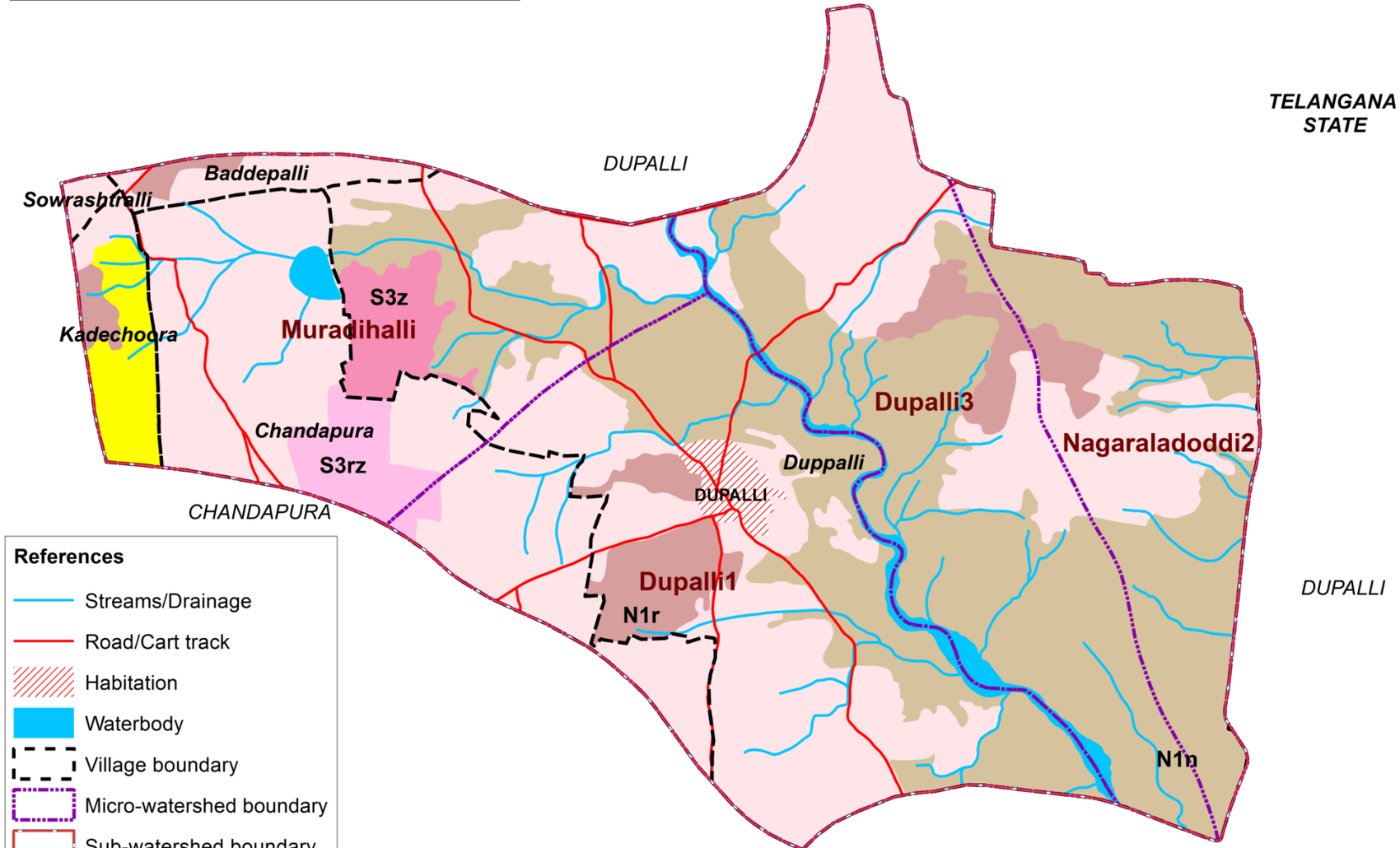
LAND SUITABILITY FOR JAMUN

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N



Key
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

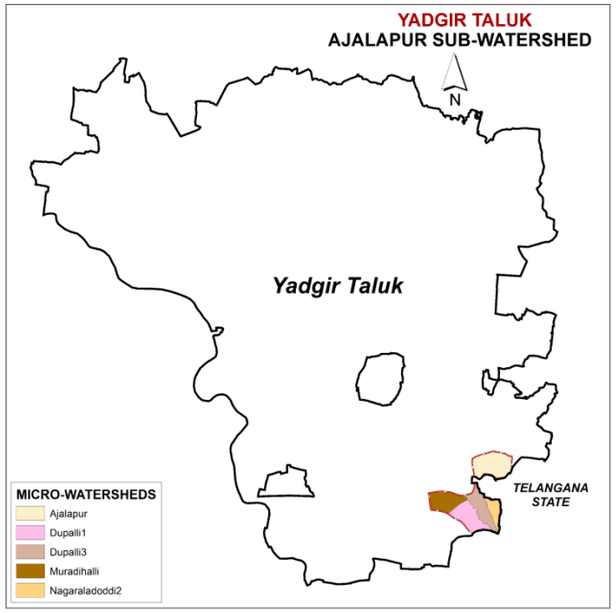
Suitability subclass	Area in ha (%)
S2rt	120 (4.05)
S3r	1463 (49.51)
S3z	45 (1.51)
S3rz	47 (1.6)
N1n	1018 (34.43)
N1r	164 (5.53)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

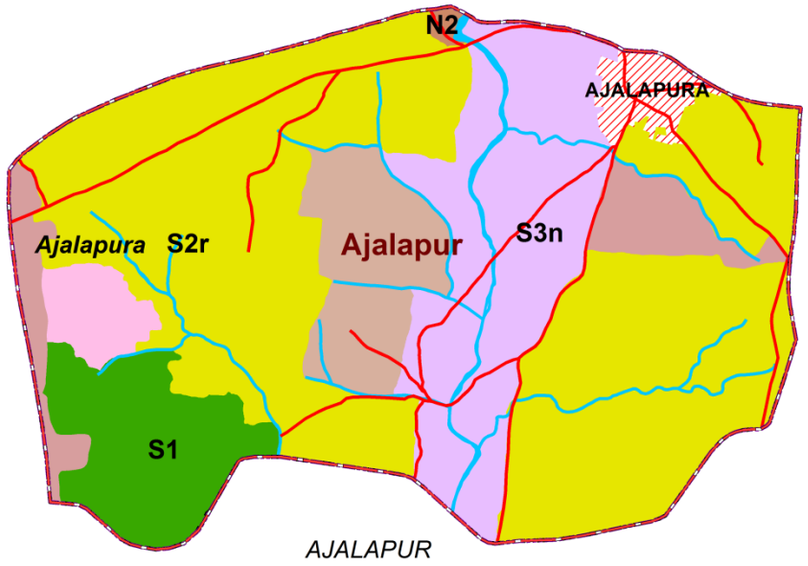
References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.20. Land Suitability for Musambi





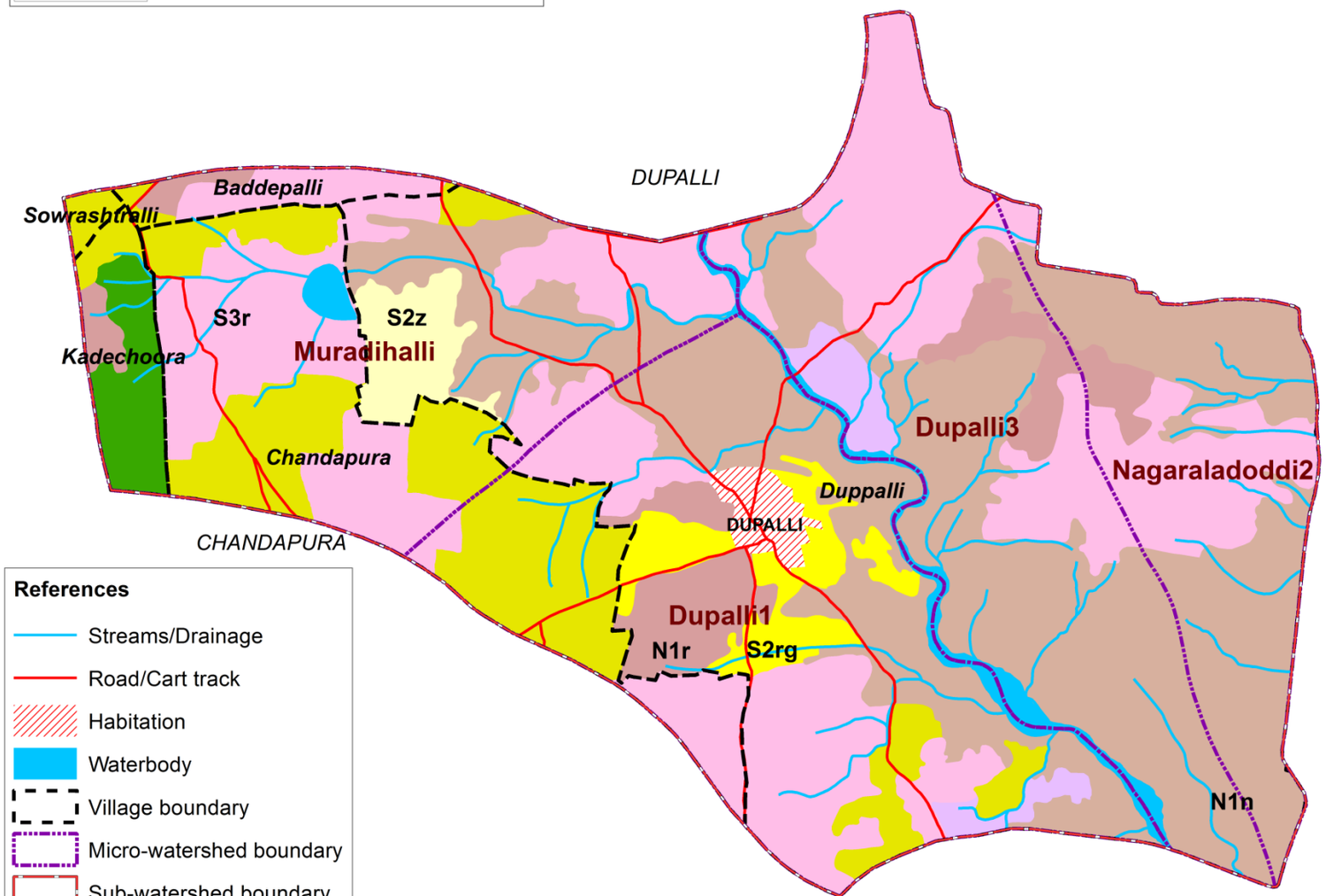
LAND SUITABILITY FOR MUSAMBI

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N



Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
z- excess salt/calcareousness

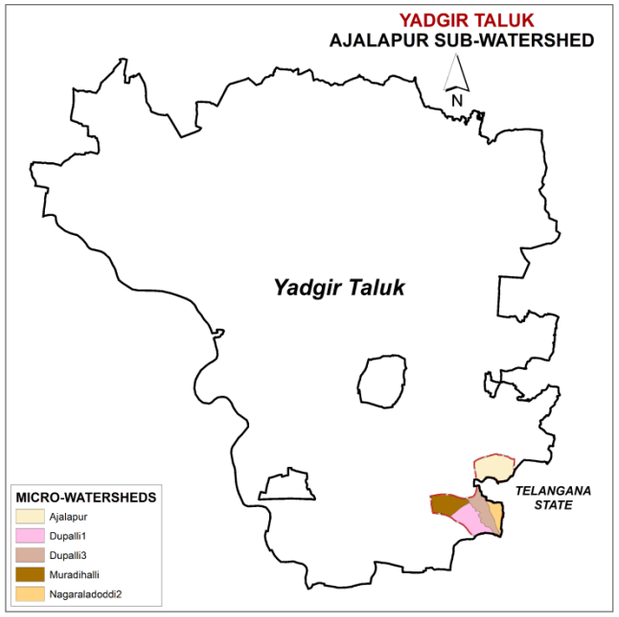
References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

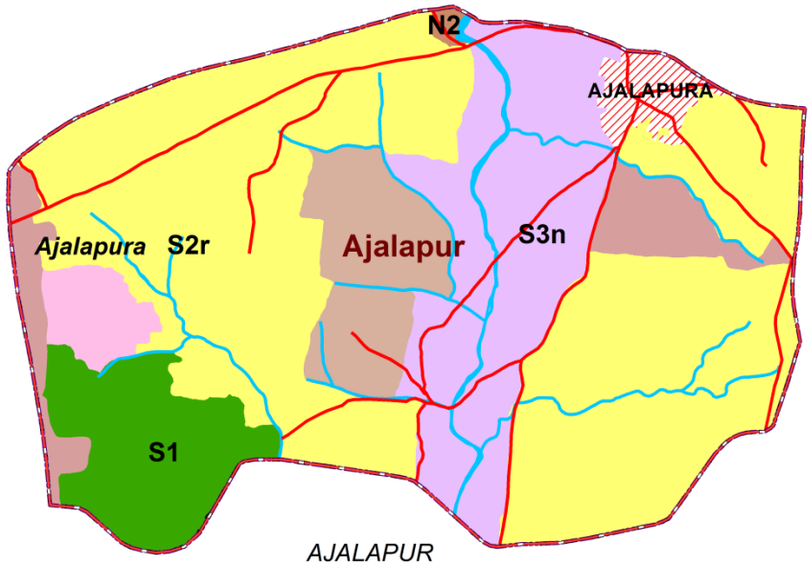
Suitability subclass	Area in ha (%)
S1	120 (4.05)
S2r	735 (24.88)
S2z	45 (1.51)
S2rg	65 (2.19)
S3n	199 (6.72)
S3r	710 (24.03)
N1n	819 (27.71)
N1r	164 (5.53)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.21. Land Suitability for Lime





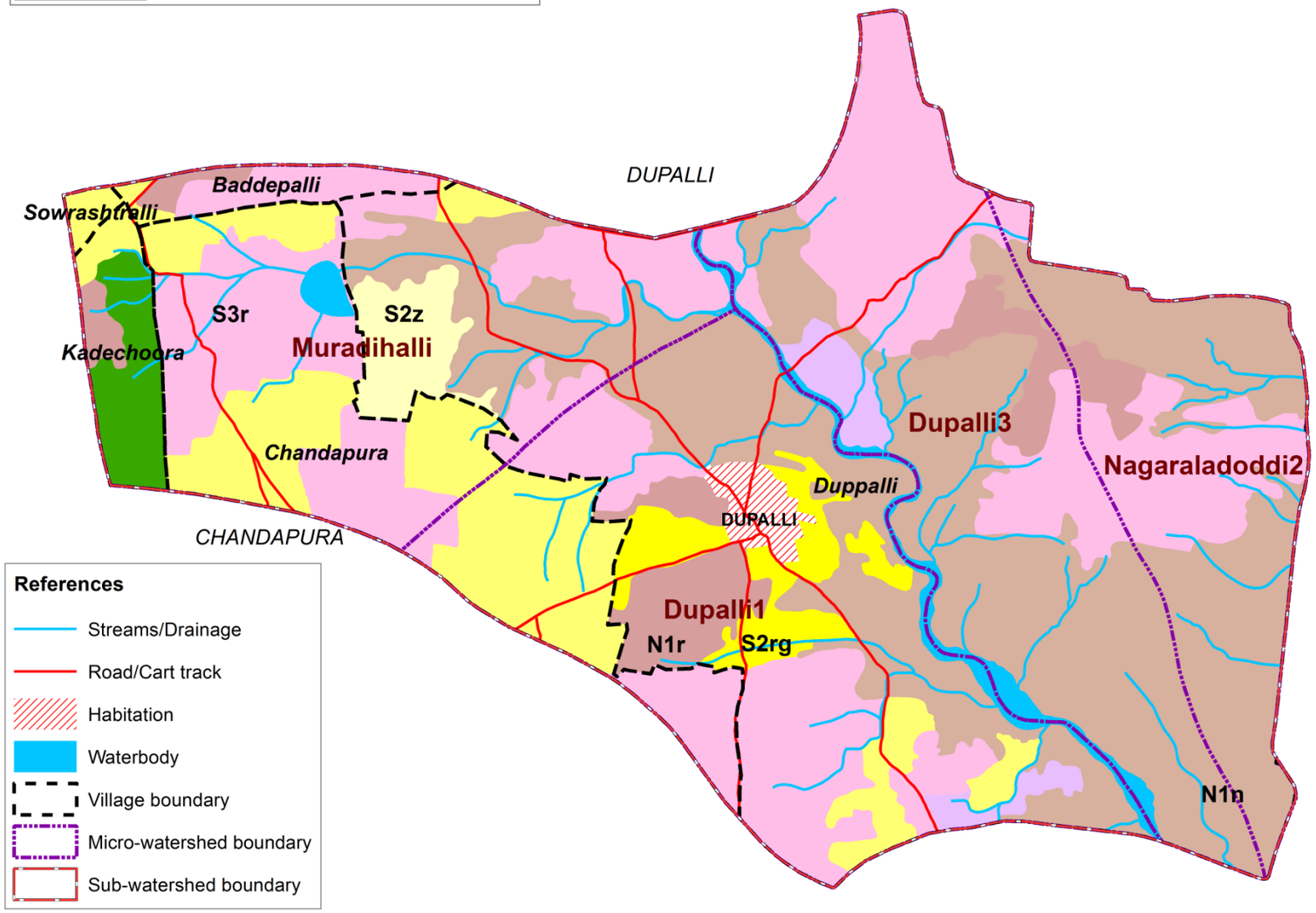
LAND SUITABILITY FOR LIME

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N



Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
z- excess salt/calcareousness

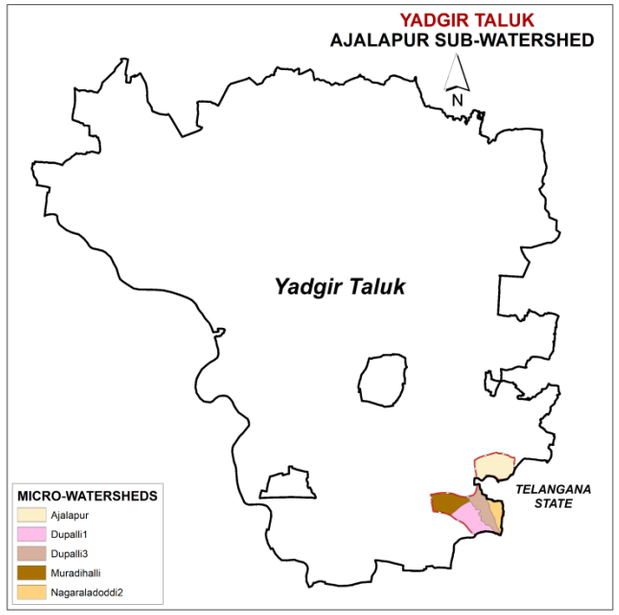
References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

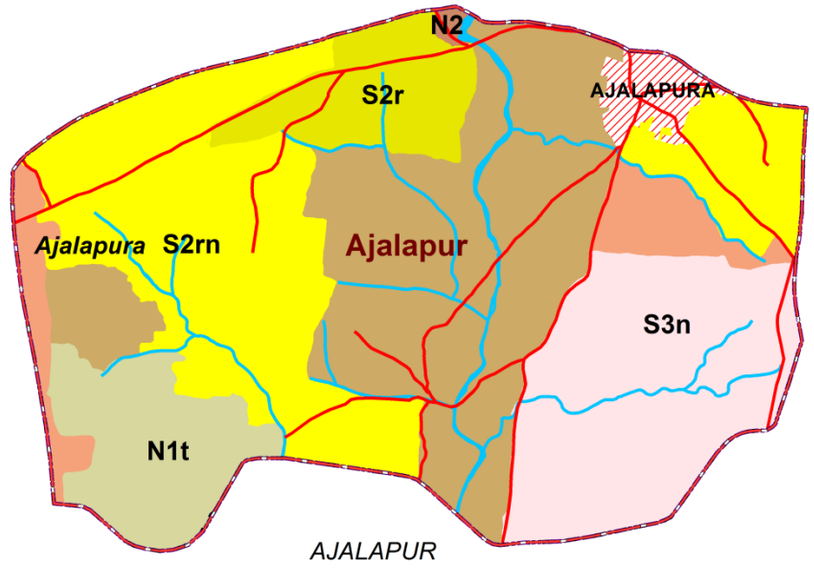
Suitability subclass	Area in ha (%)
S1	120 (4.05)
S2r	735 (24.88)
S2z	45 (1.51)
S2rg	65 (2.19)
S3n	199 (6.72)
S3r	710 (24.03)
N1n	819 (27.71)
N1r	164 (5.53)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.22. Land Suitability for Cashew





LAND SUITABILITY FOR CASHEW

Ajalapur Sub-watershed

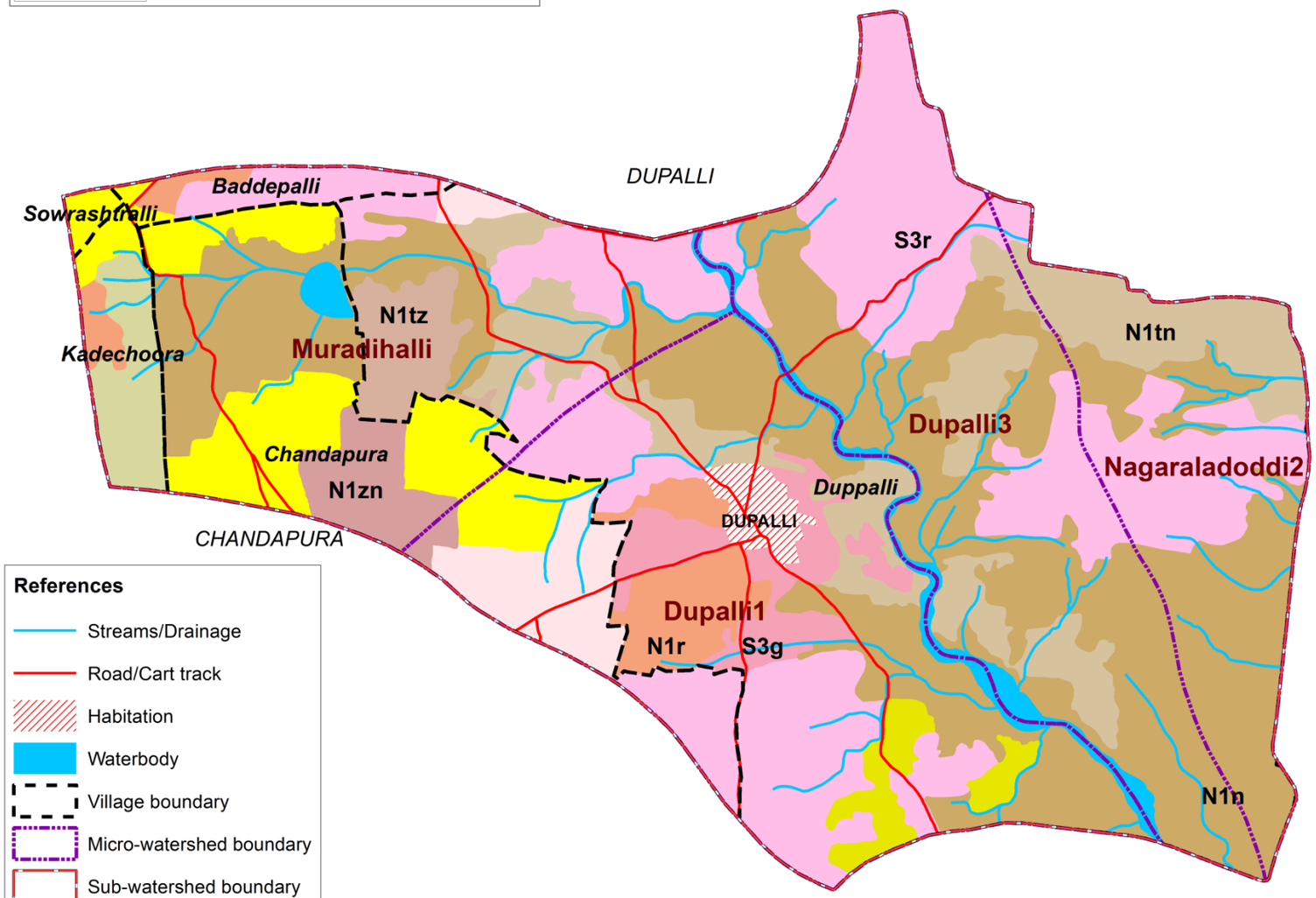
(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N

Key
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

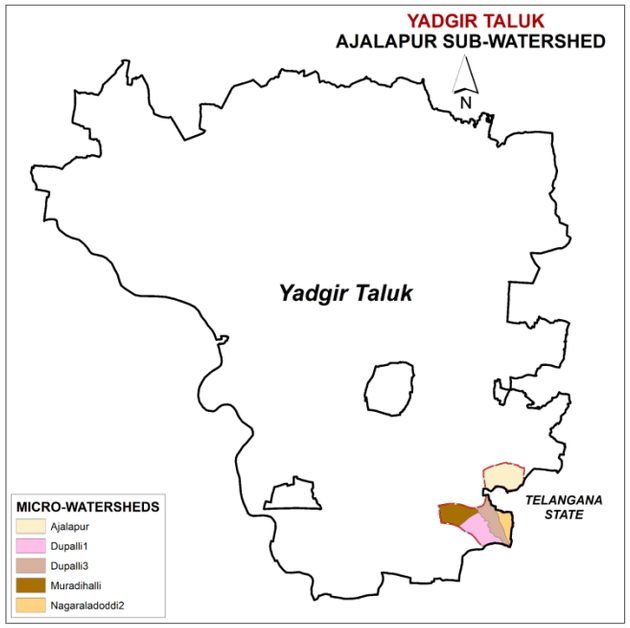


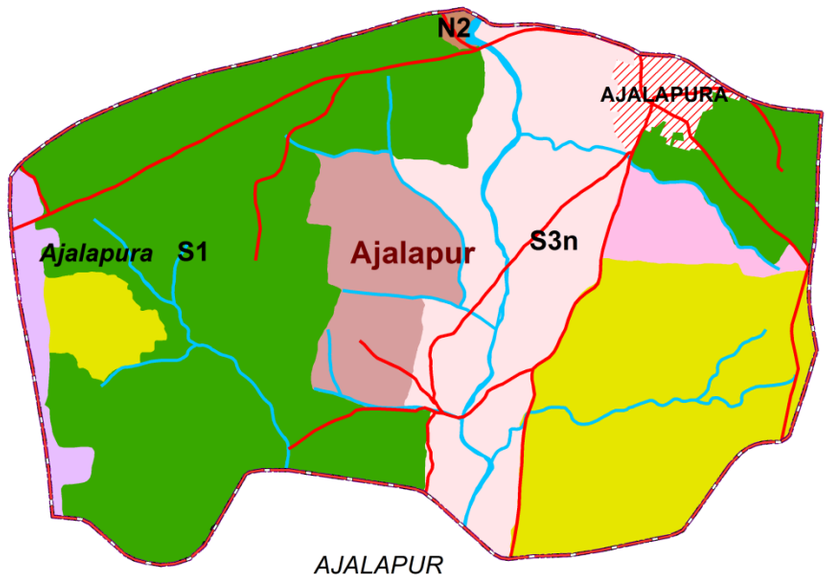
Suitability subclass	Area in ha (%)
S2r	96 (3.25)
S2rn	406 (13.73)
S3g	65 (2.19)
S3n	234 (7.9)
S3r	547 (18.52)
N1n	936 (31.67)
N1r	119 (4.04)
N1t	120 (4.05)
N1tn	241 (8.17)
N1tz	45 (1.51)
N1zn	47 (1.6)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.23. Land Suitability for Custard Apple





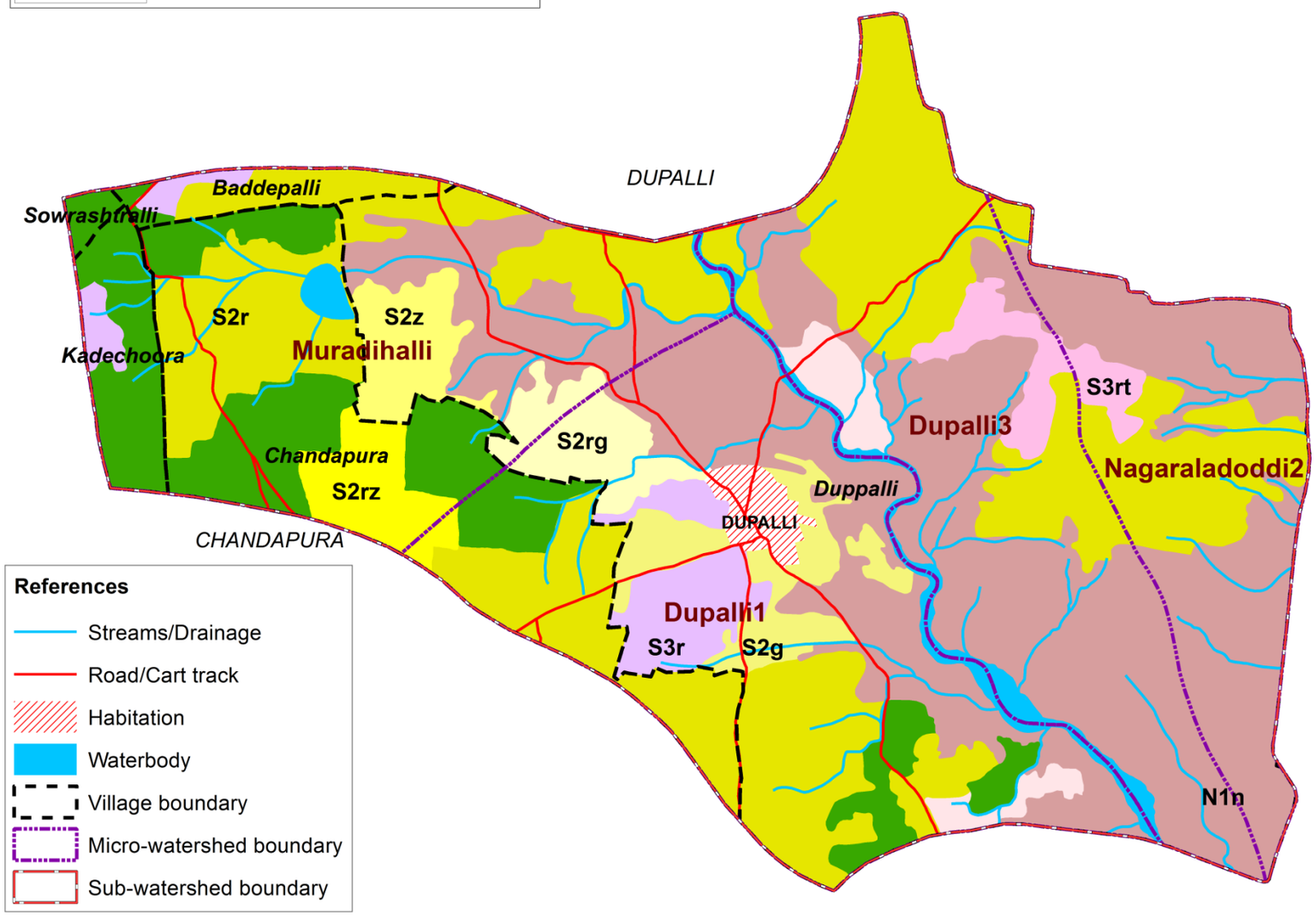
LAND SUITABILITY FOR CUSTARD APPLE

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N



Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

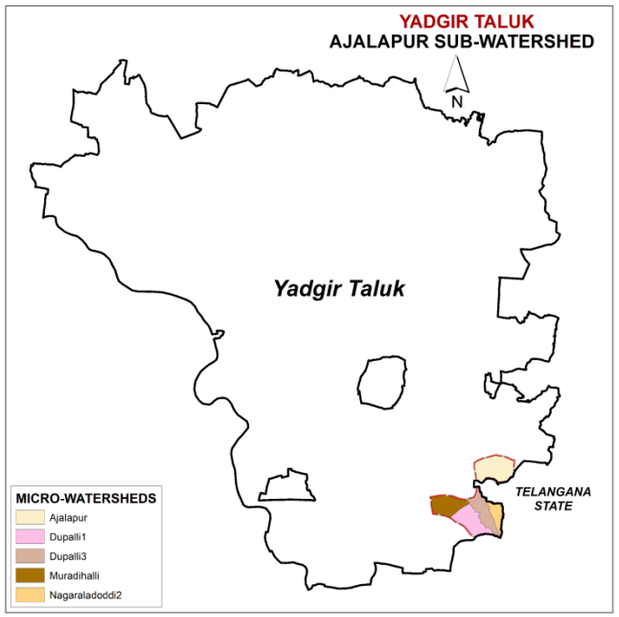
Suitability subclass	Area in ha (%)
S1	622 (21.03)
S2g	65 (2.19)
S2r	843 (28.53)
S2z	45 (1.51)
S2rg	54 (1.81)
S2rz	47 (1.6)
S3n	199 (6.72)
S3r	93 (3.15)
S3rt	70 (2.38)
N1n	819 (27.71)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

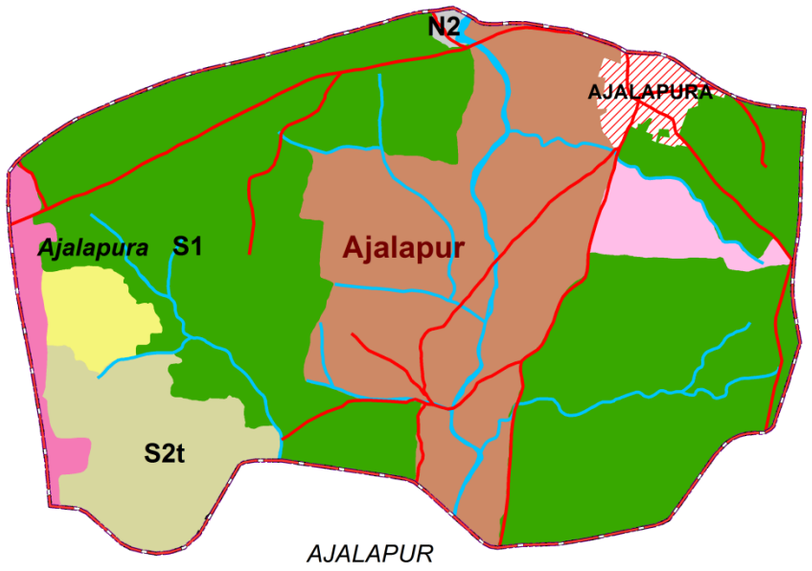
References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.24. Land Suitability for Amla





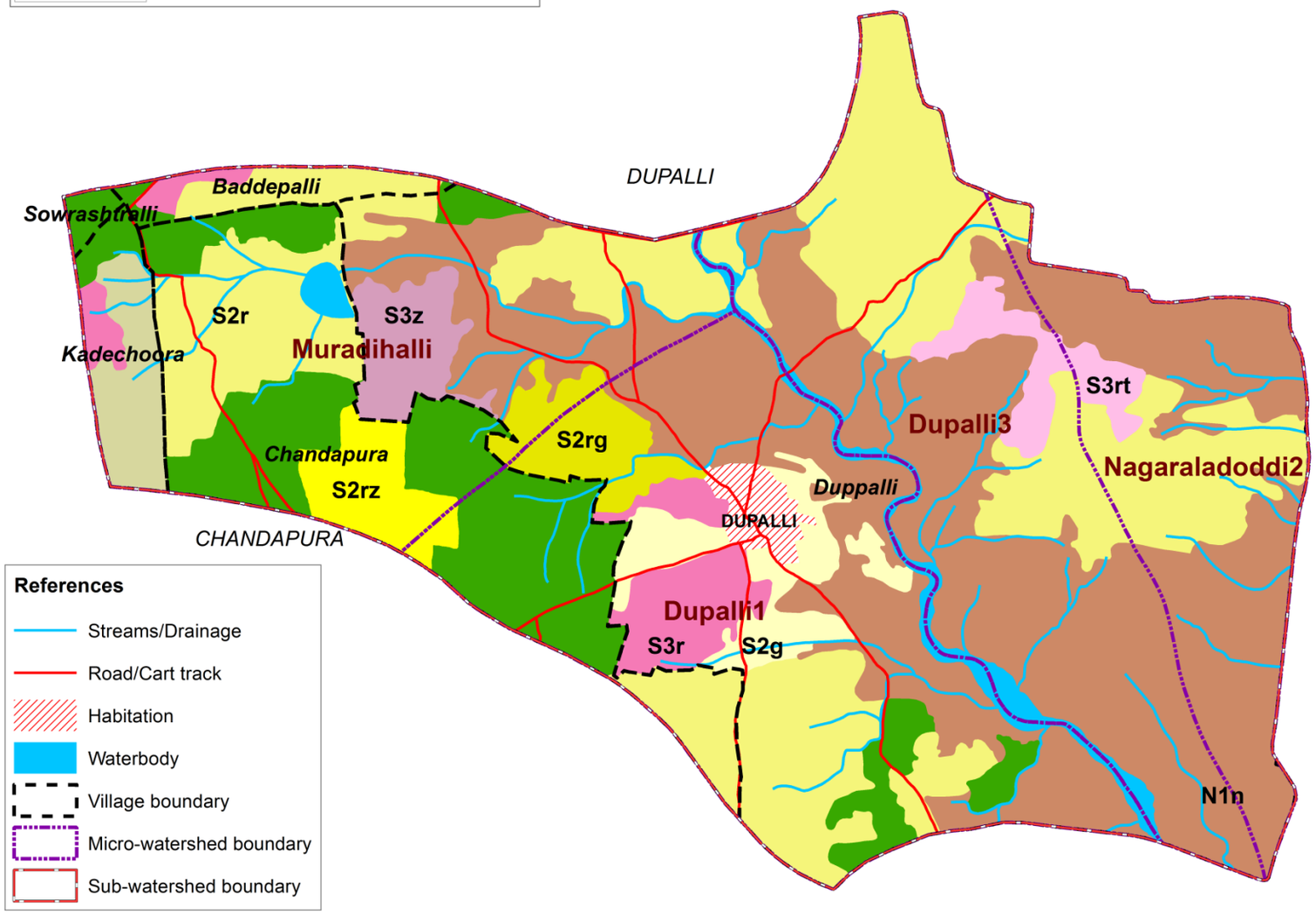
LAND SUITABILITY FOR AMLA

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N



Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

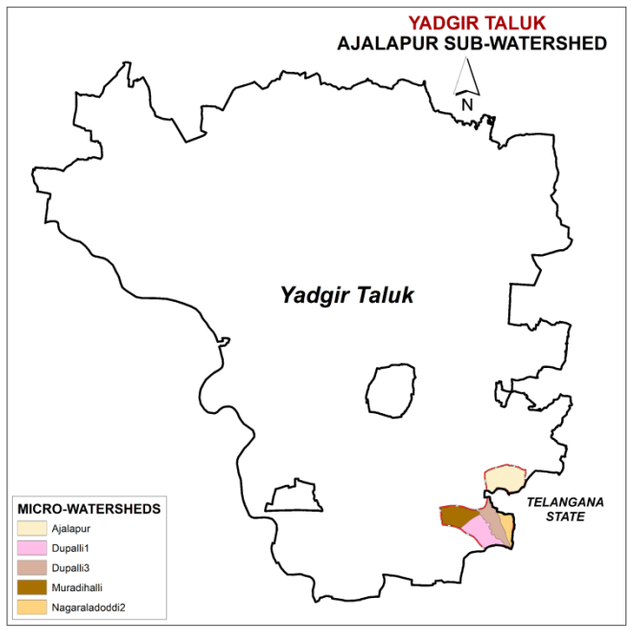
Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

Suitability subclass	Area in ha (%)
S1	735 (24.88)
S2g	65 (2.19)
S2r	610 (20.62)
S2t	120 (4.05)
S2rg	54 (1.81)
S2rz	47 (1.6)
S3r	93 (3.15)
S3z	45 (1.51)
S3rt	70 (2.38)
N1n	1018 (34.43)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.25. Land Suitability for Tamarind



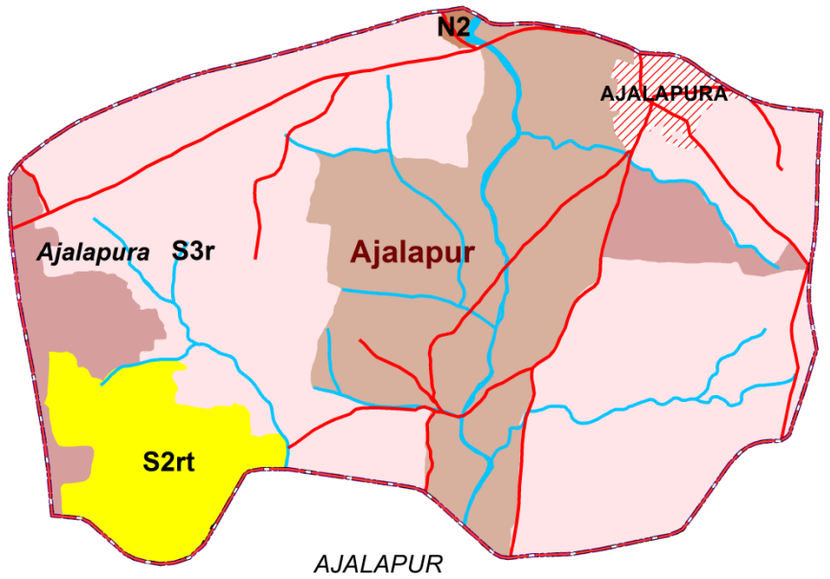
LAND SUITABILITY FOR TAMARIND

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

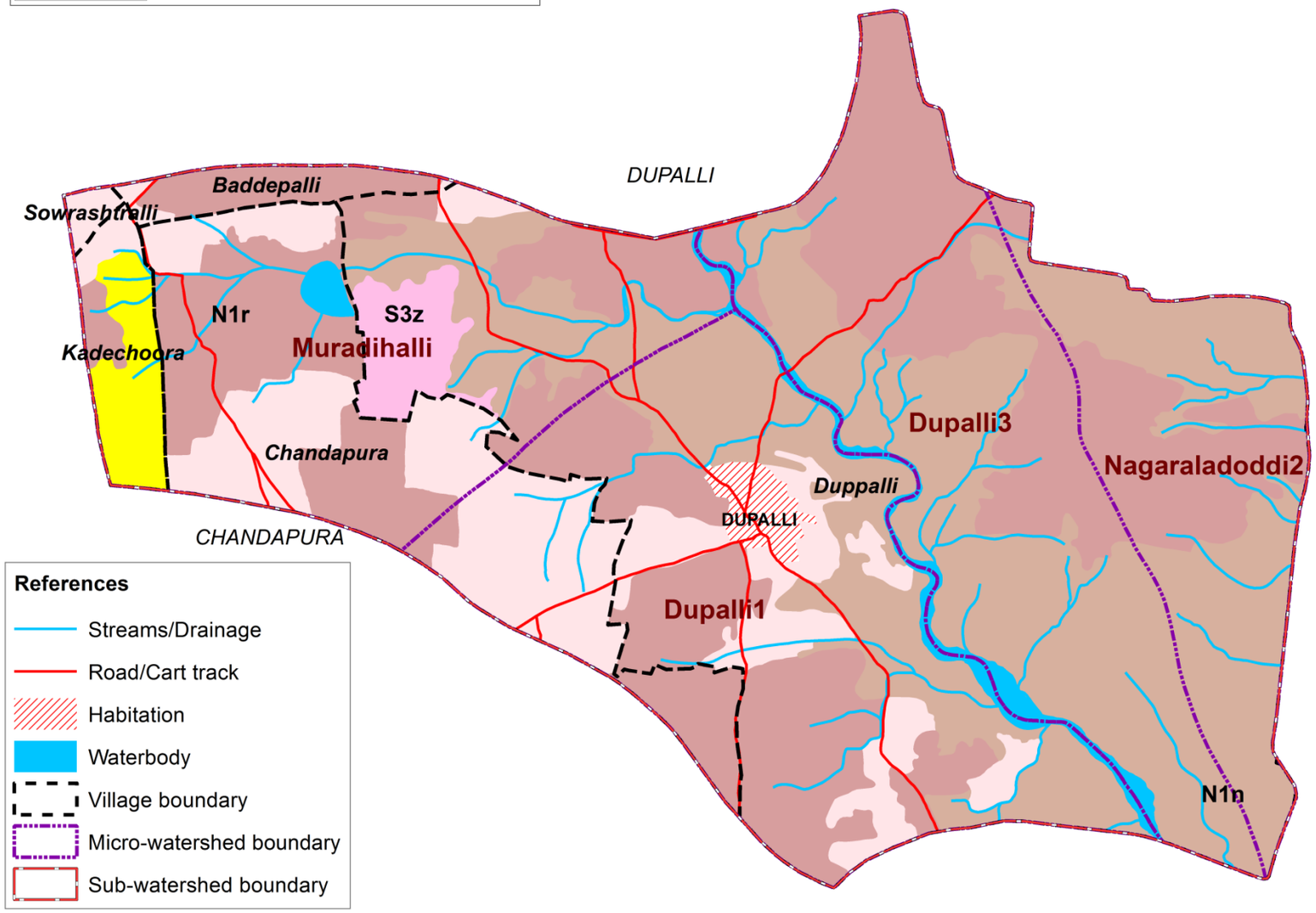
YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N



Key
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness



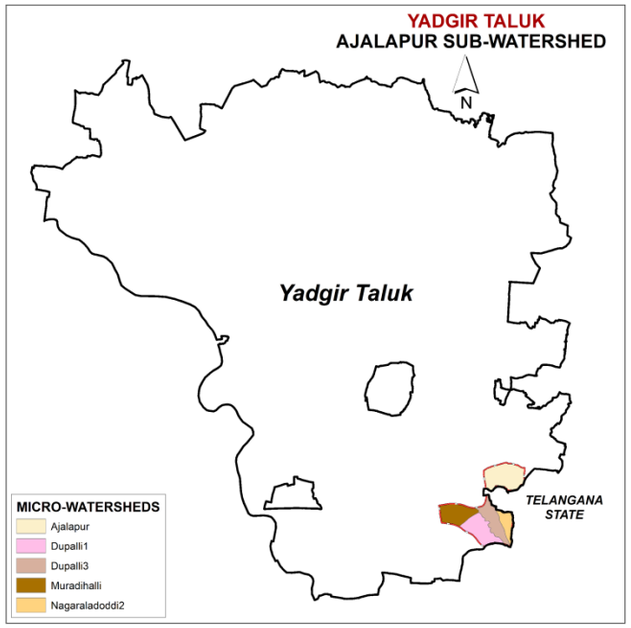
References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

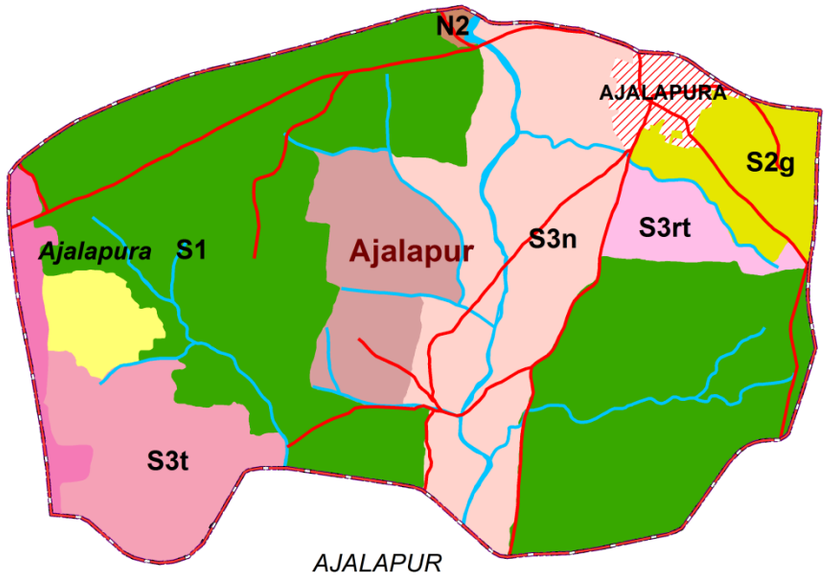
Suitability subclass	Area in ha (%)
S2rt	120 (4.05)
S3r	800 (27.07)
S3z	45 (1.51)
N1n	1018 (34.43)
N1r	874 (29.57)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.26. Land Suitability for Brinjal





LAND SUITABILITY FOR BRINJAL

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

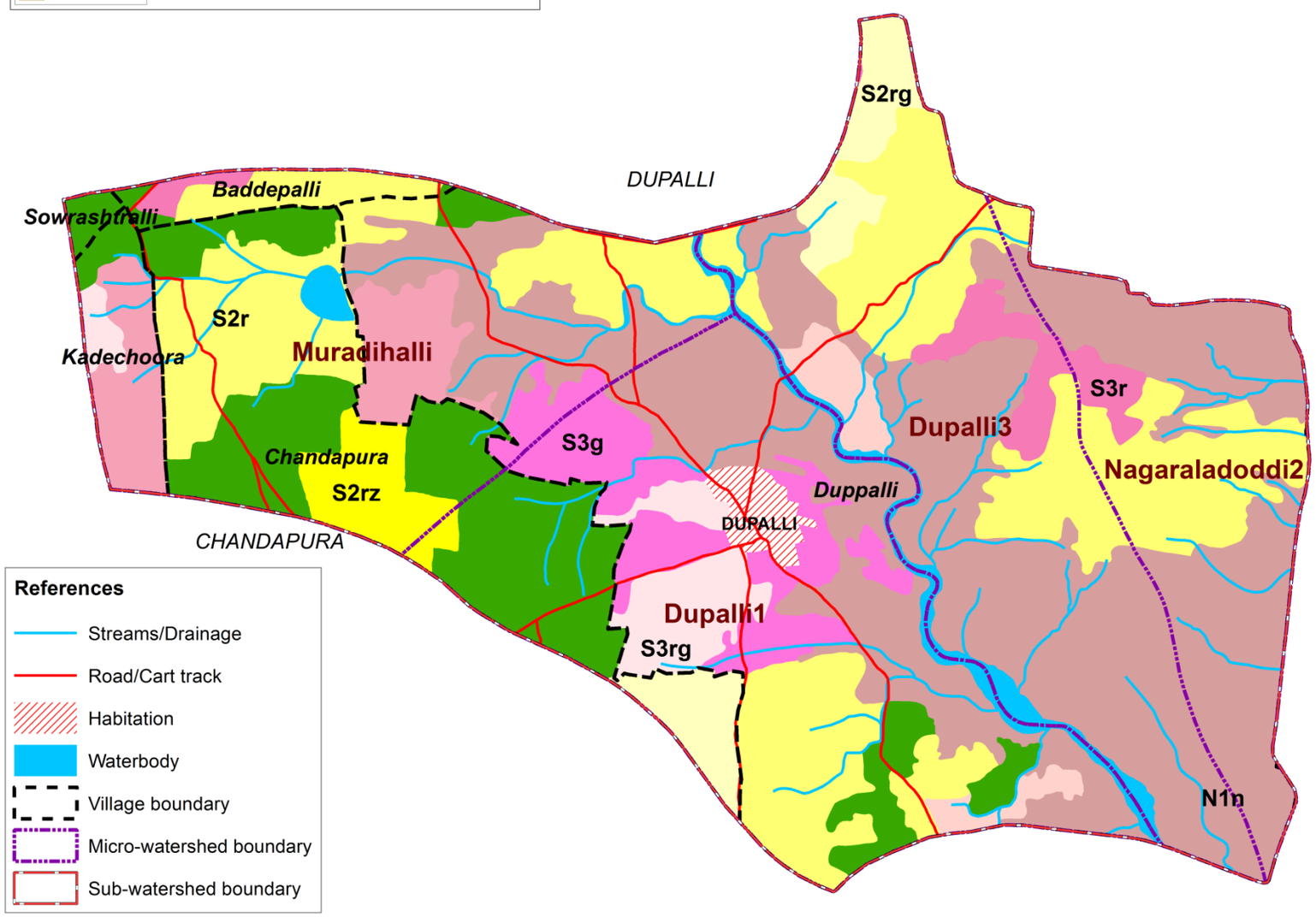
YADGIR TALUK & DISTRICT

0 0.5 1 2 km

N

Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

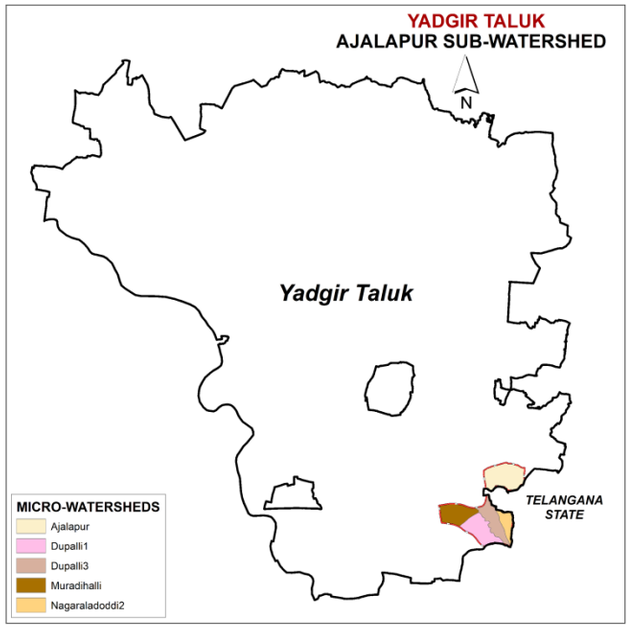


Suitability subclass	Area in ha (%)
S1	689 (23.3)
S2g	47 (1.58)
S2r	535 (18.1)
S2rg	75 (2.52)
S2rz	47 (1.6)
S3g	118 (4.0)
S3n	199 (6.72)
S3r	72 (2.44)
S3t	164 (5.56)
S3rg	65 (2.2)
S3rt	26 (0.89)
N1n	819 (27.71)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.27. Land Suitability for Onion

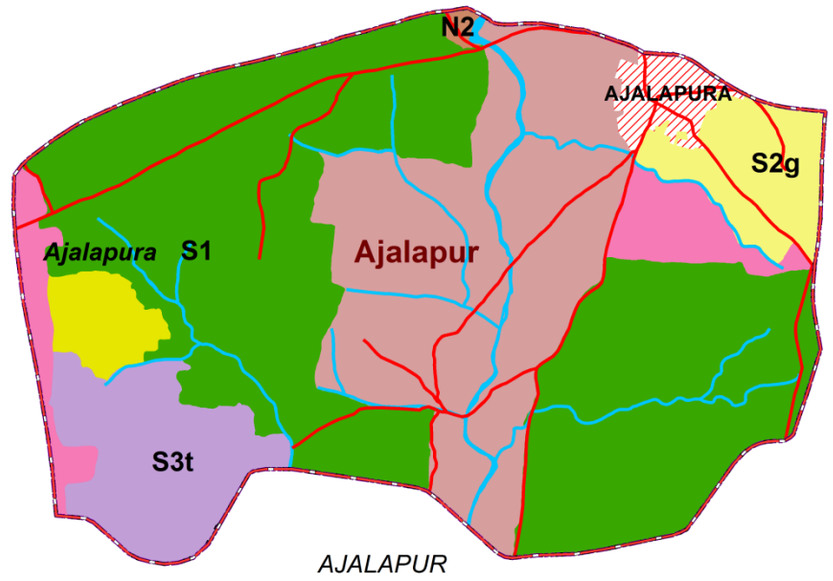


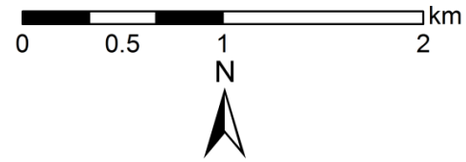
LAND SUITABILITY FOR ONION

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

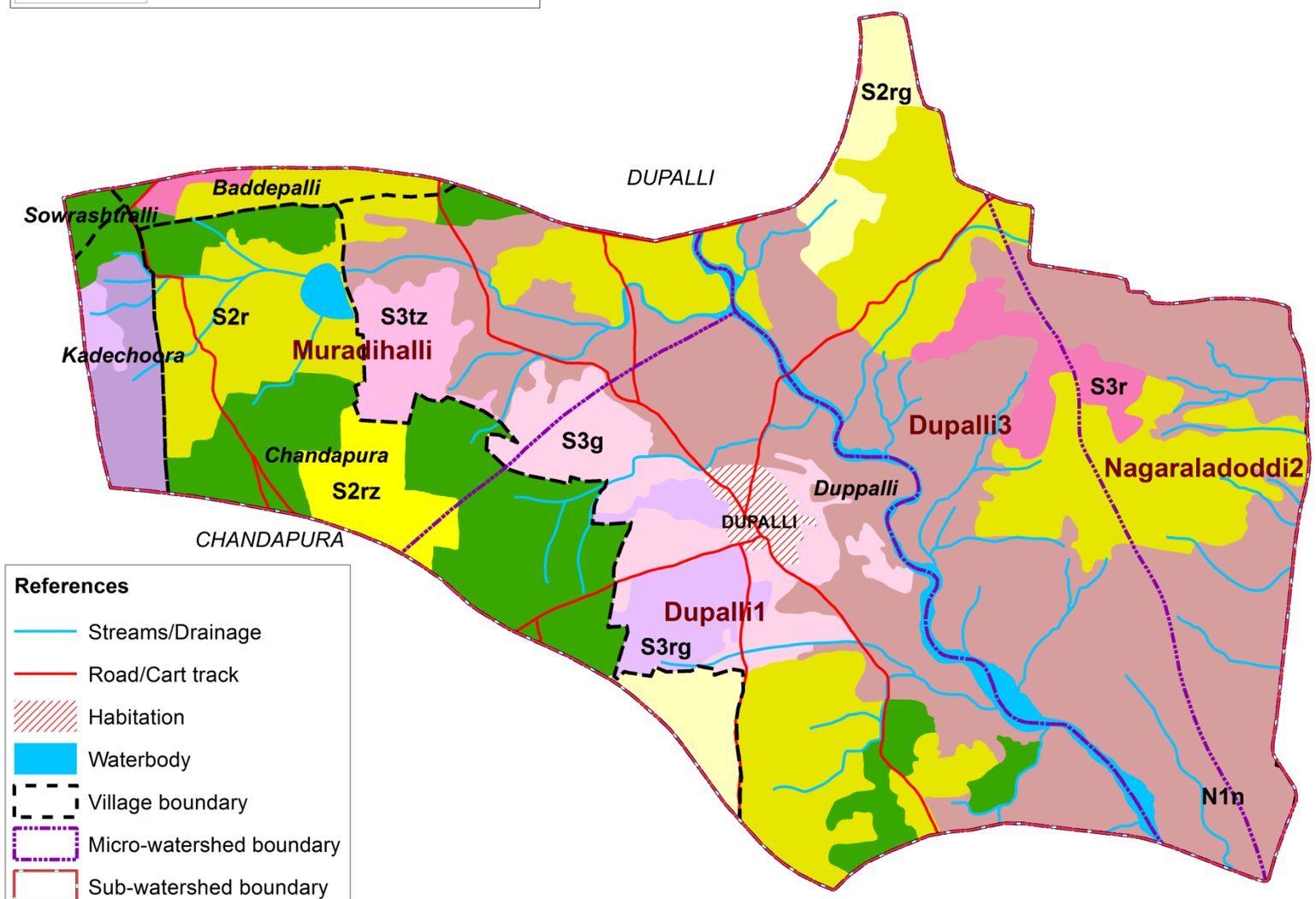
YADGIR TALUK & DISTRICT





Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness



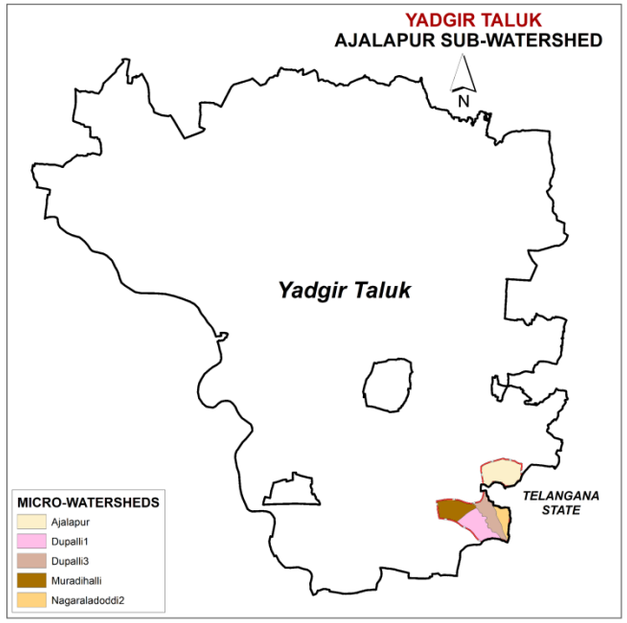
References
- Streams/Drainage
- Road/Cart track
- Habitation
- Waterbody
- Village boundary
- Micro-watershed boundary
- Sub-watershed boundary

Suitability subclass	Area in ha (%)
S1	689 (23.3)
S2g	47 (1.58)
S2r	535 (18.1)
S2rg	75 (2.52)
S2rz	47 (1.6)
S3g	118 (4.0)
S3r	99 (3.34)
S3t	120 (4.05)
S3rg	65 (2.2)
S3tz	45 (1.51)
N1n	1018 (34.43)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.28. Land Suitability for Marigold



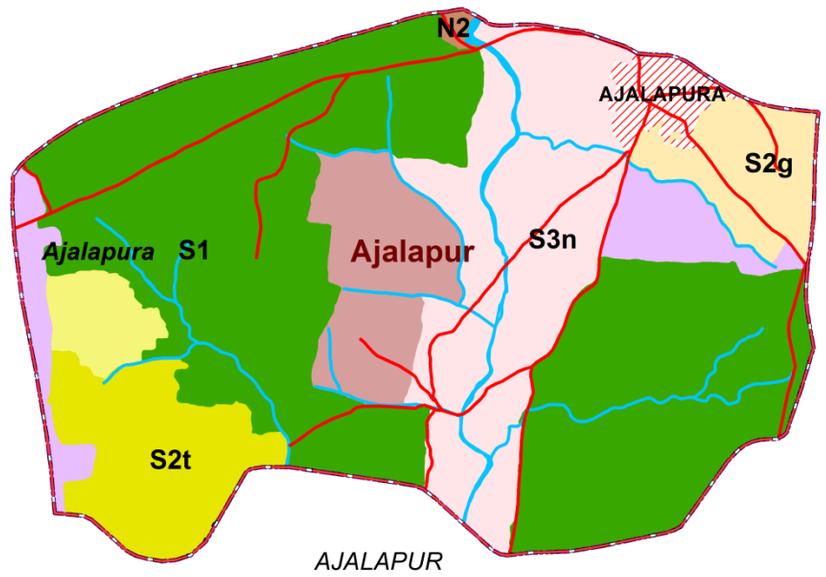
LAND SUITABILITY FOR MARIGOLD

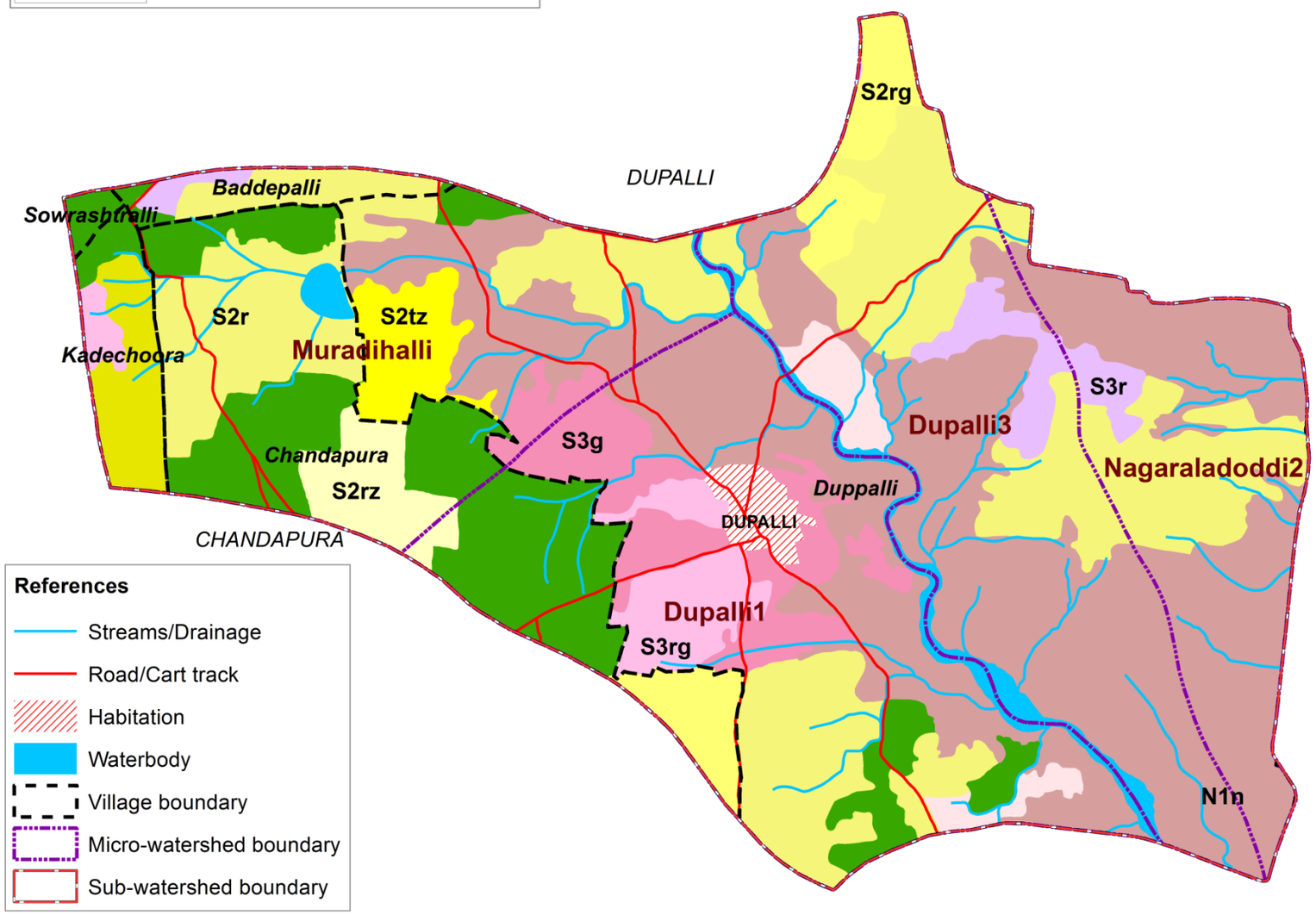
Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

YADGIR TALUK & DISTRICT

km
0 0.5 1 2
N





Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

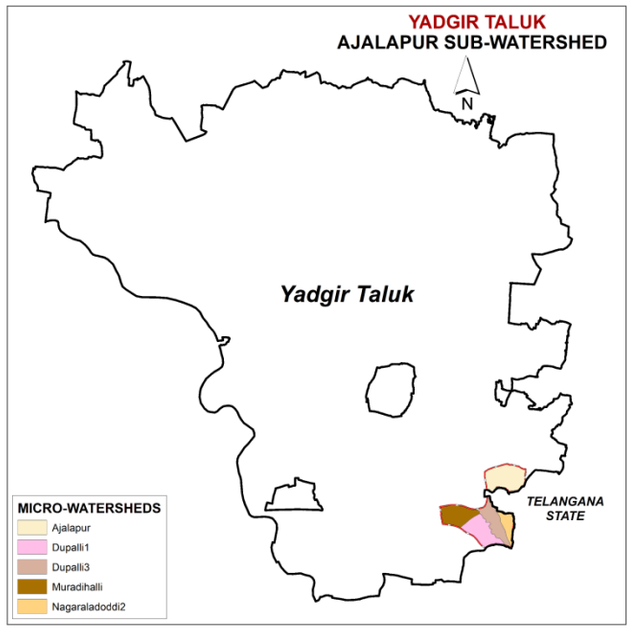
Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness

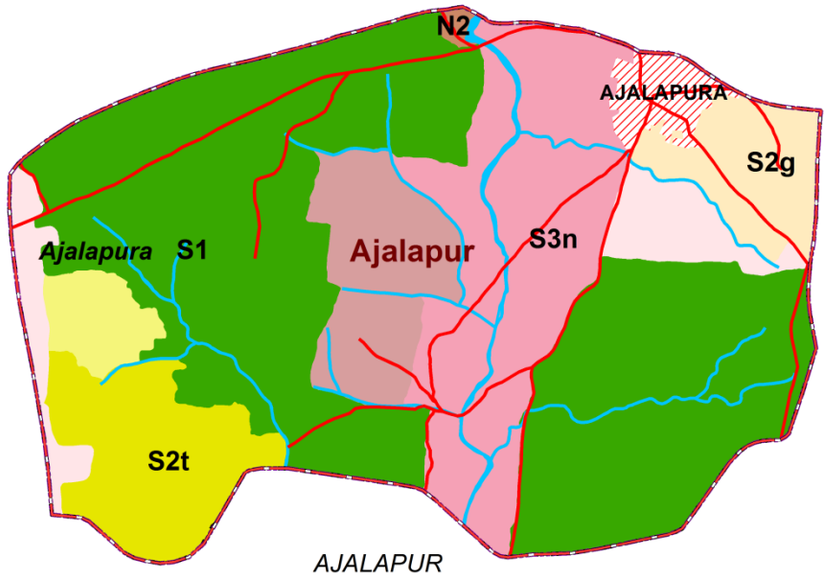
Suitability subclass	Area in ha (%)
S1	689 (23.3)
S2g	47 (1.58)
S2r	535 (18.1)
S2t	120 (4.05)
S2rg	75 (2.52)
S2rz	47 (1.6)
S2tz	45 (1.51)
S3g	118 (4.0)
S3n	199 (6.72)
S3r	99 (3.34)
S3rg	65 (2.2)
N1n	819 (27.71)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

Source: ICAR-NBSS&LUP, Bengaluru

7.29. Land Suitability for Chrysanthemum





LAND SUITABILITY FOR CHRYSANTHEMUM

Ajalapur Sub-watershed

(4D2D6P : Area - 2955.47 ha)

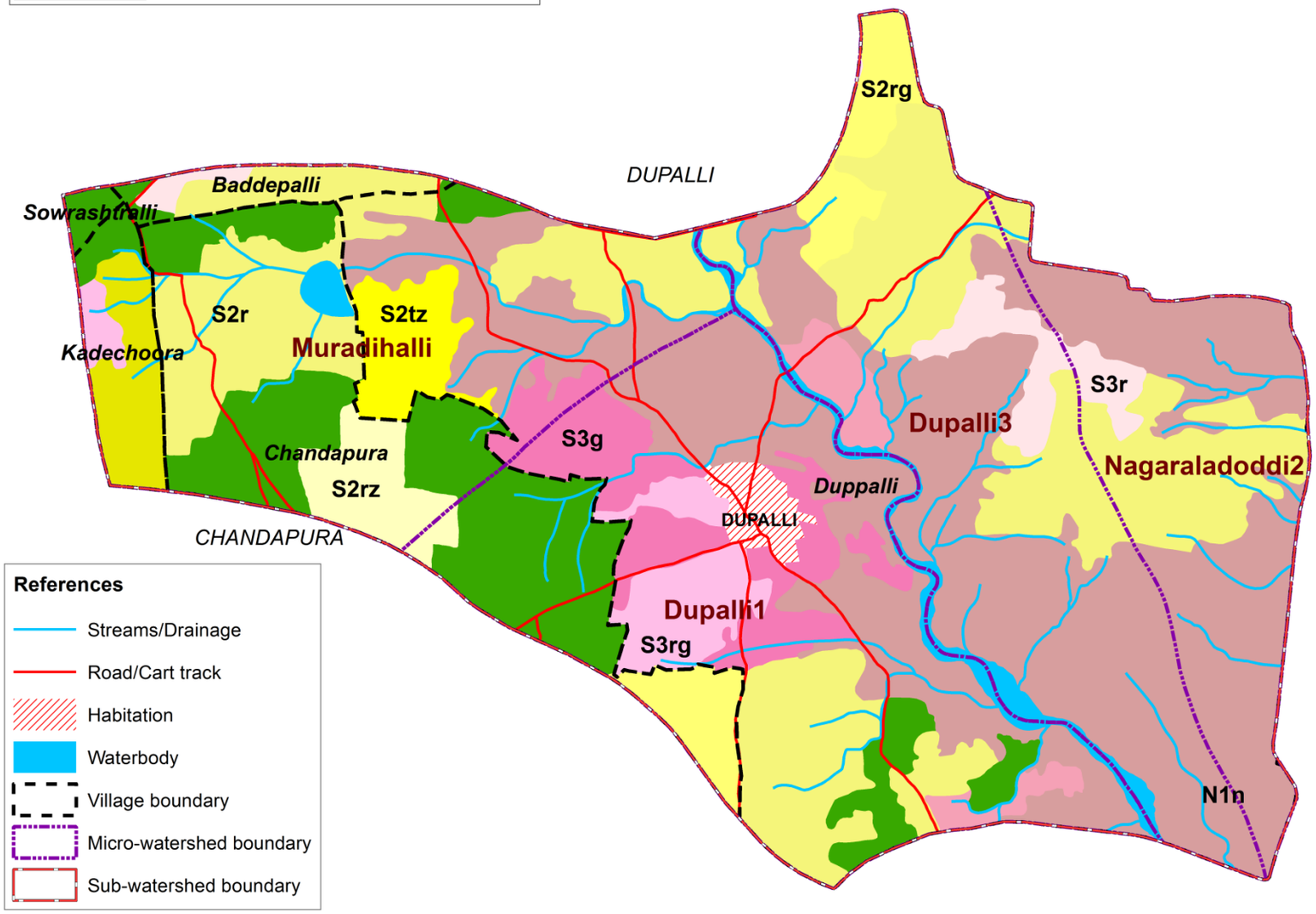
YADGIR TALUK & DISTRICT

0 0.5 1 2 km

N

Key
S1- Highly Suitable
S2- Moderately Suitable
S3- Marginally Suitable
N1- Currently Not Suitable
N2- Permanently Not Suitable

Limitations
g- gravelliness/stoniness
n- nutrient availability
r- rooting condition
t- texture
z- excess salt/calcareousness



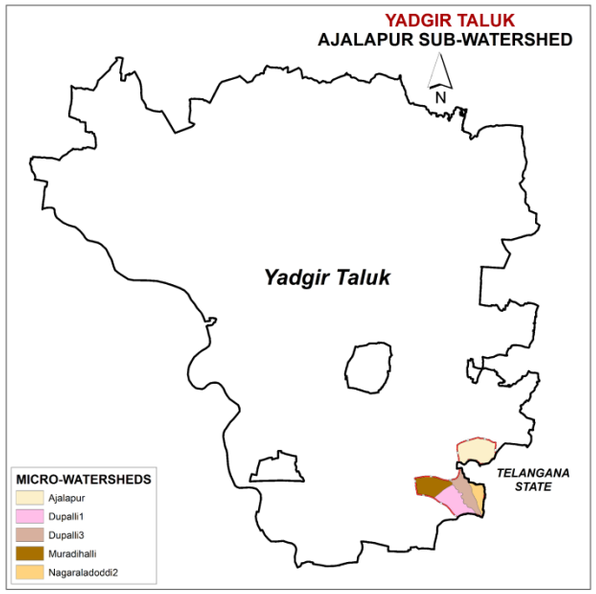
Suitability subclass	Area in ha (%)
S1	689 (23.3)
S2g	47 (1.58)
S2r	535 (18.1)
S2t	120 (4.05)
S2rg	75 (2.52)
S2rz	47 (1.6)
S2tz	45 (1.51)
S3g	118 (4.0)
S3n	199 (6.72)
S3r	99 (3.34)
S3rg	65 (2.2)
N1n	819 (27.71)
N2	3 (0.09)
Mining/Industrial	1 (0.03)
Others*	96 (3.25)

* - Habitation & Waterbody

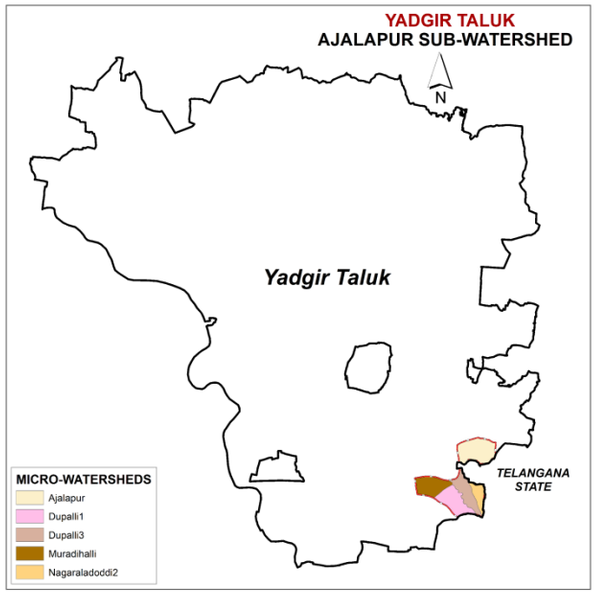
Source: ICAR-NBSS&LUP, Bengaluru

8. Soil and Water Conservation Measures

8.1. Soil & Water Conservation Plan



9. Land Management Units



NOTE: *Proposed Crop Plan for LMUs are given in Table*

10. Table. Proposed Crop Plan for Ajalapur Sub-watershed, Yadgir Hobli, Yadgir Taluk, Yadgir District based on soil-site–crop suitability Assessment

LMU. No	Soil Map Units	Survey Number	Field Crops/ Commercial crops	Horticulture Crops (Rainfed/Irrigated)	Suitable Interventions
1	42.YDRcB2 53.ANRhB2 55.ANRiB2 100.VKSmB1 117.VKSiB2 127.GWDmB2 (Moderately deep to very deep, sodic soils)	**Ajalapura:** 117,118,119,120,121,122,123,124/1, 124/2,125/1,125/2,126,127,128,148, 217,218/1, 218/2,219,549, 555 **Duppalli:** 13,30,31,32,33,61,62,77,78,79,80,81, 82,85,86,87,90,91,92,93,94,95,96,98, 99,100,103,104,105,107,108,109,110, 111,112,113,114,115,116,117,118,119 ,121,130,131,132,133,134,135,136, 138,139,140,141,142,143,144,145, 146,148,149,150,151,152,153,154, 155,156,157,158,159,160,162,165, 166,167,168,169,170,171,172,173, 174,175,176,177,178,179,180,181, 182,183,184,185,186,187,188,189, 190,191,192,193,194,200,201,202, 203,211,221,222,223,224,225,226, 227,228,229,230,236,237,238,239, 240,245,246,247,248,249,250,251, 252,253,278,282,283,287,296,297, 298,335,337,338,339,340,341,342, 344,345,346,347,348,349,350,351, 352,354,355,358,359,368,370,371, 372,374,380,381,382,383,384,385, 386,387,388,389,390,391,392,393, 394,395,396,401,402,403,404,405, 406,424,428,430,431,432,438,440, 441,442,443,444,445,446,447,449, 450,452,456,457,459,460,464,467/2 **Telangana State:** 225,226,227,237,239,240	-	**Agri-Silvi-Pasture** Ber, Aonla, Acacia sp. Dhaincha, Rhodes grass, Para grass ,Bermuda grass	Application of gypsum, iron pyrites and elemental sulphur. Addition of farm yard manures, green manures and providing subsurface drainage

To be continued….

LMU. No	Soil Map Units	Survey Number	Field Crops/ Commercial crops	Horticulture Crops (Rainfed/Irrigated)	Suitable Interventions
2	58.MDGiB2 148.MDGhB2 169.MDGcA1 171.MDGhA1 (Deep to Very deep, sandy clay loam and strongly alkaline soils)	**Ajalapura:** 56,62,91,92,93,101,102,103,104,105,106, 107,108,109,110,111,112,113,114/1,114/2, 114/3,115,116,188,189,190,191,192,193, 194,195,196,197,198,199,200,201,202,203, 204,205,206, 207,208,220,221,222,223, 224,225,226,227,228,229,230,231,232,233, 234,235,238,239,240,241,241/2,241/3, 241/4,242,243,244,245,246/1,246/2,247, 248,249,250,251,252,253,254,255,256,257, 258,259,260, 261,262,263,264,265,266, 267,268,269,270,271,272,273,274,275,276, 277,278,279,280,281,282,283,284,285, 286,287,288,289,290,291,292,293,294, 295,296,297,298,299,300,301,302,303, 304,305,306,307,308,309,310,311,312, 313,314,315,316,317,318,319,320,321, 322,323,324,325,326,327,328,329,330, 331,332,333,334,335,336,337,338,339, 340,341,342,343,344,345,346,347,348, 349,350,351,352,353,354,355,356,357, 358,359,360,361,362,363,364,371,373, 374,375,376,377,378,379,380,381,382, 383,384,385,386,387,388,389,390,391, 392,393,394,395,478,53,530,537,538,539, 54,540,541,542,543,550,551,552,553,554, 556, 557,558,559,560,561,562, 564 **Duppalli:** 124,125,254,255,256,257,258,259,260,261, 262,263, 264,265,266,268,269,270, 271,272,273,274,275,276, 277,343	Sorghum, Maize, Bajra	**Agri-Silvi-Pasture** Ber, Aonla, Acacia sp. Dhaincha, Rhodes grass, Para grass ,Bermuda grass	Application of gypsum, iron pyrites and elemental sulphur. Addition of farm yard manures, green manures and providing subsurface drainage

To be continued….

LMU. No	Soil Map Units	Survey Number	Field Crops/ Commercial crops	Horticulture Crops (Rainfed/Irrigated)	Suitable Interventions
3	32.HSLcB2 111.HSLbB2 126.HSLhB2 155.BLCcB2g1 91.SWRmB2 50.BGDbB2 (Moderately deep to deep, black sandy clay to clay soils)	**Ajalapura:** 23,24,36,37,38,39,40,41,45,46, 47,48,51,52/1,52/2,60,61,63,64, 65,66,67,68,69,70,71,72,73,74, 75,76,77,78,79,80,81,82,83,84, 85,86,87,88,89,90,94,95,96,97, 98,99,100, 133,134,135,136,137,138, 141,142,143,144,145,152, 155,156 **Baddepalli:** 353 **Chandapura:** 60,97,98,99,103,104,105/1, 105/2,106/1,106/2,107,108, 109,110,116,117,118,119, 120,121 **Duppalli:** 439,453,458,461,462,463, 465,466,467/1,468,469,470 **Kadechoora:** 165/1,166,167,168,169,170,171 , 172,173,174,180	Maize, sorghum, Sunflower, Cotton, Red gram, Bengalgram, Bajra	**Fruit crops:** Lime, Musambi, Custard apple, Pomegranate **Vegetables:** Chilli, Bhendi **Flowers:** Marigold, Chrysanthemum	Application of FYM, Bio-fertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices

To be continued….

LMU. No	Soil Map Units	Survey Number	Field Crops/ Commercial crops	Horticulture Crops (Rainfed/Irrigated)	Suitable Interventions
4	40.PGPcB2 37.BLCcB2 38.BLCiB2 (Moderately deep, red sandy clay soils)	**Ajalapura:** 129,130,131,132,146,147, 149,150,151,153,163,164, 165,166,167,168,169,170, 171,172,173,174,175,176, 177,178,179,180,181,182, 183,184,185,186,187,209, 210,211,212,213,214,215, 216,397,399,400/1,400/2, 402,403,405,406,407,408, 409,410,411,412,415,416, 422,423,424 **Baddepalli:** 366,408 **Chandapura:** 8,9,10,11,18,19,20,21,22,35,36, 37,38,39,40,41,43,5,53, 54,55,56,57, 58,59,61,62, 100,101,102 **Duppalli :** 56,57,58,60,126,128 **Kadechoora:** 175,176 **Sowrashtralli:** 75,76,77,78	Sunflower, Sorghum, Maize, Groundnut, Red gram, Bajra	**Fruit crops:** Mango, Musambi, Sapota, Tamarind, Pomegranate, Amla, Custard apple, Guava, Jackfruit, Jamun, Lime **Vegetables:** Tomato, Onion**,** Bhendi, Chilli, Brinjal, Drumstick, Coriander **Flowers:** Marigold, Chrysanthemum	Application of FYM, Biofertilizers and micronutrients, drip irrigation, Mulching, suitable soil and water conservation practices

To be continued….

LMU. No	Soil Map Units	Survey Number	Field Crops/ Commercial crops	Horticulture Crops (Rainfed/Irrigated)	Suitable Interventions
5	39.KBDbB3 130.KBDhB2 (Moderately deep, red gravelly sandy clay loam soils)	**Duppalli:** 8,11,12,14,15,16,17,18,19, 20,21,24,25,26/1,28,29,34, 36,37,38,39,40,41,42,71,72, 73, 74,75,76, 83,84,88,89,97 101,102, 356,357, 360,361, 376,377, 473,480,481,482	Groundnut, Bajra, Horse gram, Castor, Mulberry	**Fruit crops:** Musambi, Lime, Jamun, Jackfruit Amla, Custard apple, Tamarind **Vegetable crops:** Drumstick, Curry leaves	Drip irrigation, mulching, suitable soil and water conservation practises (Crescent Bunding with Catch Pit etc)
6	27.YLRbB2 29.YLRcB2g1 31.YLRiB2 147.YLRmB2g2 (Moderately shallow, red clay soils)	**Baddepalli:** 354,359,360,362,363,364, 365 **Chandapura:** 123,124,125,126,127, 128,129,130,131,132, 137 **Duppalli:** 45,44,46,47,48,49,52,53,54,55,59,63,64,65,66,67,68,69,70,120,122,123,127,195,196,197,198,199,204,205,206,207,208,209,210, 214, 215, 216,217,218,219,220,231, 241,242,243,279,280/1,280/2, 285/1,285/2,286,288,289,290,291,292,293,294,295,299,300,301, 302,303,304,305,306,307,308,311, 312, 327,328,329,330,331,333, 334,336,375,378,379,398,399, 400,407,408,409,410,411,412, 413,420,421,422,425,426,427, 429,43,433,434,435,436,437,448,451,454,455 **Telangana State:** 220,221,241	Maize, sorghum Groundnut, Bajra, Cotton	**Fruit crops:** Amla, Custard apple **Vegetables:** Tomato, Chilli, Brinjal, Bhendi, Onion **Flowers:** Marigold, Chrysanthemum	Application of FYM, Bio-fertilizers and micronutrients, drip irrigation, Mulching, suitable soil and water conservation practices

To be continued….

LMU. No	Soil Map Units	Survey Number	Field Crops/ Commercial crops	Horticulture Crops (Rainfed/Irrigated)	Suitable Interventions
7	16.HLGcB2 20.JNKcB2 166.JNKcA1 (Moderately shallow, black calcareous sandy clay loam soils)	**Ajalapura :** 154,159,160 **Chandapura:** 12,13,14,15,16,17,23,24,25,26, 27,28,29,30,31,32,33,34,42,44, 45,48,49,50,51,52,63,64	Maize, sorghum Groundnut, Bajra	**Fruit crops:** Amla, Custard apple **Vegetables:** Tomato, Chilli, Brinjal, Bhendi, Onion **Flowers:** Marigold, Chrysanthemum	Application of FYM, Bio-fertilizers and micronutrients, drip irrigation, Mulching, suitable soil and water conservation practices
8	2.BDLbB2 9.VNKcB2 108.DSBiB2 161.HTKbB2g1 (Shallow red soils)	**Ajalapura :** 49,50,55,57,58,59,139,140, 157,158,161,162, 413,414 **Baddepalli:** 367,368 **Duppalli:** 212,213,232,233,234,235, 244,27,281,284,310,35,373,471 , 472,474,475,476,477,478,479, 483,484,485,486, 487,489 **Kadechoora :** 179	-	Hybrid Napier, *Styloxanthes hamata, Styloxanthes scabra*	Use of short duration varieties, sowing across the slope

PART-B

Hydrological Inventory of Ajalapur Sub-watershed, Yadgir Taluk, Yadgir 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 Ajalapur Sub-watershed, Yadgir Taluk, Yadgir 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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Sh. R.S.Reddy	Consultant
Sh. A.G.Devendra Prasad	Consultant
Smt. K.Karunya Lakshmi	Research Associate
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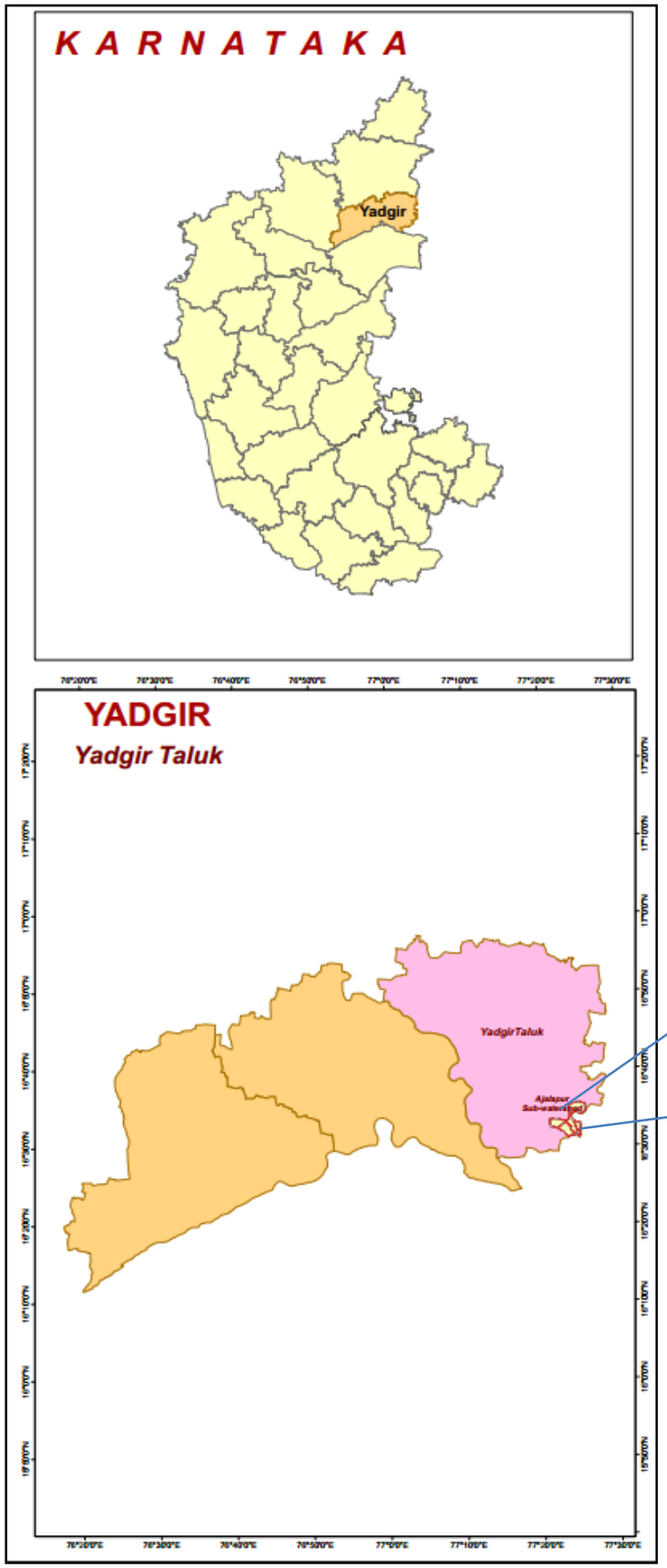
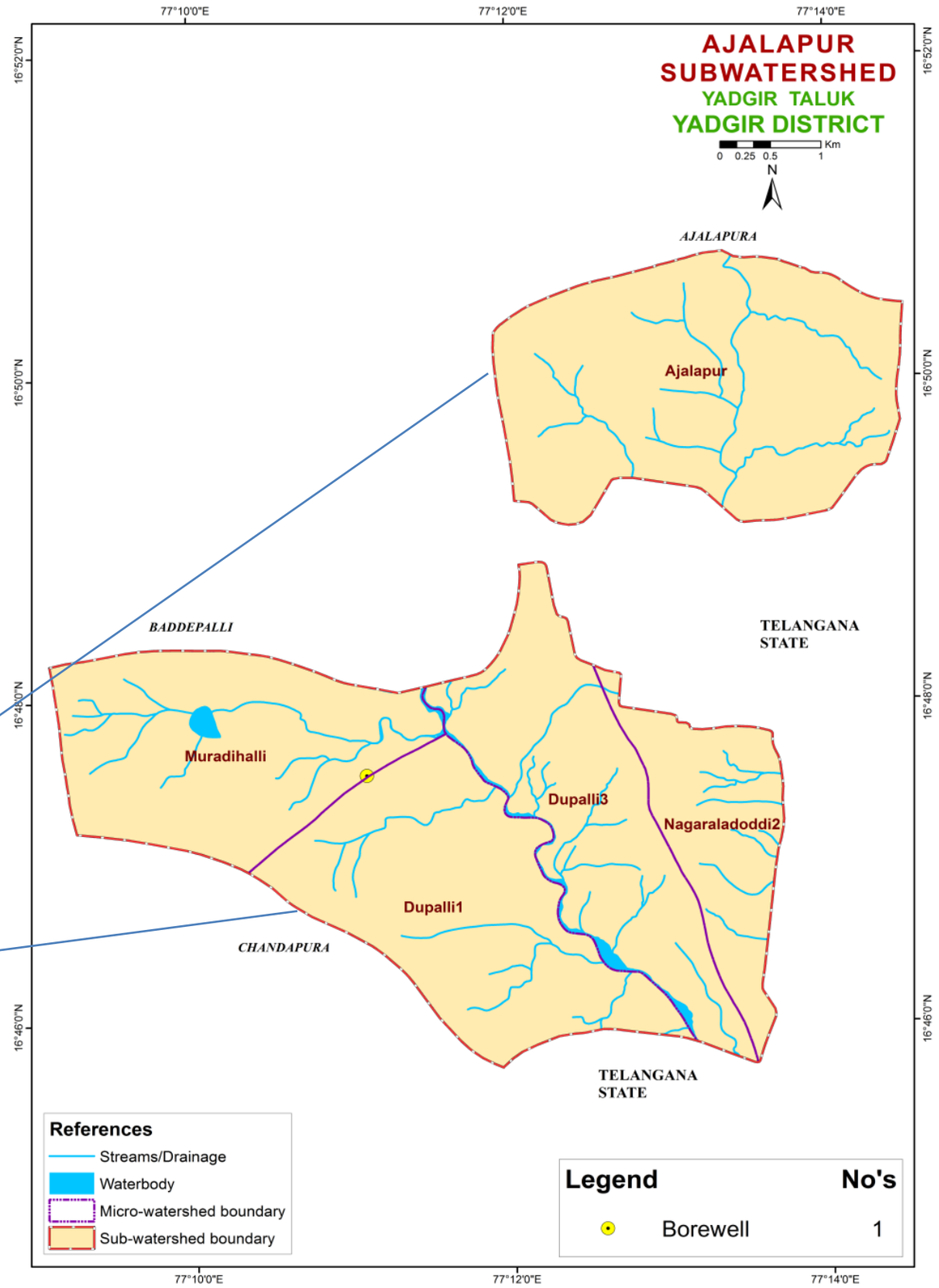
INTRODUCTION

- The inventory and documentation of spatial and temporal changes in hydrological components of Ajalapur sub-watershed (4D2D6P) in Yadgir Taluk, Yadgir District, has been undertaken for integrated planning, development and management.
- Ajalapur sub-watershed (Yadgir Taluk, Yadgir District) is located between $16^0$31'6''–$16^0$35' 34'' North latitudes and 77^0 21'0''- 77^0 25'49'' East longitudes, covering an area of about 2956 ha.
- This sub-watershed encompasses of 5 MWs namely, Ajalapur (4D2D6P2a), Dupalli-1 (4D2D6P1b), Dupalli-3 (4D2D6P1c), Muradihalli (4D2D6P1a) and Nagaraladoddi-2 (4D2D6P2c). Land Resource Inventory (LRI) was generated for all the five micro-watersheds .
- Average annual rainfall (1960-2014) of the Hobli (Block) pertaining to the sub-watershed is 887 mm.
- In this sub-watershed major *kharif* crops grown are Maize, Cotton, Sunflower, Groundnut, Red gram, Chilly, Soybean , Paddy and major *rabi* crops are Sorghum, Bengalgram, Bajra.
- Hydrological components namely rainfall (annual, *kharif*, *rabi* and summer), PET, AET, runoff, surface soil moisture, ground water status and water balance are presented.

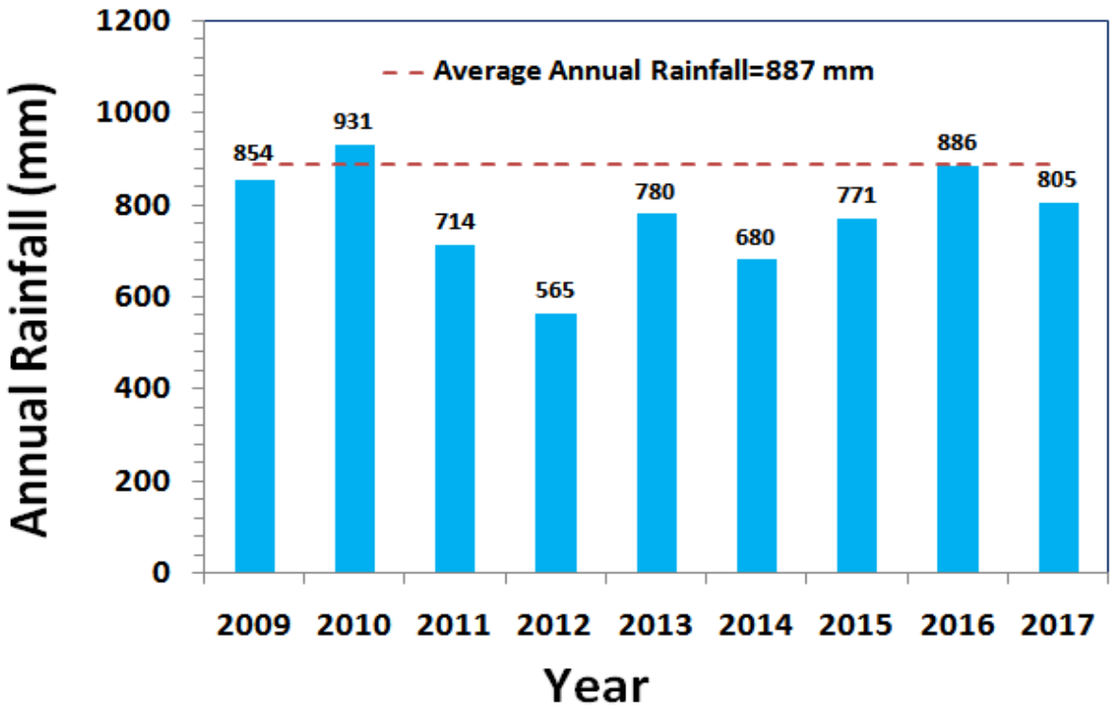
LOCATION MAP OF AJALAPUR SUB-WATERSHED





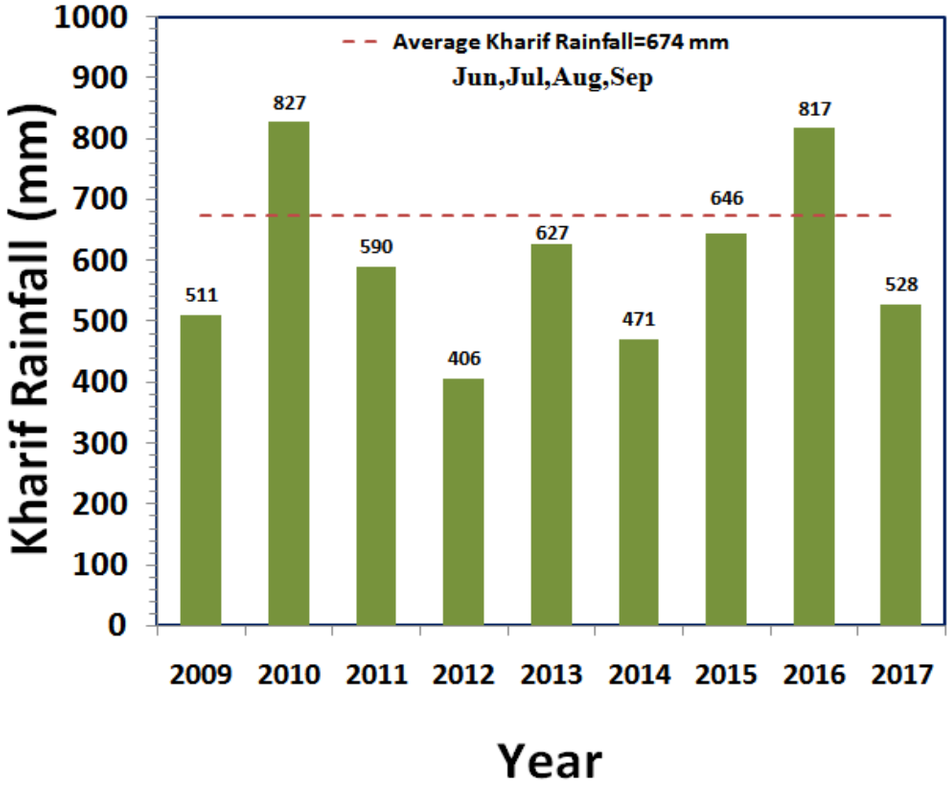
Soil & Water Conservation Structures in Ajalapur sub-watershed, Yadgir Taluk, Yadgir District

RAINFALL INDEX

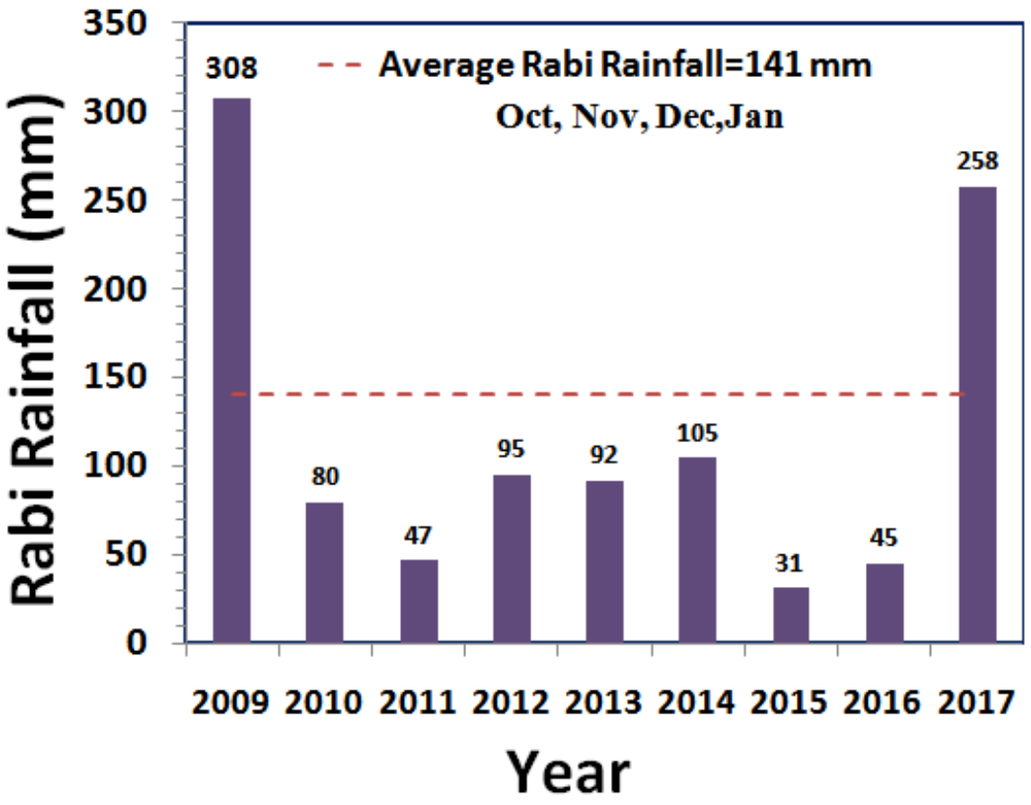


The average annual rainfall (1960-2014) recorded at the Yadgir station in Yadgir taluk of Yadgir district is 887 mm. The annual rainfall at Sydhapur station (Hobli H.Q.) is presented. During the years 2009, 2011, 2012, 2013, 2014, 2015 and 2017 the annual rainfall was deficient by 5%, 27%, 51%, 17%, 33%, 18% and 13% respectively.

The *kharif* rainfall (Jun–Sep) is an average about 77% of the annual rainfall and it typically follows the annual rainfall patterns.

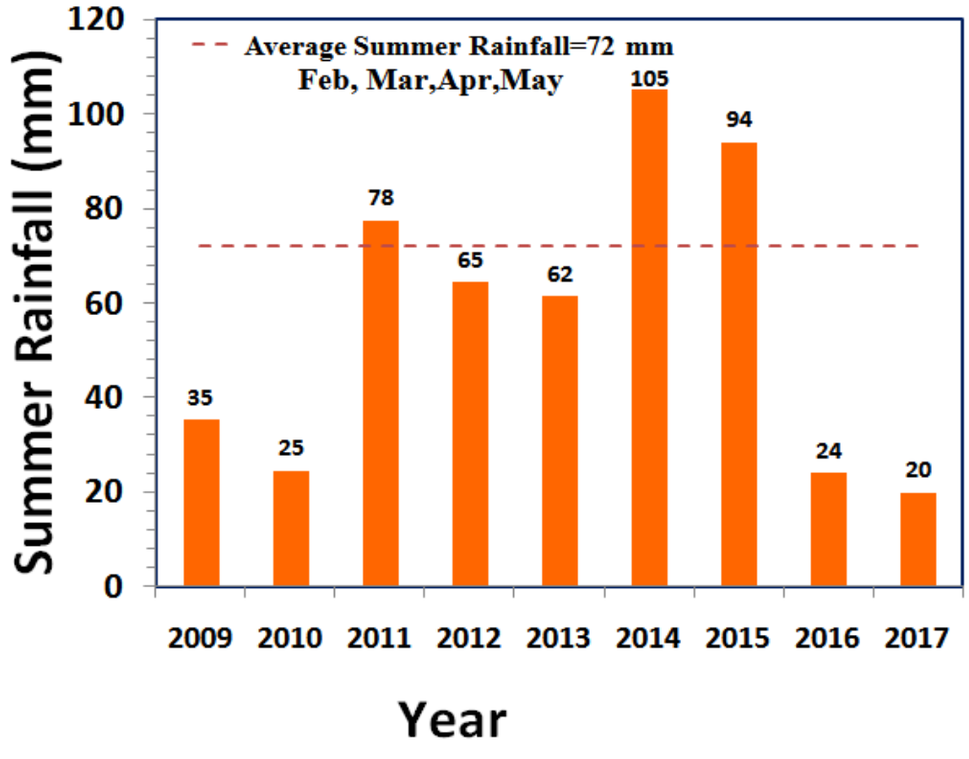


RAINFALL INDEX

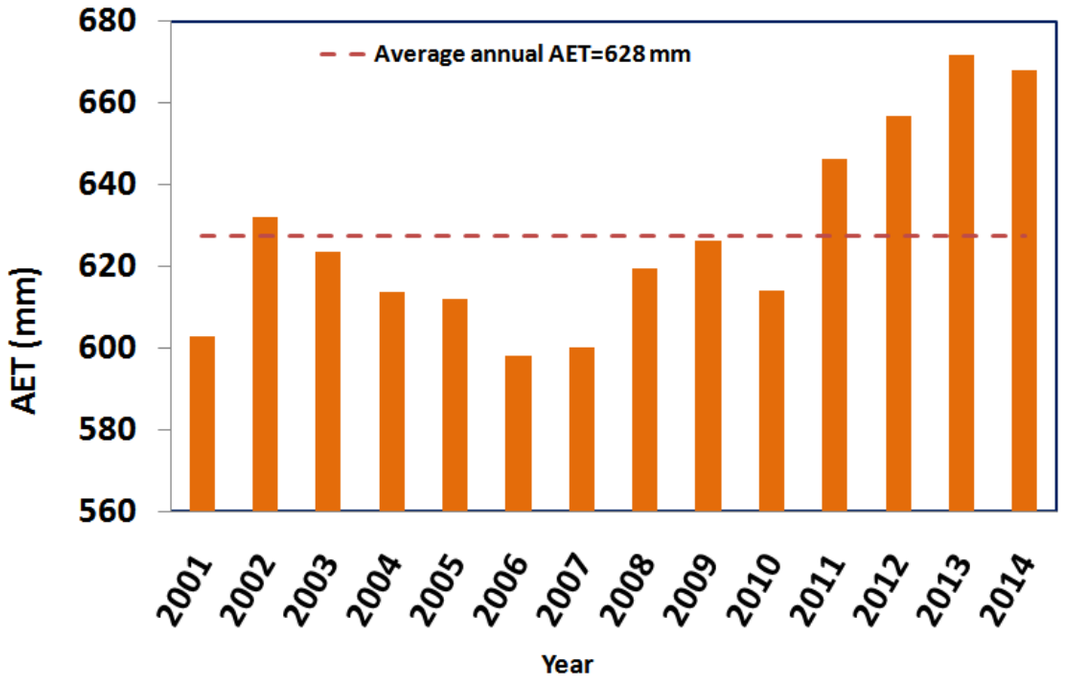


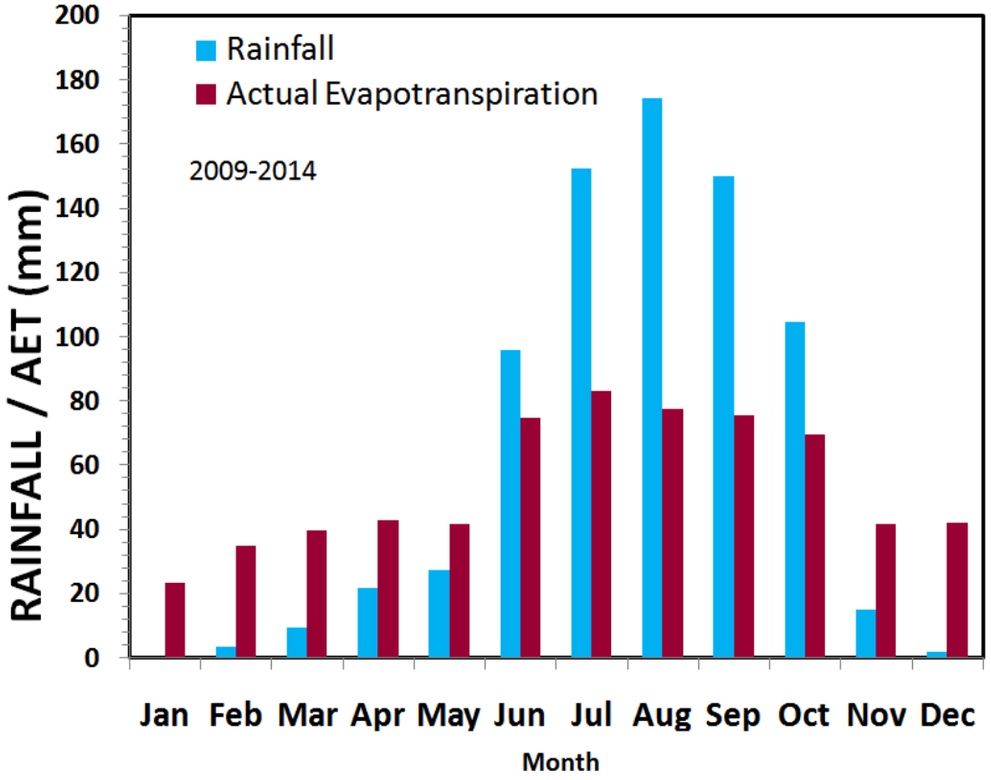
The average *rabi* rainfall (Oct-Jan) is about 15% of the Average annual rainfall. During the years 2009 and 2017 high *rabi* rainfall was received, where as other years showed deficient rainfall.

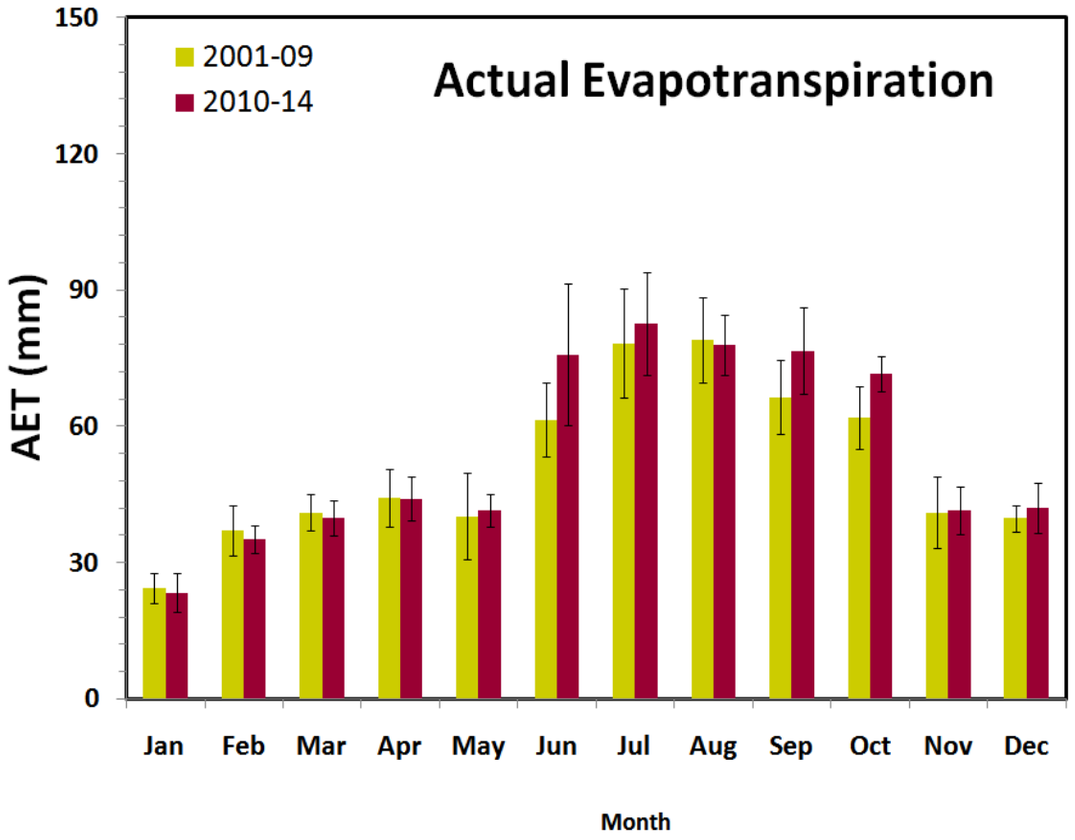
The average summer rainfall (Feb-May) is about 7% of the average annual rainfall.



EVAPOTRANSPIRATION

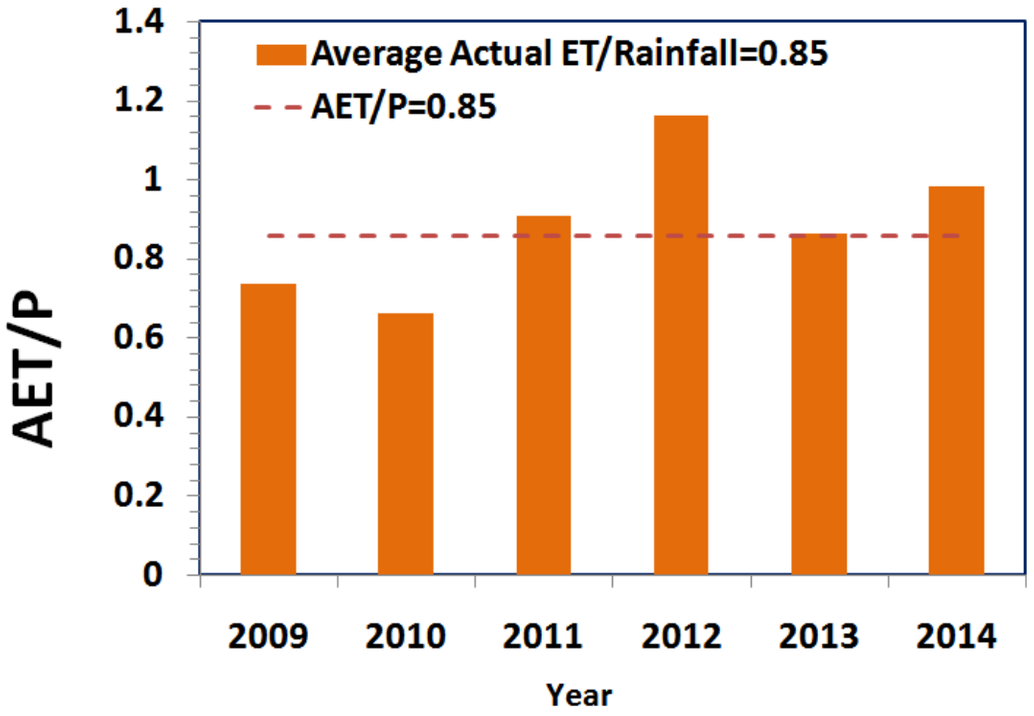


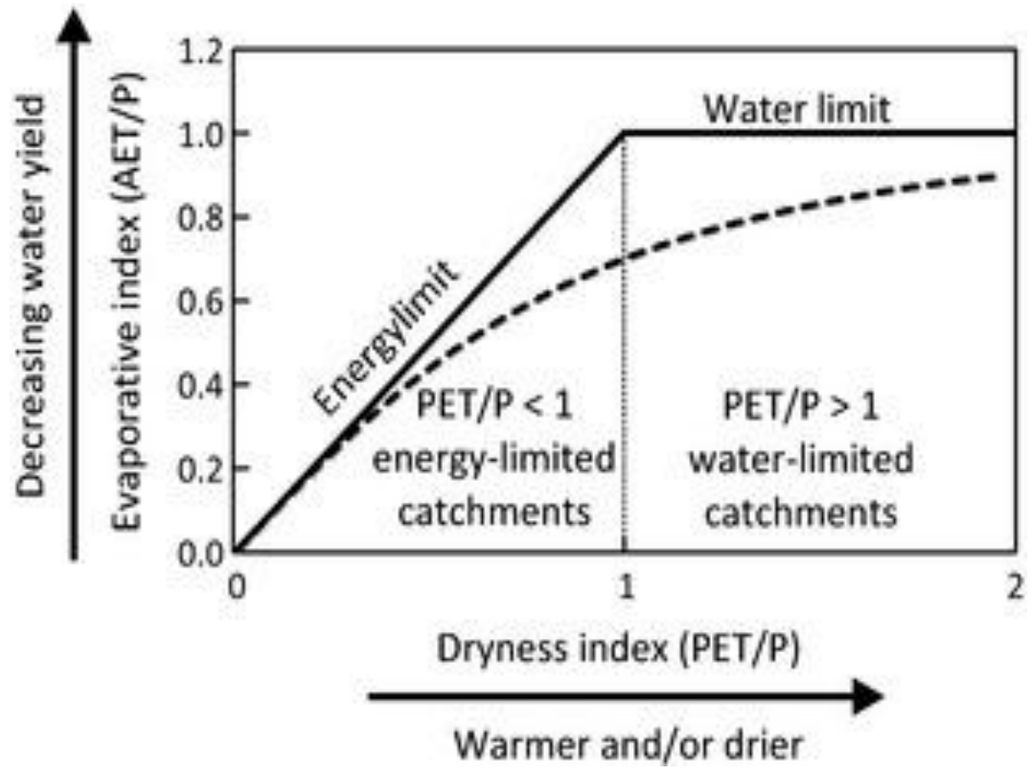




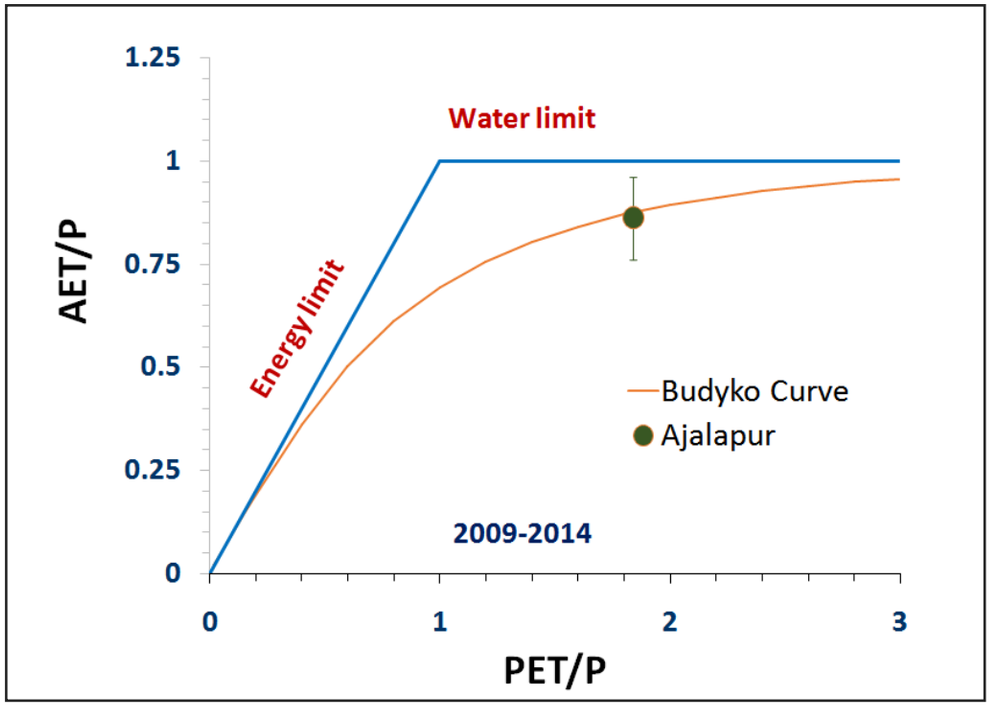
The average annual actual ET is lower than the average rainfall. During *kharif*, average rainfall and AET was found to be 674 mm and 311 mm respectively, whereas in *rabi* it was about 141 mm and 178 mm. The annual ET increased by 6% during 2010-2014 compared to 2001-2009 .

EVAPOTRANSPIRATION INDEX

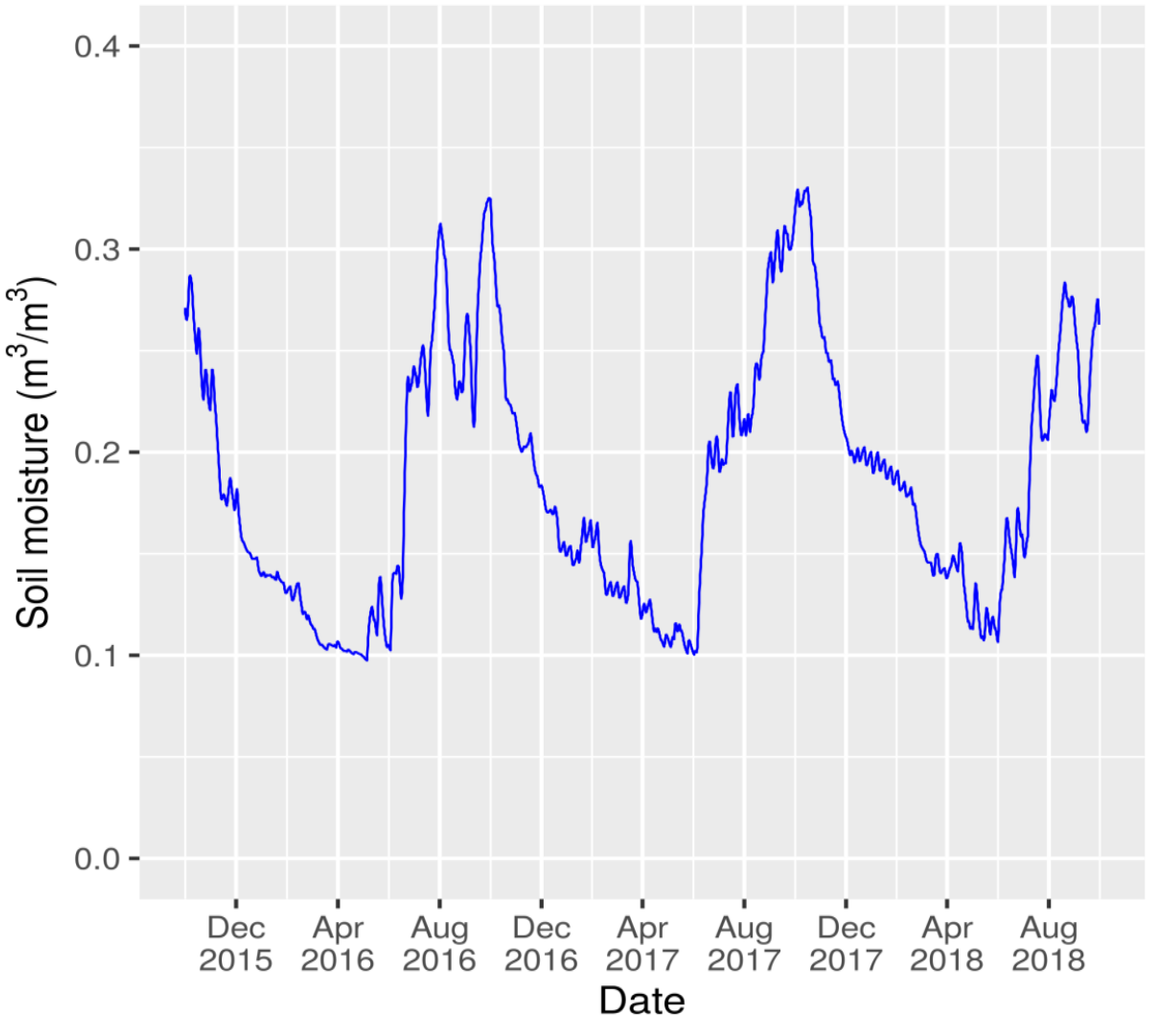


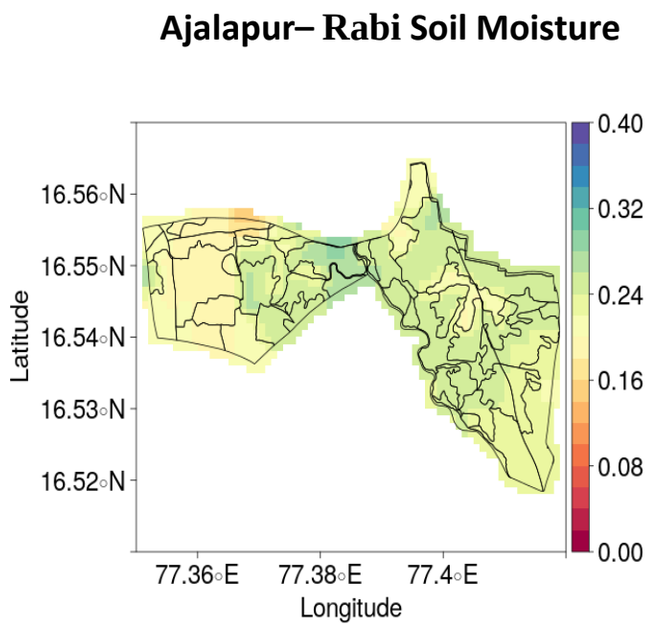


The average AET/P ratio was about 86%, which is slightly higher than the sustainable limit of about 80%. Even during extremely lower rainfall year of 2012, AET was 630 mm. This suggests the presence of water storage and utilization from other sources such as groundwater, which buffered the lower rainfall.

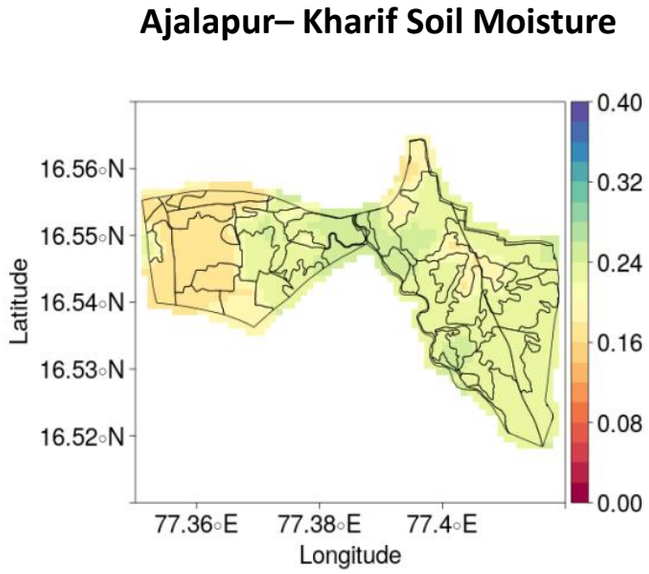


SATELLITE RETRIEVED SOIL MOISTURE





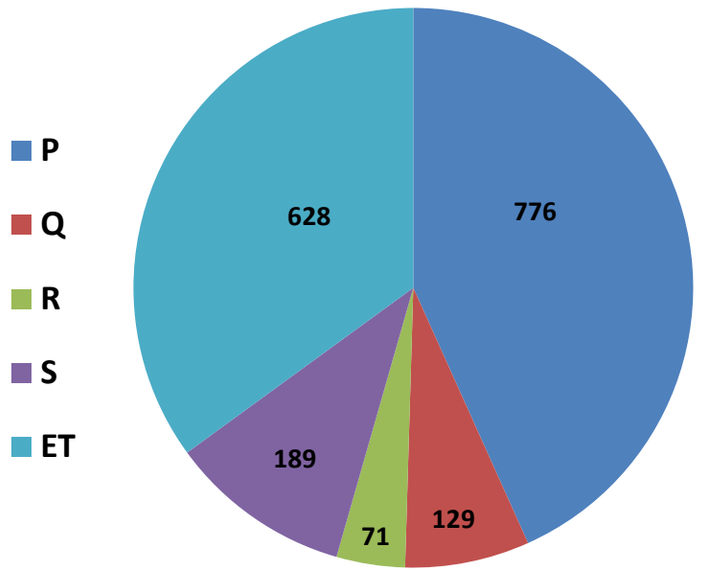
The method developed for retrieving soil moisture from multi-satellite observations allowed to map surface soil moisture behavior in the micro-watershed. The available surface moisture was varied in the range of 11-27 % in *kharif* and 14-33% in *rabi* seasons of 2016 and 10-31% in *Kharif* and 15-33% in *rabi* seasons of 2017.



WATER BALANCE

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

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

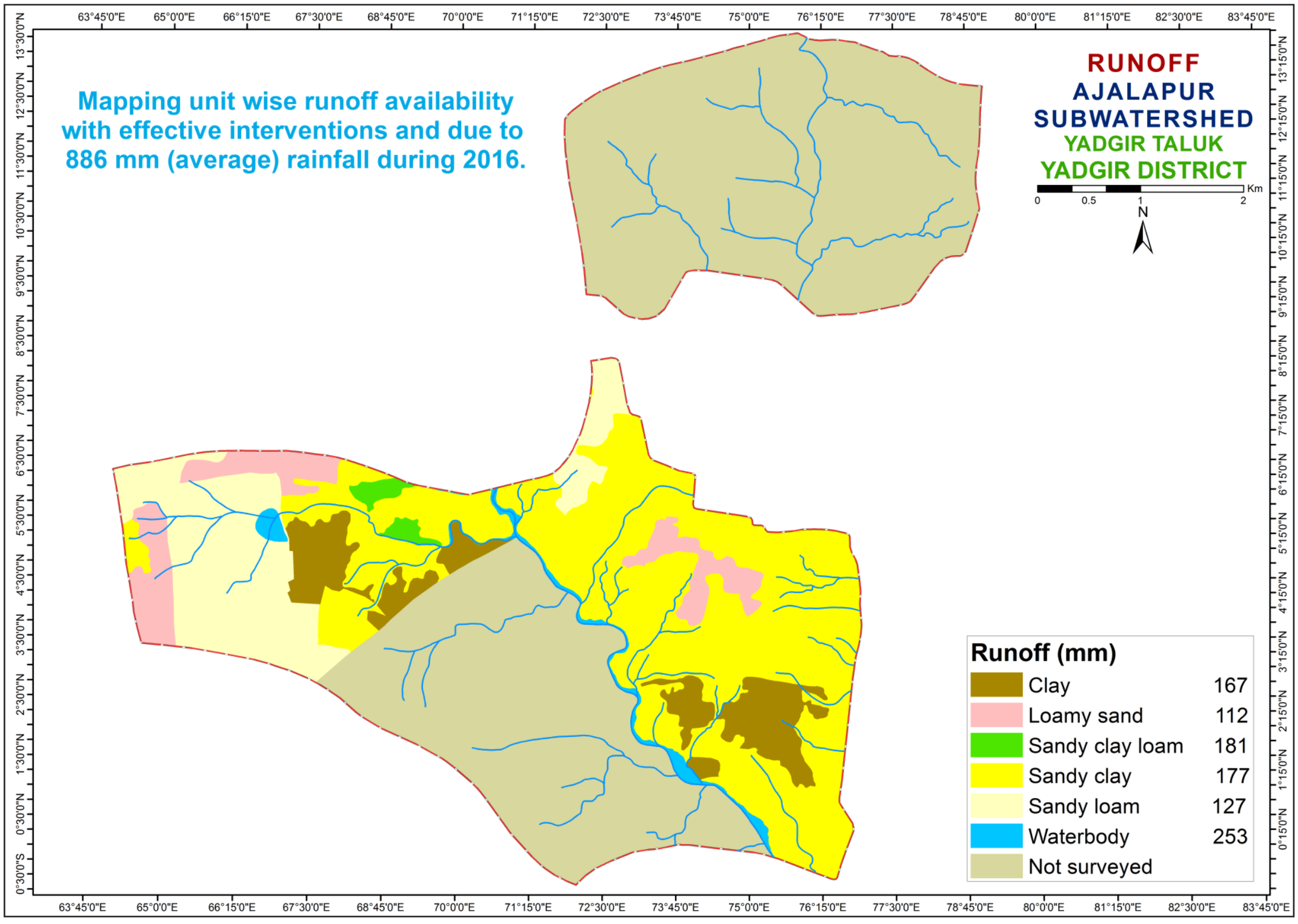


During June-October months, Precipitation is higher than Evapotranspiration, hence Runoff can occur in the watershed.

P = 776 mm (average of 2009-2017) ET = 628 mm R = 71 mm S = 189 mm Q = 129 mm

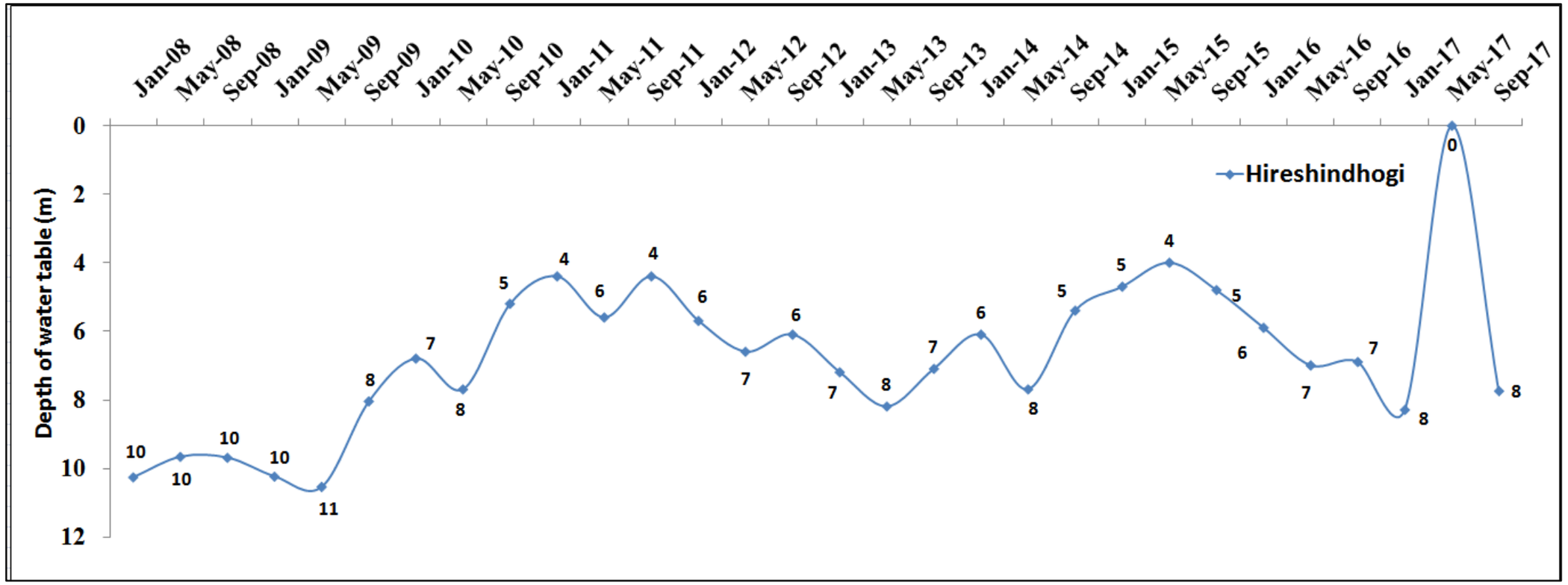
Sl. No.	Parameters	Average_ 2016 (mm)
1.	Rainfall	886
2.	Runoff availability with existing conditions	184
3.	Runoff availability with effective interventions	161
4.	Runoff allowed as environmental flow at the outlet	32
5.	Runoff excess for harvesting by construction of structures	129

RUNOFF


Mapping unit wise runoff availability with effective interventions and due to 886 mm (average) rainfall during 2016.
RUNOFF
AJALAPUR
SUBWATERSHED
YADGIR TALUK
YADGIR DISTRICT
0 0.5 1 2 Km
N
Runoff (mm)
Clay 167
Loamy sand 112
Sandy clay loam 181
Sandy clay 177
Sandy loam 127
Waterbody 253
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

HIRESHINDHOGI STATION



The groundwater level shown above is from the data obtained from Dept. of Mines & Geology for the nearest station Hireshindhogi. The graph depicts the groundwater levels during the years 2008-2016 were slightly varying, where as during the 2017 was found constant.

X

SUMMARY

- The average annual rainfall of 887 mm in the Ajalapur sub-watershed as recorded from the Sydhapur station data.

- 77%, 15% and 7% 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 sustainable condition. 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 129 mm for an average annual rainfall of 776 mm (2009-2017). The utilizable groundwater is 49.7 mm (70% of 71 mm recharge estimated). This means the total available water resource combining the soil moisture store for kharif & rabi (189 mm) and utilizable runoff plus recharge is 368 (=129+189+50)

- The average actual evapotranspiration estimated in the watershed based on the current land use and irrigation practices for the kharif and rabi seasons is 488 mm. Hence the amount of water use for kharif and rabi seasons may be estimated as 610 mm (i.e. 125% of AET). This demand for the two seasons is higher by 242 mm, i.e. (610-368). The AET in June-Sept months is only 54% of rainfall. Hence, there is a good opportunity to harvest the excess water through watershed management practices for utilizing during rabi season.

- The groundwater level data obtained from Dept. of Mines & Geology for the nearest station Hireshindhogi. The graph depicts the groundwater levels during the years 2008-2016 were slightly varying, where as during the 2017 was found constant.