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LAND RESOURCE INVENTORY AND SOCIO-ECONOMIC STATUS OF FARM HOUSEHOLDS FOR WATERSHED PLANNING AND DEVELOPMENT

MUNDRAGI -1 (4D5B1H2e) MICROWATERSHED

Yadgir & Hattakuni Hobli, Yadgir Taluk and District, Karnataka

Karnataka Watershed Development Project – II

SUJALA – III

World Bank funded Project

The World Bank

ICAR – NATIONAL BUREAU OF SOIL SURVEY AND LAND USE PLANNING

ICAR - NBSS & LUP

WATERSHED DEVELOPMENT DEPARTMENT
GOVT. OF KARNATAKA, BANGALORE

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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.

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PREFACE

In Karnataka, as in other Indian States, the livelihoods of rural people are intertwined with farming pursuits. The challenges in agriculture are seriously threatening the livelihood of a large number of farmers as they have been practicing farming in contextual factors beyond their control. Climatic factors are the most important ones and have become much more significant in recent times due to rapid climate changes induced by intensive anthropogenic activities affecting our ecosystem in multiple ways. Climate change has become the reality, it is happening and efforts to evolve and demonstrate climate resilient technologies have become essential. Due to the already over stressed scenario of agrarian sector, the climate change is resulting in manifold increase in the complexities, pushing the rural mass to face more and more unpredictable situations. The rising temperatures and unpredictable rainfall patterns are going to test seriously the informed decisions farmers have to make in order to survive in farming and sustain their livelihood.

It is generally recognized that impacts of climate change shall not be uniform across the globe. It is said that impact of climate change is more severe in South Asia. Based on the analysis of meteorological data, it is predicted that in India, there will be upward trend in mean temperature, downward trend in relative humidity, annual rainfall and number of wet days in a year. Also, in general, phenomena like erratic monsoon, spread of tropical diseases, rise in sea levels, changes in availability of fresh water, frequent floods, droughts, heat waves, storms and hurricanes are predicted. Each one of these adverse situations are already being experienced in various parts of India and also at the global level. Decline in agricultural productivity of small and marginal farmers becoming more vulnerable is already witnessed.

In Karnataka, more than 60 per cent of the population live in rural areas and depend on agriculture and allied activities for their livelihood. Though the state has achieved significant progress in increasing the yield of many crops, there is tremendous pressure on the land resources due to the growing and competing demands of various land uses. This is reflected in the alarming rate of land degradation observed. Already more than 50 per cent of the area is affected by various forms of degradation. If this trend continues, the sustainability of the fragile ecosystem will be badly affected. The adverse effects of change in the climatic factors are putting additional stress on the land resources and the farmers dependent on this.

The natural resources (land, water and vegetation) of the state need adequate and constant care and management, backed by site-specific technological interventions and investments particularly by the government. Detailed database pertaining to the nature of the land resources, their constraints, inherent potentials and suitability for various land based rural enterprises, crops and other uses is a prerequisite for preparing location-specific action plans, which are in tune with the inherent capability of the resources. Any

effort to evolve climate resilient technologies has to be based on the baseline scientific database. Then only one can expect effective implementation of climate resilient technologies, monitor the progress, make essential review of the strategy, and finally evaluate the effectiveness of the implemented programs. The information available at present on the land resources of the state are of general nature and useful only for general purpose planning. Since the need of the hour is to have site-specific information suitable for farm level planning and detailed characterization and delineation of the existing land resources of an area into similar management units is the only option.

ICAR-NBSS&LUP, Regional Centre, Bangalore has taken up a project sponsored by the Karnataka Watershed Development Project-II, (Sujala-III), Government of Karnataka funded by the World Bank under Component-1 Land Resource Inventry. This study was taken up to demonstrate the utility of such a database in reviewing, monitoring and evaluating all the land based watershed development programs on a scientific footing. To meet the requirements of various land use planners at grassroots level, the present study on "Land Resource Inventory and Socio-Economic Status of Farm Households for Watershed Planning and Development of Mundragi-1 Microwatershed, Yadgir Taluk and District, Karnataka" for integrated development was taken up in collaboration with the State Agricutural Universities, IISC, KSRSAC, KSNDMC as Consortia partners. The project provides detailed land resource information at cadastral level (1:7920 scale) for all the plots and socio-economic status of farm households covering thirty per cent farmers randomely selected representing landed and landless class of farmers in the micro-watershed. The project report with the accompanying maps for the Microwatershed will provide required detailed database for evolving effective land use plan, alternative land use options and conservation plans for the planners, administrators, agricutural extention personnel, KVK officials, developmental departments and other land users to manage the land resources in a sustainable manner.

It is hoped that this database will be useful to the planners, administrators and developmental agencies working in the area in not only for formulating location specific developmental schemes but also for their effective monitoring at the village/watershed level.

Nagpur
Date: 24-07-2019

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PART-A

LAND RESOURCE INVENTORY

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EXECUTIVE SUMMARY

The land resource inventory of Mundragi-1 Microwatershed was conducted using village cadastral maps and IRS satellite imagery on 1:7920 scale. The false colour composites of IRS imagery were interpreted for physiography and the physiographic delineations were used as base for mapping soils. The soils were studied in several transects and a soil map was prepared with phases of soil series as mapping units. Random checks were made all over the area outside the transects to confirm and validate the soil map unit boundaries. The soil map shows the geographic distribution and extent, characteristics, classification, behavior and use potentials of the soils in the microwatershed.

The present study covers an area of 452 ha in Yadgir taluk & district, Karnataka. The climate is semiarid and categorized as drought-prone with an average annual rainfall of 866 mm, of which about 652 mm is received during south-west monsoon, 138 mm during north-east and the remaining 76 mm during the rest of the year. An area of 409 ha in the microwatershed is covered by soils, 19 ha by rock outcrops and about 24 ha by others (habitation and water bodies). The salient findings from the land resource inventory are summarized briefly below.

- *The soils belong to 9 soil series and 15 soil phases (management units) and 5 land management units.*
- *The length of crop growing period is about 120-150 days starting from 1st week of June to 4th week of October.*
- *From the master soil map, several interpretative and thematic maps like land capability, soil depth, surface soil texture, soil gravelliness, available water capacity, soil slope and soil erosion were generated.*
- *Soil fertility status maps for macro and micronutrients were generated based on the surface soil samples collected at every 320 m grid interval.*
- *Land suitability for growing 29 major agricultural and horticultural crops was assessed and maps showing the degree of suitability along with constraints were generated.*
- *Entire area in the microwatershed is suitable for agriculture.*
- *About88 per cent area of the microwatershed has soils that are moderately deep to very deep (75 - >150 cm) and 3 per cent soils are moderately shallow (50-75 cm).*
- *About 45 per cent area in the microwatershed has loamy soils and 46 per cent clayey soils.*
- *About 90 per cent area is non gravelly (<15%) and less than 1 per cent is gravelly (15-35%).*
- *About 76 per cent area of the microwatershed is very high (>200 mm/m) in available water capacity and 15 per cent area low (51-100 mm/m) in available water capacity.*

- *An area of about 36 per cent soils are nearly level (0-1%) and 55% area of microwatershed has very gently sloping (1-3% slope) lands.*
- *An area of about 36 per cent is slightly (e1) eroded, 55 per cent area is moderately (e2) eroded.*
- *An area of about 44 per cent soils are neutral (pH 6.5-7.3) in soil reaction and 47 per cent soils are slightly to moderately alkaline (pH 7.3-8.4).*
- *The Electrical Conductivity (EC) of the soils in the entire area of the microwatershed is dominantly <2 dsm^{-1} indicating that the soils are non-saline.*
- *About 16 per cent low (<0.5%), 55 per cent medium (0.5-0.75%) and 20 per cent high (>0.75) in organic carbon content.*
- *About 80 per cent area is medium (23-57 kg/ha) and 10 per area is high (>57 kg/ha) in available phosphorus.*
- *About an area of 41 per cent is medium (145-337 kg/ha) and 50 per cent high (>337 kg/ha) in available potassium.*
- *Available sulphur is low (<10 ppm) in an area of about 72 per cent and medium (10 -20 ppm) in 18 per cent of the microwatershed.*
- *Available boron is low (<0.5 ppm) in 76 percent and medium (0.5-0.75 ppm) in 15 per cent of the microwatershed.*
- *Available iron is sufficient (>4.5 ppm) in 77 per cent and deficient (<4.5 ppm) in 14 per cent of the microwatershed.*
- *Available manganese and copper are sufficient in all the soils of the microwatershed.*
- *Available zinc is deficient (<0.6 ppm) in entire area of the microwatershed.*
- *The land suitability for 29 major crops grown in the microwatershed were assessed and the areas that are highly suitable (S1) and moderately suitable (S2) are given below. It is however to be noted that a given soil may be suitable for various crops but what specific crop to be grown may be decided by the farmer looking to his capacity to invest on various inputs, marketing infrastructure, market price and finally the demand and supply position.*

Land suitability for various crops in the Microwatershed

Crop	Suitability Area in ha (%)			Crop	Suitability Area in ha (%)	
	Highly suitable (S1)	Moderately suitable (S2)			Highly suitable (S1)	Moderately suitable (S2)
Sorghum	*341(76)*	*50(11)*		*Guava*	-	*54(12)*
Maize	-	*391(87)*		*Sapota*	-	*54(12)*
Bajra	-	*409(91)*		*Pomegranate*	-	*395(88)*
Groundnut	-	*57(13)*		*Musambi*	*240(53)*	*156(34)*
Sunflower	*243(54)*	*135(30)*		*Lime*	*240(53)*	*156(34)*
Redgram	-	*395(88)*		*Amla*	*108(24)*	*282(62)*
Bengal gram	*341(76)*	*37(8)*		*Cashew*	-	*23(5)*
Cotton	*328(73)*	*49(11)*		*Jackfruit*	-	*36(8)*
Chilli	-	*409(91)*		*Jamun*	-	*359(80)*
Tomato	-	*289(64)*		*Custard apple*	*356(79)*	*35(8)*
Brinjal	*143(32)*	*267(59)*		*Tamarind*	-	*359(80)*
Onion	*88(20)*	*100(22)*		*Mulberry*	-	*36(8)*
Bhendi	*262(58)*	*147(32)*		*Marigold*	-	*409(91)*
Drumstick	-	*395(88)*		*Chrysanthemum*	-	*409(91)*
Mango	-	*21(5)*				

- *Apart from the individual crop suitability, a proposed crop plan has been prepared for the identified LUCs by considering only the highly and moderately suitable lands for different crops and cropping systems with food, fodder, fibre and horticulture crops.*
- *Maintaining soil-health is vital to crop production and conserve soil and land resource base for maintaining ecological balance and to mitigate climate change. For this, several ameliorative measures have been suggested to these problematic soils like saline/alkali, highly eroded, sandy soils etc.,*
- *Soil and water conservation treatment plan has been prepared that would help in identifying the sites to be treated and also the type of structures required.*
- *As part of the greening programme, several tree species have been suggested to be planted in marginal and sub marginal lands, field bunds and also in the hillocks, mounds and ridges. This would help in not only supplementing the farm income but also provide fodder and fuel and generate lot of biomass which would help in maintaining an ecological balance and also contribute to mitigating the climate change.*

Chapter 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 the land in a rational and judicious manner. But what is happening in many areas of the state is a cause for concern to everyone involved in the management of land resources at the grassroots level. The area available for agriculture is about 51 per cent of the total geographical area and more than 60 per cent of the people are still dependant 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 significant diversion of farm lands and water resources for non-agricultural purposes. Apart from this, due to lack of interest in farmers for farming, large tracts of cultivable lands are turning into fallows in many areas and this trend is continuing at an alarming rate.

Further, land degradation has emerged as a serious problem which has already affected about 38 lakh ha of cultivated area in the state. Soil erosion alone has degraded about 35 lakh ha. Almost all the uncultivated areas are facing various degrees of degradation, particularly soil erosion. Salinity and alkalinity has emerged as a major problem in more than 3.5 lakh ha in the irrigated areas of the state. Nutrient depletion and declining factor productivity is common in both rainfed and irrigated areas. The degradation is continuing at an alarming rate and there appears to be no systematic effort among the stakeholders to contain this process. In recent times, an aberration of weather due to climate change phenomenon has added another dimension leading to unpredictable situations to be tackled by the farmers.

In this critical juncture, the challenge before us is not only to increase the productivity per unit area which is steadily declining and showing a fatigue syndrome, but also to prevent or at least reduce the severity of degradation. If the situation is not reversed at the earliest, then the sustainability of the already fragile crop production system and the overall ecosystem will be badly affected in the state. The continued neglect and unscientific use of the resources for a long time has led to the situation observed at present in the state. It is a known fact and established beyond doubt by many studies in the past that the cause for all kinds of degradation is the neglect and irrational use of the land resources. Hence, there is an urgent need to generate a detailed site-specific farm level database on various land resources for all the villages/watersheds in a time bound manner that would help to protect the valuable soil and land resources and also to stabilize the farm production.

Therefore, the land resource inventory required for farm level planning is the one which investigates not only the surface but also consider the other parameters which are critical for productivity *viz.*, soils, climate, water, minerals and rocks, topography, geology, hydrology, vegetation, crops, land use pattern, animal population, socio-

economic conditions, infrastructure, marketing facilities and various schemes and developmental works of the government etc. 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.

The Land Resource Inventory is basically done for identifying the potential and problem areas, developing sustainable land use plans, estimation of surface run off and water harvesting potential, preparation of soil and water conservation plans, land degradation/desertification etc. The Bureau is presently engaged in developing an LRI methodology using high resolution satellite remote sensing data and Digital Elevation Model (DEM) data to prepare Landscape Ecological Units (LEU) map representing agro-ecosystem as a whole. The LEU is preferred over landform as the base map for LRI. LEU is the assemblage of landform, slope and land use. An attempt has already been made to upscale the soil resource information from 1:250000 and 1:50000 scale to the LEU map in Goa and other states.

The land resource inventory aims to provide site-specific database for Mundragi-1 microwatershed in Yadgir Taluk & District, Karnataka State for the Karnataka Watershed Development Department. The database was generated by using cadastral map of the village as a base along with high resolution IRS LISS IV and Cartosat-1 merged satellite imagery. Later, an attempt will be made to uplink this LRI data generated at 1:7920 scale under Sujala-III Project to the proposed Landscape Ecological Units (LEUs) map.

The study was organized and executed by the ICAR- National Bureau of Soil Survey and Land Use Planning, Regional Centre, Bangalore under Generation of Land Resource Inventory Data Base Component-1 of the Sujala-III Project funded by the World Bank.

Chapter 2

GEOGRAPHICAL SETTING

2.1 Location and Extent

The Mundragi-1 microwatershed is located in the northern part of Karnataka in Yadgir Taluk & District, Karnataka State (Fig.2.1). It comprises parts of Dastharabadha, Yadhagiri.b, Mundaragi, Bandhalli & Yadhagiri.k Villages. It lies between 16^0 45'- 16^0 48' North latitudes and 77^0 8'-77^0 10' East longitudes covering an area of about 451.54 ha. It is about 5 km northwest of Yadgir town and is surrounded by Mundaragi on the north and east, Bandhalli on the northwest, Yadhagiri.k village on the west and south side and Yadhagiri.b village on the southwesten side of the microwatershed.

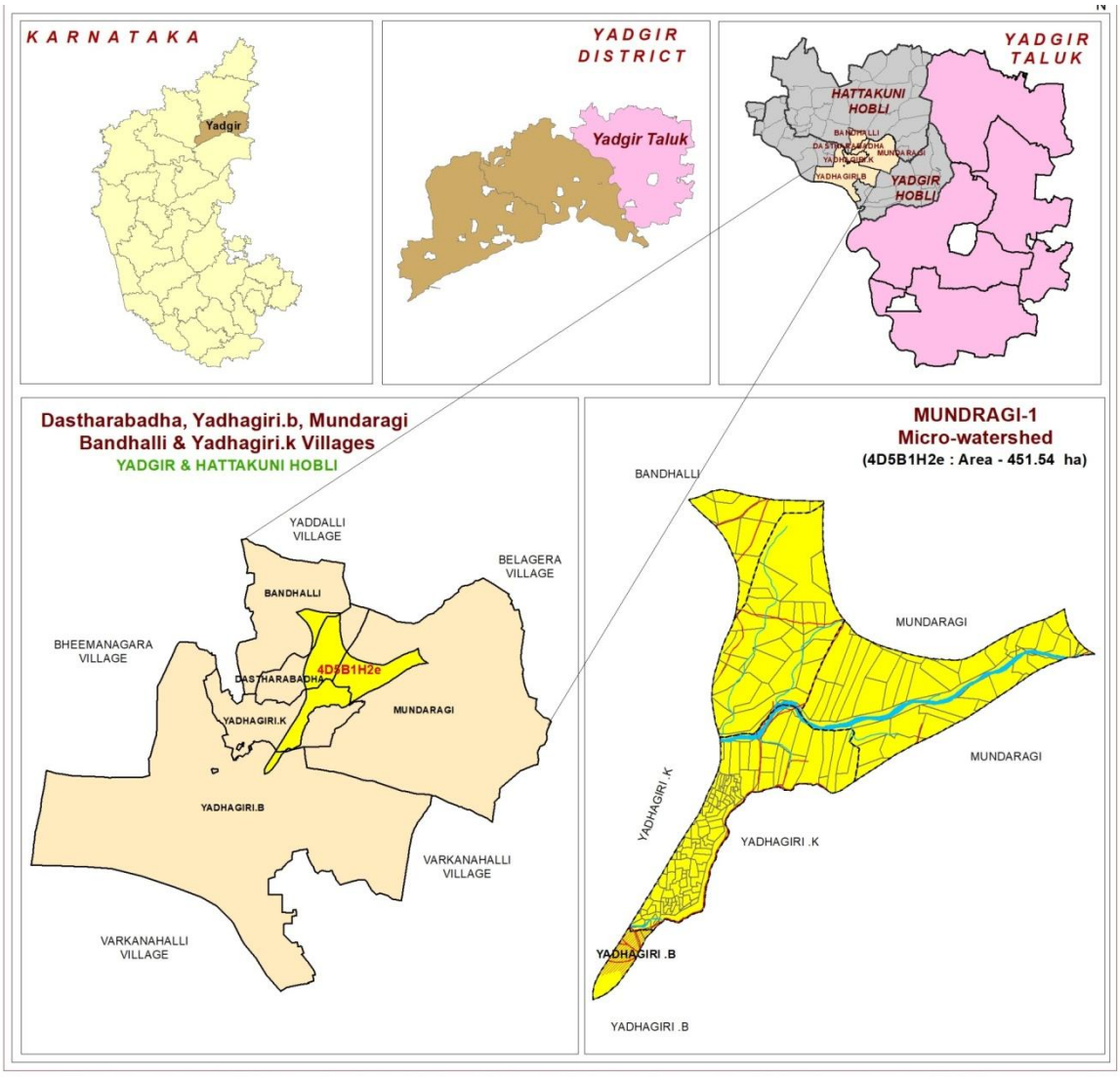


Fig.2.1 Location map of Mundragi-1 Microwatershed

2.2 Geology

Major rock formation observed in the microwatershed are granite gneiss (Fig.2.2). Granite gneisses are essentially pink to gray and are coarse to medium grained. They consist primarily of quartz, feldspar, biotite and hornblende. The gray granite gneisses are

highly weathered, fractured and fissured up to a depth of about 10 m. Dolerite dykes and quartz veins are common with variable width and found to occur in Mundragi-1 microwatershed. Underlying formation is gneiss soils occur over gneiss, limestone and shale.

Fig.2.2 Granite and granite gneiss rocks

2.3 Physiography

Physiographically, the area has been identified as granite and gneiss landscape based on geology. The area has been further subdivided into five landforms, *viz;* mounds/ridges, summits, side slopes and very gently sloping uplands, plains and valleys based on slope and its relief features. The elevation ranges from 378-406 m above MSL. The mounds and ridges are mostly covered by rock outcrops.

2.4 Drainage

The area is drained by several parallel streams like Bori, Amerja and Kanga which finally join the river Bhima along its course. Though, they are not perennial, during rainy season they carry large quantities of rain water. The microwatershed has only few small tanks which are not capable of storing the water that flows during the rainy season. Due to this, the ground water recharge is very much affected. This is reflected in the failure of many bore wells in the villages. If the available rain water is properly harnessed by constructing new tanks and recharge structures at appropriate places in the villages, then the drinking and irrigation needs of the area can be easily met. The drainage network is parallel to sub parallel and dendritic.

2.5 Climate

The Yadgir district lies in the northern plains of Karnataka and falls under semiarid tract of the state and is categorized as drought- prone with total annual rainfall of 866 mm (Table 2.1). Of the total rainfall, maximum of 652 mm is received during the south–west monsoon period from June to September, the north-east monsoon from

October to early December contributes about 138 mm and the remaining 76 mm during the rest of the year. The summer season starts during the middle of February and continues up to the first week of June. The period from December to the middle of February is the coldest season. December is the coldest month with mean daily maximum and minimum temperatures being 29.5^{0}C and 10^{0}C respectively. During peak summer, temperature shoots up to 45^{0}C. Relative humidity varies from 26% in summer to 62% in winter. Rainfall distribution is shown in Figure 2.3. The average Potential Evapo-Transpiration (PET) is 141 mm and varies from a low of 81 mm in December to 199 mm in the month of May. The PET is always higher than precipitation in all the months except end of June to end of September. Generally, the Length of crop Growing Period (LGP) is 120-150 days and starts from 1st week of June to 4th week of October.

Table 2.1 Mean Monthly Rainfall, PET, 1/2 PET at Yadgir Taluk, Yadgir District

Sl. No.	Months	Rainfall	PET	1/2 PET
1	January	4.30	86.0	43.0
2	February	2.30	125.5	62.7
3	March	15.10	166.0	83.0
4	April	18.50	179.8	89.9
5	May	36.0	198.8	97.9
6	June	118.0	175.1	87.5
7	July	171.80	156.3	78.1
8	August	182.9	150.3	75.1
9	September	179.7	142.0	71.0
10	October	105.3	138.5	69.2
11	November	26.4	97.60	48.6
12	December	6.0	80.90	40.4
Total		**866.3**		

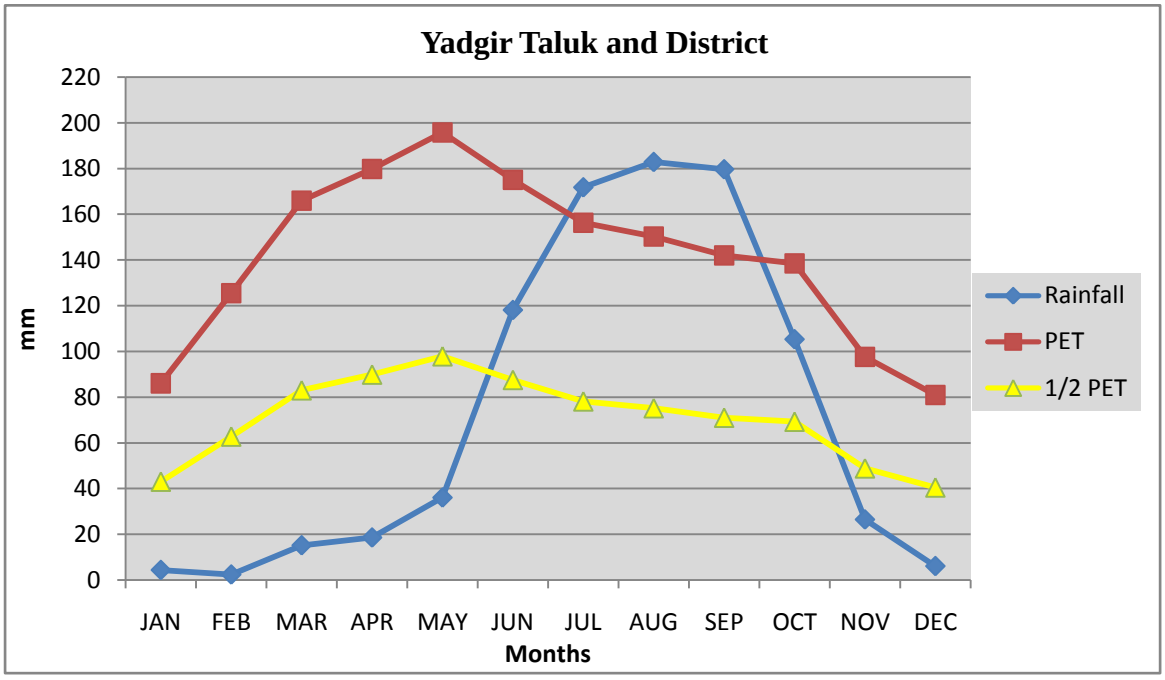


Fig 2.3 Rainfall distribution in Yadgir Taluk, Yadgir District

2.6 Natural Vegetation

The natural vegetation is sparse comprising few tree species, shrubs and herbs. The mounds, ridges and boulders occupy very sizeable area which is under thin to moderately thick forest vegetation. Still, there are some remnants of the past forest cover which can be seen in patches in some ridges and hillocks in the microwatershed (Fig 2.4).

Apart from the continuing deforestation, the presence of large population of goats, sheep and other cattle in the microwatershed is causing vegetative degradation of whatever little vegetation left in the area. The uncontrolled grazing has left no time for the regeneration of the vegetative cover. This leads to the accelerated rate of erosion on the hill slopes resulting in the formation of deep gullies in the foot slopes that eventually result in the heavy siltation of tanks and reservoirs in the microwatershed.

Fig 2.4 Natural vegetation of Mundragi-1 Microwatershed

2.7 Land Utilization

About 72 per cent area (Table 2.2) in Yadgir district is cultivated at present. An area of about 2 per cent is permanently under pasture, 20 per cent under current fallows and 6 per cent under non-agricultural land and 5 per cent under currently barren. Forests occupy an area of about 7 per cent and the tree cover is in a very poor state. Most of the mounds, ridges and bouldery areas have very poor vegetative cover. Major crops grown in the area are paddy, cotton, groundnut and red gram. While carrying out land resource inventory, the land use/land cover particulars are collected from all the survey numbers and a current land use map of the microwatershed is prepared. The current land use map prepared shows the arable and non-arable lands, other land uses and different types of crops grown in the area. The current land use map of Mundragi-1 microwatershed is presented in Fig.2.5. The different crops and cropping systems adopted in the

microwatershed is presented in the Figures 2.6. Map showing the location of wells in the Mundragi-1 microwatershed is given in fig 2.7.

Table 2.2 Land Utilization in Yadgir District

Sl. No.	Agricultural land use	Area (ha)	Per cent
1	Total geographical area	516088	-
2	Total cultivated area	373617	72.4
3	Area sown more than once	74081	14.3
4	Cropping intensity	-	119.8
5	Trees and grooves	737	0.14
6	Forest	33773	6.54
7	Cultivable wasteland	2385	0.46
8	Permanent Pasture land	11755	2.28
9	Barren land	27954	5.41
10	Non- Agriculture land	29623	5.73
11	Current Fallows	105212	20.4

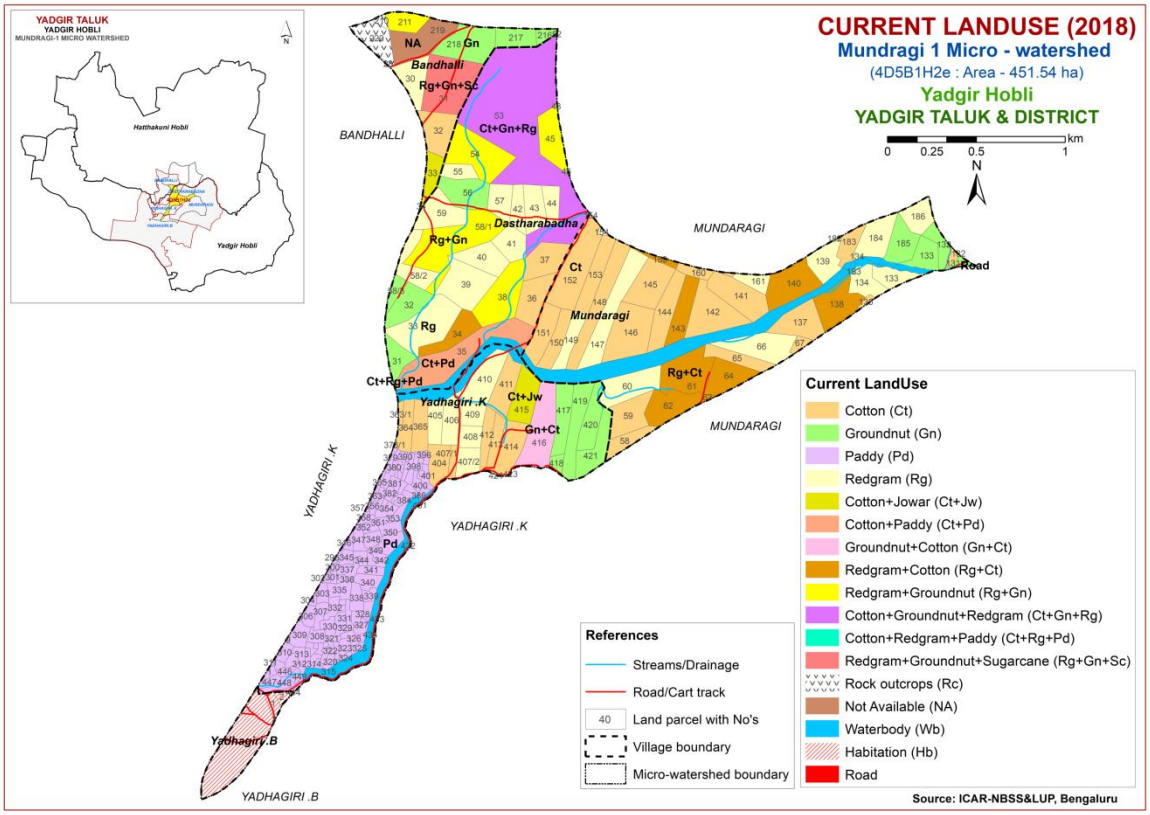


Fig.2.5 Current Land Use map of Mundragi-1 Microwatershed

Fig. 2.6 b. Different Crops and Cropping Systems in Mundragi-1 Microwatershed

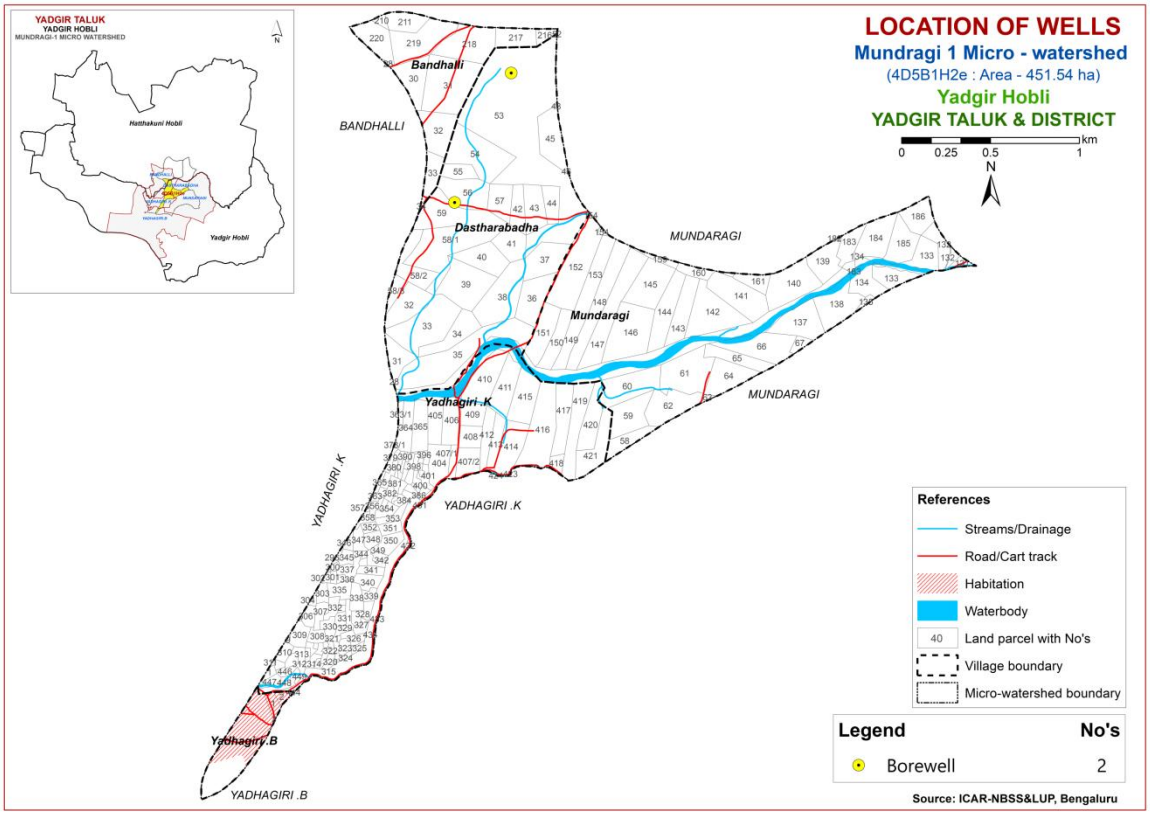


Fig 2.7 Location of wells - Mundragi-1 Microwatershed

Chapter 3

SURVEY METHODOLOGY

The purpose of land resource inventory is to delineate similar areas (soil series and phases), which respond or expected to respond similarly to a given level of management. This was achieved in Mundragi-1 microwatershed by the detailed study of all the soil characteristics (depth, texture, colour, structure, consistence, coarse fragments, porosity, soil reaction, soil horizons etc.) and site characteristics (slope of the land, erosion, drainage, occurrence of rock fragments etc.) followed by grouping of similar areas based on soil-site characteristics into homogeneous (management units) units, and showing the area extent and their geographic distribution on the microwatershed cadastral map. The detailed survey at 1:7920 scale was carried out in an area of 452 ha. The methodology followed for carrying out land resource inventory was as per the guidelines given in Soil Survey Manual (IARI, 1971; Soil Survey Staff, 2006; Natarajan *et al.*, 2015) which is briefly described below.

3.1 Base Maps

The detailed survey of the land resources occurring in the microwatershed was carried out by using digitized cadastral map and IRS satellite imagery as base supplied by KSRSAC. The cadastral map shows field boundaries with their survey numbers, location of tanks, streams and other permanent features of the area (Fig. 3.1). Apart from the cadastral map, remote sensing data products from Cartosat-1 and LISS IV merged at the scale of 1:7920 were used in conjunction with the cadastral map to identify the landscapes, landforms and other surface features. The imagery helped in the identification and delineation of boundaries between hills, uplands and lowlands, water bodies, forest and vegetated areas, roads, habitations and other cultural features of the area (Fig. 3.2). The cadastral map was overlaid on the satellite imagery (Fig. 3.3) that helps to identify the parcel boundaries and other permanent features. Apart from cadastral maps and images, toposheets of the area (1:50,000 scale) were also used for initial traversing, identification of geology and landforms, drainage features, present land use and also for selection of transects in the microwatershed.

3.2 Image Interpretation for Physiography

False Colour Composites (FCCs) of Cartosat-I and LISS-IV merged satellite data covering microwatershed area was visually interpreted using image interpretation elements and all the available collateral data with local knowledge. The delineated physiographic boundaries were transferred on to a cadastral map overlaid on satellite imagery. Physiographically, the area has been identified as granite and granite gneiss landscape. It was divided into five landforms, *viz;* ridges and mounds, gently and very gently sloping uplands and lowlands based on slope and image characteristics. They were

further subdivided into physiographic/image interpretation units based on image characteristics. The image interpretation legend for physiography is given below.

Image Interpretation Legend for Physiography

G- Granite Gneiss Landscape

G1			Hills/ Ridges/ Mounds
	G11		Summits
	G12		Side slopes
		G121	Side slopes with dark grey tones
G2			Uplands
	G21		Summits
	G22		Gently sloping uplands
		G221	Gently sloping uplands, yellowish green (eroded)
		G222	Gently sloping uplands, yellowish white (severely eroded)
	G23		Very gently sloping uplands
		G231	Very gently sloping uplands, yellowish green
		G232	Very gently sloping uplands, medium green and pink
		G233	Very gently sloping uplands, pink and green (scrub land)
		G234	Very gently sloping uplands, medium greenish grey
		G235	Very gently sloping uplands, yellowish white (eroded)
		G236	Very gently sloping uplands, dark green
		G237	Very gently sloping uplands, medium pink (coconut garden)
		G238	Very gently sloping uplands, pink and bluish white (eroded)
	G24		Valleys/ lowlands
		G241	Valleys, pink tones
		G242	Valleys gray mixed with pink tones

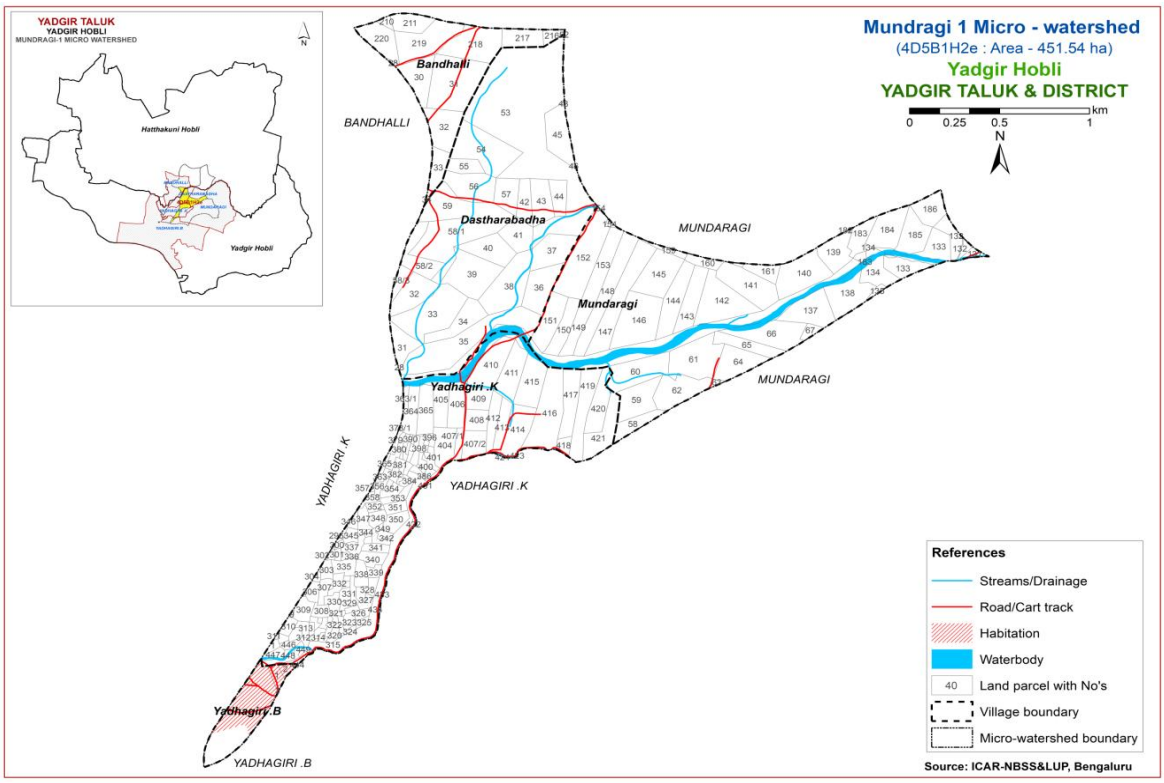


Fig 3.1 Scanned and Digitized Cadastral map of Mundragi-1 Microwatershed

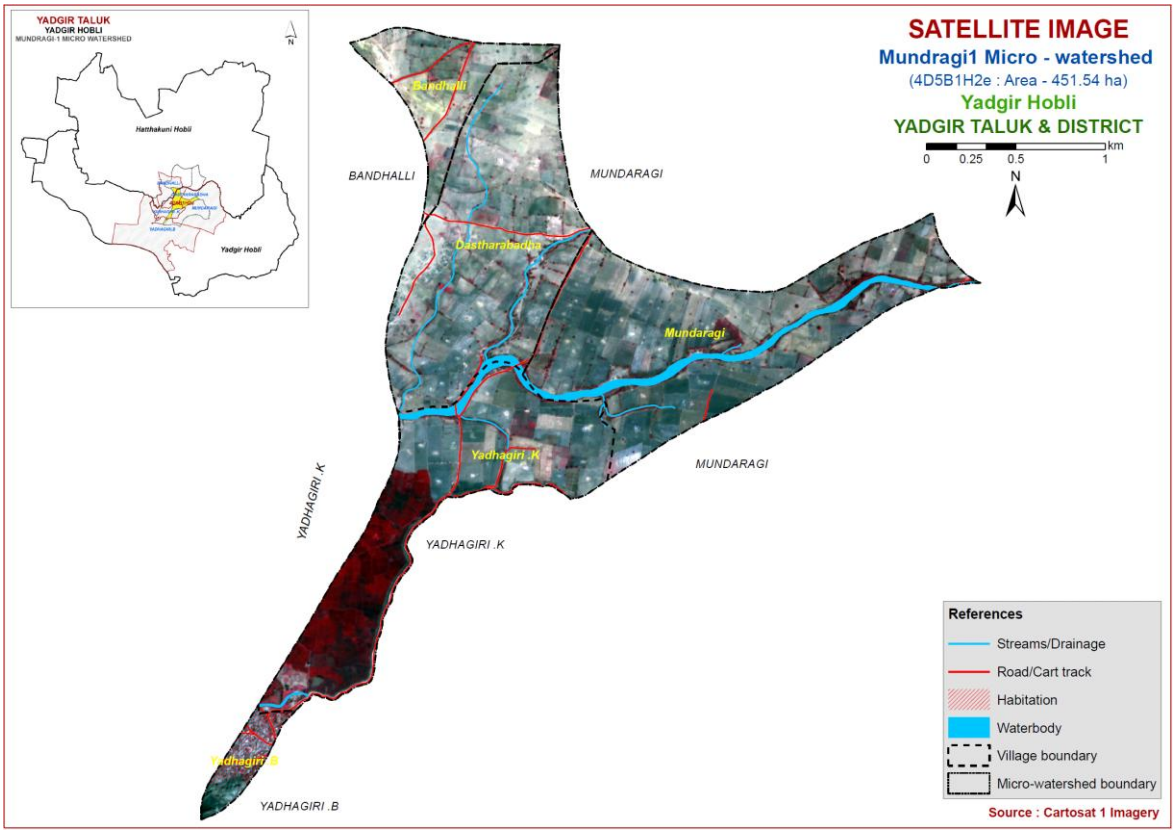


Fig.3.2 Satellite Image of Mundragi-1 Microwatershed

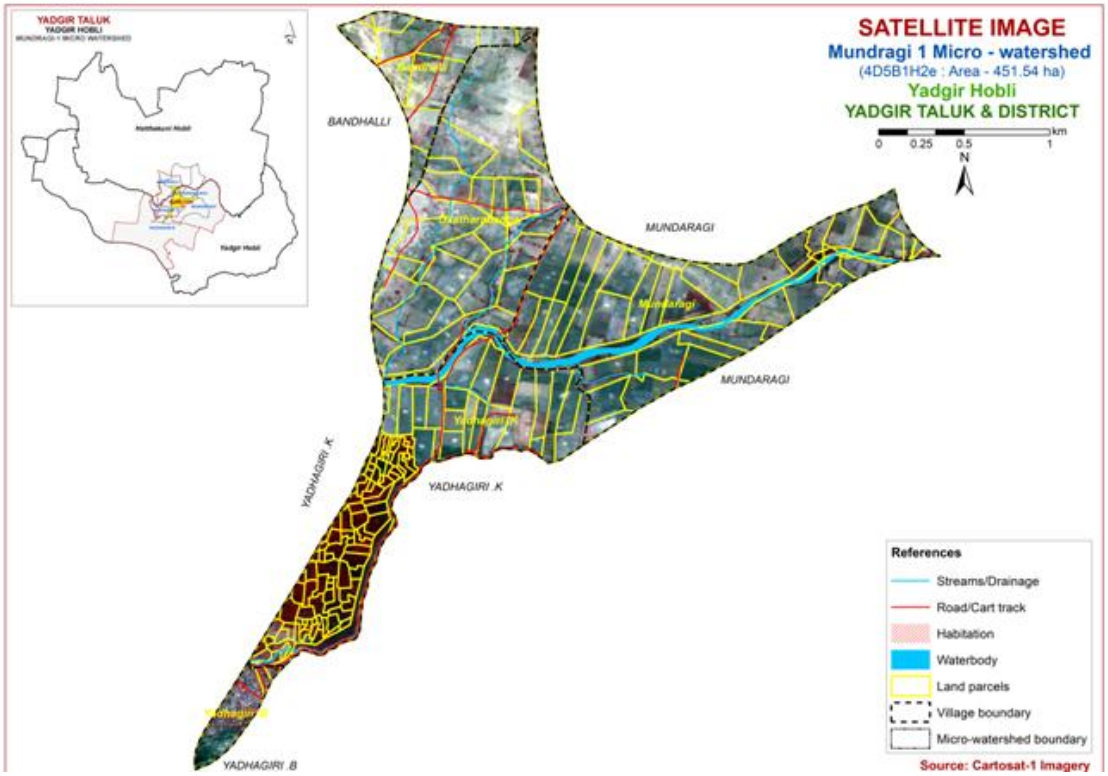


Fig.3.3 Cadastral map overlaid on IRS PAN+LISS IV merged imagery of Mundragi-1 Microwatershed

3.3 Field Investigation

The field boundaries and survey numbers given on the cadastral sheet were located on the ground by following permanent features like roads, cart tracks, *nallas*, streams, tanks etc., and wherever changes were noticed, they were incorporated on the microwatershed cadastral map. Preliminary traverse of the microwatershed was carried out with the help of cadastral map, imagery and toposheets. While traversing, landforms and physiographic units identified were checked and preliminary soil legend was prepared by studying soils at few selected places. Then, intensive traversing of each physiographic unit like hills, ridges, uplands and valleys was carried out. Based on the variability observed on the surface, transects (Fig. 3.4) were selected across the slope covering all the landform units in the microwatershed (Natarajan and Dipak Sarkar, 2010).

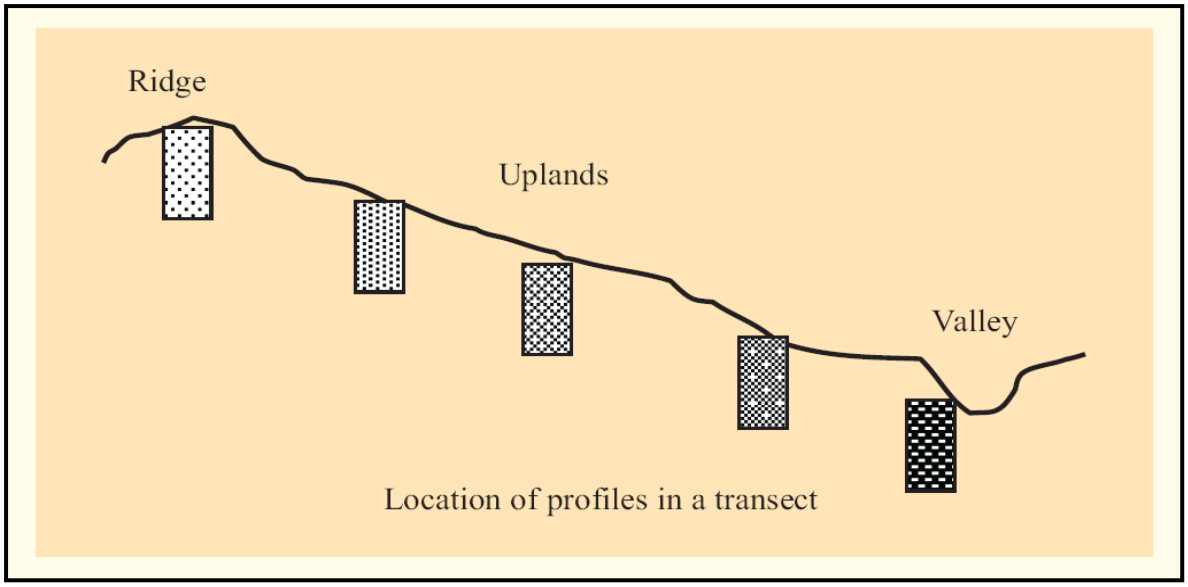


Fig: 3.4. Location of profiles in a transect

In the selected transect, soil profiles were located (Fig. 3.4) at closely spaced intervals to take care of any change in the land features like break in slope, erosion, gravel, stones etc. In the selected sites, profiles (vertical cut showing the soil layers from surface to the rock) were opened up to 200 cm or to the depth limited by rock or hard substratum and studied in detail for all their morphological and physical characteristics. The soil and site characteristics were recorded for all profile sites on a standard proforma as per the guidelines given in USDA Soil Survey Manual (Soil Survey Staff, 2012). Apart from the transect study, profiles were also studied at random, almost like in a grid pattern, outside the transect areas.

Based on the soil characteristics, the soils were grouped into different soil series. Soil series is the most homogeneous unit having similar horizons and properties and behaves similarly for a given level of management. Soil depth, texture, colour, kind of horizon and horizon sequence, calcareousness, amount and nature of gravel present, nature of substratum etc, were used as the major differentiating characteristics for identifying soil series occurring in the area. The differentiating characteristics used for identifying the soil series are given in Table 3.1. Based on the above characteristics, 09 soil series were identified in the Mundragi-1 microwatershed.

Table 3.1 Differentiating Characteristics used for identifying Soil Series

(Characteristics are of Series Control Section)

Soils of Granite gneiss Landscape							
Sl. no	**Soil Series**	**Depth (cm)**	**Colour (moist)**	**Texture**	**Gravel (%)**	**Horizon sequence**	**Calcareous-ness**
1	HLG (Halagera)	50-75	10YR 3/2,4/4 7.5YR4/3,4/2	scl	-	Ap-Bw	es
2	JNK (Jinkera)	50-75	10YR5/3,3/2 7.5YR3/4	scl	-	Ap-Bw	e

3	HSL (Hosalli)	75-100	10YR 5/4,4/4,4/6	sc	-	Ap-Bw	e
4	BLC (Balichakra)	75-100	2.5YR5/3,2.5/4 5YR4/3,3/3	scl	-	Ap-Bt	-
5	YDR (Yadgir)	100-150	10YR4/3,4/4 2.5Y4/3,5/3	ls-sl	-	Ap-Ac	-
6	MDR (Madhwara)	>150	10YR 3/1,3/2,2/1,2/2	scl	-	Ap-Bw	e
7	BMN (Bhimanahalli)	>150	10YR 3/1	c	-	Ap-Bss	es
8	MDG (Mundargi)	100-150	10YR 4/4,3/3 7.5YR4/4	scl	-	Ap-Bw	-
9	TMK (Thumakur)	>150	10YR 3/1,3/2,3/3,4/3	c	-	Ap-Bw	e

3.4 Soil Mapping

The area under each soil series was further separated into soil phases and their boundaries delineated on the cadastral map based on the variations observed in the texture of the surface soil, slope, erosion, presence of gravel, stoniness etc. A soil phase is a subdivision of soil series based mostly on surface features that affect its use and management. The soil mapping units are shown on the map (Fig.3.5) in the form of symbols. During the survey many profile pits, few minipits and a few auger bores representing different landforms occurring in the microwatershed were studied. In addition to the profile study, spot observations in the form of minipits, road cuts, terrace cuts etc., were studied to validate the soil boundaries on the soil map.

The soil map shows the geographic distribution of 15 mapping units representing 9 soil series occurring in the microwatershed. The soil map unit (soil legend) description is presented in Table 3.2. The soil phase map (management units) shows the distribution of 15 soil phases mapped in the microwatershed. Each mapping unit (soil phase) delineated on the map has similar soil and site characteristics. In other words, all the farms or survey numbers included in one phase will have similar management needs and have to be treated accordingly.

3.5 Land Management Units

The 15 soil phases identified and mapped in the microwatershed were grouped into 5 Land Management Units (LMU's) for the purpose of preparing a Proposed Crop Plan for sustained development of the microwatershed. The database (soil phases) generated under LRI was utilized for identifying Land Management Units (LMU's) based on the management needs. One or more than one soil site characteristic having influence on the management have been chosen for identification and delineation of LMUs. For Mundragi-1 microwatershed, five soil and site characteristics, namely soil depth, soil texture, slope, erosion and gravel content have been considered for defining LMUs. The

Land Management Units are expected to behave similarly for a given level of management.

3.6 Laboratory Characterization

Soil samples were collected from representative master profiles for laboratory characterization by following the methods outlined in the Laboratory Manual (Sarma *et al*, 1987). Surface soil samples collected from farmer's fields (44 samples) for fertility status (major and micronutrients) at 320 m grid interval in the year 2018 were analyzed in the laboratory (Katyal and Rattan, 2003). By linking the soil fertility data to the survey numbers through GIS, soil fertility maps were generated by using Kriging method for the microwatershed.

Table 3.2 Soil map unit description of Mundragi-1 Microwatershed

*Soil map unit No.	Soil Series	Soil Phase	Mapping Unit Description	Area in ha (%)
Soils of Granite and Granite Gneiss Landscape				
	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		**2.32(0.6)**
17		HLGiB2	Sandy clay surface, slope 1-3, moderate erosion	2 (0.53)
18		HLGiB2g1	Sandy clay surface, slope 1-3, moderate erosion, gravelly (15-35%)	0.32 (0.07)
	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		**11(2.48)**
22		JNKiB2	Sandy clay surface, slope 1-3, moderate erosion	10 (2.24)
23		JNKiB2g1	Sandy clay surface, slope 1-3, moderate erosion, gravelly (15-35%)	1 (0.24)
	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		**13 (2.86)**
33		HSLiB2	Sandy clay surface, slope 1-3, moderate erosion	13 (2.86)
	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		**23 (5.01)**
38		BLCiB2	Sandy clay surface, slope 1-3, moderate erosion	23 (5.01)

	YDR	Yadgir soils are deep (100-150 cm), well drained, have brown to dark yellowish brown and olive brown, sandy loam soils occurring on very gently sloping uplands under cultivation		**18 (4.09)**
42		YDRcB2	Sandy loam surface, slope 1-3%, moderate erosion	18 (4.09)
	MDR	Madhwara soils are very deep (>150 cm), moderately well drained, have very dark gray to very dark brown, slightly calcareous, sandy clay loam soils occurring on nearly level to very gently sloping uplands under cultivation		**120.1(26.53)**
59		MDRcB2	Sandy loam surface, slope 1-3%, moderate erosion	77 (17.12)
60		MDRiA1	Sandy clay surface, slope 0-1%, slight erosion	30 (6.55)
61		MDRmB2	Clay surface, slope 1-3%, moderate erosion	0.1 (0.02)
133		MDRiB2	Sandy clay surface, slope 1-3, moderate erosion	13 (2.84)
	BMN	Bhimanahalli soils are very deep (>150 cm), moderately well drained, have very dark gray, calcareous, cracking clay black soils occurring on very gently sloping uplands under cultivation		**114(25.33)**
62		BMNmB2	Clay surface, slope 1-3%, moderate erosion	67 (14.85)
159		BMNmA1	Clay surface, slope 0-1%, slight erosion	47 (10.48)
	MDG	Mundargi soils are deep (100-150 cm), moderately well drained, have brown to dark yellowish brown, sandy clay loam soils occurring on very gently sloping uplands under cultivation		**21 (4.7)**
148		MDGhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	21 (4.7)
	TMK	Thumakur soils are very deep (>150 cm), moderately well drained, have brown to very dark grayish brown, slightly calcareous, sodic, clay black soils occurring on nearly level to very gently sloping lowlands under cultivation		**86 (19.02)**
103		TMKhA1	Sandy clay loam surface, slope 0-1%, slight erosion	86 (19.02)
999	Rock outcrops	Rock lands, both massive and boulder with little or no soil		**19 (4.11)**
1000		Habitation and Water body		**24 (5.28)**

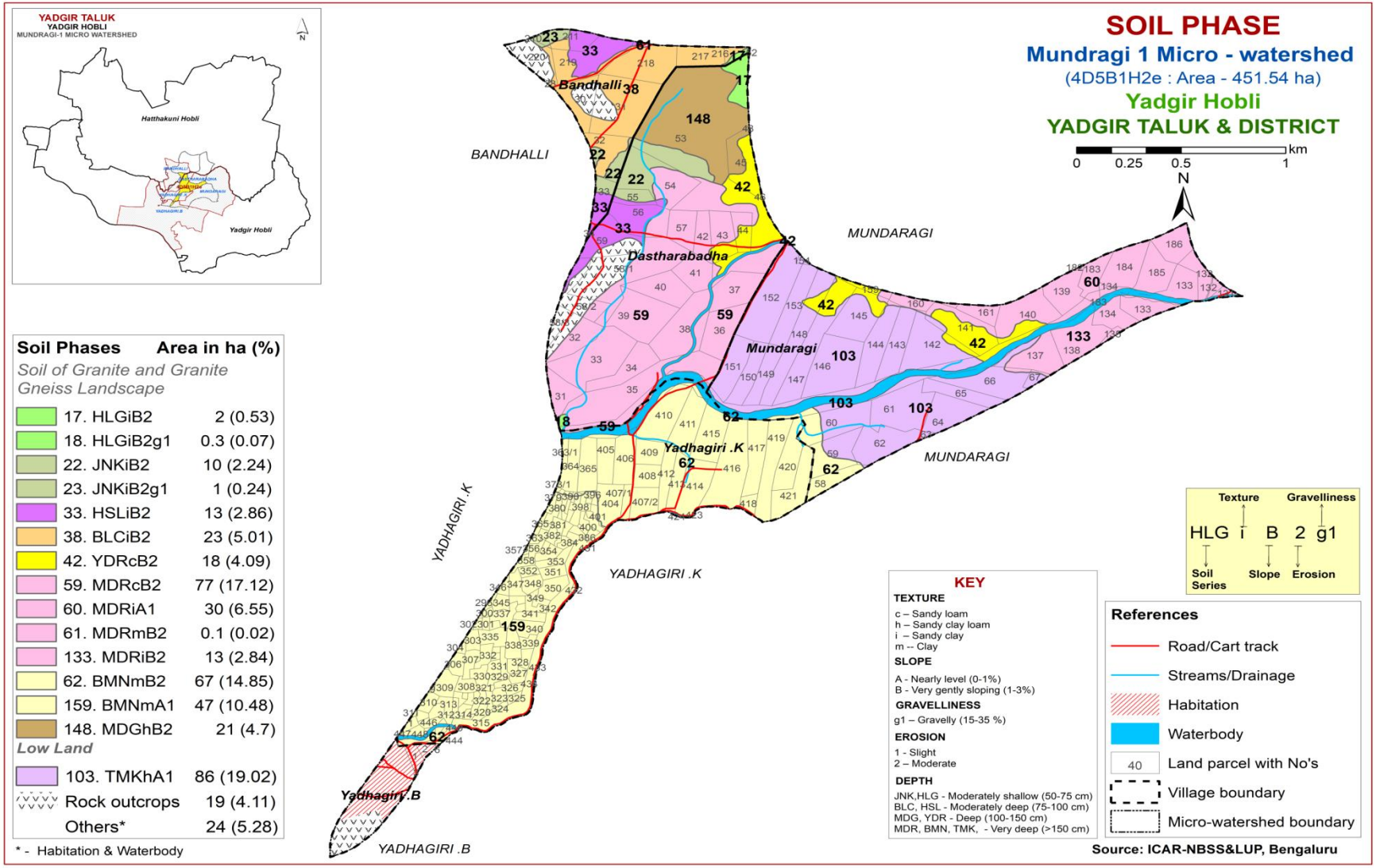


Fig 3.5 Soil Phase or Management Units - Mundragi-1 Microwatershed

Chapter 4

THE SOILS

Detailed information pertaining to the nature, extent and their distribution of different kinds of soils occurring in Mundragi-1 microwatershed is provided in this chapter. The microwatershed area has been identified as granite and gneiss landscape based on geology. In all, 9 soil series are identified. Soil formation is the result of the combined effect of environmental and terrain factors that are reflected in soil morphology. In the granite gneiss landscape, it is by parent material, relief and climate.

A brief description of each of the 9 soil series identified followed by 15 soil phases (management units) mapped under each series are furnished below. The physical and chemical characteristics of soil series identified in Mundragi-1 microwatershed are given in Table 4.1 along with soil classification. The soils in any one map unit differ from place to place in their depth, texture, slope, gravelliness, erosion or any other site characteristic that affect management. The soil phase map can be used for identifying the suitability of areas for growing specific crops or for other alternative uses and also for deciding the type of conservation structures needed. The detailed information on soil and site-characteristics like soil depth, surface soil texture, slope, erosion, gravelliness, AWC, LCC etc, with respect to each of the soil phase identified is given village/survey number wise for the microwatershed in Appendix-I.

4.1 Soils of granite gneiss landscape

In this landscape, 9 soil series are identified and mapped. Of these, MDR series occupies maximum area of 120 ha (27%) followed by BMN 114 ha (25%), TMK 86 ha (19%) and BLC 23 ha (5%). The other series occupy minor area in the microwatershed. Brief description of each series identified and number of soil phases mapped is given below.

4.1.1 Halagera (HLG) Series: Halagera soils are moderately shallow (50-75 cm), well drained, have very dark grayish brown to dark yellowish brown, calcareous, sandy clay loam soils. They are developed from weathered granite gneiss and occur on very gently sloping uplands under cultivation. The Halagera series has been classified as a member of the fine-loamy, mixed (calcareous), isohyperthermic family of Typic Haplustepts.

The thickness of the solum ranges from 51 to 75 cm. The thickness of A horizon ranges from 9 to 15 cm. Its colour is in 7.5 YR and 10 YR hue with value 3 to 4 and chroma 2 to 4. The texture is loamy sand to sandy clay loam. The thickness of B horizon ranges from 44 to 66 cm. Its colour is in 10 YR and 7.5 YR hue with value 3 to 4 and chroma 2 to 3. Its texture varies from sandy clay loam to sandy clay and is calcareous. The available water capacity is low (51-100 mm/m). Two phases were identified and mapped.

Landscape and Soil Profile characteristics of Halagera (HLG) Series

4.1.2 Jinkera (JNK) Series: Jinkera soils are moderately shallow (50-75 cm), well drained, have very dark gray to very dark grayish brown and dark brown, slightly calcareous, sandy clay loam soils. They are developed from weathered granite gneiss and occur on very gently sloping uplands under cultivation. The Jinkera series has been classified as a member of the fine-loamy, mixed, isohyperthermic family of Typic Haplustepts.

The thickness of the solum ranges from 51-75 cm. Thickness of A horizon ranges from 6 to 11 cm. Its colour is in hue 10 YR and 7.5 YR with value and chroma of 3 to 4. The texture varies from sandy loam to sandy clay. The thickness of B horizon ranges from 53 to 66 cm. Its colour is in 10 YR and 7.5 YR hue with value and chroma of 2 to 4. The texture varies from sandy clay loam to sandy clay and is slightly calcareous. The available water capacity is low (51-100 mm/m). Two phases were identified and mapped.

Landscape and Soil Profile characteristics of Jinkera (JNK) Series

4.1.3 Hosalli (HSL) Series: Hosalli soils are moderately deep (75-100 cm), moderately well drained, have dark yellowish brown to yellowish brown, slightly calcareous, sandy clay soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands under cultivation. The Hosalli series has been classified as a member of the fine, mixed, isohyperthermic family of Typic Haplustepts.

The thickness of the solum ranges from 76 to 100 cm. The thickness of A horizon ranges from 6 to 15 cm. Its colour is in hue 10 YR and 7.5 YR with value 3 to 5 and chroma 2 to 4. Its texture varies from loamy sand to sandy loam and sandy clay loam. The thickness of B horizon ranges from 62 to 93 cm. Its colour is in hue 10 YR with value 3 to 4 and chroma 2 to 4. Its texture varies from sandy clay loam to sandy clay and clay and is slightly calcareous. The available water capacity is medium (101-150 mm/m). Only one phase was identified and mapped.

Landscape and Soil Profile characteristics of Hosalli (HSL) Series

4.1.4 Balichakra (BLC) Series: Balichakra soils are moderately deep (75-100 cm), well drained, dark reddish brown to reddish brown, slightly calcareous, sandy clay loam soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands under cultivation. The Balichakra series has been classified as a member of the fine-loamy, mixed, isohyperthermic family of Typic Haplustalfs.

The thickness of the solum ranges from 80 to 100 cm. The thickness of A horizon ranges from 10 to 16 cm. Its colour is in hue 5 YR with value and chroma of 3 to 4. Its texture varies from sandy clay loam and sandy clay. The thickness of B horizon ranges from 70 to 88 cm. Its colour is in hue 2.5 YR and 5 YR with value 3 to 5 and chroma 3 to 4. Its texture is sandy clay loam to sandy clay and is slightly calcareous. The available water capacity is medium (101-150 mm/m). Only one phase was identified and mapped.

Landscape and Soil Profile characteristics of Balichakra (BLC) Series

4.1.5 Yadgir (YDR) Series: Yadgir soils are deep (100-150 cm), well drained, have very dark yellowish brown to light olive brown, sodic sandy loam soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands under cultivation. The Yadgir series has been classified as a member of the coarse-loamy, isohyperthermic family of Typic Ustorthents.

The thickness of the soil ranges from 105 to 145 cm. The thickness of A horizon ranges from 6 to 10 cm. Its colour is in 10 YR hue with value 4 and chroma 3. The texture is loamy sand. The thickness of subsurface horizons ranges from 95 to 130 cm. Its colour is in 10 YR and 2.5 Y hue with value 4 to 5 and chroma 3 to 4. Texture is loamy sand to sandy loam and sandy clay loam and are sodic soils. The available water capacity is low (51-100 mm/m). Only one phase was identified and mapped.

Landscape and Soil Profile characteristics of Yadgir (YDR) Series

4.1.6 Madhwara (MDR) Series: Madhwara soils are very deep (>150 cm), well drained, have black to very dark brown and very dark gray to very dark grayish brown, slightly calcareous, sandy clay loam soils. They are developed from weathered granite gneiss and occur on nearly level to very gently sloping uplands under cultivation. The Madhwara series has been classified as a member of the fine-Loamy, mixed, isohyperthermic family of Fluventic Haplustepts.

The thickness of the solum is more than150 cm. The thickness of A horizon ranges from 10 to 16 cm. Its colour is in 10 YR hue with value 3 to 5 and chroma 2 to 3. Texture varies from sandy clay and clay. The thickness of B horizon is >150 cm. Its colour is in 10 YR hue with value 3 to 5 and chroma 1 to 3. Texture varies from sandy clay loam to sandy clay and is slightly calcareous. The available water capacity is very high (>200 mm/m). Four phases were identified and mapped.

Landscape and Soil Profile characteristics of Madhwara (MDR) Series

4.1.7 Bhimanahalli (BMN) Series: Bhimanahalli soils are very deep (>150 cm), moderately well drained, very dark gray, calcareous, cracking clay soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands under cultivation. The Bhimanahalli series has been classified as a member of the fine, smectitic (calcareous), isohyperthermic family of Typic Haplusterts.

The thickness of the solum is more than 150 cm. The thickness of A horizon ranges from 6 to 13 cm. Its colour is in 10 YR hue with value 3 to 4 and chroma 1 to 2 with clay texture. The thickness of B horizon ranges from 163 to 176 cm. Its colour is in 10 YR hue with value 2 to 4 and chroma 1. Its texture is clay and is calcareous. The available water capacity is very high (>200 mm/m). Two phases were identified and mapped.

Landscape and Soil Profile characteristics of Bhimanahalli (BMN) Series

4.1.8 Mundargi (MDG) Series: Mundargi soils are deep (100-150 cm), moderately well drained, dark brown to dark yellowish brown, sandy clay loam soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands under cultivation. The Mundargi series has been classified as a member of the fine-loamy, mixed, isohyperthermic family of Fluventic Haplustepts.

The thickness of the solum ranges from 100 to 149 cm. The thickness of A horizon ranges from 8 to 20 cm. Its colour is in 10 YR hue with value 3 and chroma 1 to 4. The texture ranges from sandy loam to sandy clay loam and sandy clay. The thickness of B horizon ranges from 105 to 140 cm. Its colour is in 10 YR hue with value 3 to 4 and chroma 2 to 4. The texture varies from sandy loam to sandy clay loam and sandy clay. The available water capacity is very high (>200 mm/m). Only one phase was identified and mapped.

Landscape and Soil Profile characteristics of Mundargi (MDG) Series

4.1.9 Thumakur (TMK) Series: Thumakur soils are very deep (>150 cm), moderately well drained, have very dark gray to dark brown, slightly calcareous, sodic clay soils. They are developed from weathered granite gneiss and occur on nearly level to very gently sloping low lands under cultivation. The Thumakur series has been classified as a member of the fine, mixed, isohyperthermic family of Typic Haplustepts.

The thickness of the solum ranges from 150-200 cm. The thickness of A horizon ranges from 7 to 14 cm. Its colour is in 10 YR hue with value 3 to 5 and chroma 1 to 3. Texture varies from sandy loam to sandy clay and clay. The thickness of B horizon is >150 cm. Its colour is in 10 YR hue with value 3 to 5 and chroma 1 to 3. Texture varies from sandy clay to clay and is slightly calcareous, sodic soils. The available water capacity is very high (>200 mm/m). Only one phase was identified and mapped.

Landscape and Soil Profile characteristics of Thumakur (TMK) Series

Table: 4.1 Physical and Chemical Characteristics of Soil Series identified in Mundragi-1 microwatershed

Soil Series: Halagera **(**HLG) **Pedon:** R-4

Location: $16^0$44'29.3"N $77^0$13'56.3"E, Halagera village, Yadgir hobli, Yadgir taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Fine-loamy, mixed (calcareous), isohyperthermic, Typic Haplustepts

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-8	Ap	81.02	8.42	10.56	10.41	24.08	18.98	19.08	8.47	<15	ls	9.10	4.79
8-22	Bw1	61.00	11.50	27.50	8.29	9.35	21.89	14.35	7.12	<15	scl	16.91	12.28
22-53	Bw2	61.41	13.80	24.79	15.98	15.67	12.62	11.78	5.36	15-35	scl	17.08	11.26

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-8	8.49	-	-	0.185	0.30	2.99	-	-	0.24	0.06	-	8.80	0.83	100	0.69
8-22	8.57	-	-	0.116	0.45	4.03	-	-	0.11	0.02	-	19.50	0.71	100	0.12
22-53	8.70	-	-	0.113	0.27	7.67	-	-	0.11	0.05	-	15.50	0.63	100	0.33

Contd...

Soil Series: Jinkera **(**JNK) **Pedon:** R-1

Location: $16^0$45'13.5"N $77^0$10'59.8"E, Varkanahalli village, Yadgir hobli, Yadgir taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Fine-loamy, mixed, isohyperthermic Typic Haplustepts

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-15	Ap	66.84	13.62	19.54	12.15	21.22	11.23	12.56	9.68	10	sl	14.42	7.70
15-38	Bw1	59.08	12.11	28.81	12.53	12.42	17.85	8.77	7.52	20	scl	18.21	12.23
38-50	Bw2	68.21	11.68	20.11	17.90	21.81	10.60	10.80	7.10	10	scl	14.54	8.96

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-15	8.42	-	-	0.148	0.70	0.65	-	-	0.15	0.03	-	14.50	0.74	100	0.18
15-38	8.38	-	-	0.226	0.31	2.21	-	-	0.09	0.23	-	21.70	0.75	100	1.05
38-50	8.40	-	-	0.195	0.25	1.17	-	-	0.07	0.19	-	15.90	0.79	100	1.23

Contd...

Soil Series: Hosalli (HSL) **Pedon:** R-3

Location: $16^0$46'60.3"N $77^0$05'47.6"E, Mudhanala village, Yadgir hobli, Yadgir taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Fine, mixed, isohyperthermic Typic Haplustepts

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-10	Ap	88.43	5.15	6.42	5.69	6.40	36.04	27.31	12.99	-	s	7.40	2.74
10-30	Bw1	58.47	7.24	34.29	4.26	9.37	19.91	19.28	5.64	-	scl	19.07	11.57
30-50	Bw2	51.43	12.67	35.90	3.49	8.89	16.72	15.87	6.46	<15	sc	21.64	12.44
50-90	Bw3	49.89	13.64	36.47	2.43	2.96	20.61	16.17	7.72	<15	sc	21.12	12.95

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-10	7.16	-	-	0.117	0.48	0.00	2.83	1.50	0.15	0.29	4.76	4.90	0.76	97	5.94
10-30	6.91	-	-	0.040	0.36	0.00	10.64	5.43	0.10	0.26	16.43	17.80	0.52	92	1.47
30-50	8.17	-	-	0.182	0.24	1.43	-	-	0.12	0.22	-	19.90	0.55	100	1.08
50-90	8.60	-	-	0.148	0.20	4.29	-	-	0.13	0.16	-	19.70	0.54	100	0.81

Contd...

Soil Series: Balichakra (BLC) **Pedon:** T1/P2

Location: $16^0$33'25.0"N $77^0$20'52.3"E, Sowrashtralli village, Sydhapura hobli, Yadgir taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Fine-loamy, mixed, isohyperthermic Typic Haplustalfs

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-8	Ap	65.46	8.38	26.16	12.51	18.72	18.82	10.44	4.96	-	scl	15.15	8.63
8-19	BA	63.48	8.16	28.36	12.80	15.84	17.21	12.49	5.14	-	scl	16.45	8.81
19-40	Bt	52.64	11.58	35.79	13.19	13.19	14.35	8.23	3.69	-	sc	21.49	10.36
40-75	BC	55.14	10.71	34.15	14.10	14.42	14.63	7.53	4.45	-	scl	17.77	8.99

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-8	6.75	-	-	0.19	0.72	0.00	12.18	3.10	0.43	0.22	15.92	16.80	0.64	95	1.31
8-19	7.23	-	-	0.12	0.68	0.84	11.37	2.50	0.23	0.18	14.28	14.77	0.52	97	1.24
19-40	7.13	-	-	0.08	0.50	0.48	13.80	2.82	0.18	0.09	16.89	17.66	0.49	96	0.51
40-75	7.07	-	-	0.07	0.35	0.84	13.00	2.90	0.17	0.10	16.16	17.55	0.51	92	0.57

Contd...

Soil Series: Yadgir **(**YDR) **Pedon:** R-5

Location: $16^0$35'43.6"N $77^0$17'06.4"E, Kanikal village, Balichakra hobli, Yadgir taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Coarse-loamy, mixed, isohyperthermic Fluventic Haplustepts

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-14	Ap	73.39	11.31	15.30	6.76	20.27	24.87	15.66	5.83	-	sl	12.14	7.22
14-43	A2	86.59	8.77	4.64	23.19	26.92	14.11	15.22	7.16	-	ls	6.97	2.68
43-89	BW1	80.41	3.75	15.84	8.06	13.47	36.73	15.71	6.43	-	sl	22.84	10.18
89-110	BW2	63.55	5.40	31.05	8.10	23.05	19.00	9.87	3.53	15-35	scl	38.46	17.70

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-14	9.47	-	-	0.371	0.32	1.30	14.71	4.28	0.38	1.54	20.91	12.70	0.83	165	4.86
14-43	7.25	-	-	0.114	0.56	0.00	2.29	0.86	0.07	0.03	3.25	3.40	0.73	96	0.31
43-89	10.30	-	-	0.820	0.16	0.52	1.70	0.98	0.15	6.62	9.45	8.61	0.54	110	30.77
89-110	10.80	-	-	1.440	0.12	0.91	1.02	2.00	0.29	14.43	17.74	16.17	0.52	110	35.688

Contd...

Soil Series: Madhawara (MDR) **Pedon:** T_2 P_2

Location: $16^0$43'48.9"N $77^0$18'38.3"E, Yaleri village, Balichakra hobli, Yadgir taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Fine-loamy, mixed, isohyperthermic Fluventic Haplustepts

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-11	Ap	58.94	20.74	20.32	5.41	7.28	13.31	20.89	12.06	-	scl	16.47	8.85
11-30	Bw1	55.52	19.32	25.16	5.00	7.19	13.12	19.69	10.52	-	scl	18.25	10.18
30-53	Bw2	53.95	19.15	26.90	4.68	7.48	12.58	19.65	9.56	-	scl	26.99	14.02
53-117	Bw3	52.68	19.51	27.81	2.84	5.47	14.72	20.82	8.83	-	scl	37.86	17.40
117-160	Bw4	49.95	17.27	32.79	2.11	5.07	14.15	20.49	8.13	-	scl	44.15	20.38

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-11	8.31	-	-	0.33	0.46	2.76	-	-	0.45	0.47	-	20.57	1.01	100	0.90
11-30	9.25	-	-	0.20	0.31	4.20	-	-	0.19	1.40	-	23.98	0.95	100	2.34
30-53	9.78	-	-	0.40	0.19	5.76	-	-	0.16	1.53	-	24.53	0.91	100	2.49
53-117	9.94	-	-	0.88	0.23	4.80	-	-	0.18	9.09	-	24.31	0.87	100	14.96
117-160	9.98	-	-	0.93	0.15	3.00	-	-	0.24	11.09	-	28.27	0.86	100	15.69

Contd...

Soil Series: Bhimanahalli (BMN) **Pedon:** R-3

Location: $16^0$31'82.4"N $77^0$12'70.8"E, Bheemanahalli village, Sydhapura hobli, Yadgir taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Fine, smectitic (calcareous), isohyperthermic Typic Haplusterts

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-8	Ap	20.34	19.94	59.72	2.68	5.03	3.75	5.25	3.64	-	c	50.19	33.49
8-40	Bss1	19.61	22.76	57.62	1.94	2.59	5.28	4.96	4.85	-	c	43.22	29.05
40-70	Bss2	21.25	17.65	61.10	3.02	5.26	3.91	5.48	3.58	-	c	44.30	30.25
70-120	Bss3	19.08	22.29	58.63	1.75	5.04	3.84	5.15	3.29	-	c	43.26	30.31
120-170	Bss4	11.11	20.44	68.45	2.04	1.93	1.70	2.83	2.61	-	c	51.33	33.51

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-8	8.2	-	-	0.284	0.72	4.94	-	-	1.20	0.34	-	52.70	0.88	100	0.65
8-40	8.44	-	-	0.139	0.40	7.28	-	-	0.30	0.48	-	52.06	0.90	100	0.93
40-70	8.32	-	-	0.202	0.40	6.37	-	-	0.18	0.40	-	52.52	0.86	100	0.77
70-120	9.3	-	-	0.282	0.36	6.89	-	-	0.27	0.38	-	50.97	0.87	100	0.75
120-170	8.47	-	-	0.305	0.37	8.19	-	-	0.28	0.91	-	58.19	0.85	100	1.57

Contd...

Soil Series: Mundargi **(**MDG) **Pedon:** R-2

Location: $16^0$46'82.4"N $77^0$04'85.2"E, Thumakura village, Yadgir hobli, Yadgir taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Fine-Loamy, mixed, isohyperthermic Fluventic Haplustepts

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-9	Ap	81.23	12.97	5.80	4.84	10.19	14.83	37.94	13.42	<15	ls	11.75	3.31
9-20	A2	76.82	16.19	6.98	4.96	10.12	20.75	27.53	13.46	-	ls	14.52	3.99
20-46	Bw1	42.43	17.43	40.15	2.26	5.59	11.49	14.93	8.16	-	c	34.90	21.14
46-90	Bw2	54.51	16.56	28.93	4.72	5.03	19.92	16.67	8.18	-	scl	36.73	18.88
90-110	Bw3	53.69	11.00	35.30	9.57	9.89	16.23	13.01	4.99	-	sc	38.72	20.53

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-9	8.2	-	-	0.399	0.44	0.78	-	-	0.16	0.38	-	4.90	0.84	100	3.08
9-20	8.44	-	-	0.075	0.29	1.82	-	-	0.05	0.35	-	4.90	0.70	100	2.88
20-46	9.39	-	-	0.451	0.32	2.73	-	-	0.12	5.22	-	20.77	0.52	100	10.06
46-90	9.75	-	-	0.616	0.24	3.25	-	-	0.12	5.72	-	16.56	0.57	100	13.82
90-110	9.72	-	-	0.725	0.24	3.64	-	-	0.14	6.84	-	19.76	0.56	100	13.836

Contd...

Soil Series: Thumakuru (TMK) **Pedon:** R-10

Location: $16^0$38'01.3"N $77^0$16'49.8"E, Kilankera village, Balichakra hobli, Yadgir taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Fine, mixed, isohyperthermic Typic Haplustepts

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-12	Ap	62.92	15.76	21.32	5.56	9.37	21.83	18.33	7.83	-	scl	17.98	6.60
12-29	Bw1	45.91	18.53	35.56	6.08	8.18	15.41	11.43	4.82	-	sc	33.40	11.79
29-74	Bw2	48.47	16.24	35.29	5.93	9.84	16.40	11.75	4.55	-	sc	28.66	11.19
74-132	Bw3	38.25	20.59	41.16	3.21	8.23	14.64	8.97	3.21	-	c	38.85	14.72
132-158	Bw4	36.87	19.99	43.14	3.54	7.61	13.08	8.57	4.07	-	c	44.36	15.75

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-12	9.60	-	-	0.35	0.48	1.44	-	-	0.23	3.62	-	21.83	1.02	100	6.63
12-29	9.72	-	-	1.27	0.50	1.44	-	-	0.59	20.88	-	30.50	0.86	100	27.39
29-74	9.16	-	-	3.44	0.31	3.72	-	-	0.38	25.84	-	28.68	0.81	100	36.04
74-132	9.33	-	-	2.52	0.23	4.92	-	-	0.82	20.25	-	34.99	0.85	100	23.148
132-158	9.23	-	-	2.07	0.31	3.48	-	-	0.70	21.03	-	34.24	0.79	100	24.564

Chapter 5

INTERPRETATION FOR LAND RESOURCE MANAGEMENT

The most important soil and site characteristics that affect the land use and conservation needs of an area are land capability, soil depth, soil texture, coarse fragments, available water capacity, soil slope, soil erosion, soil reaction etc. These are interpreted from the data base generated through land resource inventory and several thematic maps are generated. These would help in identifying the areas suitable for growing crops, soil and water conservation measures and structures needed thus helping to maintain good soil health for sustained crop production. The various interpretative and thematic maps generated are described below.

5.1 Land Capability Classification

Land capability classification is an interpretative grouping of soil map units (soil phases) mainly based on inherent soil characteristics, external land features and environmental factors that limit the use of land for agriculture, pasture, forestry, or other uses on a sustained basis (IARI, 1971). The land and soil characteristics used to group the land resources in an area into various land capability classes, subclasses and units are

Soil Characteristics: Depth, texture, gravelliness, calcareousness.

Land characteristics: Slope, erosion, drainage, rock outcrops.

Climate: Total rainfall and its distribution, and length of crop growing period.

The Land capability classification system is divided into land capability classes, subclasses and units based on the level of information available. Eight land capability classes are recognized. They are

Class I: They are very good lands that have no limitations or very few limitations that restrict their use.

Class II: They are good lands that have minor limitations and require moderate conservation practices.

Class III: They are moderately good lands that have moderate limitations that reduce the choice of crops or that require special conservation practices.

Class IV: They are fairly good lands that have very severe limitations that reduce the choice of crops or that require very careful management.

Class V: Soils in these lands are not likely to erode, but have other limitations like wetness that are impractical to remove and as such not suitable for agriculture, but suitable for pasture or forestry with minor limitations.

Class VI: The lands have severe limitations that make them generally unsuitable for cultivation, but suitable for pasture or forestry with moderate limitations.

Class VII: The lands have very severe limitations that make them unsuitable for cultivation, but suitable for pasture or forestry with major limitations.

Class VIII: Soil and other miscellaneous areas (rock lands) that have very severe limitations that nearly preclude their use for any crop production, but suitable for wildlife, recreation and installation of wind mills.

The land capability subclasses are recognised based on the dominant limitations observed within a given land capability class. The subclasses are designated by adding a lower case letter like 'e', 'w', 's', or 'c' to the class numeral. The subclass "e" indicates that the main hazard is risk of erosion, "w" indicates drainage or wetness as a limitation for plant growth, "s" indicates shallow soil depth, coarse or heavy textures, calcareousness, salinity/alkalinity or gravelliness and "c" indicates limitation due to climate.

The land capability subclasses have been further subdivided into land capability units based on the kinds of limitations present in each subclass. Ten land capability units are used in grouping the soil map units. They are stony or rocky (0), erosion hazard (slope, erosion) (1), coarse texture (sand, loamy sand, sandy loam) (2), fine texture (cracking clay, silty clay) (3), slowly permeable subsoil (4), coarse underlying material (5), salinity/alkali (6), stagnation, overflow, high ground water table (7), soil depth (8) and fertility problems (9). The capability units thus identified have similar soil and land characteristics that respond similarly to a given level of management. The soils of the microwatershed have been classified up to l and capability subclass level.

The 15 soil map units identified in the Mundragi-1 microwatershed are grouped under 1 land capability class and 4 subclasses. Entire area in the microwatershed is suitable for agriculture (Fig. 5.1).

Good cultivable lands (Class II) cover a whole area and are distributed in all parts of the microwatershed with minor problems of soil, erosion and wetness.

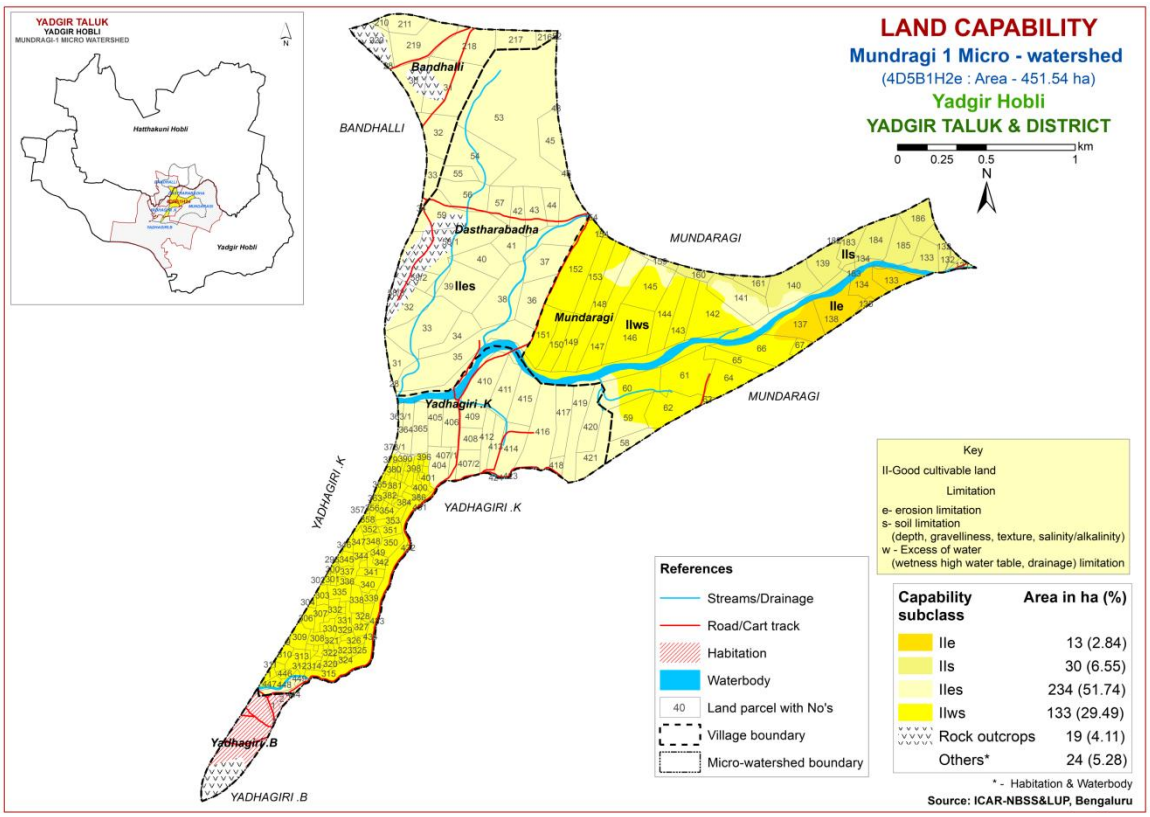


Fig. 5.1 Land Capability map of Mundragi-1 Microwatershed

5.2 Soil Depth

Soil depth refers to the depth of the soil occurring above the parent material or hard rock. The depth of the soil determines the effective rooting depth for plants and in accordance with soil texture, mineralogy and gravel content, the capacity of the soil column to hold water and nutrient availability. Soil depth is one of the most important soil characteristic that is used in differentiating soils into different soil series. The soil depth classes used in identifying soils in the field are very shallow (<25 cm), shallow (25-50 cm), moderately shallow (50-75 cm), moderately deep (75-100 cm), deep (100-150 cm) and very deep (>150 cm). They were used to classify the soils into different depth classes and a soil depth map was generated. The area extent and their geographical distribution in the microwatershed is given in Fig. 5.2.

Moderately shallow (50-75 cm) and moderately deep (75-100 cm) soils occupy an area of about 14 ha (3%) and 36 ha (8%) respectively of the microwatershed and are distributed in the northern, northwestern and western part of the microwatershed. Deep (100-150 cm) soils cover an area of 40 ha (9%) and are distributed in the northern part of the microwatershed. Very deep (>150 cm) soils occur in a maximum area of 320 ha (71%) and are distributed in all parts of the microwatershed.

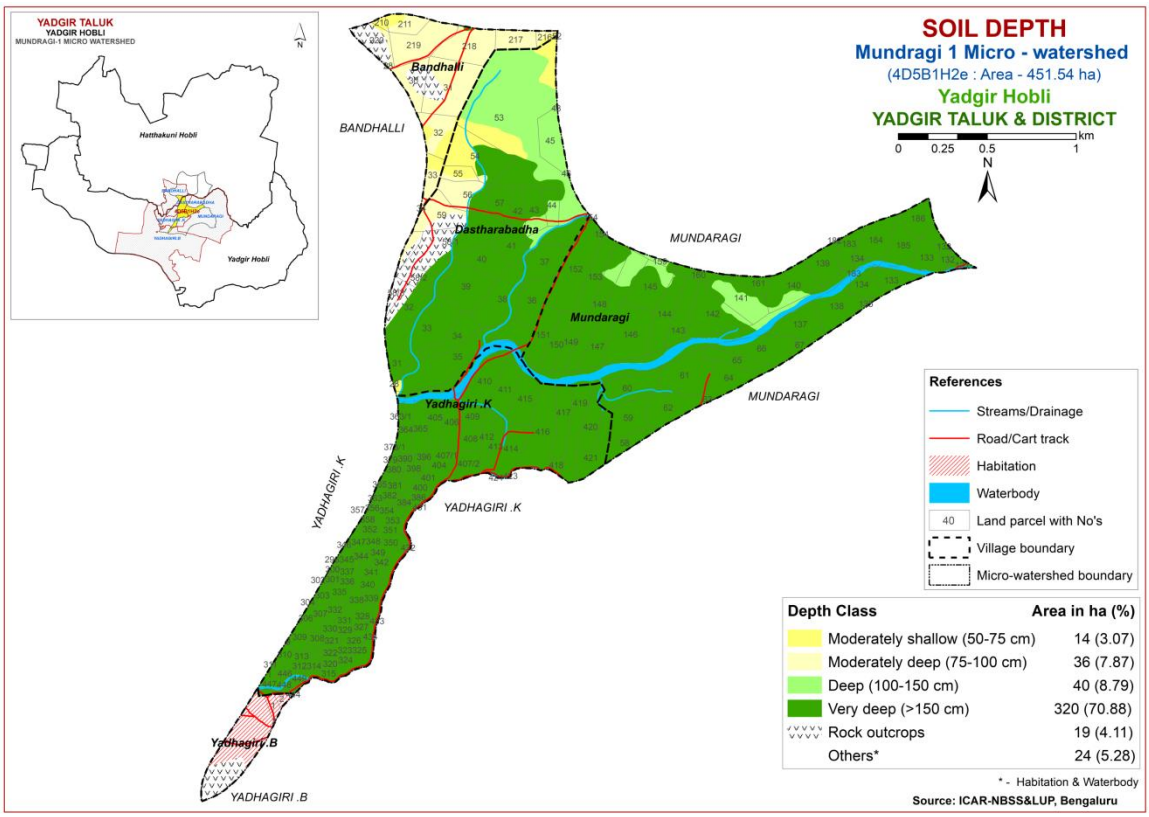


Fig. 5.2 Soil Depth map of Mundragi-1 Microwatershed

The most productive lands cover a maximum area of 360 ha (80%) with respect to soil rooting depth where all climatically adapted annual and perennial crops can be grown are deep to very deep (100->150 cm depth) soils occurring in the major part of the microwatershed. The problematic soils not found.

5.3 Surface Soil Texture

Texture is an expression to indicate the coarseness or fineness of the soil as determined by the relative proportion of primary particles of sand, silt and clay. It has a direct bearing on the structure, porosity, adhesion and consistence. The surface layer of a soil to a depth of about 25 cm is the layer that is most used by crops and plants. The surface soil textural class provides a guide to understanding soil-water retention and availability, nutrient holding capacity, infiltration, workability, drainage, physical and chemical behaviour, microbial activity and crop suitability. The textural classes used for LRI were used to classify and a surface soil texture map was generated. The area extent and their geographical distribution in the microwatershed is shown in Figure 5.3.

An area of about 203 ha (45%) is loamy and are distributed in the central, northern, eastern and western part of the microwatershed. An area of 206 ha (46%) has soils that are clayey at the surface and occur in the major part of the microwatershed.

Entire area has most productive lands with respect to surface soil texture. The clayey soils (46%) have high potential for soil-water retention and availability, and

nutrient retention and availability, but have more problems of drainage, infiltration, workability and other physical problems. The other productive lands are loamy soils (45%) which also have high potential for soil-water retention and nutrient availability but have no drainage or other physical problems.

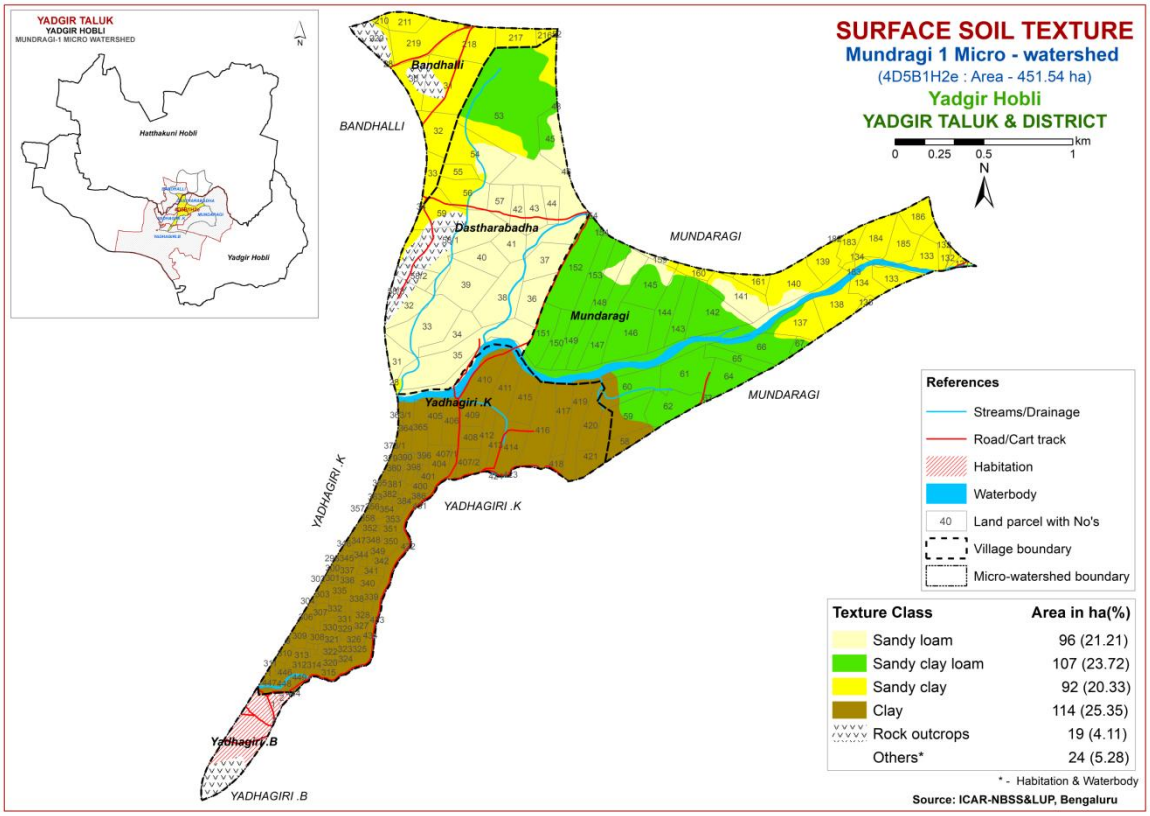


Fig. 5.3 Surface Soil Texture map of Mundragi-1 Microwatershed

5.4 Soil Gravelliness

Gravel is the term used for describing coarse fragments between 2 mm and 7.5 cm diameter and stones for those between 7.5 cm and 25 cm. The presence of gravel and stones in soil reduces the volume of soil responsible for moisture and nutrient storage, drainage, infiltration and runoff, and hinders plant growth by impeding root growth and seedling emergence, intercultural operations and farm mechanization. The gravelliness classes used in LRI were used to classify the soils and using these classes a gravelliness map was generated. The area extent and their geographic distribution in the microwatershed is shown in Figure 5.4.

Non gravelly (<15%) soils cover a maximum area of about 408 ha (90%) and are distributed in all parts of the microwatershed. A small area of about 1 ha (<1%) is gravelly (15-35%) and are distributed in the northwestern part of the microwatershed.

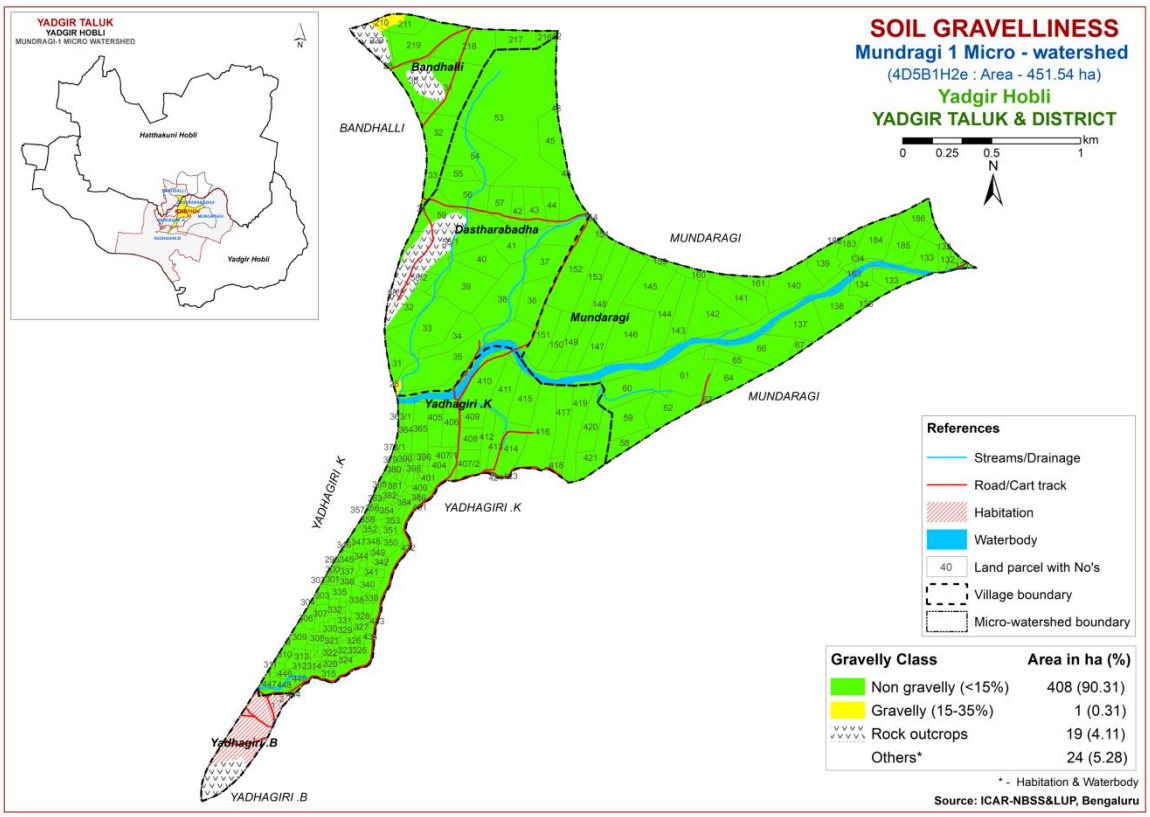


Fig. 5.4 Soil Gravelliness map of Mundragi-1 Microwatershed

The problem soils (<1%) that are gravelly (15-35%), where only short or medium duration crops can be grown. The most productive soils (90%) that are non gravelly (<15%) where, all climatically adapted long duration crops can be grown.

5.5 Available Water Capacity

The soil available water capacity (AWC) is estimated based on the ability of the soil column to retain water between the tensions of 0.33 and 15 bar in a depth of 100 cm or the entire solum if the soil is shallower. The AWC of the soils (soil series) as estimated by considering the soil texture, mineralogy, soil depth and gravel content (Sehgal *et al.*, 1990) and accordingly the soil map units were grouped into five AWC classes *viz*, very low (<50 mm/m), low (50-100 mm/m), medium (100-150 mm/m), high (150-200 mm/m) and very high (>200 mm/m) and using these values, an AWC map was generated. The area extent and their geographic distribution of different AWC classes in the microwatershed is given in Figure 5.5.

An area of about 68 ha (15%) in the microwatershed has soils that are low (51-100 mm/m) in available water capacity and are distributed in the northern, northwestern and western part of the microwatershed. Very high (>200 mm/m) occur in a maximum area of about 341 ha (76%) and are distributed in all parts of the microwatershed.

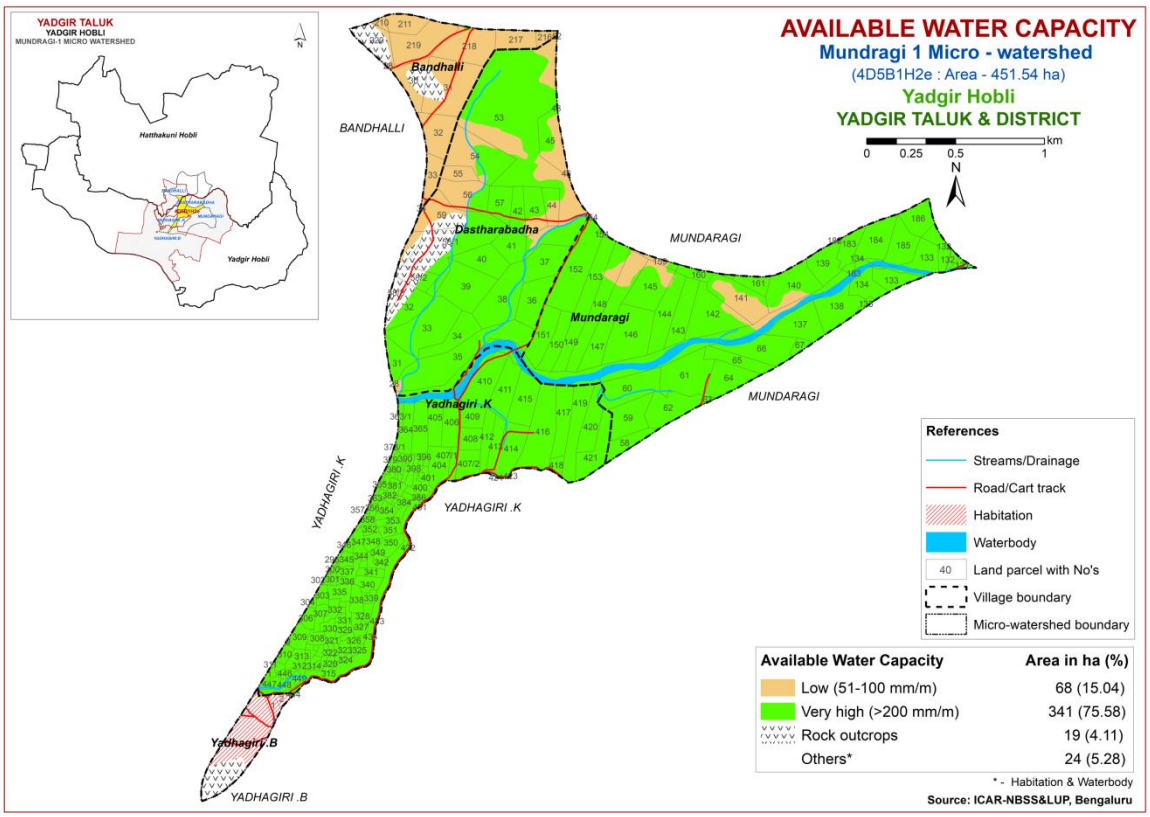


Fig. 5.5 Soil Available Water Capacity map of Mundragi-1 Microwatershed

About 68 ha (15%) area in the microwatershed has soils that are problematic with regard to available water capacity. Here, only short duration crops can be grown and the probability of crop failure is very high. These areas are best put to other alternative uses. An area of 341 ha (76%) are potential with regard to AWC where all climatically adapted annual and perennial crops can be grown.

5.6 Soil Slope

Soil slope refers to the inclination of the surface of the land. It is defined by gradient, shape and length, and is an integral feature of any soil as a natural body. Slope is considered important in soil genesis, land use and land development. The length and gradient of slope influences the rate of runoff, infiltration, erosion and deposition. The soil map units were grouped into two slope classes and a slope map was generated showing the area extent and their geographic distribution in the microwatershed (Fig. 5.6).

An area of about 163 ha (36%) falls under nearly level (0-1%) lands and are distributed in the northern, central, eastern, northeastern and southwestern part of the microwatershed. An area of about 246 ha (55%) falls under very gently sloping (1-3% slope) lands and are distributed in the major part of the microwatershed.

In these areas, all climatically adapted annual and perennial crops can be grown without much soil and water conservation and other land development measures.

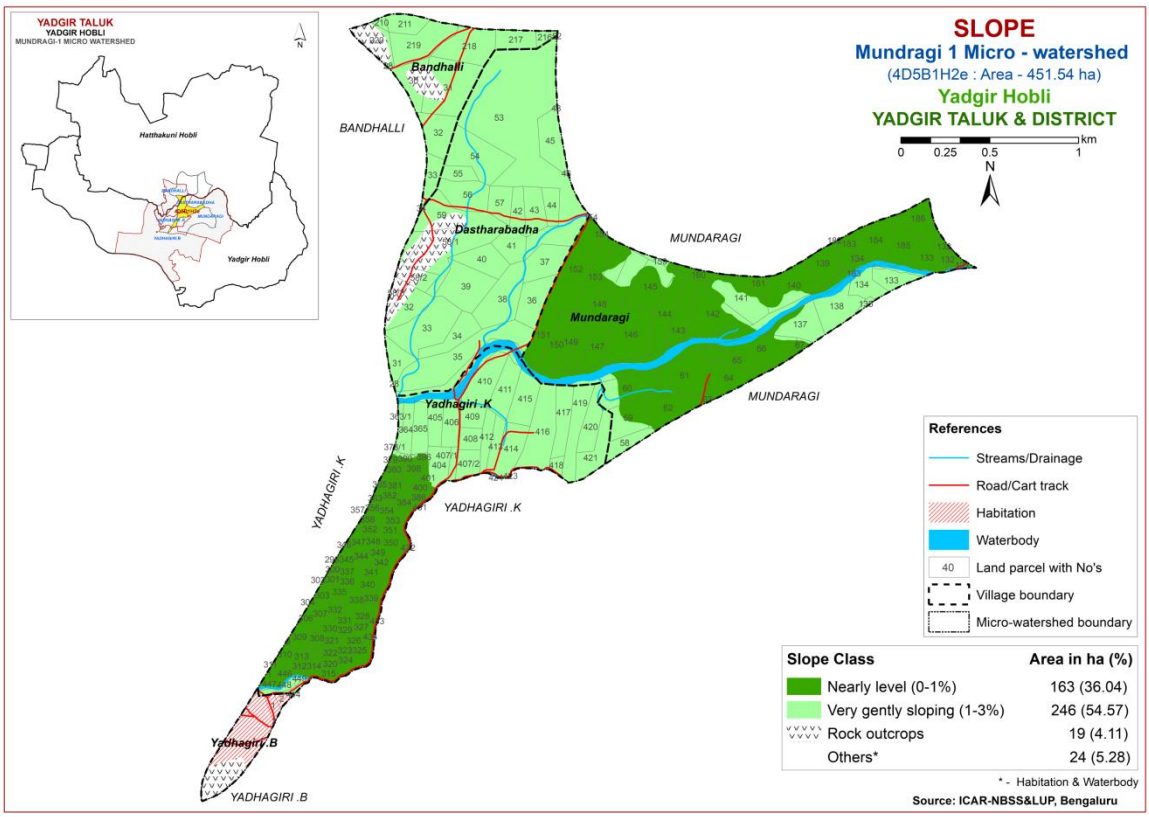


Fig. 5.6 Soil Slope map of Mundragi-1 Microwatershed

5.7 Soil Erosion

Soil erosion refers to the wearing away of the earth's surface by the forces of water, wind and ice involving detachment and transport of soil by raindrop impact. It is used for accelerated soil erosion resulting from disturbance of the natural landscape by burning, excessive grazing and indiscriminate felling of forest trees and tillage, all usually by man. The erosion classes showing an estimate of the current erosion status as judged from field observations in the form of rills, gullies or a carpet of gravel on the surface are recorded. Four erosion classes, viz, slight erosion (e1), moderate erosion (e2), severe erosion (e3) and very severe erosion (e4) are recognized. The soil map units were grouped into different erosion classes and a soil erosion map generated. The area extent and their spatial distribution in the microwatershed is given in Figure 5.7.

Soils that are slightly eroded (e1 class) soils cover an area of 163 ha (36%) and are distributed in the northern, central, eastern, northeastern and southwestern part of the microwatershed. Moderately eroded (e2 class) soils cover an area of 246 ha (55%) and are distributed in the major part of the microwatershed.

Major (55%) area in the microwatershed is problematic because of moderate erosion. For these areas, taking up soil and water conservation and other land development measures are needed.

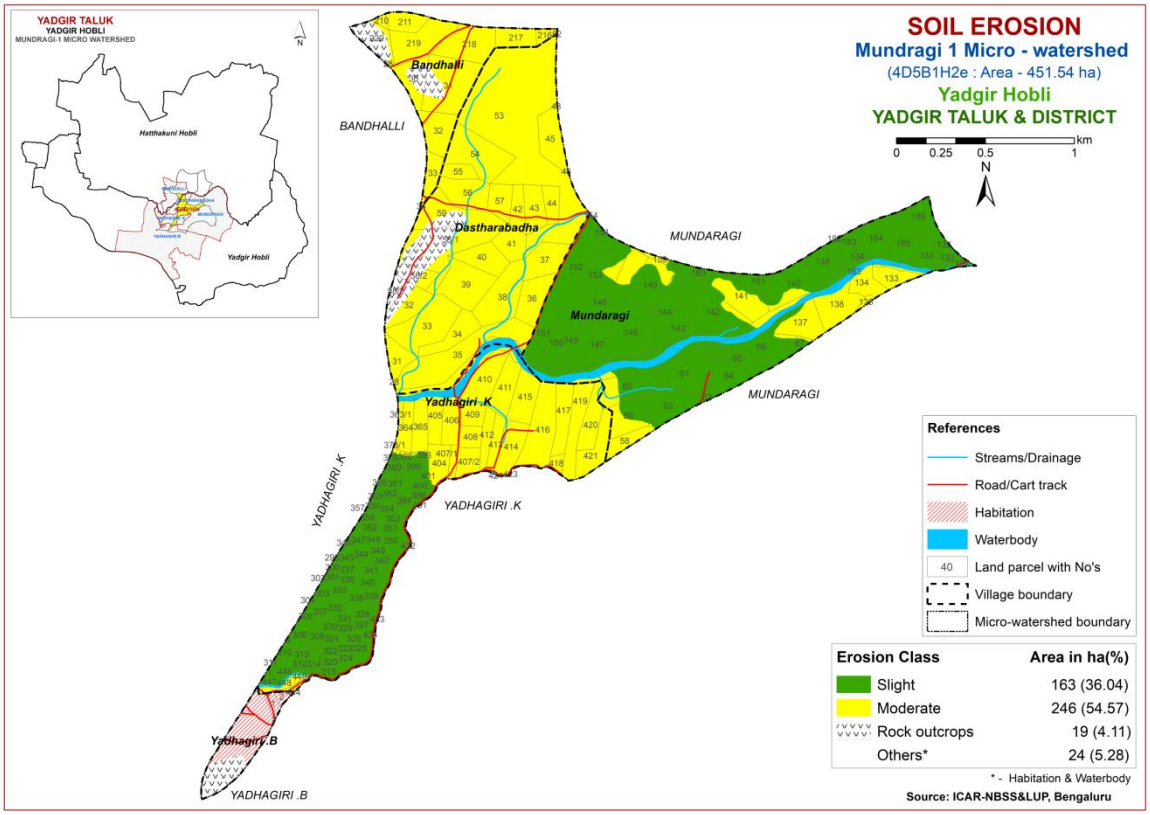


Fig. 5.7 Soil Erosion map of Mundragi-1 Microwatershed

Chapter 6

FERTILITY STATUS

Soil fertility plays an important role in increasing crop yield. The adoption of high yielding varieties that require high amounts of nutrients has resulted in deficiency symptoms in crops and plants due to imbalanced fertilization and poor inherent fertility status as these areas are characterised by low rainfall and high temperatures. Hence, it is necessary to know the fertility (macro and micro nutrients) status of the soils of the watersheds for assessing the kind and amount of fertilizers required for each of the crop intended to be grown. For this purpose, the surface soil samples collected from the grid points (one soil sample at every 320 m interval) all over the microwatershed through land resource inventory in the year 2018 were analysed for pH, EC, organic carbon, available phosphorus and potassium, and for micronutrients like zinc, boron, copper, iron and manganese, and secondary nutrient sulphur.

Soil fertility data generated has been assessed and individual maps for all the nutrients for the microwatershed have been generated using Kriging method under GIS. The village/survey number wise fertility data for the microwatershed is given in Appendix-II.

6.1 Soil Reaction (pH)

The soil analysis of the Mundragi-1 microwatershed for soil reaction (pH) showed that an area of about 199 ha (44%) is neutral (pH 6.5-7.3) and are distributed in the northern, western and northwestern, part of the microwatershed. A maximum area of about 210 ha (47%) is slightly alkaline (pH 7.3-7.8) and are distributed in the major part of the microwatershed. An area of about less than 1 ha (<1%) are moderately alkaline (pH 7.8-8.4) and are distributed in the eastern and southern part of the microwatershed. In all, an area of about 199 ha is neutral and 210 ha is alkaline.

6.2 Electrical Conductivity (EC)

The Electrical Conductivity of the soils of the entire microwatershed area is <2 dS m^{-1} (Fig 6.2) and as such the soils are non-saline.

6.3 Organic Carbon

The soil organic carbon content (an index of available Nitrogen) in the soils of the microwatershed is high (>0.75%) in an area of about 89 ha (20%) and are distributed in the southern, southwestern and northwestern part of the microwatershed, medium (0.5-0.75%) in a maximum area of about 248 ha (55%) and are distributed in the major part of the microwatershed and low (<0.50%) in an area of about 72 ha (16%) and are distributed in the northern, central and eastern part of the microwatershed (Fig. 6.3).

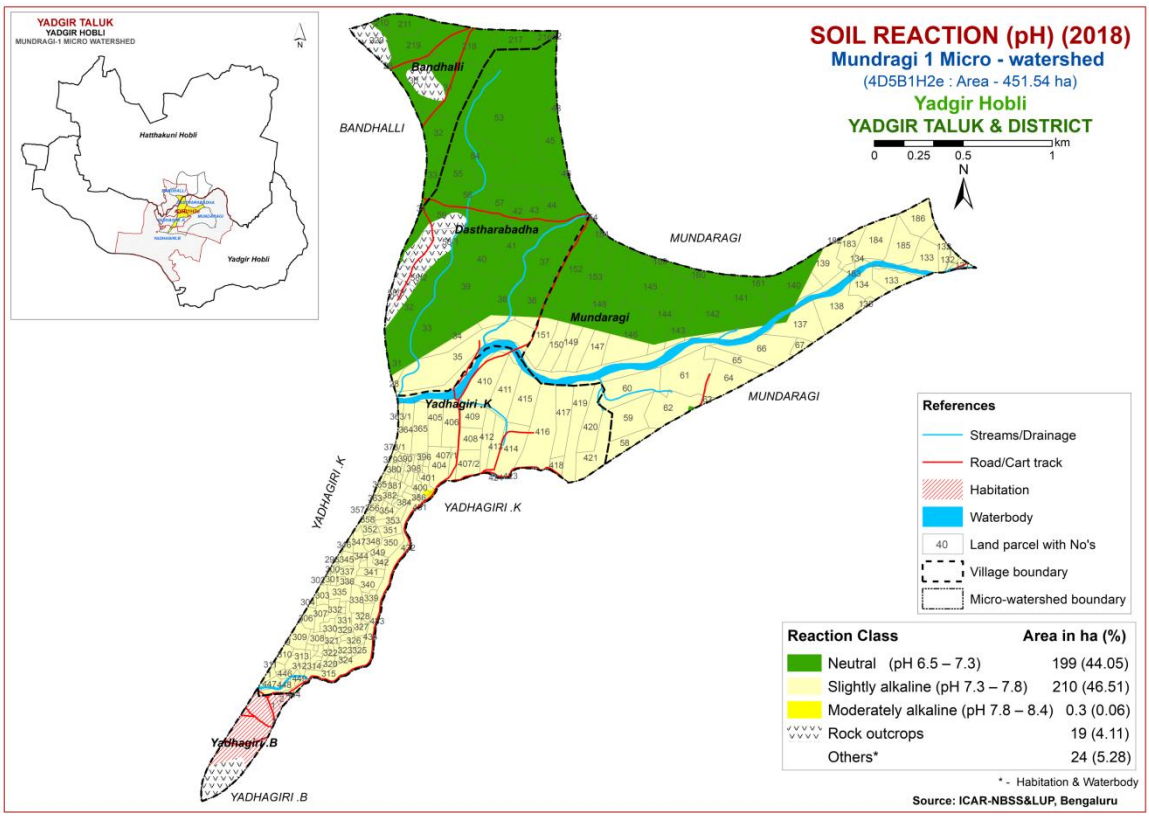


Fig.6.1 Soil Reaction (pH) map of Mundragi-1 Microwatershed

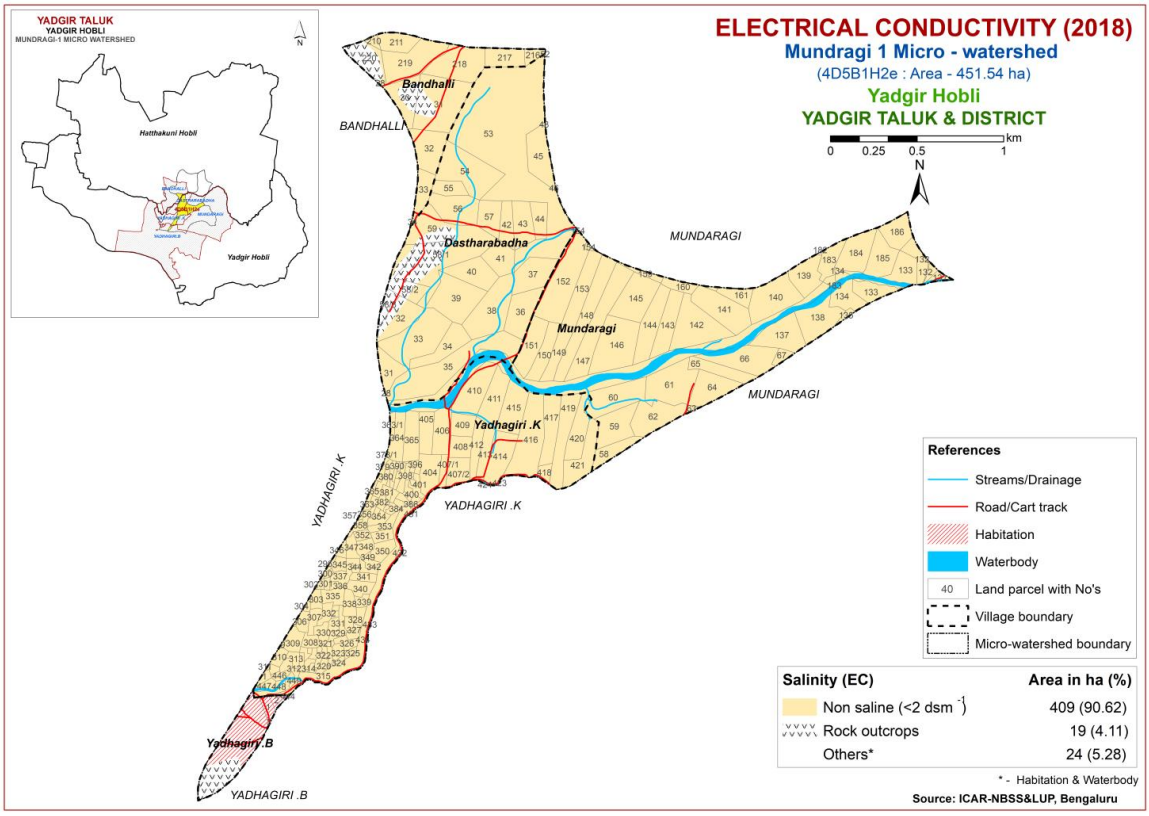


Fig.6.2 Electrical Conductivity (EC) map of Mundragi-1 Microwatershed

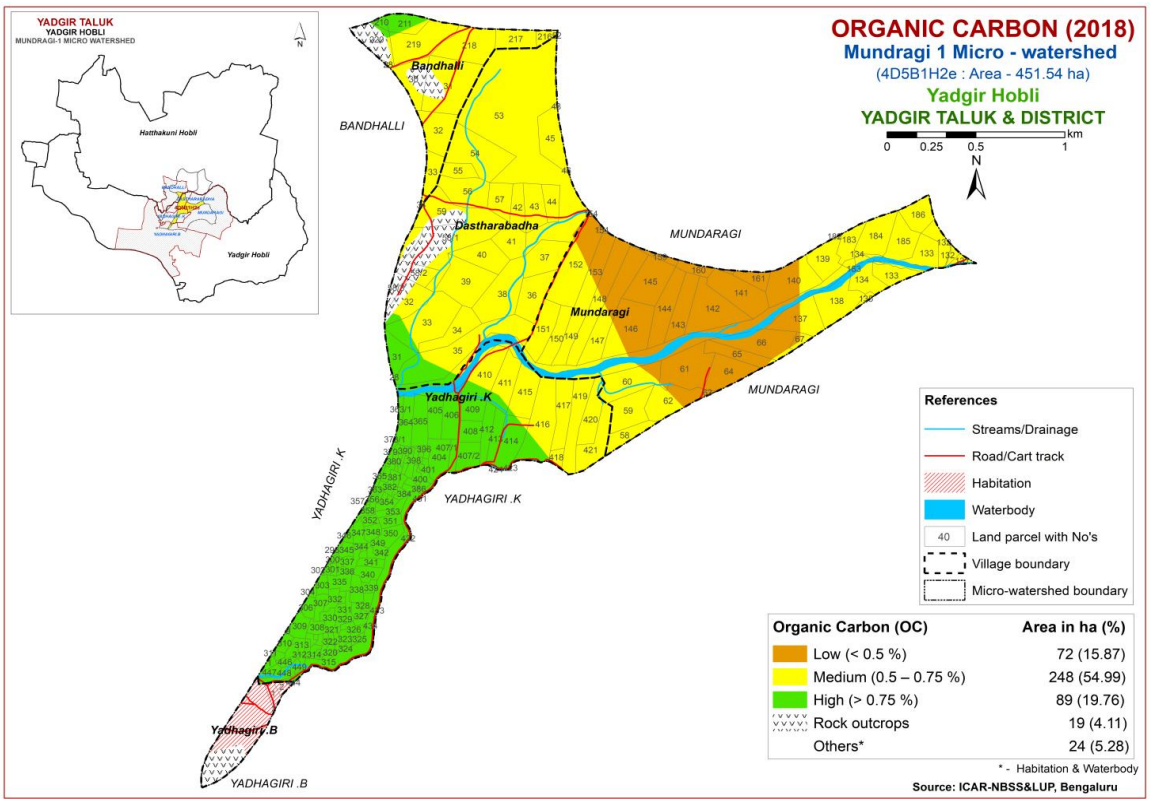


Fig.6.3 Soil Organic Carbon map of Mundragi-1 Microwatershed

6.4 Available Phosphorus

Available phosphorus content is medium (23-57 kg/ha) in a maximum area of about 362 ha (80%) and are distributed in all parts of the microwatershed and high (>57 kg/ha) in an area of 47 ha (10%) and are distributed in the northwestern and southwestern part of the microwatershed (Fig. 6.4).

6.5 Available Potassium

Available potassium content is medium (145-337 kg/ha) in an area of about 183 ha (41%) and are distributed in northern, eastern, western, northeastern and northwestern part of the microwatershed and low (<145 kg/ha) in a maximum area of about 226 ha (50%) and are distributed in the major part of the microwatershed (Fig. 6.5).

6.6 Available Sulphur

A maximum area of about 326 ha (72%) is low (<10 ppm) in available sulphur content and are distributed in all parts of the microwatershed and medium (10-20 ppm) in an area of about 83 ha (18%) and are distributed in the southern, western and southwestern part of the microwatershed (Fig. 6.6).

6.7 Available Boron

Available boron content is low (<0.5 ppm) in a maximum area of about 342 ha (76%) and are distributed in all parts of the microwatershed and medium (0.5-1.0 ppm) in

an area of about 67 ha (15%) and are distributed in the southern and southwestern part of the microwatershed (Fig. 6.7).

6.8 Available Iron

Available iron content is deficient (<4.5 ppm) in an area of about 63 ha (14%) and are distributed in the central and southern part of the microwatershed and sufficient (>4.5 ppm) in a maximum area of 346 ha (77%) and are distributed in all parts of the microwatershed (Fig 6.8).

6.9 Available Manganese

Available manganese content is sufficient (>1.0 ppm) in the entire microwatershed area (Fig 6.9).

6.10 Available Copper

Available copper content is sufficient (>0.2 ppm) in the entire microwatershed area (Fig 6.10).

6.11 Available Zinc

Available zinc content is deficient (<0.6 ppm) in the entire microwatershed (Fig 6.11).

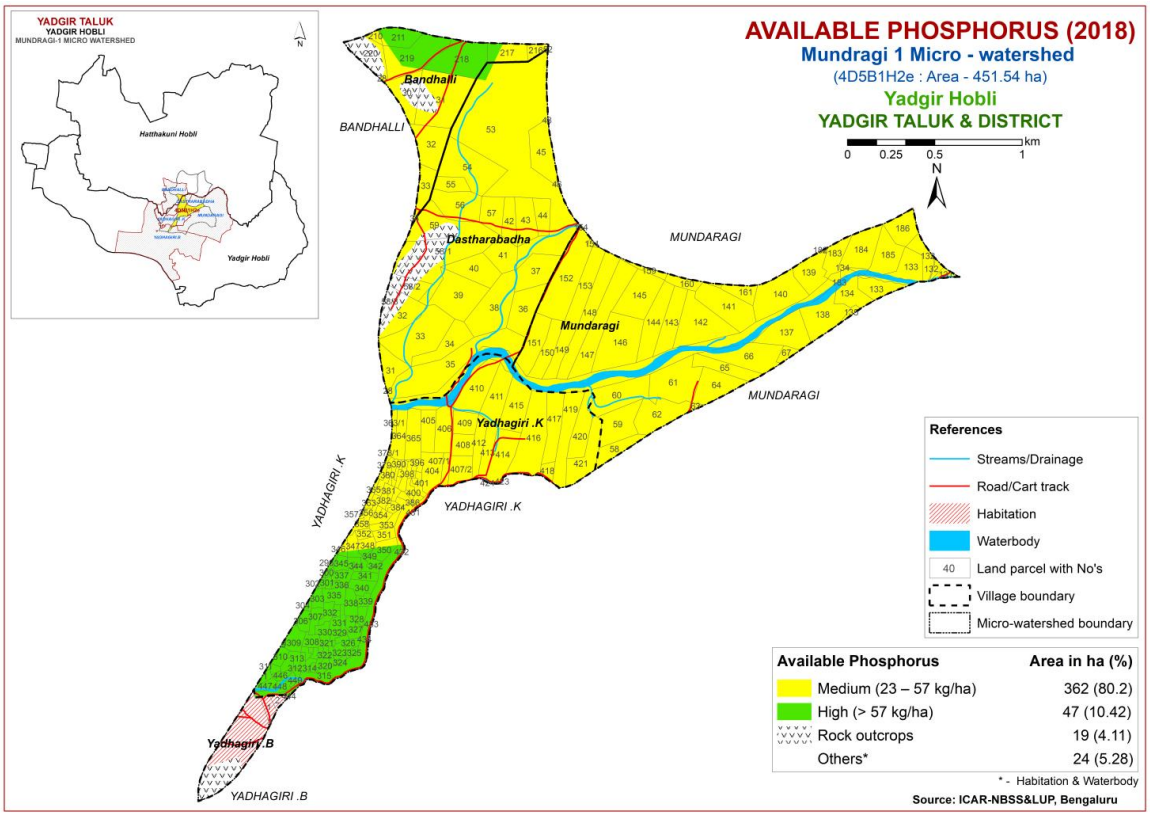


Fig.6.4 Soil Available Phosphorus map of Mundragi-1 Microwatershed

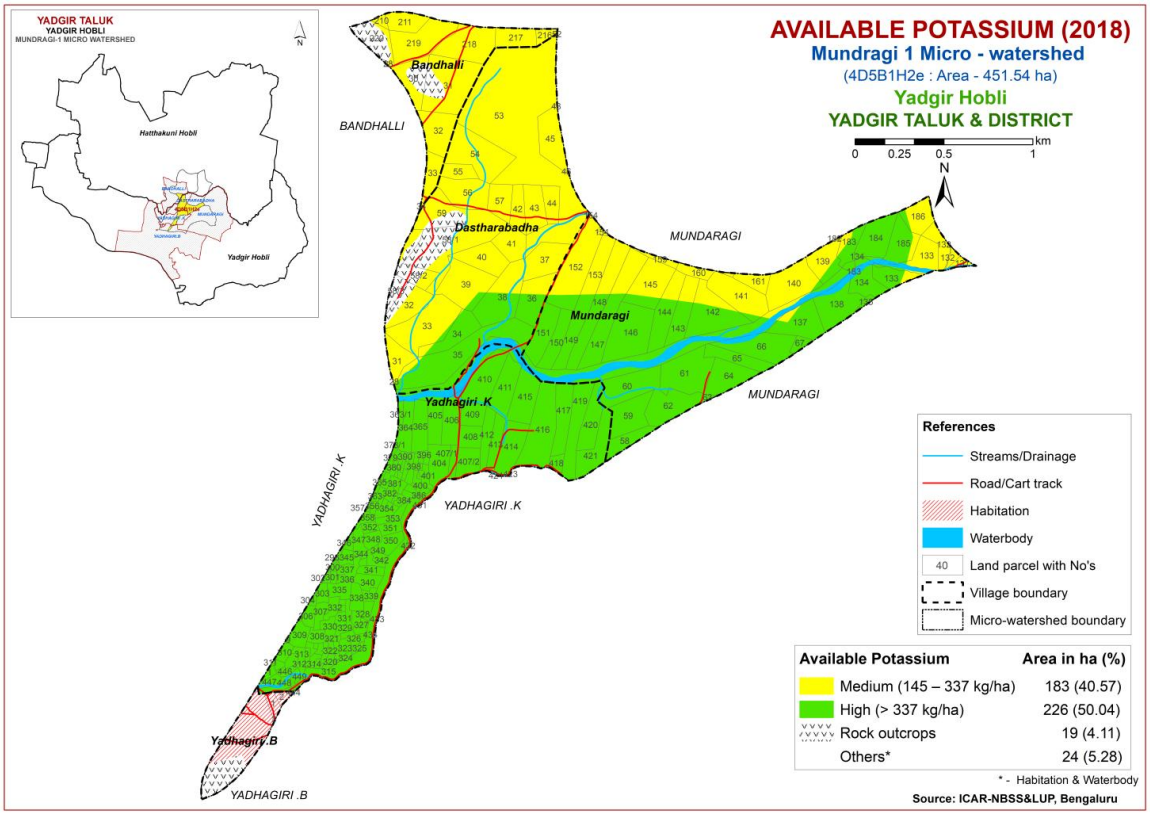


Fig.6.5 Soil Available Potassium map of Mundragi-1 Microwatershed

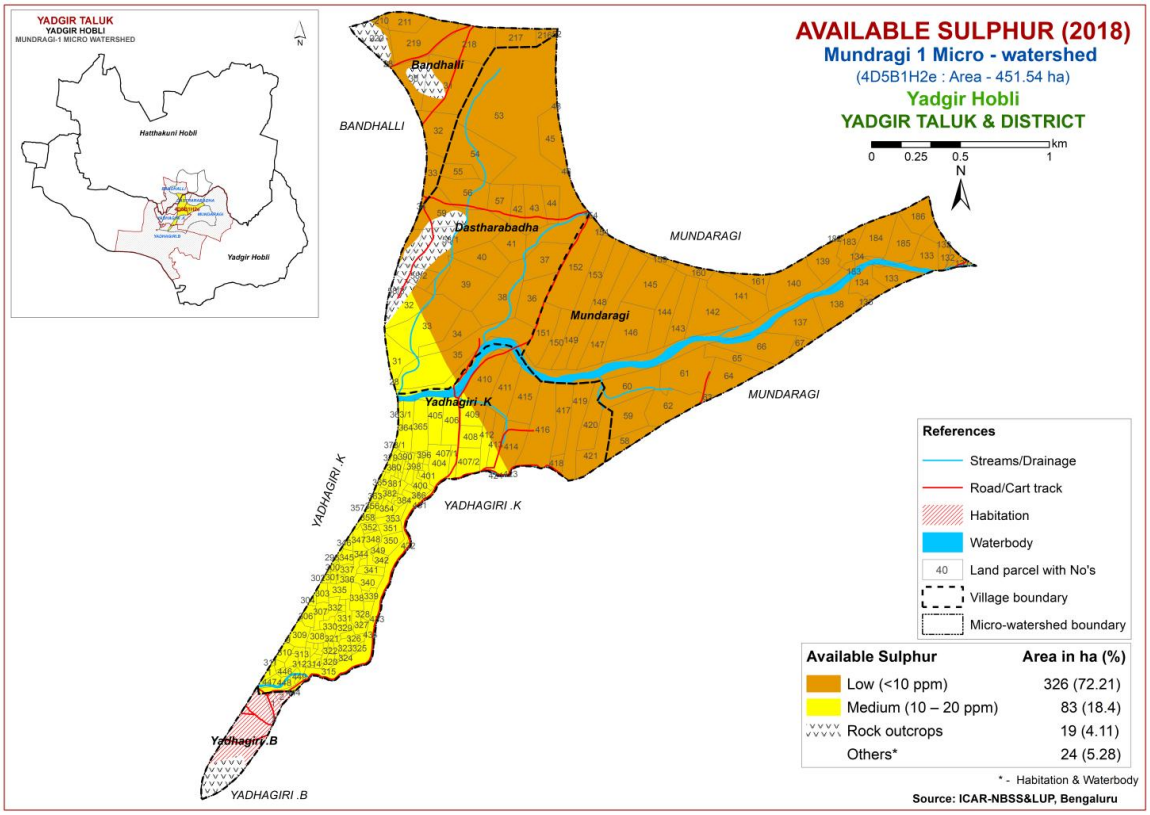


Fig.6.6 Soil Available Sulphur map of Mundragi-1 Microwatershed

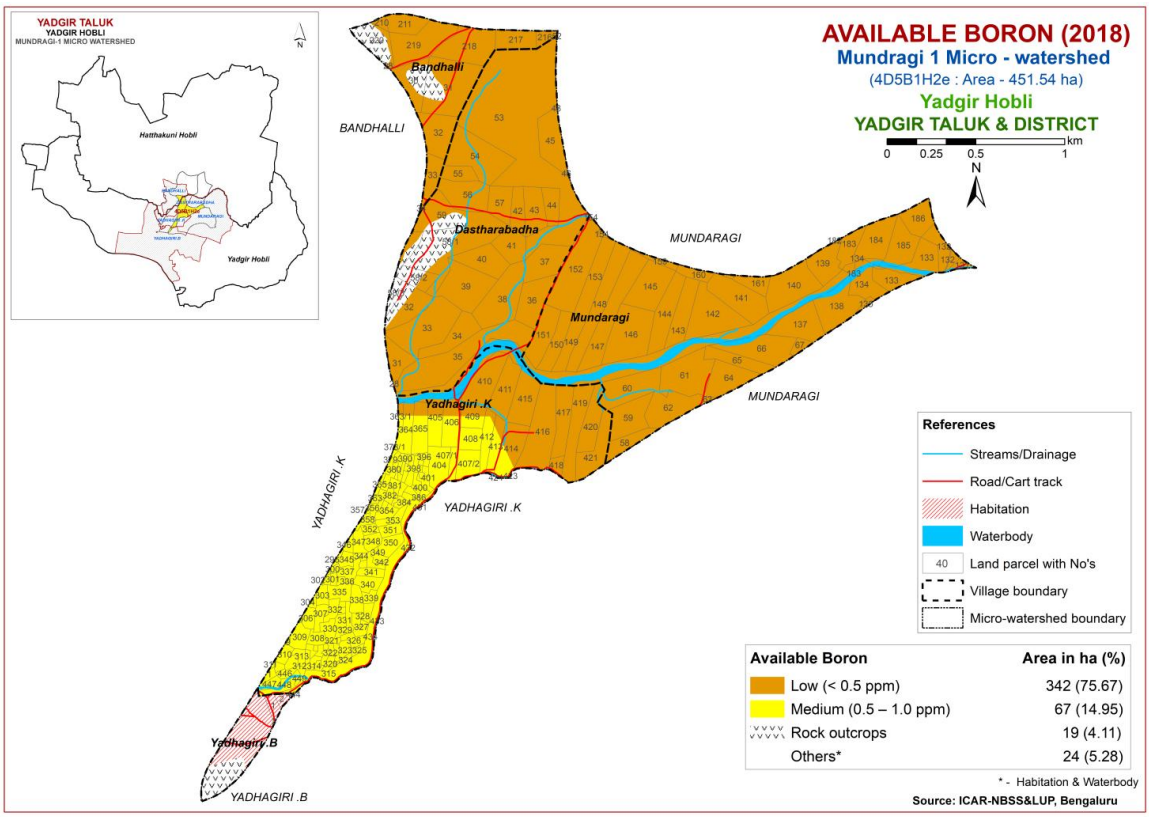


Fig.6.7 Soil Available Boron map of Mundragi-1 Microwatershed

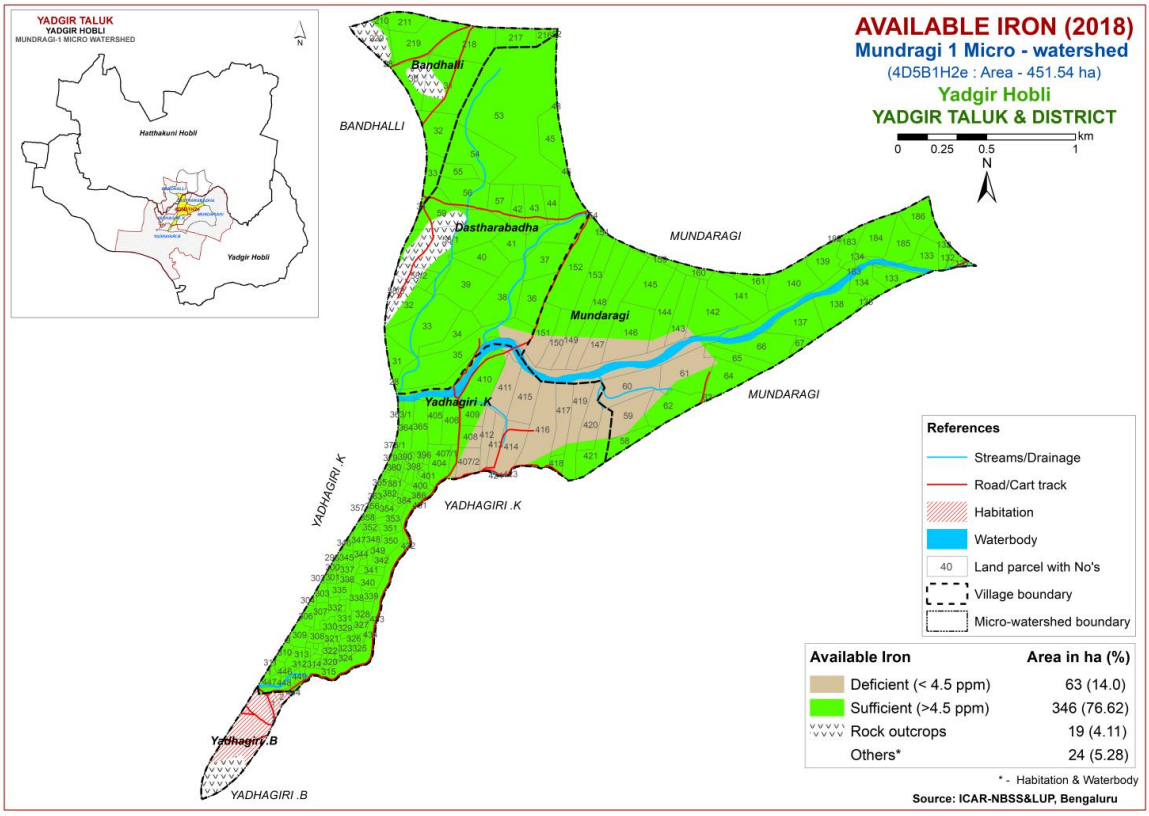


Fig.6.8 Soil Available Iron map of Mundragi-1 Microwatershed

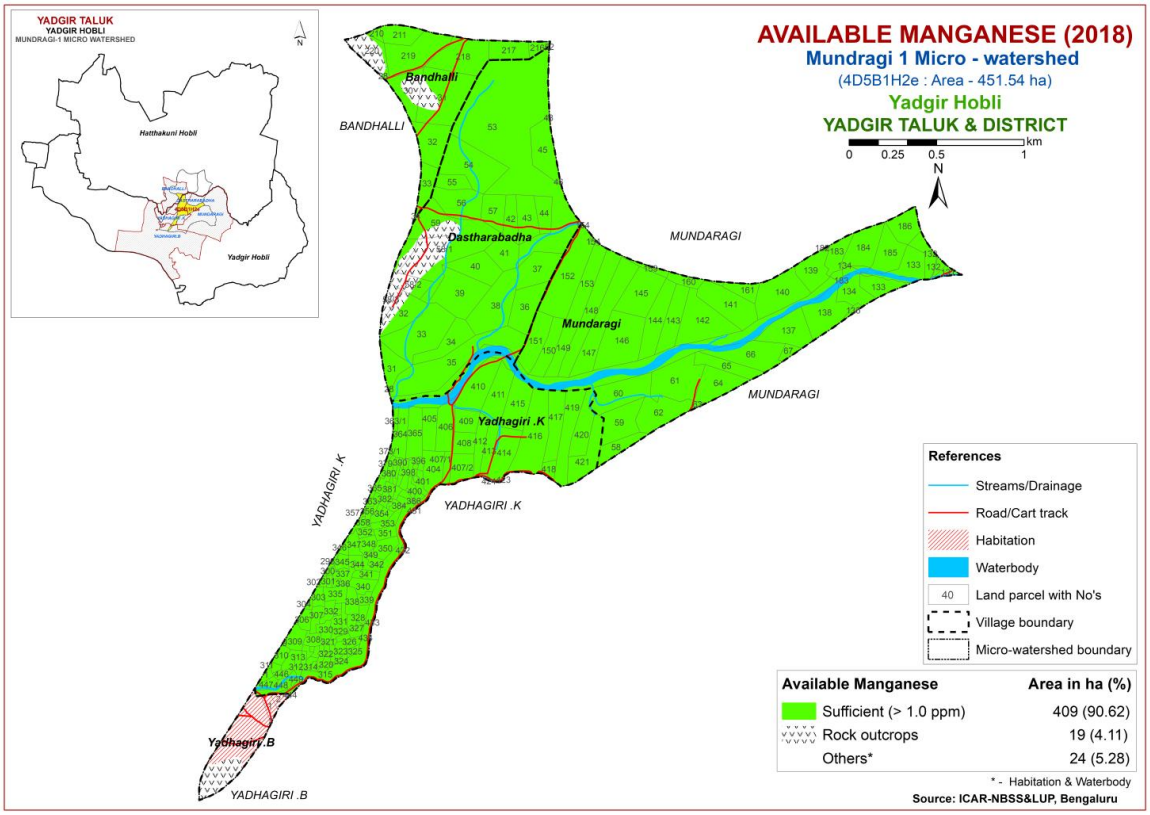


Fig.6.9 Soil Available Manganese map of Mundragi-1 Microwatershed

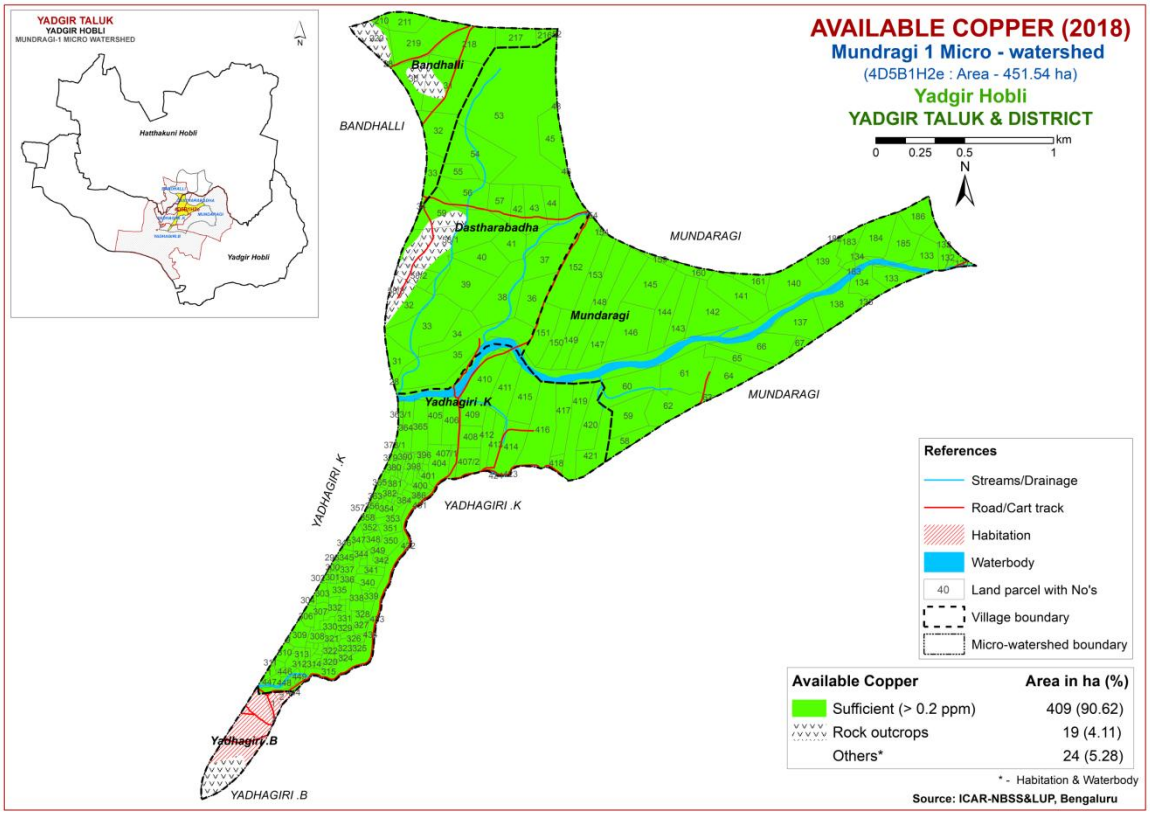


Fig.6.10 Soil Available Copper map of Mundragi-1 Microwatershed

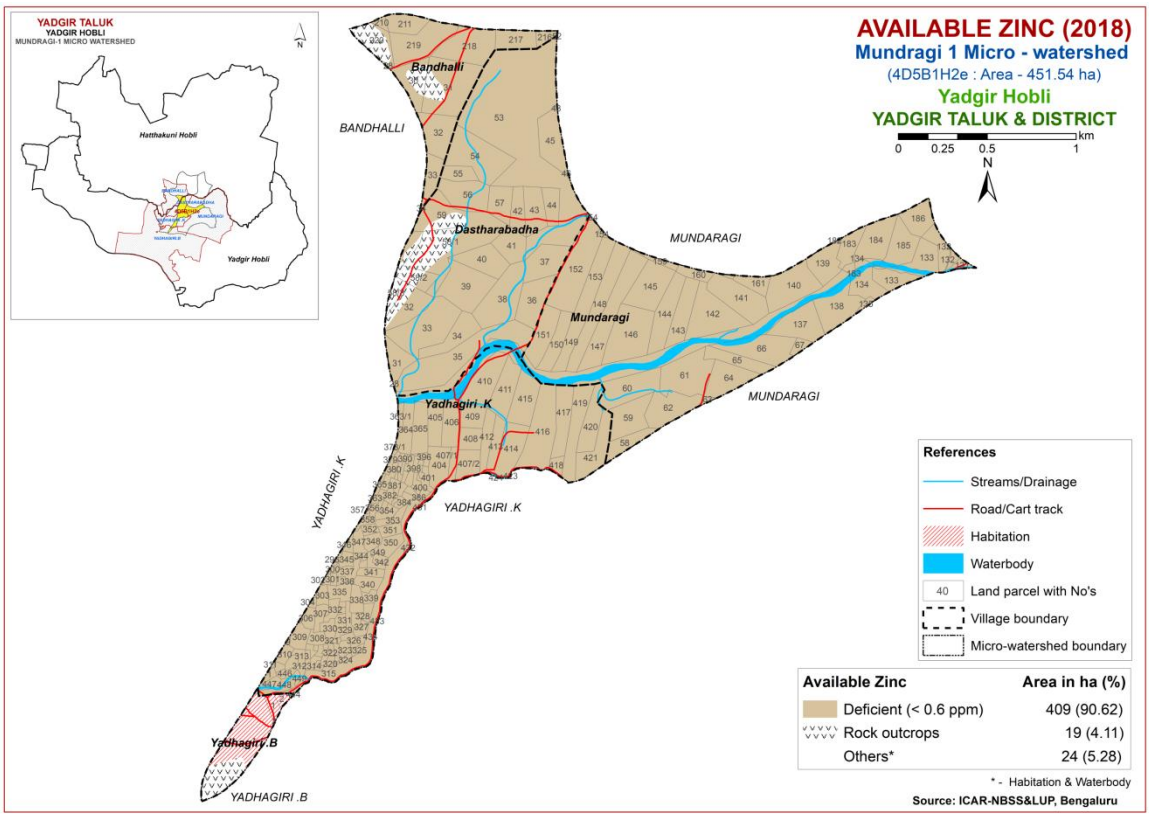


Fig.6.11 Soil Available Zinc map of Mundragi-1 Microwatershed

Chapter 7

LAND SUITABILITY FOR MAJOR CROPS

The soil and land resource units (soil phases) of Mundragi-1 microwatershed were assessed for their suitability for growing food, fodder, fibre and other horticulture crops by following the procedure as outlined in FAO, 1976 and 1983. Crop requirements were developed for each of the crop from the available research data and also by referring to Naidu *et. al.* (2006) and Natarajan *et. al* (2015). The soil and land characteristics were matched with the crop requirement to arrive at the crop suitability. The soil and land characteristics table (Table 7.1) and crop requirement tables (Tables 7.2 to Tables 7.30) are given at the end. In FAO land suitability classification, two orders are recognized. Order S-Suitable and Order N-Not suitable. The orders have classes, subclasses and units. Order-S has three classes, Class S1-Highly Suitable, Class S2-Moderately Suitable and Class S3- Marginally Suitable. Order N has two classes, N1-Currently not Suitable and N2- Permanently not Suitable. There are no subclasses within the Class S1 as they will have very minor or no limitations for crop growth. Classes S2, S3 and N1 are divided into subclasses based on the kinds of limitations encountered. The limitations that affect crop production are 'c' for erratic rainfall and its distribution and length of growing period (LGP), 'e' for erosion hazard, 'r' for rooting condition, 't' for lighter or heavy texture, 'g' for gravelliness or stoniness, 'n' for nutrient availability, 'l' for topography, 'm' for moisture availability, 'w' for drainage and 'z' for calcareousness. These limitations are indicated as lower case letters to the Class symbol. For example, moderately suitable lands with the limitations of soil depth and erosion are designated as S2re. For the microwatershed, the soil mapping units were evaluated and classified up to subclass level.

Using the above criteria, the soil map units of the microwatershed were evaluated and land suitability maps for 29 major annual and perennial crops were generated. The detailed information on the kind of suitability of each of the soil phase for the crops assessed are given village/ survey number wise for the microwatershed in Appendix-III.

7.1 Land Suitability for Sorghum (*Sorghum bicolor*)

Sorghum is one of the major crop grown in Karnataka in an area of 10.47 lakh ha in Bijapur, Gulbarga, Raichur, Bidar, Belgaum, Dharwad, Bellary, Chitradurga, Mysore and Tumakuru districts. The crop requirements for growing sorghum (Table 7.2) were matched with the soil-site characteristics (Table 7.1) of the soils of the microwatershed and a land suitability map for growing sorghum was generated. The area extent and their geographic distribution of different suitability subclasses in the microwatershed are given in Figure 7.1.

A maximum area of about 341 ha (76%) is highly suitable (Class S1) for growing sorghum and are distributed in all parts of the microwatershed with no limitations. An area of about 50 ha (11%) is moderately suitable (Class S2) for growing sorghum and are distributed in the northern, northwestern and western part of the microwatershed. They

have minor limitations of texture, gravelliness, calcareousness and rooting depth. An area of about 18 ha (4%) is marginally suitable (Class S3) for growing sorghum and are distributed in the northern and eastern part of the microwatershed with moderate limitations calcareousness and texture.

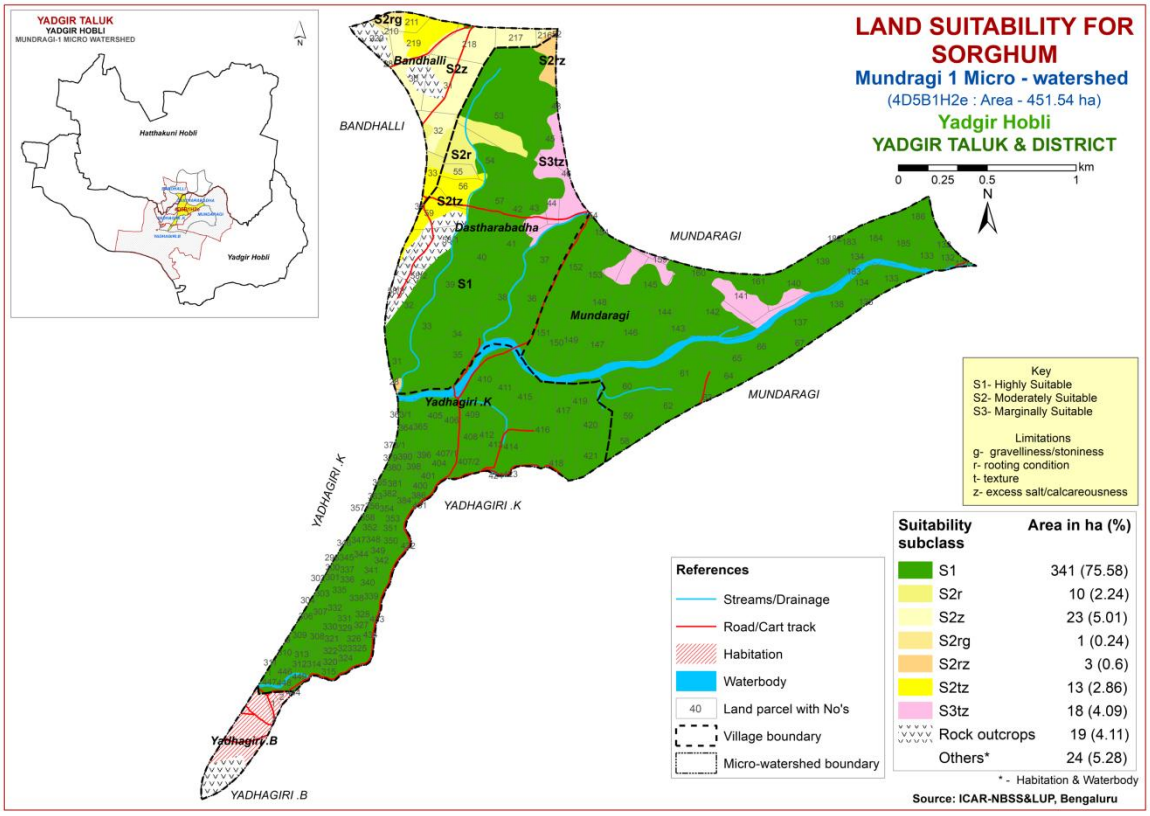


Fig. 7.1 Land Suitability map of Sorghum

7.2 Land Suitability for Maize (*Zea mays*)

Maize is one of the most important food crop grown in an area of 13.37 lakh ha in almost all the districts of the State. The crop requirements for growing maize (Table 7.3) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing maize was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.2.

A maximum area of about 391 ha (87%) is moderately suitable (Class S2) for growing maize and occur in all parts of the microwatershed. They have minor limitations of texture, rooting depth, gravelliness, calcareousness and drainage. Marginally suitable lands (Class S3) for growing maize occupy an area of about 18 ha (4%) and occur in the northern and eastern part of the microwatershed. They have moderate limitations of calcareousness and texture.

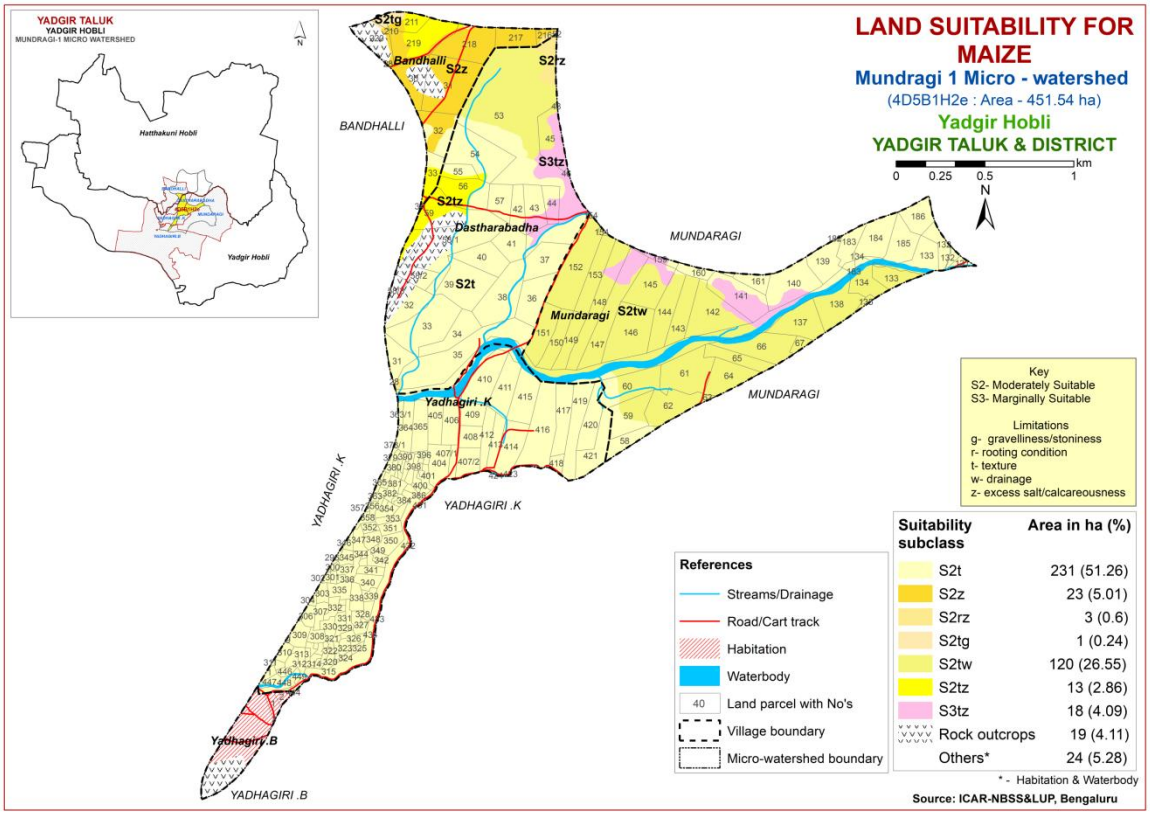


Fig. 7.2 Land Suitability map of Maize

7.3 Land Suitability for Bajra (*Pennisetum glaucum)*

Bajra is one of the most important millet crop grown in an area of 2.34 lakh ha in the northern districts of Karnataka state. The crop requirements for growing bajra (Table 7.4) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing bajra was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.3.

Entire area of about 409 ha (91%) is moderately suitable (Class S2) for growing bajra and occur in all parts of the microwatershed. They have minor limitations of texture, rooting depth, calcareousness and drainage.

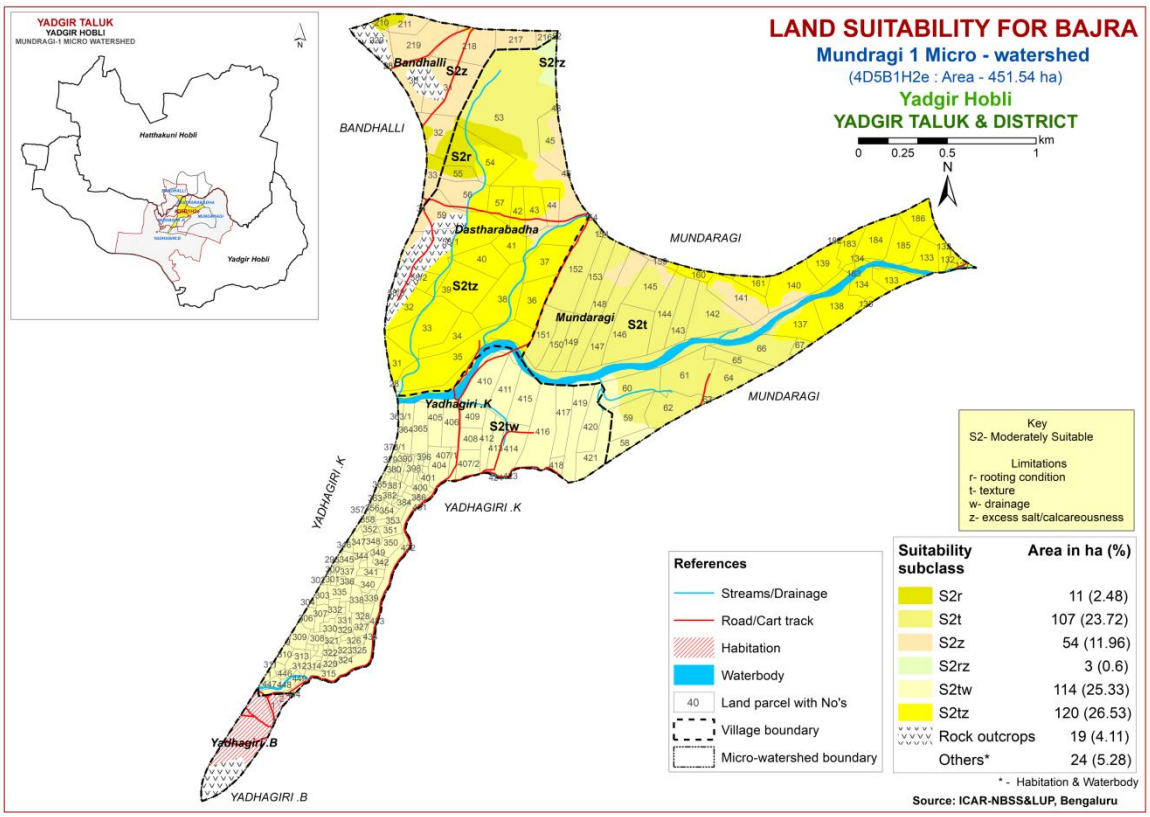


Fig. 7.3 Land Suitability map of Bajra

7.4 Land Suitability for Groundnut (*Arachis hypogaea*)

Groundnut is one of the major oilseed crop grown in an area of 6.54 lakh ha in Karnataka in most of the districts either as rainfed or irrigated crop. The crop requirements for growing groundnut (Table 7.5) were matched with the soil-site characteristics (Table 7.1) of the soils of the microwatershed and a land suitability map for growing groundnut was generated. The area extent and their geographic distribution of different suitability subclasses in the microwatershed are given in Figure 7.4.

An area of about 57 ha (13%) is moderately suitable (Class S2) for groundnut and are distributed in the northern, eastern, western and northwestern part of the microwatershed. It has minor limitations of rooting depth, texture and calcareousness. Marginally suitable lands (Class S3) for growing groundnut occupy a maximum area of about 352 ha (78%) and are distributed in all parts of the microwatershed. They have moderate limitations of texture and drainage.

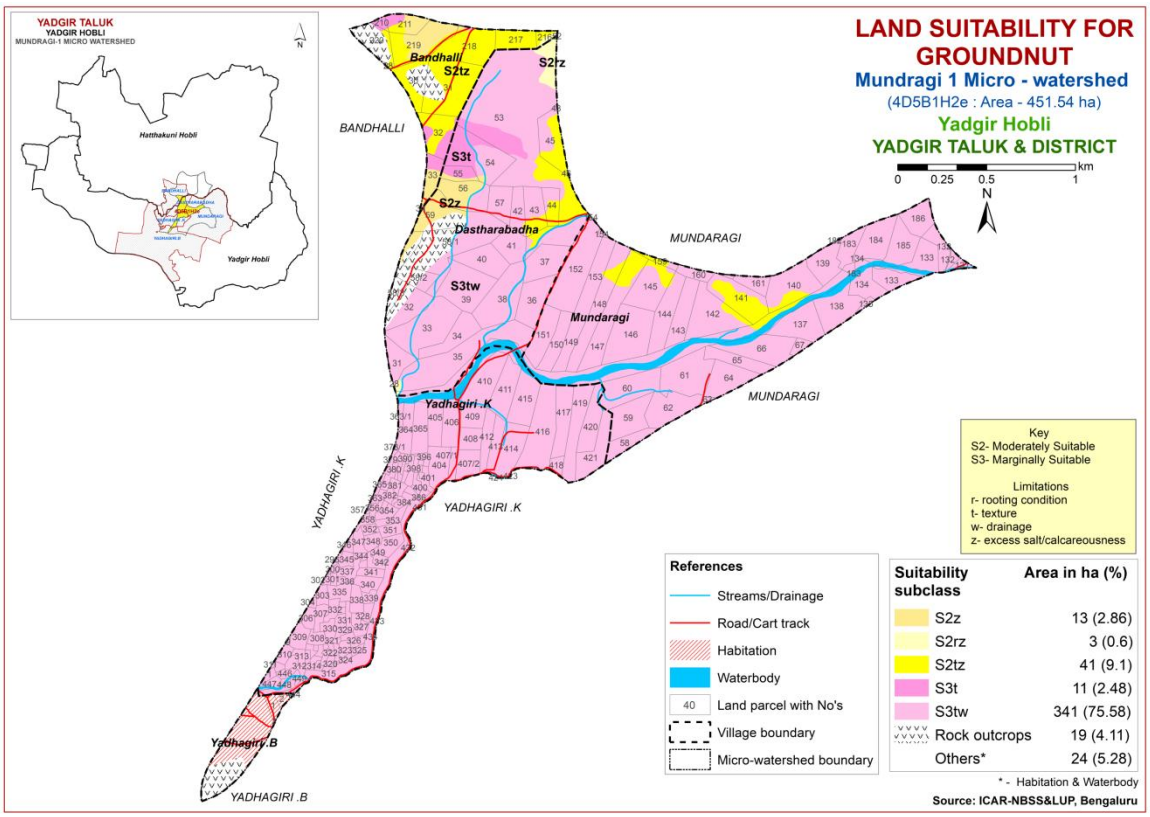


Fig. 7.4 Land Suitability map of Groundnut

7.5 Land Suitability for Sunflower (*Helianthus annus*)

Sunflower is one of the most important oilseed crop grown in an area of 3.56 lakh ha in the State in all the districts. The crop requirements for growing sunflower (Table 7.6) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing sunflower was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.5.

A maximum area of about 243 ha (54%) is highly suitable (Class S1) for growing sunflower and are distributed in the major part of the microwatershed with no limitations. An area of about 135 ha (30%) is moderately suitable (Class S2) for growing sunflower and are distributed in the northern, northwestern, central, northeastern and eastern part of the microwatershed. It has minor limitations of rooting depth, drainage and calcareousness. Marginally suitable (Class S3) lands for sunflower are found to occur in an area of about 32 ha (7%) with moderate limitations of rooting depth, calcareousness and texture and are distributed in the northern and northwestern part of the microwatershed.

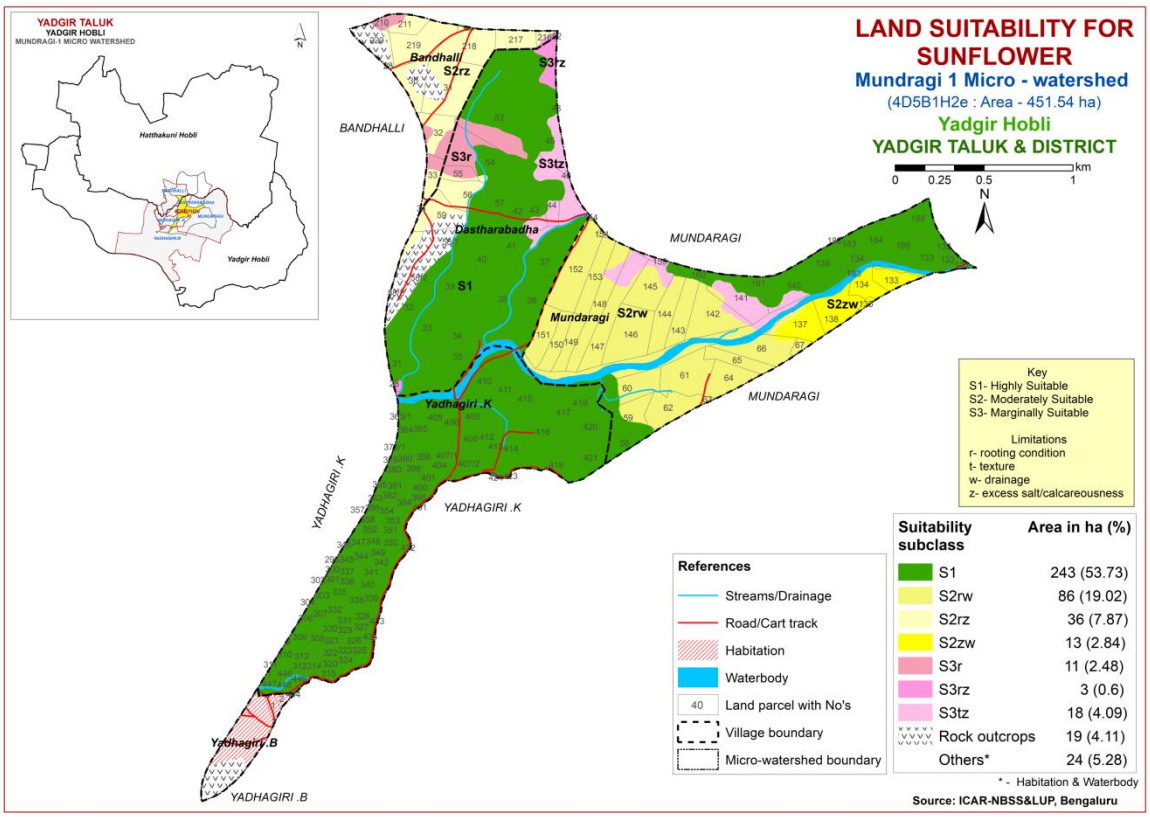


Fig. 7.5 Land Suitability map of Sunflower

7.6 Land Suitability for Red gram (*Cajanus Cajan)*

Redgram is one of the most important pulse crop grown in an area of 7.28 lakh ha in almost all the districts of the State. The crop requirements for growing red gram (Table 7.7) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing redgram was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.6.

A maximum area of about 395 ha (88%) is moderately suitable (Class S2) for growing redgram and are distributed in all parts of the microwatershed. They have minor limitations of rooting depth, calcareousness, texture and drainage. Marginally suitable lands (Class S3) for growing redgram occupy an area of about 14 ha (3%) and occur in the northern, western and northwestern part of the microwatershed. They have moderate limitations of rooting depth and calcareousness.

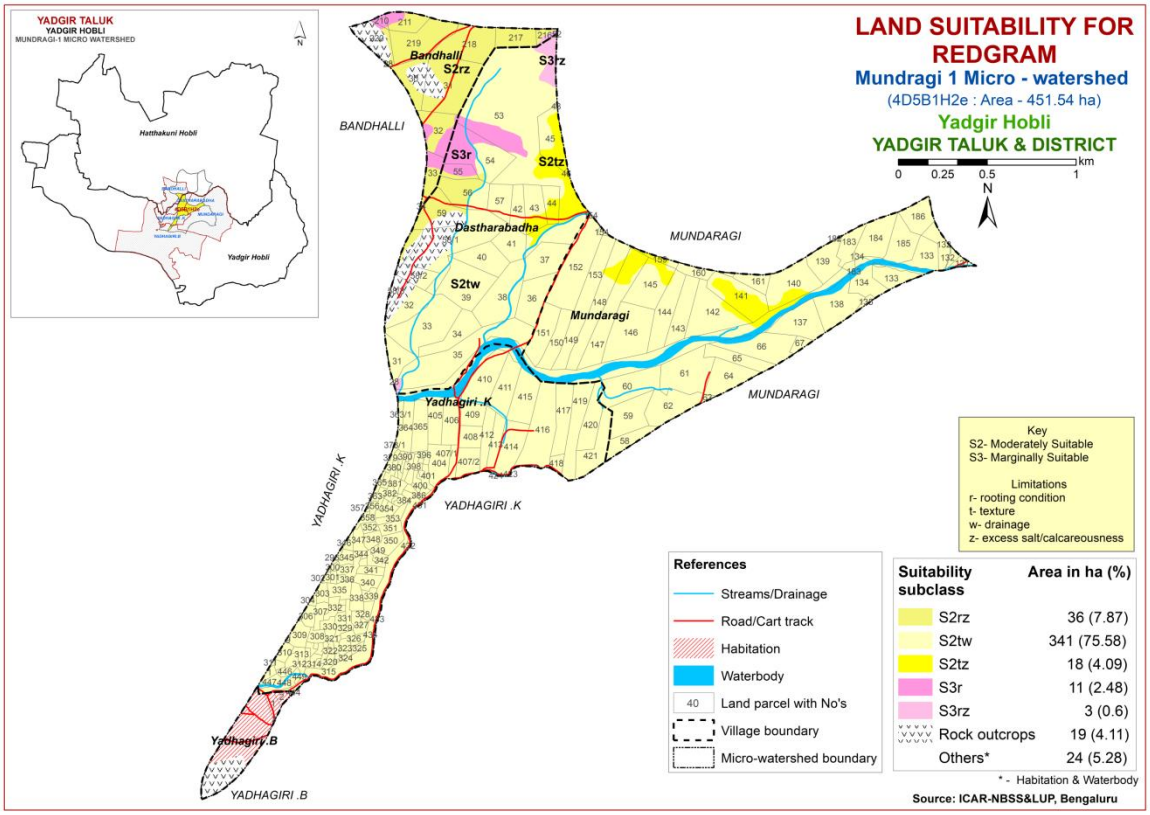


Fig. 7.6 Land Suitability map of Redgram

7.7 Land Suitability for Bengal gram (*Cicer aerativum*)

Bengal gram is one of the most important pulse crop grown in about 9.39 lakh ha area in Bijapur, Raichur, Kalaburgi, Dharwad, Belgaum and Bellary districts. The crop requirements for growing Bengal gram (Table 7.8) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing Bengal gram was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.7.

Highly (Class S1) suitable lands for growing Bengal gram occur in a maximum area of about 341 ha (76%) and are distributed in all parts of the microwatershed. An area of about 37 ha (8%) is moderately suitable (Class S2) for growing Bengal gram and are distributed in the northern, western and northwestern part of the microwatershed. It has minor limitations of rooting depth, texture, gravelliness and calcareousness. Marginally suitable lands (Class S3) occupy an area of about 13 ha (3%) and are distributed in the northwestern and western part of the microwatershed. They have moderate limitations of texture and calcareousness. Currently not suitable (Class N1) lands occur in an area of 18 ha (4%) and are distributed in the northern and eastern part of the microwatershed with severe limitations of texture and calcareousness.

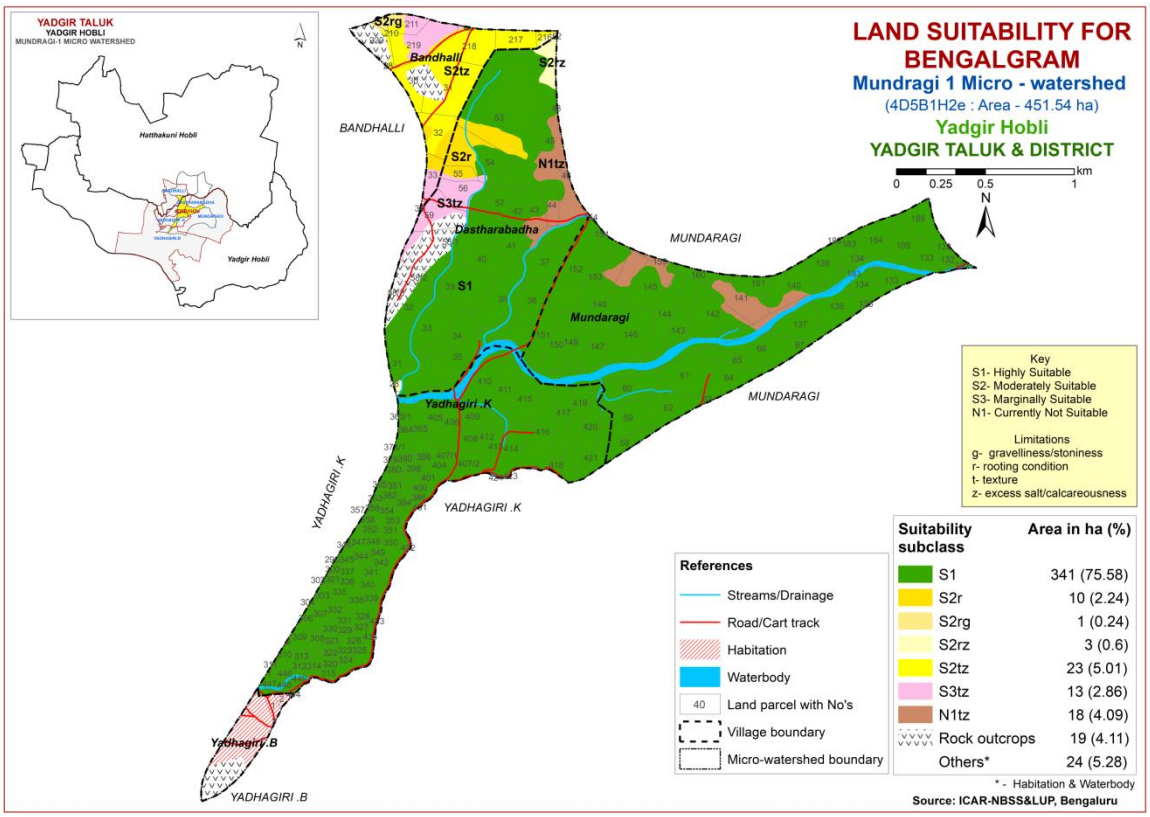


Fig. 7.7 Land Suitability map of Bengal gram

7.8 Land Suitability for Cotton (*Gossypium hirsutum*)

Cotton is one of the most important fibre crop grown in the State in about 8.75 lakh ha area in Raichur, Dharwad, Belgaum, Kalaburgi, Bijapur, Bidar, Bellary, Chitradurga and Chamarajnagar districts. The crop requirements for growing cotton (Table 7.9) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing cotton was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.8.

Highly (Class S1) suitable lands for growing Cotton occur in a maximum area of about 328 ha (73%) and are distributed in all parts of the microwatershed. An area of about 49 ha (11%) is moderately suitable (Class S2) for growing Cotton and are distributed in the northern, eastern, western and northwestern part of the microwatershed. It has minor limitations of rooting depth, gravelliness and calcareousness. Marginally suitable lands (Class S3) occupy an area of about 13 ha (3%) and are distributed in the northwestern and western part of the microwatershed. They have moderate limitations of texture and calcareousness. Currently not suitable (Class N1) lands occur in an area of 18 ha (4%) and are distributed in the northern and eastern part of the microwatershed with severe limitations of texture and calcareousness.

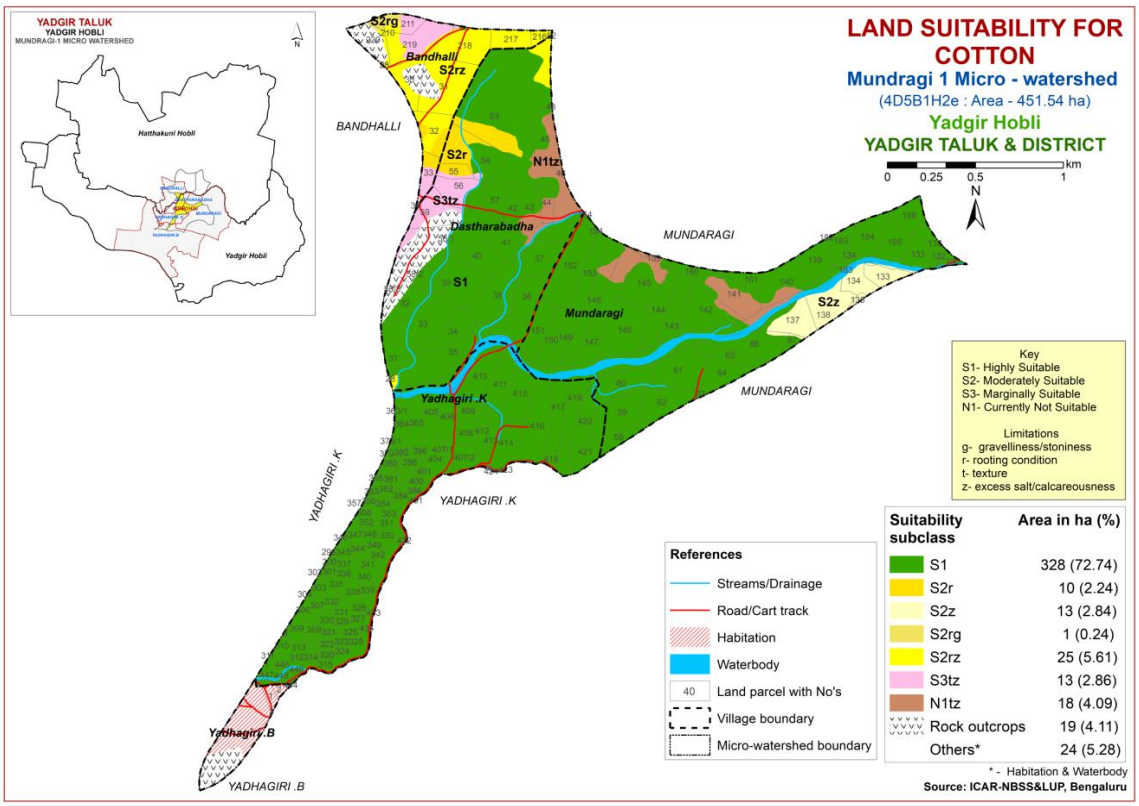


Fig. 7.8 Land Suitability map of Cotton

7.9 Land Suitability for Chilli (*Capsicum annuum)*

Chilli is one of the most important spice crop grown in about 0.42 lakh ha in Karnataka state. The crop requirements for growing chilli (Table 7.10) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing chilli was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.9.

An entire area of about 409 ha (91%) is moderately suitable (Class S2) for growing chilli and are distributed in all parts of the microwatershed. They have minor limitations of texture, gravelliness, drainage, calcareousness and rooting depth.

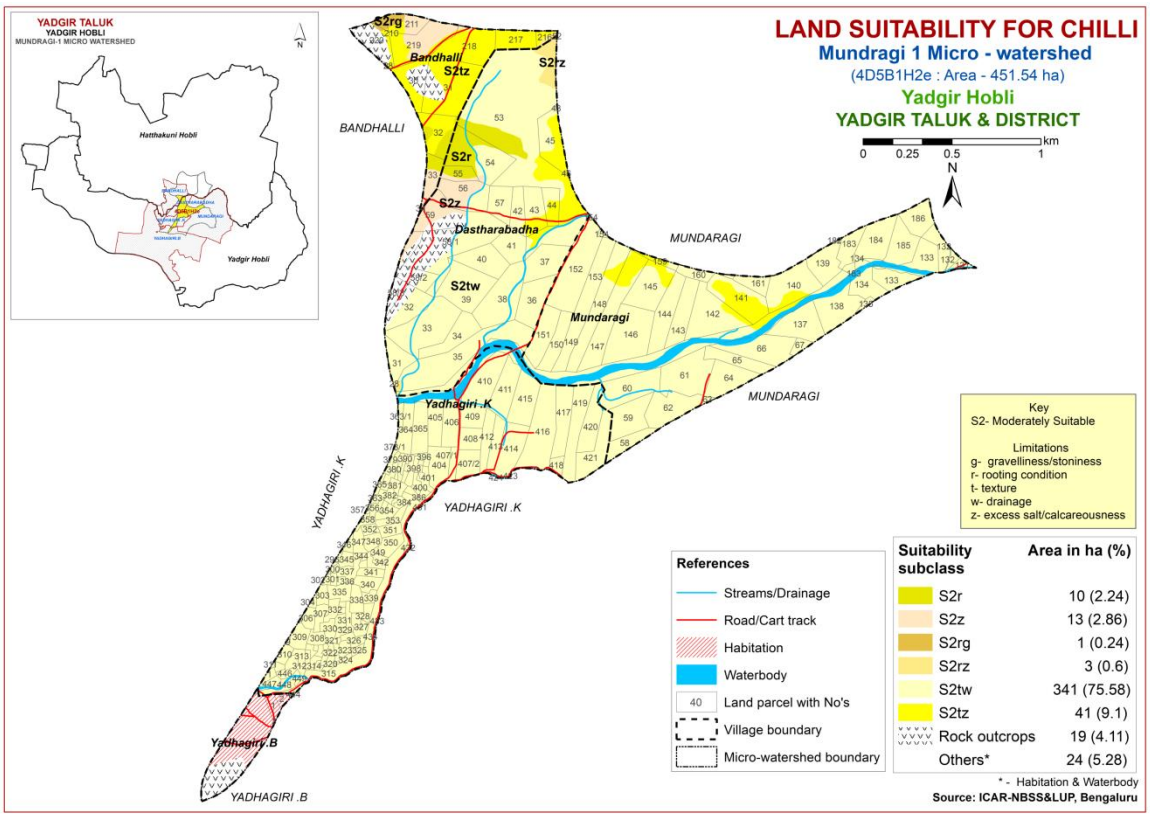


Fig 7.9 Land Suitability map of Chilli

7.10 Land Suitability for Tomato (*Lycopersicon esculentum*)

Tomato is one of the most important vegetable crop grown in about 0.61 lakh ha covering almost all the district of the state. The crop requirements for growing tomato (Table 7.11) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing tomato was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.10.

A maximum area of about 289 ha (64%) is moderately suitable (Class S2) for growing tomato and are distributed in the major part of the microwatershed. They have minor limitations of calcareousness, texture, drainage, gravelliness and rooting depth. Marginally suitable lands (Class S3) occupy an area of about 120 ha (27%) and are distributed in the central, northern, eastern and northeastern part of the microwatershed. They have moderate limitations of drainage and texture.

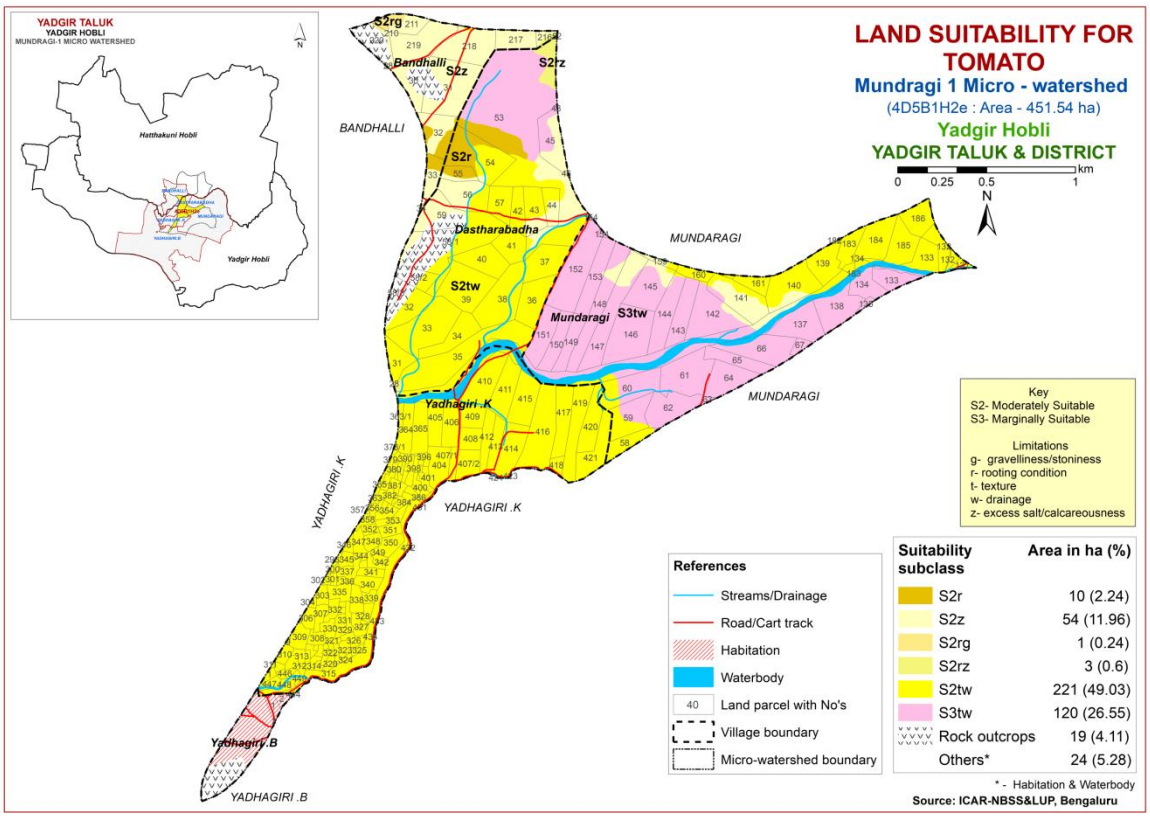


Fig 7.10 Land Suitability map of Tomato

7.11 Land Suitability for Brinjal (*Solanum melongena*)

Brinjal is one of the most important vegetable crop grown in the state. The crop requirements for growing Brinjal (Table 7.12) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing Brinjal was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.11.

Highly (Class S1) suitable lands for growing brinjal occur in an area of about 143 ha (32%) and are distributed in the northern, northwestern, central, eastern and northeastern part of the microwatershed. A maximum area of about 267 ha (59%) is moderately suitable (Class S2) for brinjal and is distributed in the major part of the microwatershed. They have minor limitations of texture and rooting depth.

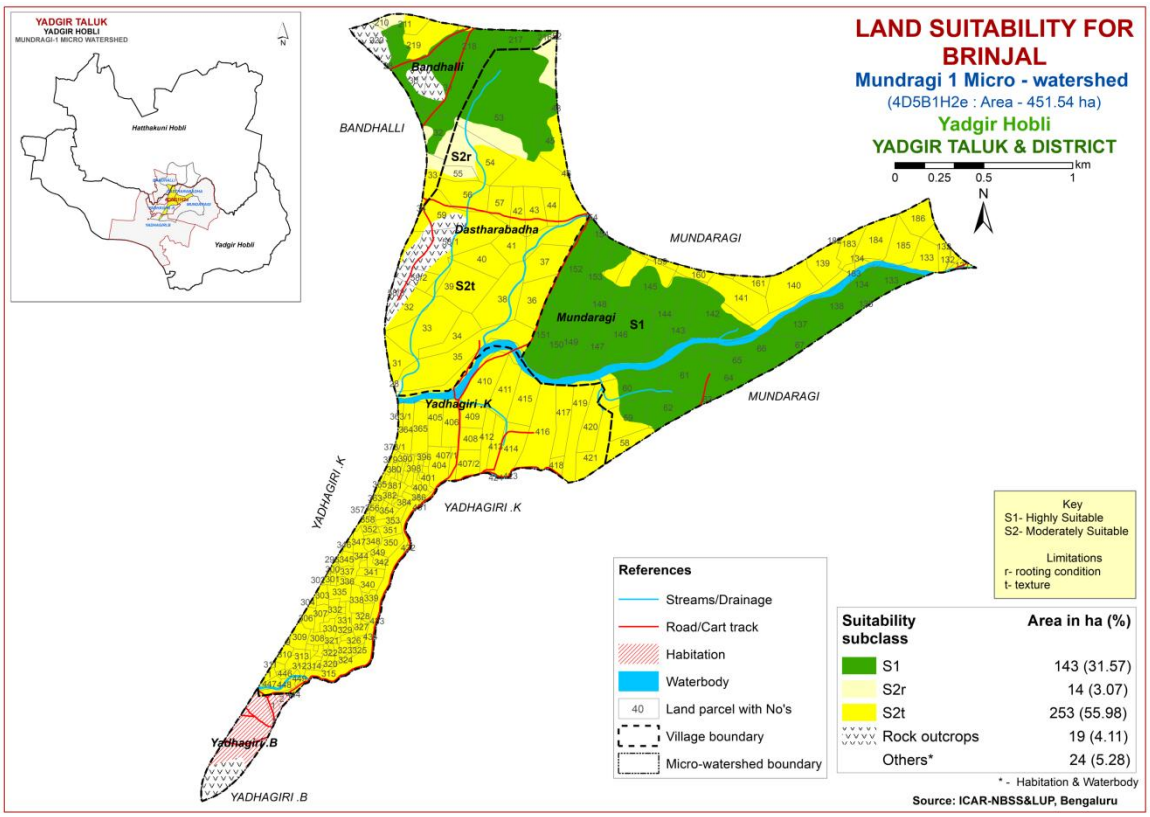


Fig 7.11 Land Suitability map of Brinjal

7.12 Land Suitability for Onion (*Allium cepa L.*,)

Onion is one of the most important vegetable crop grown in the state. The crop requirements for growing onion (Table 7.13) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing onion was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.12.

Highly (Class S1) suitable lands for growing onion occur in an area of 88 ha (20%) and are distributed in the northern, eastern, western, northeastern and northwestern part of the microwatershed. An area of about 100 ha (22%) is moderately suitable (Class S2) for onion and is distributed in the northern, central, northwestern and eastern part of the microwatershed. They have minor limitations of texture and rooting depth. A maximum area of 221 ha (49%) is marginally suitable (Class S3) and is distributed in major part of the microwatershed with moderate limitation of texture.

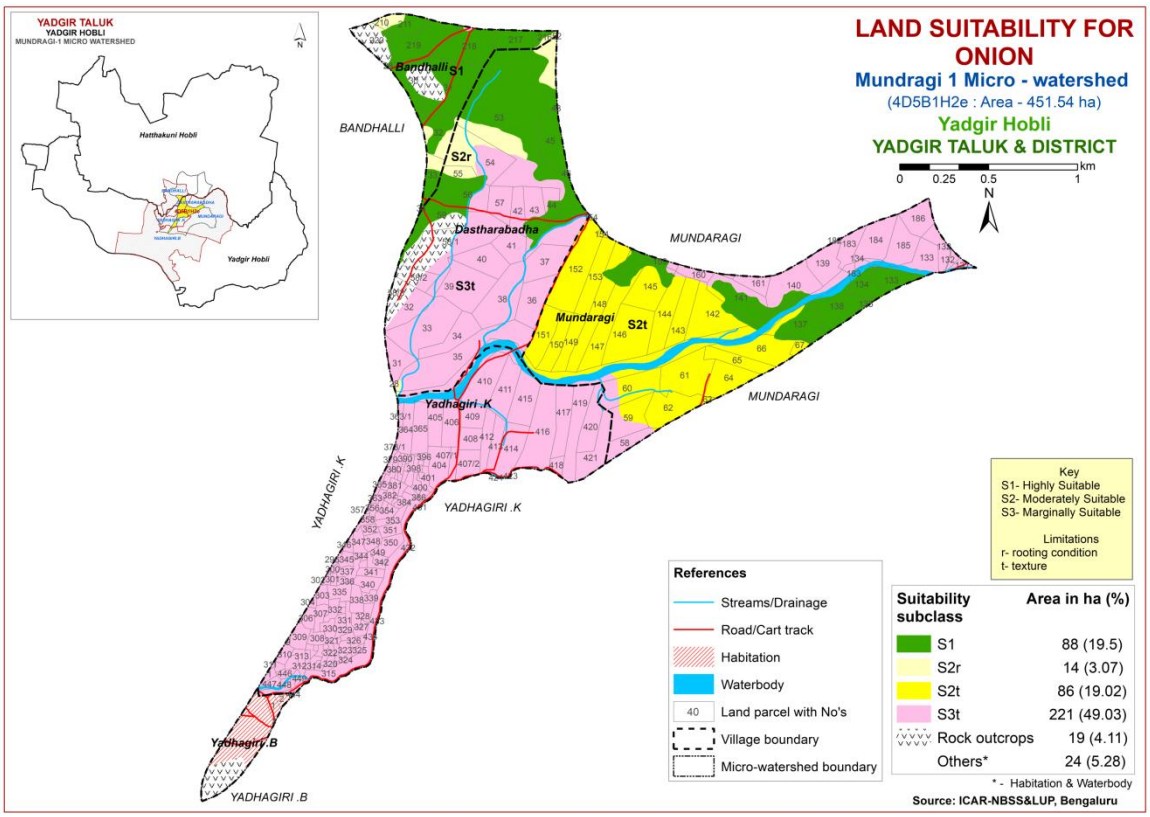


Fig 7.12 Land Suitability map of Onion

7.13 Land Suitability for Bhendi (*Abelmoschus esculentus*)

Bhendi is one of the most important vegetable crop grown in the state. The crop requirements for growing bhendi (Table 7.14) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing bhendi was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.13.

Highly (Class S1) suitable lands for growing bhendi occur in a maximum area of 262 ha (58%) and are distributed in the major part of the microwatershed. An area of about 147 ha (32%) is moderately suitable (Class S2) for bhendi and is distributed in the northern, southern, northwestern, eastern and southwestern part of the microwatershed. They have minor limitations of texture and rooting depth.

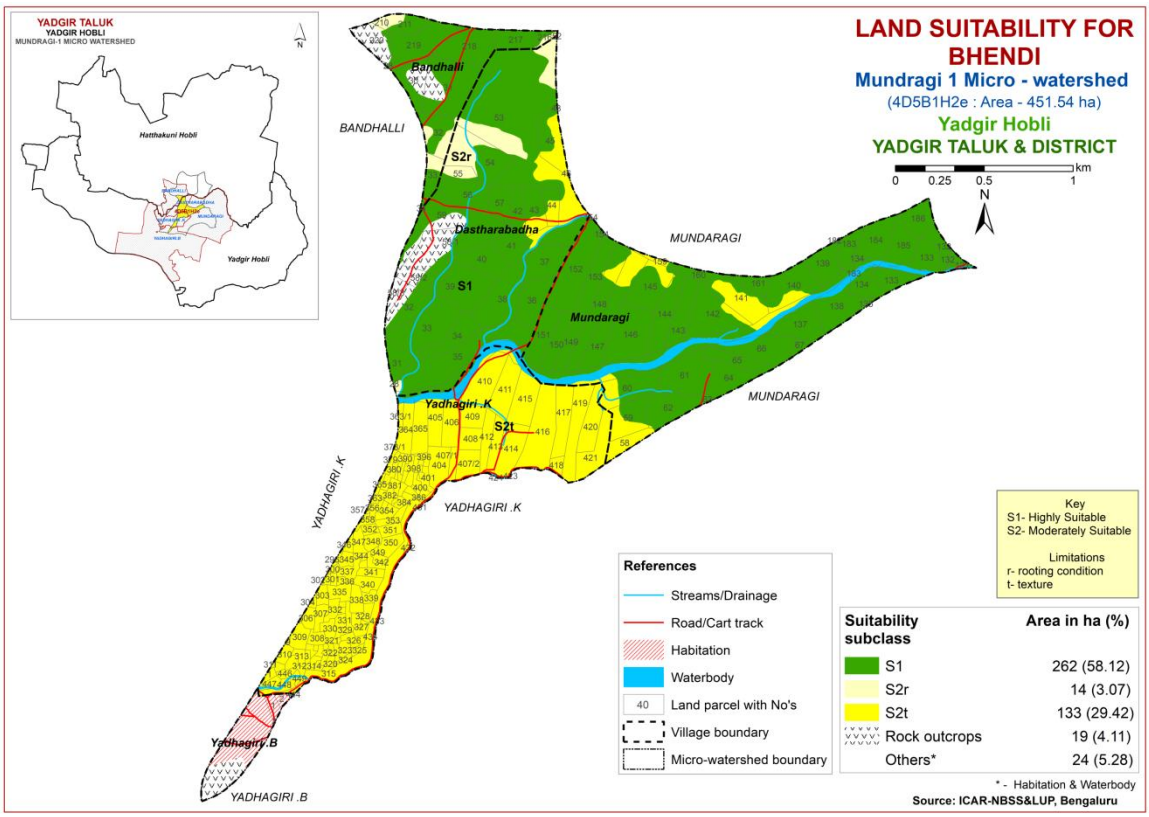


Fig 7.13 Land Suitability map of Bhendi

7.14 Land Suitability for Drumstick (*Moringa oleifera*)

Drumstick is one of the most important vegetable crop grown in about 2403 ha in the state. The crop requirements for growing drumstick (Table 7.15) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing drumstick was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.14.

A maximum area of about 395 ha (88%) is moderately suitable (Class S2) for growing drumstick and are distributed in all parts of the microwatershed. They have minor limitations of rooting depth, texture, calcareousness and drainage. An area of about 14 ha (3%) is marginally suitable (Class S3) for growing drumstick and are distributed in the northern, northwestern and western part of the microwatershed. They have moderate limitations of rooting depth and calcareousness.

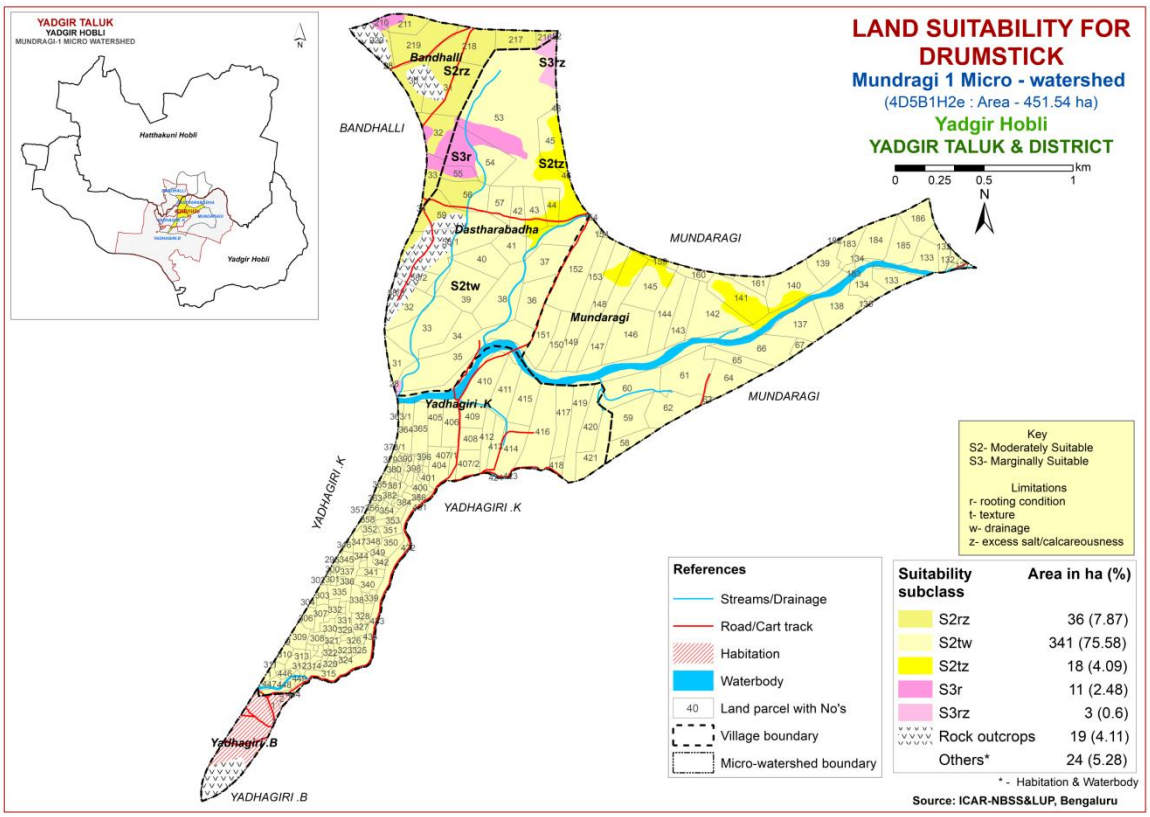


Fig 7.14 Land Suitability map of Drumstick

7.15 Land suitability for Mango (*Mangifera indica*)

Mango is one of the most important fruit crop grown in an area of 1.73 lakh ha in almost all the districts of the State. The crop requirements (Table 7.16) for growing mango were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing mango was generated. The area extent and their geographic distribution of different suitability subclasses in the microwatershed is given in Figure 7.15.

An area of about 21 ha (5%) is moderately suitable (Class S2) for growing drumstick and are distributed in the northern part of the microwatershed. It has minor limitation of rooting depth. A maximum area of 374 ha (83%) is marginally suitable (Class S3) for growing mango with moderate limitations of calcareousness, drainage, texture and rooting depth and are distributed in all parts of the microwatershed. An area of about 14 ha (3%) is currently not suitable (Class N1) for growing mango and occur in northern, northwestern and western part of the microwatershed with severe limitations of rooting depth and calcareousness.

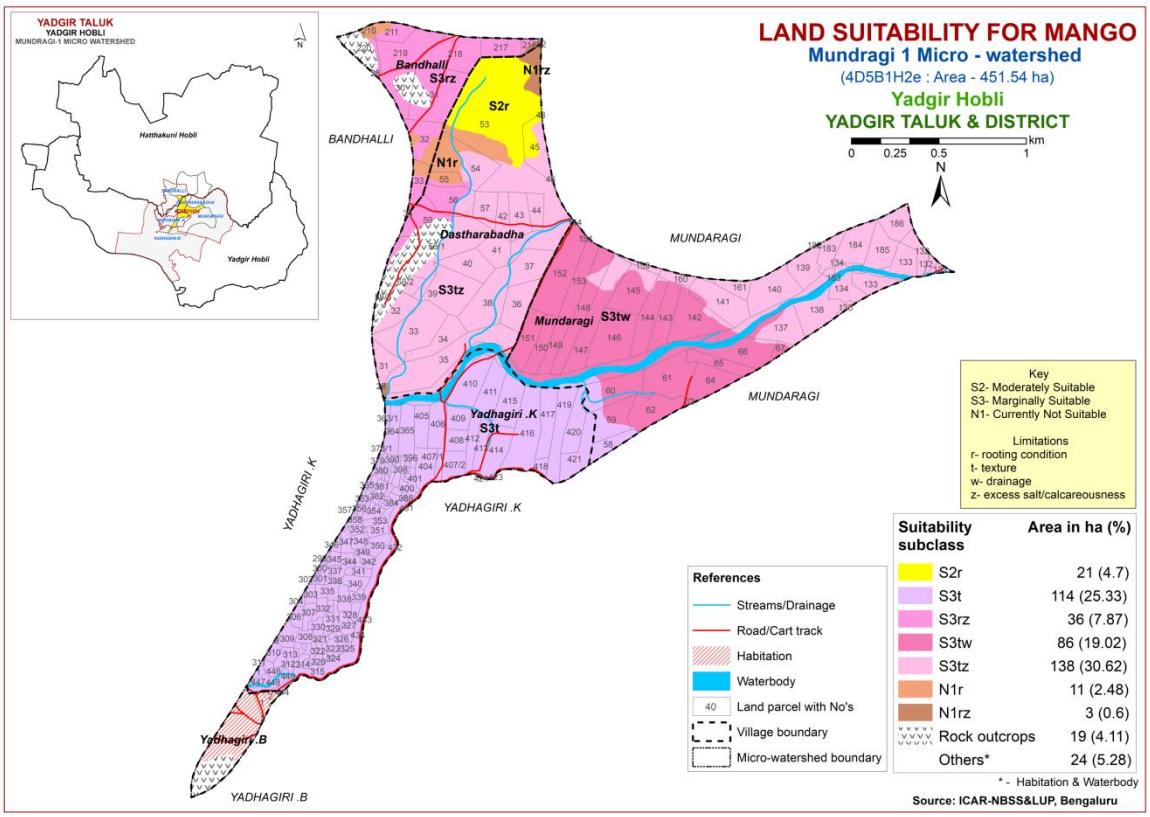


Fig. 7.15 Land Suitability map of Mango

7.16 Land suitability for Guava (*Psidium guajava*)

Guava is one of the most important fruit crop grown in an area of 0.06 lakh ha in almost all the districts of the State. The crop requirements (Table 7.17) for growing guava were matched with the soil-site characteristics (7.1) and a land suitability map for growing guava was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.16.

An area of about 54 ha (12%) is moderately suitable (Class S2) for guava and are distributed in the northern, eastern, western and northwestern part of the microwatershed. It has minor limitations of rooting depth, texture and calcareousness. Marginally suitable (Class S3) lands cover a maximum area of about 355 ha (79%) and are distributed in all parts of the microwatershed. They have moderate limitations of rooting depth, texture, calcareousness and drainage.

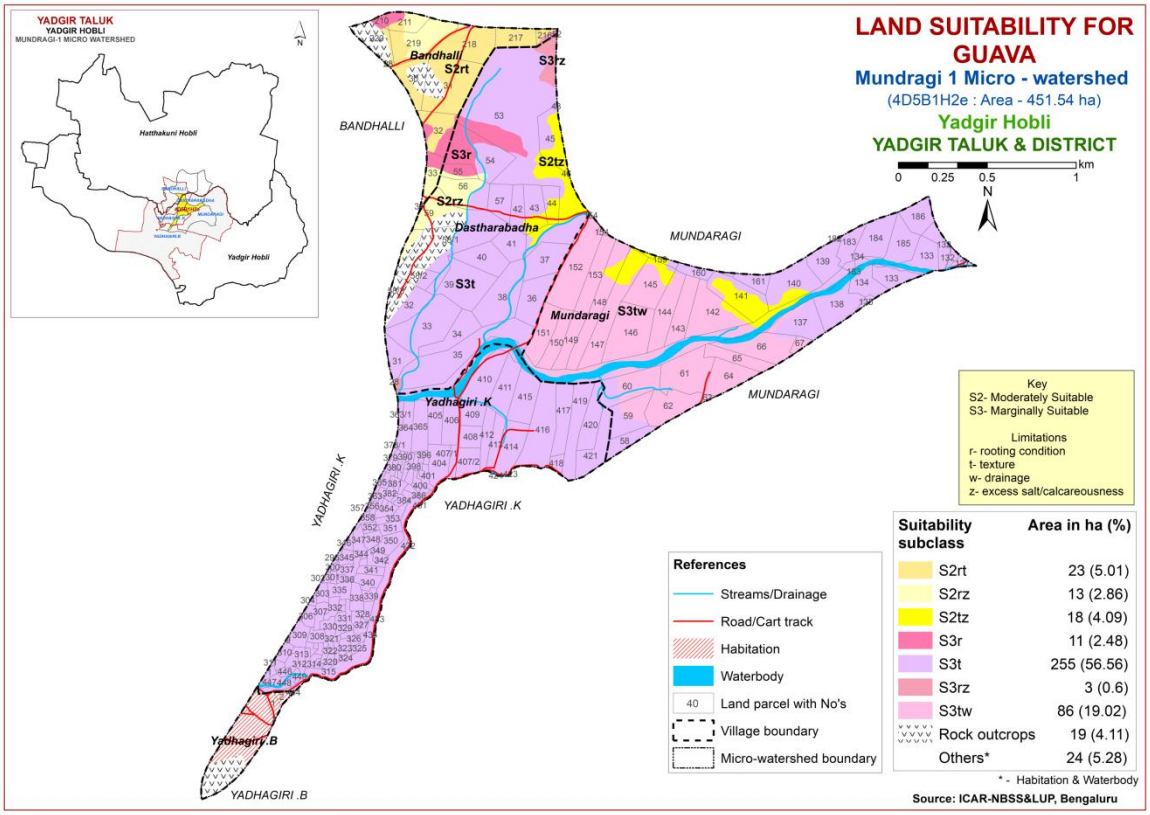


Fig. 7.16 Land Suitability map of Guava

7.17 Land suitability for Sapota (*Manilkara zapota*)

Sapota is one of the most important fruit crop grown in an area of 29373 ha in almost all the districts of the State. The crop requirements (Table 7.18) for growing sapota were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing sapota was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed are given in Figure 7.17.

An area of about 54 ha (12%) is moderately suitable (Class S2) for sapota and are distributed in the northern, eastern, western and northwestern part of the microwatershed. It has minor limitations of rooting depth, texture and calcareousness. Marginally suitable (Class S3) lands cover a maximum area of about 355 ha (79%) and are distributed in all parts of the microwatershed. They have moderate limitations of rooting depth, texture, calcareousness and drainage.

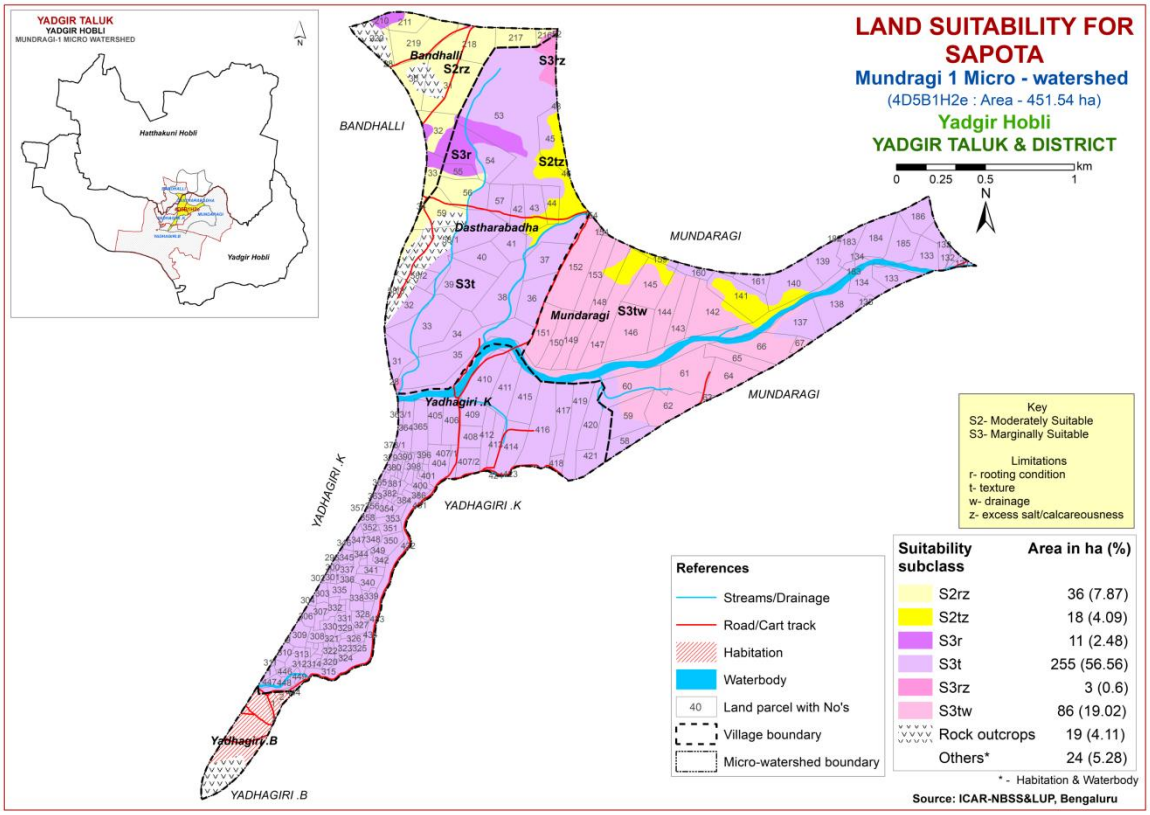


Fig. 7.17 Land Suitability map of Sapota

7.18 Land Suitability for Pomegranate (*Punica granatum*)

Pomegranate is one of the most important fruit crop commercially grown in about 18488 ha in Karnataka, mainly in Bijapur, Bagalkot, Koppal, Gadag and Chitradurga districts. The crop requirements for growing pomegranate (Table 7.19) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing pomegranate was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.18.

A maximum area of about 395 ha (88%) is moderately suitable (Class S2) for growing pomegranate and are distributed in all parts of the microwatershed. They have minor limitations of rooting depth, texture, calcareousness and drainage. An area of about 14 ha (3%) is marginally suitable (Class S3) for growing pomegranate and are distributed in the northern, northwestern and western part of the microwatershed. They have moderate limitations of rooting depth and calcareousness.

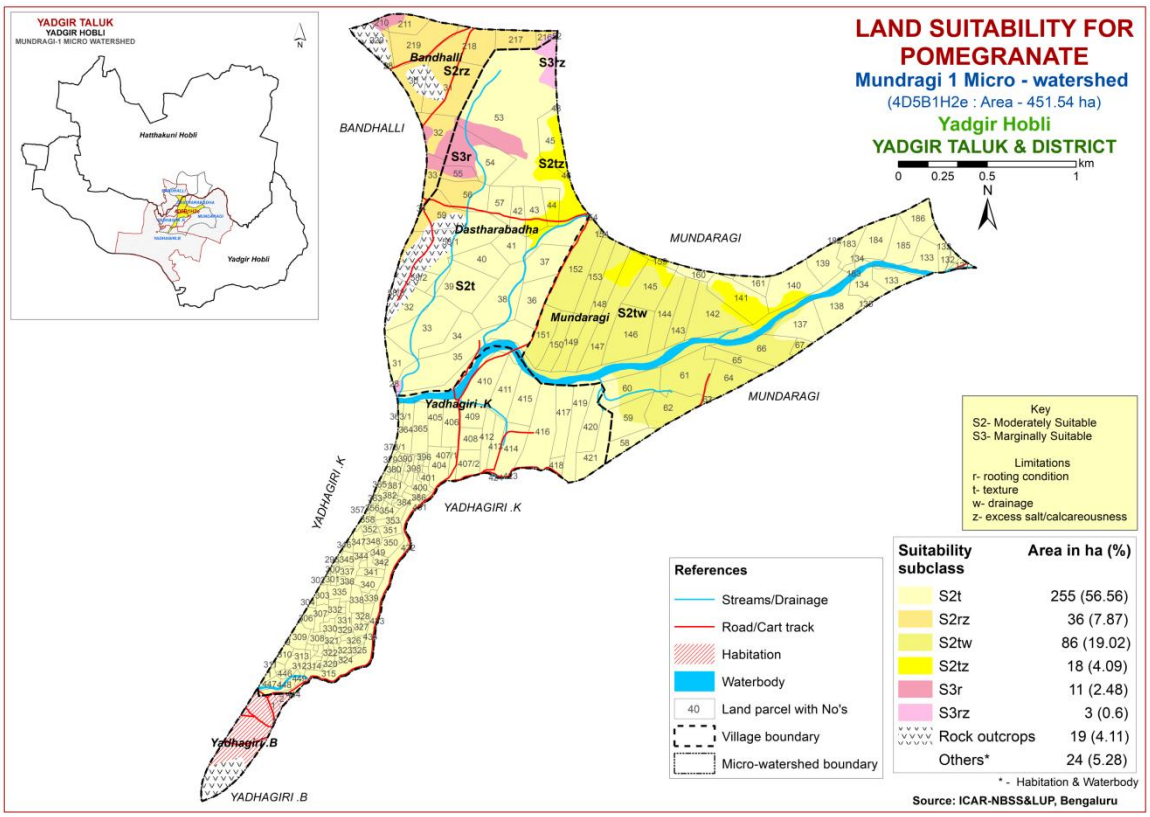


Fig 7.18 Land Suitability map of Pomegranate

7.19 Land Suitability for Musambi (*Citrus limetta*)

Musambi is one of the important fruit crop grown in an area of 3446 ha in almost all the districts of the State. The crop requirements for growing musambi (Table 7.20) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing musambi was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.19.

Highly (Class S1) suitable lands for growing musambi occur in a maximum area of 240 ha (53%) and are distributed in the major part of the microwatershed. An area of about 156 ha (34%) is moderately suitable (Class S2) for growing musambi and are distributed in the northern, central, western, eastern, northeastern and northwestern part of the microwatershed. They have minor limitations of drainage, rooting depth and calcareousness. Marginally suitable (Class S3) lands occupy an area of about 14 ha (3%) and are distributed in the northern, northwestern and western part of the microwatershed. They have moderate limitations of rooting depth and calcareousness.

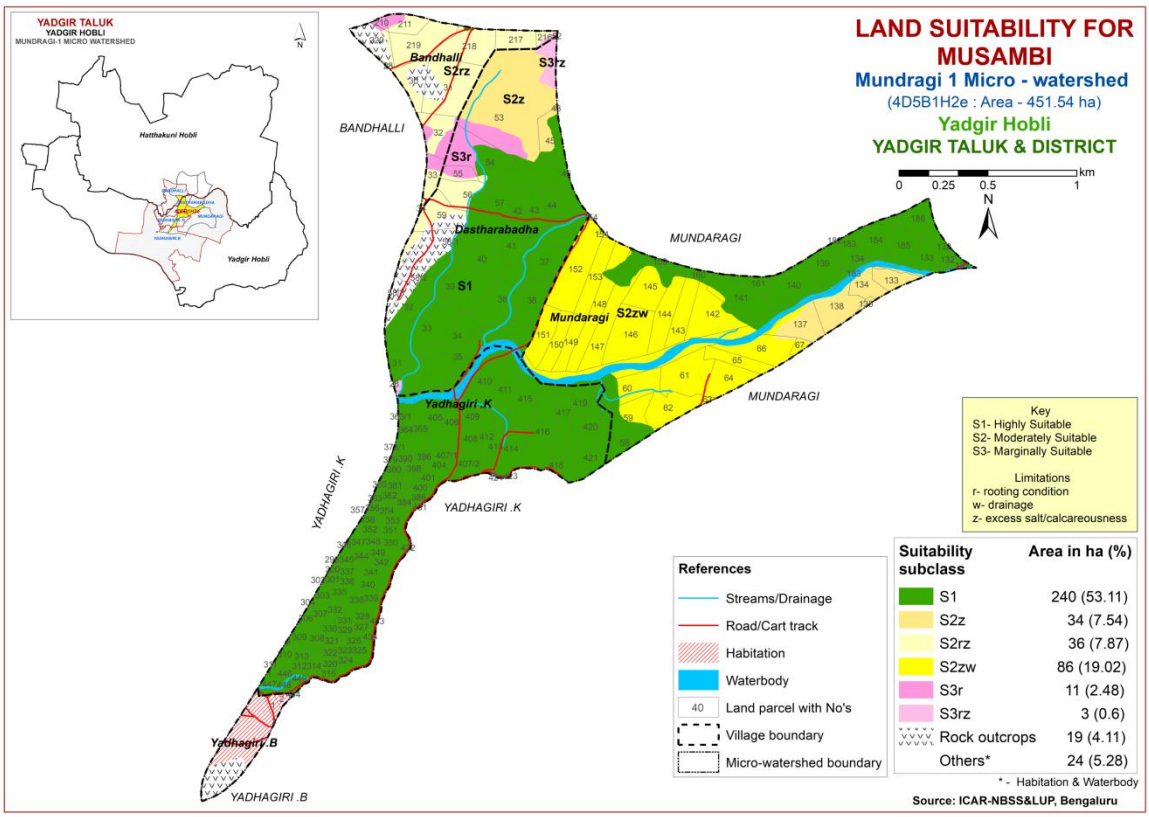


Fig. 7.19 Land Suitability map of Musambi

7.20 Land Suitability for Lime (*Citrus sp*)

Lime is one of the most important fruit crop grown in an area of 0.11 lakh ha in almost all the districts of the State. The crop requirements for growing lime (Table 7.21) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing lime was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7. 20.

Highly (Class S1) suitable lands for growing lime occur in a maximum area of 240 ha (53%) and are distributed in the major part of the microwatershed. An area of about 156 ha (34%) is moderately suitable (Class S2) for growing lime and are distributed in the northern, central, western, eastern, northeastern and northwestern part of the microwatershed. They have minor limitations of drainage, rooting depth and calcareousness. Marginally suitable (Class S3) lands occupy an area of about 14 ha (3%) and are distributed in the northern, northwestern and western part of the microwatershed. They have moderate limitations of rooting depth and calcareousness.

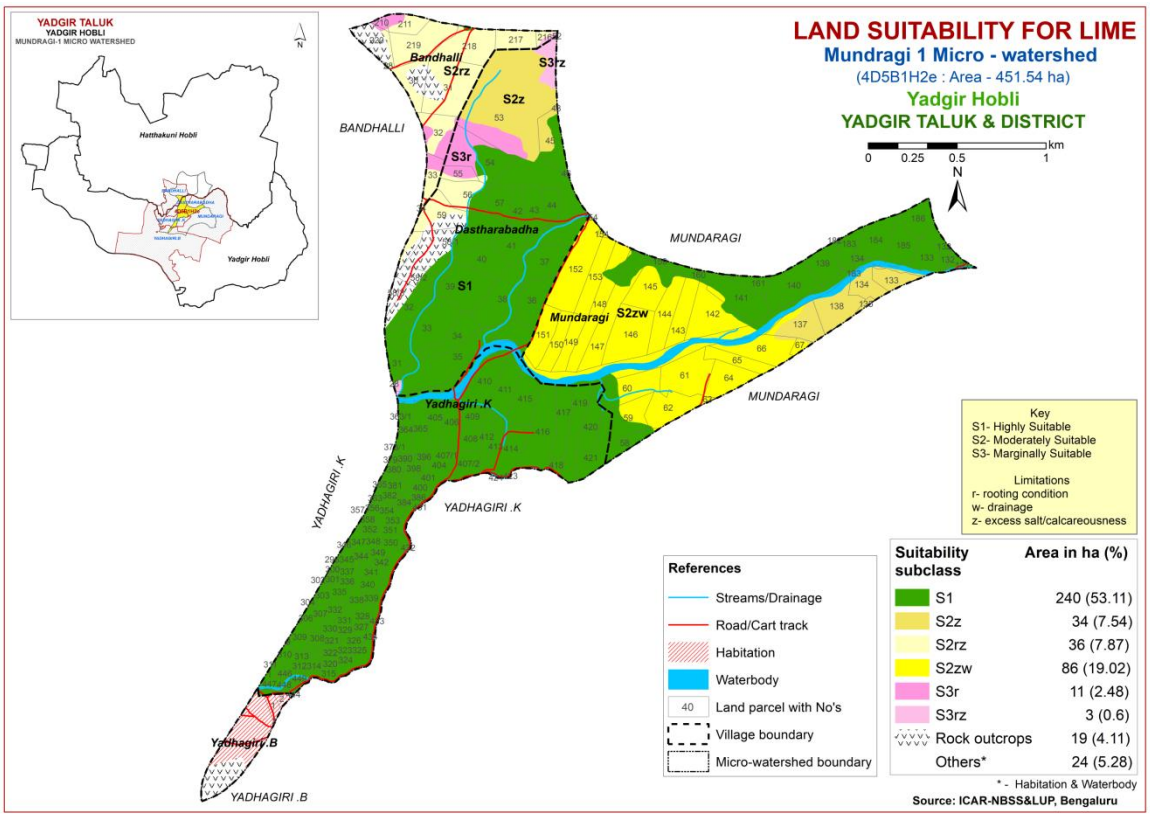


Fig. 7.20 Land Suitability map of Lime

7.21 Land Suitability for Amla (*Phyllanthus emblica*)

Amla is one of the medicinal fruit crop grown in almost all the districts of the State. The crop requirements for growing amla (Table 7.22) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing amla was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.21.

An area of about 108 ha (24%) is highly suitable (Class S1) for growing amla and is distributed in the northern, central, northwestern and eastern part of the microwatershed. A maximum area of about 282 ha (62%) has soils that are moderately suitable (Class S2) for growing amla with minor limitations of texture, calcareousness and rooting depth and are distributed in the major part of the microwatershed. An area of 18 ha (4%) is marginally suitable (Class S3) with moderate limitations of calcareousness and texture and are distributed in the northern and eastern part of the microwatershed.

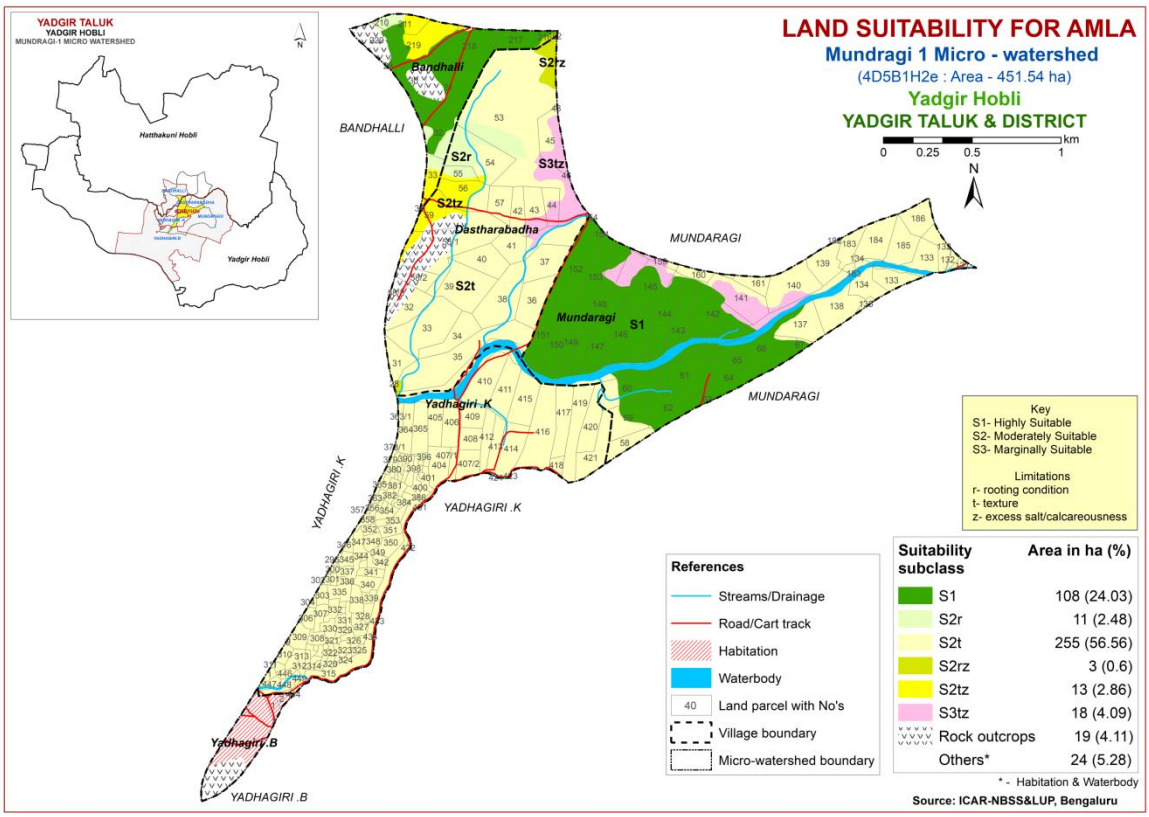


Fig. 7.21 Land Suitability map of Amla

7.22 Land Suitability for Cashew (*Anacardium occidentale)*

Cashew is one of the most important plantation nut crop grown in an area of 0.7 lakh ha in almost all the districts of the State. The crop requirements for growing cashew (Table 7.23) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing cashew was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.22.

An area of about 23 ha (5%) has soils that are moderately suitable (Class S2) for growing cashew with minor limitations of texture and rooting depth and are distributed in the northern and northwestern part of the microwatershed. The marginally suitable (Class S3) lands cover an area of about 18 ha (4%) and occur in the northern and eastern part of the microwatershed. It has moderate limitations of calcareousness and texture. A maximum area of about 367 ha (82%) is currently not suitable (Class N1) and are distributed in all parts of the microwatershed with severe limitations of rooting depth, texture and calcareousness.

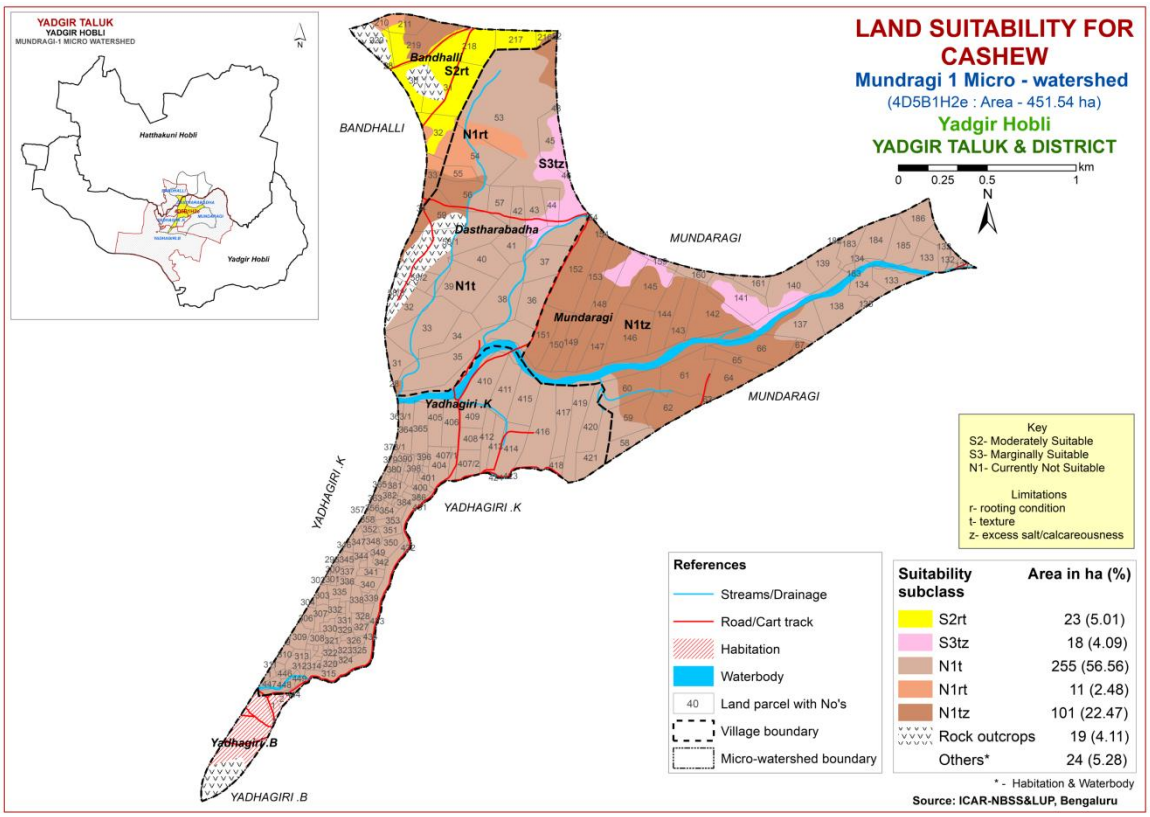


Fig. 7.22 Land Suitability map of Cashew

7. 23 Land Suitability for Jackfruit (*Artocarpus heterophyllus*)

Jackfruit is one of the most important fruit crop grown in an area of 5368 ha in almost all the districts of the State. The crop requirements for growing jackfruit (Table 7.24) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing jackfruit was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed are given in Figure 7.23.

An area of about 36 ha (8%) has soils that are moderately suitable (Class S2) for growing jackfruit with minor limitations of calcareousness and rooting depth and are distributed in the northern, northwestern and western part of the microwatershed. Marginally suitable (Class S3) lands for growing jackfruit occupy a maximum area of about 373 ha (83%) and are distributed in all parts of the microwatershed. They have moderate limitations of rooting depth, calcareousness, texture and drainage.

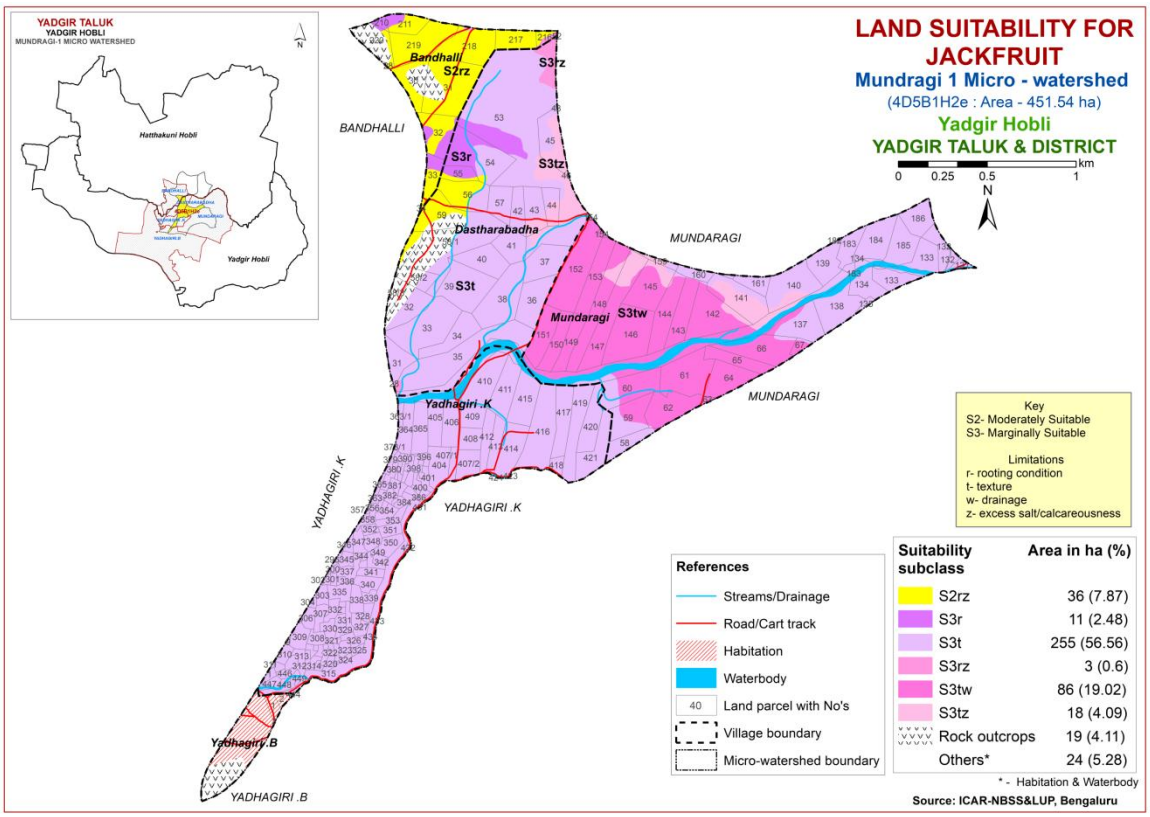


Fig. 7.23 Land Suitability map of Jackfruit

7.24 Land Suitability for Jamun (*Syzygium cumini*)

Jamun is an important fruit crop grown in almost all the districts of the State. The crop requirements for growing jamun (Table 7.25) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing jamun was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.24.

A maximum area of about 359 ha (80%) has soils that are moderately suitable (Class S2) for growing jamun with minor limitations of rooting depth, calcareousness, texture and drainage and are distributed in all parts of the microwatershed. Marginally suitable (Class S3) lands for growing jamun occupy an area of about 49 ha (11%) and are distributed in the northern, northwestern and western part of the microwatershed. They have moderate limitations of rooting depth and calcareousness.

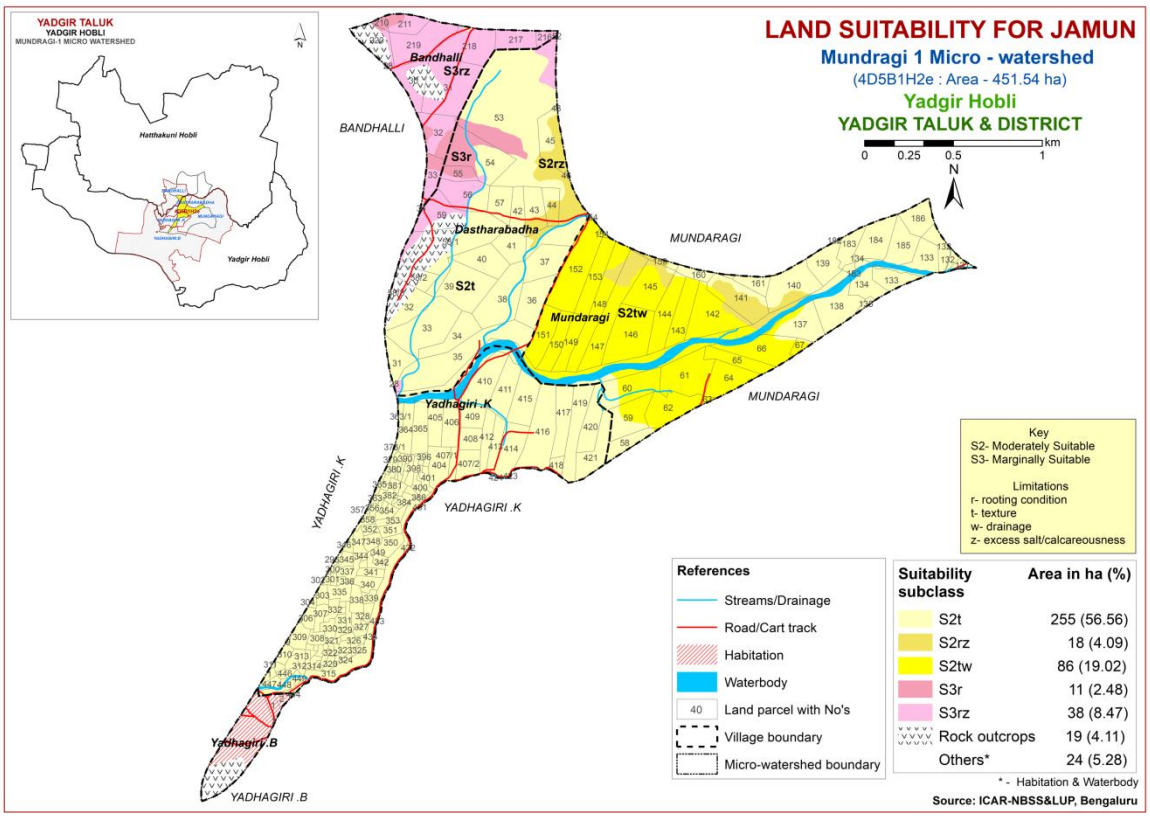


Fig. 7.24 Land Suitability map of Jamun

7.25 Land Suitability for Custard Apple (*Annona reticulata*)

Custard apple is one of the most important fruit crop grown in almost all the districts of the State. The crop requirements for growing custard apple (Table7.26) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing custard apple was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.25.

A maximum area of 356 ha (79%) is highly suitable (Class S1) for growing custard apple and are distributed in all parts of the microwatershed. An area of about 35 ha (8%) has soils that are moderately suitable (Class S2) for growing custard apple with minor limitations of rooting depth and calcareousness and are distributed in the northern, northwestern and western part of the microwatershed. An area of about 18 ha (4%) is marginally suitable (Class S3) for growing custard apple and are distributed in the northern and eastern part of the microwatershed with moderate limitations of calcareousness and texture.

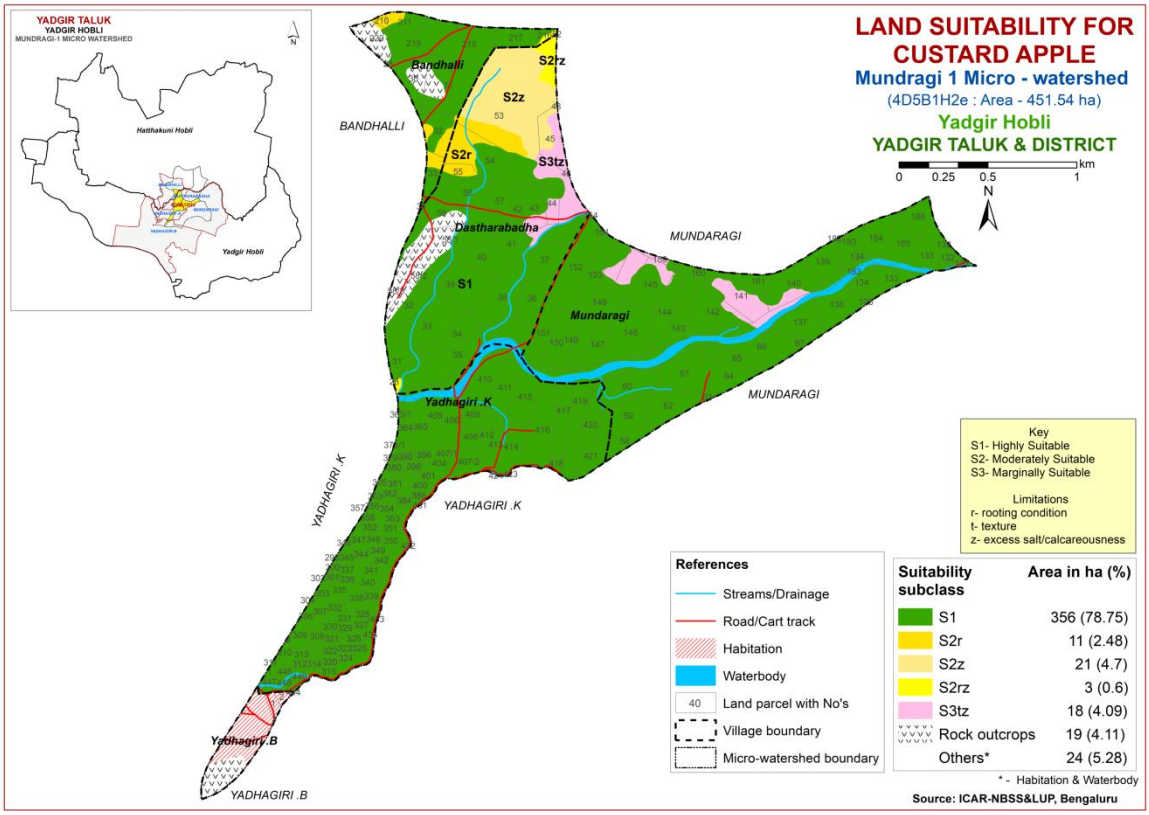


Fig. 7.25 Land Suitability map of Custard Apple

7.26 Land Suitability for Tamarind (*Tamarindus indica*)

Tamarind is one of the most important spice crop grown in almost all the districts of the state. The crop requirements for growing tamarind (Table 7.27) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing tamarind was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Fig. 7.26.

A maximum area of about 359 ha (80%) is moderately suitable (Class S2) for growing tamarind and are distributed in all parts of the microwatershed. They have minor limitations of rooting depth, texture and drainage. Marginally suitable (Class S3) lands for growing tamarind occupy an area of about 36 ha (8%) and are distributed in the northern, western and northwestern part of the microwatershed. It has moderate limitations of rooting depth and calcareousness. An area of about 14 ha (3%) is currently not suitable (Class N1) for growing tamarind and occur in the northern, northwestern and western part of the microwatershed with severe limitations of rooting depth and calcareousness.

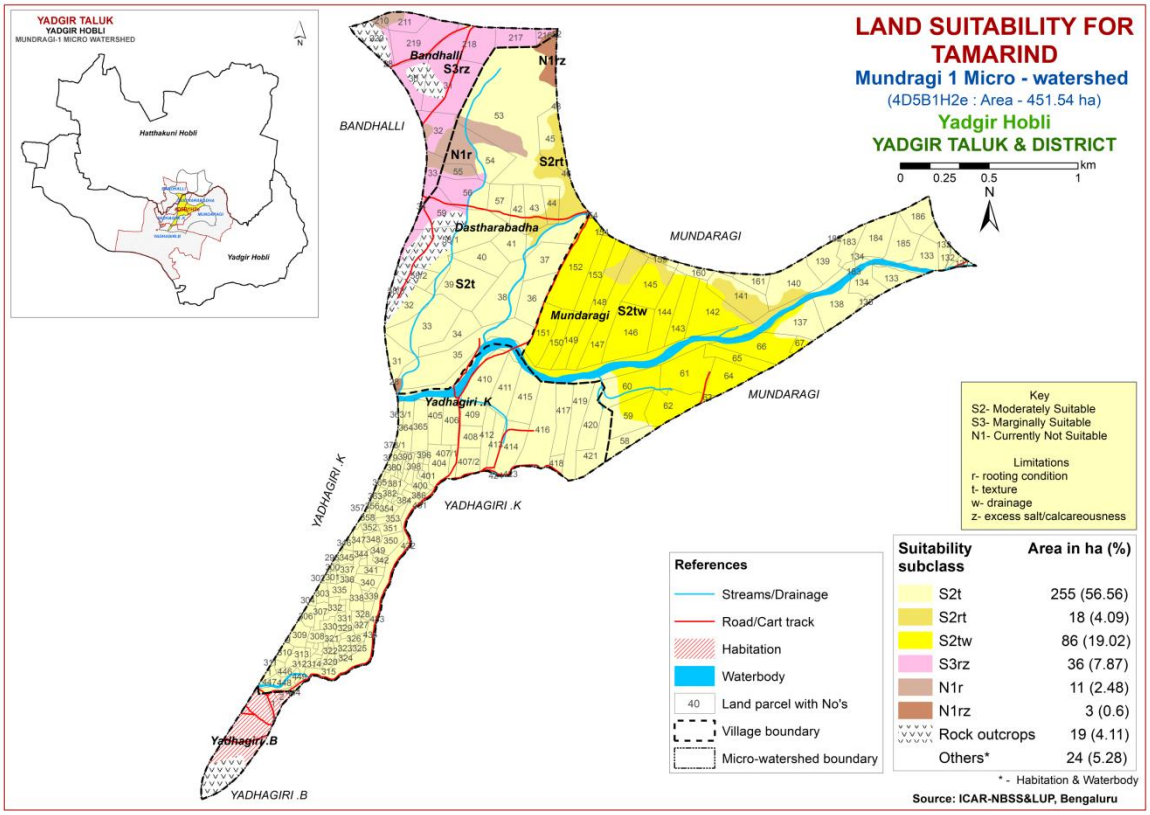


Fig. 7.26 Land Suitability map of Tamarind

7.27 Land Suitability for Mulberry (*Morus nigra*)

Mulberry is an important leaf crop grown for rearing silkworms in about 1.6 lakh ha area in all the districts of the state. The crop requirements for growing mulberry (Table 7.28) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing mulberry was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.27.

An area of about 36 ha (8%) has soils that are moderately suitable (Class S2) for growing mulberry with minor limitations of calcareousness and rooting depth and are distributed in the northern, western and northwestern part of the microwatershed. Marginally suitable (Class S3) lands for growing mulberry occupy a maximum area of about 373 ha (83%) and are distributed in all parts of the microwatershed. They have moderate limitations of rooting depth, texture, calcareousness and drainage.

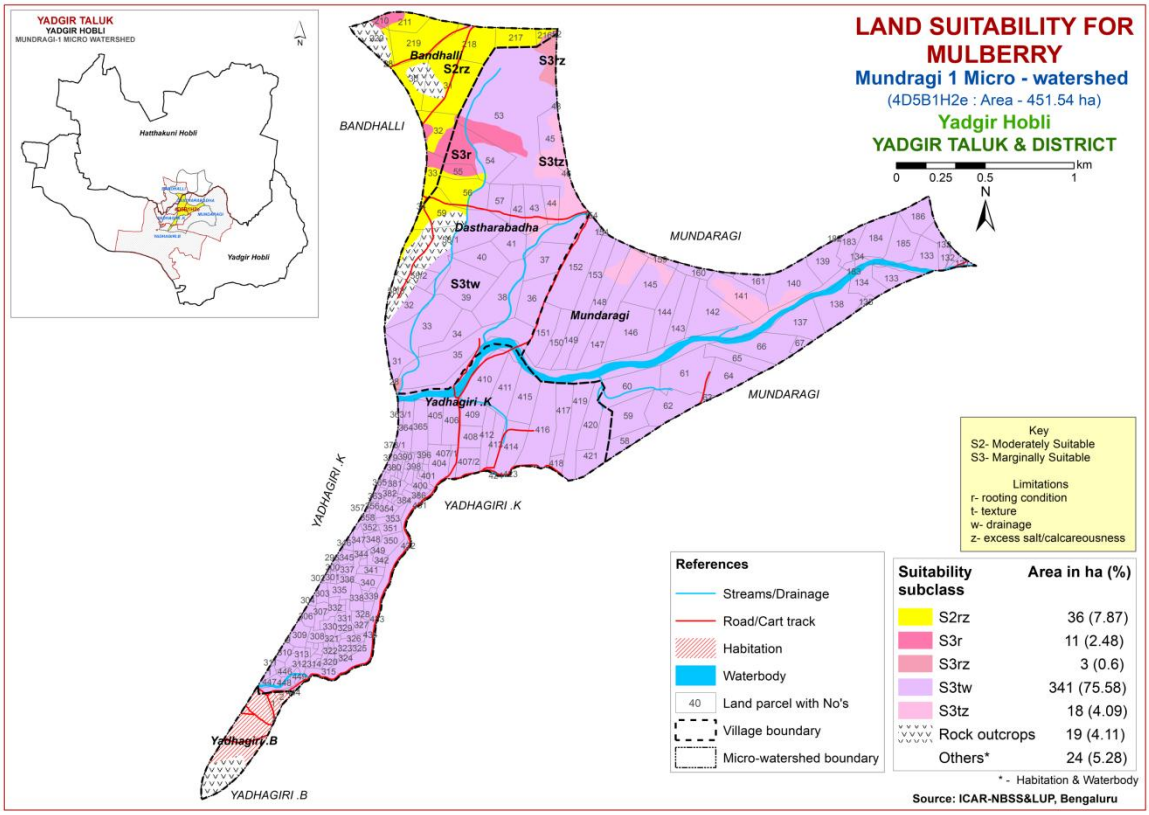


Fig 7.27 Land Suitability map of Mulberry

7.28 Land suitability for Marigold (*Tagetes sps*.)

Marigold is one of the most important flower crop grown in an area of 9108 ha in almost all the districts of the State. The crop requirements (Table 7.29) for growing marigold were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing marigold was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed are given in Figure 7.28.

An entire area of about 409 ha (91%) is moderately suitable (Class S2) for growing marigold and are distributed in all parts of the microwatershed. They have minor limitations of texture, drainage, rooting depth, gravelliness and calcareousness.

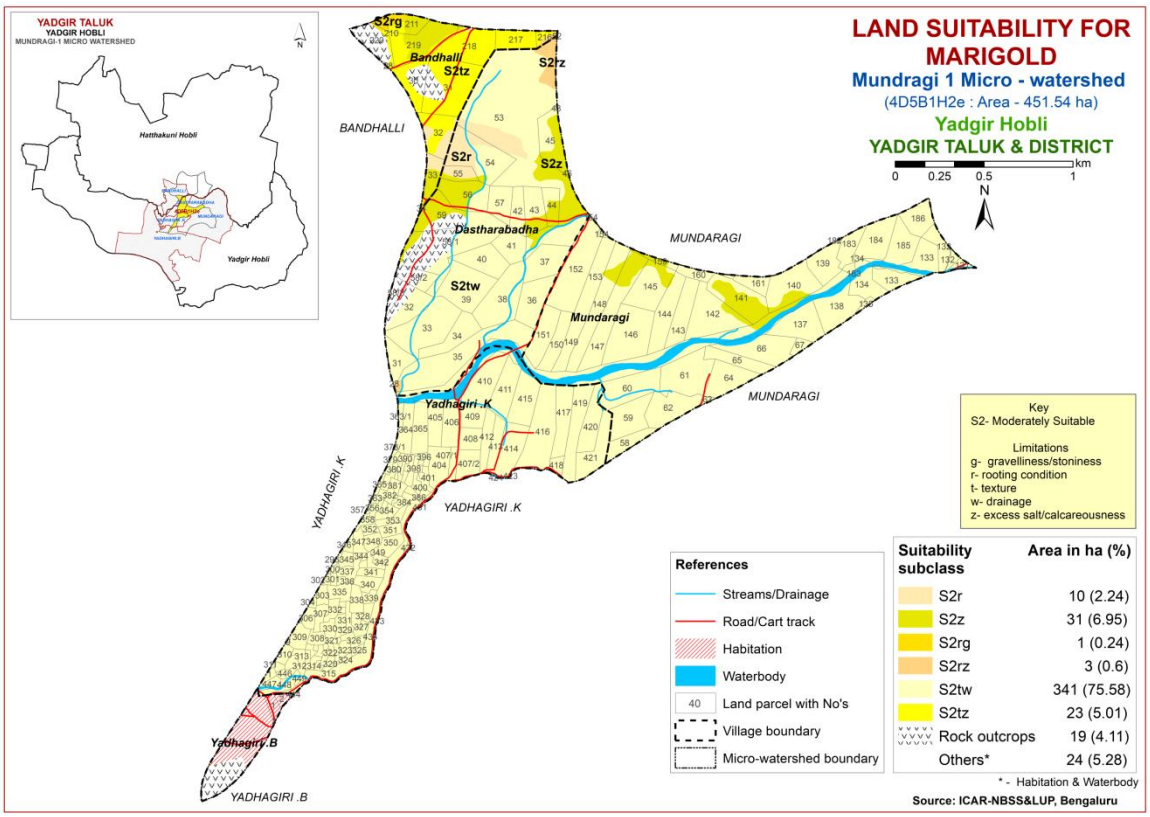


Fig. 7.28 Land Suitability map of Marigold

7.29 Land Suitability for Chrysanthemum (*Dendranthema grandiflora*)

Chrysanthemum is one of the most important flower crop grown in an area of 4978 ha in almost all the districts of the State. The crop requirements (Table 7.30) for growing chrysanthemum were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing chrysanthemum was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed are given in Figure 7.29.

An entire area of about 409 ha (91%) is moderately suitable (Class S2) for growing chrysanthemum and are distributed in all parts of the microwatershed. They have minor limitations of texture, drainage, rooting depth, gravelliness and calcareousness.

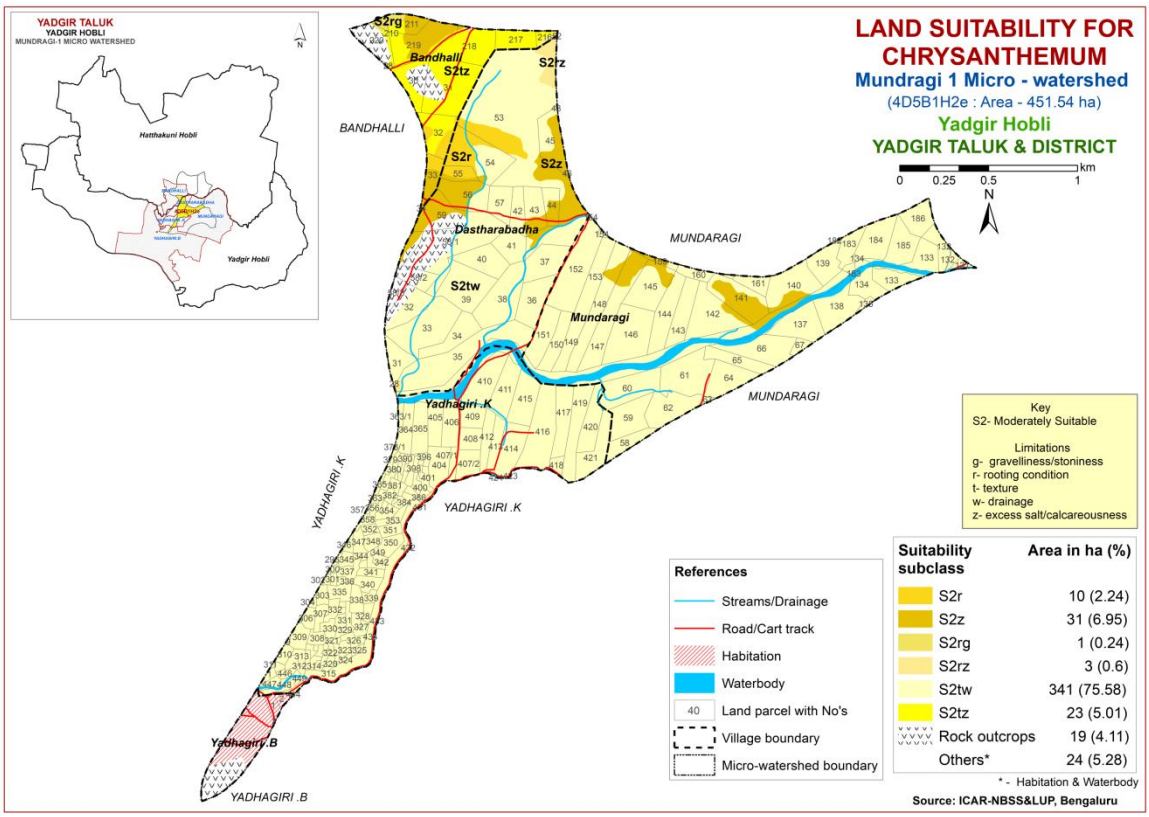


Fig. 7.29 Land Suitability map of Chrysanthemum

Table 7.1 Soil-Site Characteristics of Mundragi-1 Microwatershed

Soil Map Units	Climate (P) (mm)	Growing period (Days)	Drain-age Class	Soil depth (cm)	Soil texture		Gravelliness		AWC (mm/m)	Slope (%)	Erosion	pH	EC (dSm^{-1})	ESP (%)	CEC [Cmol (p^{+})kg^{-1}]	BS (%)
					Sur-face	Sub-surface	Surface (%)	Sub-surface (%)								
HLGiB2	866	150	WD	50-75	sc	scl	<15	<15	51-100	1-3	moderate	8.49	0.185	0.69	8.80	100
HLGiB2g1	866	150	WD	50-75	sc	scl	15-35	<15	51-100	1-3	moderate	8.49	0.185	0.69	8.80	100
JNKiB2	866	150	WD	50-75	sc	scl	<15	<15	51-100	1-3	moderate	8.42	0.148	0.18	14.50	100
JNKiB2g1	866	150	WD	50-75	sc	scl	15-35	<15	51-100	1-3	moderate	8.42	0.148	0.18	14.50	100
HSLiB2	866	150	MW	75-100	sc	sc	<15	<15	101-150	1-3	moderate	7.16	0.117	5.94	4.90	97
BLCiB2	866	150	WD	75-100	sc	scl	<15	<15	51-100	1-3	moderate	6.75	0.19	1.31	16.80	95
YDRcB2	866	150	WD	100-150	sl	sl	<15	<15	51-100	1-3	moderate	7.25	0.114	0.31	3.40	96
MDRcB2	866	150	WD	>150	sl	scl	<15	<15	>200	1-3	moderate	8.31	0.33	0.90	20.57	100
MDRiA1	866	150	WD	>150	sc	scl	<15	<15	>200	0-1	slight	8.31	0.33	0.90	20.57	100
MDRmB2	866	150	WD	>150	c	scl	<15	<15	>200	1-3	moderate	8.31	0.33	0.90	20.57	100
MDRiB2	866	150	WD	>150	sc	scl	<15	<15	>200	1-3	moderate	8.31	0.33	0.90	20.57	100
BMNmB2	866	150	MW	>150	c	c	<15	<15	>200	1-3	moderate	8.2	0.284	0.65	52.70	100
BMNmA1	866	150	MW	>150	c	c	<15	<15	>200	0-1	slight	8.2	0.284	0.65	52.70	100
MDGhB2	866	150	WD	100-150	scl	scl	<15	<15	>200	1-3	moderate	8.2	0.399	3.08	4.90	100
TMKhA1	866	150	MW	>150	scl	c	<15	<15	>200	0-1	slight	9.60	0.35	6.63	21.83	100

***Symbols and abbreviations are according to Field Guide for LRI under Sujala-III Project, Karnataka**

Table 7.2 Land suitability criteria for Sorghum

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	26–30	30–34; 24–26	34–40; 20–24	>40; <20
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately well drained	Poorly drained	V.poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	sc, c (red), c (black)	scl, cl	ls, sl	-
	pH	1:2.5	5.5-7.8	5.0-5.5 7.8-9.0	>9.0	-
	CEC	C mol (p+)/Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	10-15
	OC	%				
Rooting conditions	Effective soil depth	cm	>75	50-75	25-50	<25
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2	2-4	4-8	>8
	Sodicity (ESP)	%	5-10	10-15	>15	
Erosion hazard	Slope	%	0-3	3-5	5-10	>10

Table 7.3 Land suitability criteria for Maize

Land use requirement			Rating			
Soil –site characteristics		Unit	Highly suitable (S1)	Moderately suitable (S2)	Marginally suitable (S3)	Not suitable (N1)
Climatic regime	Mean temperature in growing season	°C	30-34	35-38 26-30	38-40 26-20	
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately well drained	Poorly drained	Very poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	scl, cl, sc	c (red), c (black)	ls, sl	-
	pH	1:2.5	5.5-7.8	5.0-5.5 7.8-9.0	>9.0	-
	CEC	C mol (p+)/Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>75	50-75	25-50	<25
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2	2-4	4-8	>8
	Sodicity (ESP)	%	5-10	10-15	>15	-
Erosion hazard	Slope	%	0-3	3-5	5-10	>10

Table 7.4 Land suitability criteria for Bajra

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	28-32	33-38 24-27	39-40 20-23	<20
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm	500-750	400-500	200-400	<200
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately well drained	Poorly drained	Very poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	sl, scl, cl,sc,c (red)	c (black)	ls	-
	pH	1:2.5	6.0-7.8	5.0-5.5 7.8-9.0	5.5-6.0 >9.0	
	CEC	C mol (p+)/ Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>75	50-75	25-50	<25
	Stoniness	%				
	Coarse fragments	Vol %	15-35	35-60	>60	
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2	2-4	4-8	>8
	Sodicity (ESP)	%	5-10	10-15	>15	
Erosion hazard	Slope	%	1-3	3-5	5-10	>10

Table 7.5 Land suitability criteria for Groundnut

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	24–33	22–24; 33–35	20–22; 35–40	<20; >40
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Mod. Well drained	Poorly drained	Very Poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	scl	sl,cl, sc	c (red), c (black), ls	-
	pH	1:2.5	6.0-7.8	5.5-6.0 7.8-8.4	5.0-5.5 8.4-9.0	>9.0
	CEC	C mol (p+)/ Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>75	50-75	25-50	<25
	Stoniness	%				
	Coarse fragments	Vol %	<35	35-60	>60	
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2	2-4	4-8	>8
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	<3	3-5	5-10	>10

Table 7.6 Land suitability criteria for Sunflower

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	24–30	30–34; 20–24	34–38; 16–20	>38; <16
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	mod. Well drained	-	Poorly to very drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	cl, sc,c (red), c (black)	scl	ls, sl	-
	pH	1:2.5	6.5-7.8	7.8-8.4 5.5-6.5	8.4-9.0; 5.0-5.5	>9.0
	CEC	C mol (p+)/Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>100	75-100	50-75	<50
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2	2-4	4-8	>8
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	<3	3-5	5-10	>10

Table 7.7 Land suitability criteria for Redgram

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	30-35(G) 20-25(AV) 15-18 (F&PS) 35-40(M)	25-30(G) 20-25 (AV) 12-15 (F&PS) 30-35(M)	20-25(G) 15-20(AV) 10-12 (F&PS) 25-30(M)	< 20 <15 <10 <25
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Mod. Well drained	Poorly drained	Very Poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	sc, c (red)	c (black),sl, scl, cl	ls	-
	pH	1:2.5	6.0-7.8	5.5-6.0 7.8-9.0	5.0-5.5 >9.0	-
	CEC	C mol (p+)/ Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>100	75-100	50-75	<50
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-50	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<1.0	1.0-2.0	>2.0	
	Sodicity (ESP)	%	5-10	10-15	>15	
Erosion hazard	Slope	%	<3	3-5	5-10	>10

Table 7.8 Land suitability criteria for Bengal gram

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	20–25	25–30; 15–20	30–35; 10–15	>35; <10
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Mod. Well drained	Poorly drained	Very Poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	c(black)	-	c (red), scl, cl, sc	ls, sl
	pH	1:2.5	6.0-7.8	5.0-6.0 7.8-9.0	>9.0	-
	CEC	C mol (p+)/Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>75	50-75	25-50	<25
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2	2-4	4-8	>8
	Sodicity (ESP)	%	5-10	10-15	>15	-
Erosion hazard	Slope	%	<3	3-5	5-10	>10

Table 7.9 Land suitability criteria for Cotton

Land use requirement			**Rating**			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	22-32	>32	<19	-
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well to moderately well	Poorly drained/Some what excessively drained	-	very poorly/excessively drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	sc, c (red,black)	cl	scl	ls, sl
	pH	1:2.5	6.5-7.8	7.8-8.4	5.5-6.5 8.4->9.0	<5.5
	CEC	C mol (p+)Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>100	50-100	25-50	<25
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2	2-4	4-8	>8
	Sodicity (ESP)	%	5-10	10-15	>15	
Erosion hazard	Slope	%	<3	3-5	-	>5

Table 7.10 Land suitability criteria for Chilli

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	25-32	33-35 20-25	35-38 <20	>38
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately well drained	Poorly drained	Very poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	scl, cl, sc	c (black), sl	ls	-
	pH	1:2.5	6.0-7.3	5.0-6.0 7.3-8.4	8.4-9.0	>9.0
	CEC	C mol (p+)/ Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>75	50-75	25-50	<25
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2	2-4	4-8	>8
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	<3	3-5	5-10	>10

Table 7.11 Land suitability criteria for Tomato

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	25-28	29-32 20-24	15-19 33-36	<15 >36
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately well drained	Poorly drained	V.poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	sl, scl, cl, sc, c (red)	-	ls, c(black)	-
	pH	1:2.5	6.0-7.3	5.0-6.0 7.3-8.4	8.4-9.0	>9.0
	CEC	C mol (p+)/Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>75	50-75	25-50	<25
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2.0	2-4	4-8	>8.0
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	<3	3-5	5-10	>10

Table 7.12 Land suitability criteria for Brinjal

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	Well drained	Moderately well drained	Poorly drained	V. Poorly drained
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class				
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	sl, scl, cl, sc c (red)	-	ls, c (black)	-
	pH	1:2.5	6.0-7.3	7.3-8.4 5.0-6.0	8.4-9.0	>9.0
	CEC	C mol (p+)/Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>75	50-75	25-50	<25
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	>60
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2.0	2-4	4-8	>8.0
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	<3	3-5	5-10	>10

Table 7.13 Land suitability criteria for Onion

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	20-30	30-35	35-40	>40
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately /imperfectly	-	Poorly to V poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	sl,scl,cl,sc,c (red)	-	c (Black),ls	-
	pH	1:2.5	6.0-7.3	5.0-6.0 7.3-7.8	7.8-8.4	>8.4
	CEC	C mol (p+)/ Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>75	50-75	25-50	<25
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<1.0	1.0-2.0	2.0-4.0	<4
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	<3	3-5	5-10	>10

Table 7.14 Land suitability criteria for Bhendi

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	25-28	29-32 20-24	15-19 33-36	<15 >36
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately well drained	Imperfectly drained	Poorly to very poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	scl, cl,sc, c (red)	c (black)	ls	-
	pH	1:2.5	6.0-7.3	5.0-6.0 7.3-8.4	8.4-9.0	>9.0
	CEC	C mol (p+)/Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>75	50-75	25-50	<25
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2.0	2-4	4-8	>8.0
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	<3	3-5	5-10	>10

Table 7.15 Land suitability criteria for Drumstick

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C				
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately well drained	Poorly drained	V.Poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	sc, scl, cl, c (red)	sl, c (black)	ls	s
	pH	1:2.5	6.0-7.3	5.0-5.5 7.3-7.8	5.5-6.0 7.8-8.4	>8.4
	CEC	C mol (p+)/Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>100	75-100	50-75	<50
	Stoniness	%				
	Coarse fragments	Vol %	<35	35-60	60-80	>80
Soil toxicity	Salinity (EC saturation extract)	ds/m				
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	<3	3-10	-	>10

Table 7.16 Land suitability criteria for Mango

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	28-32	24-27 33-35	36-40	20-24
	Min temp. before flowering	^{0}C	10-15	15-22	>22	-
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration	Days				
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately well drained	Poorly drained	V. Poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	scl, cl, sc, c (red)	-	ls, sl, c (black)	-
	pH	1:2.5	5.5-7.3	5.0-5.5 7.3-8.4	8.4-9.0	>9.0
	CEC	C mol (p+)/Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>150	100-150	75-100	<75
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2.0	2-4	4-8	>8.0
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	<3	3-5	5-10	>10

Table 7.17 Land suitability criteria for Guava

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	28-32	33-36 24-27	37-42 20-23	
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately well drained	Poorly drained	V.Poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	scl, cl, sc, c (red)	sl	c (black), ls	-
	pH	1:2.5	6.0-7.8	5.0-6.0	7.8-8.4	>8.4
	CEC	C mol (p+)/ Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>100	75-100	50-75	<50
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2.0	2-4	4-8	>8.0
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	<3	3-5	5-10	>10

Table 7.18 Land suitability criteria for Sapota

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	28-32	33-36 24-27	37-42 20-23	>42 <18
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately well drained	-	Poorly to very drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	scl, cl, sc, c (red)	sl	ls, c (black)	-
	pH	1:2.5	6.0-7.3	5.0-6.0 7.3-8.4	8.4-9.0	>9.0
	CEC	C mol (p+)/ Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>100	75-100	50-75	<50
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2.0	2-4	4-8	>8.0
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	<3	3-5	5-10	>10

Table 7.19 Land suitability criteria for Pomegranate

Land use requirement			Rating			
Soil –site characteristics		Unit	Highly suitable (S1)	Moderately suitable (S2)	Marginally suitable (S3)	Not suitable (N1)
Climatic regime	Mean temperature in growing season	°C	30-34	35-38 25-29	39-40 15-24	
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately well drained	Poorly drained	V.Poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	scl,cl, sc, c (red)	c (black),sl	ls	-
	pH	1:2.5	5.5-7.8	7.8-8.4	5.0-5.5 8.4-9.0	>9.0
	CEC	C mol (p+)/ Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>100	75-100	50-75	<50
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2.0	2-4	4-8	>8.0
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	<3	3-5	5-10	>10

Table 7.20 Land suitability criteria for Musambi

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	28-30	31-35 24-27	36-40 20-23	>40 <20
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately drained	poorly	Very poorly
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	scl, cl, sc, c	sl	ls	-
	pH	1:2.5	6.0-7.8	5.5-6.0 7.8-8.4	5.0-5.5 8.4-9.0	>9.0
	CEC	C mol (p+)/ Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>100	75-100	50-75	<50
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2.0	2-4	4-8	>8.0
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	<3	3-5	5-10	>10

Table 7.21 Land suitability criteria for Lime

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	28-30	31-35 24-27	36-40 20-23	>40 <20
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately drained	poorly	Very poorly
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	scl, cl, sc, c	sl	ls	-
	pH	1:2.5	6.0-7.8	5.5-6.0 7.8-8.4	5.0-5.5 8.4-9.0	>9.0
	CEC	C mol (p+)/ Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>100	75-100	50-75	<50
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2.0	2-4	4-8	>8.0
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	<3	3-5	5-10	>10

Table 7.22 Land suitability criteria for Amla

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C				
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Mod. well drained	Poorly drained	V. Poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	scl, cl, sc, c (red)	c (black)	ls, sl	-
	pH	1:2.5	5.5-7.3	5.0-5.5 7.3-7.8	7.8-8.4	>8.4
	CEC	C mol (p+)/Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>75	50-75	25-50	<25
	Stoniness	%				
	Coarse fragments	Vol %	<15-35	35-60	60-80	-
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2.0	2-4	4-8	>8.0
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	0-3	3-5	5-10	>10

Table 7.23 Land suitability criteria for Cashew

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	32 to 34	28 to 32; 34 to 38	24 to 28; 38 to 40	<20; >40
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	moderately well drained	Poorly drained	Very poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	scl, cl, sc, c (red)	-	sl, ls	c (black)
	pH	1:2.5	5.5-6.5	5.0-5.5 6.5-7.3	7.3-7.8	>7.8
	CEC	C mol (p+)/ Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>100	75-100	50-75	<50
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2	2-4	4-8	>8
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	<3	3-10	>10	-

Table 7.24 Land suitability criteria for Jackfruit

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C				
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Mod. well	Poorly	V. Poorly
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	scl, cl, sc, c (red)	-	sl, ls, c (black)	-
	pH	1:2.5	5.5-7.3	5.0-5.5 7.3-7.8	7.8-8.4	>8.4
	CEC	C mol (p+)/ Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>100	75-100	50-75	<50
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	>60
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2.0	2-4	4-8	>8.0
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	0-3	3-5	5-10	>10-

Table 7.25 Land suitability criteria for Jamun

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C				
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well	Mod. well	Poorly	V.Poorly
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	scl, cl, sc, c(red)	sl, c (black)	ls	-
	pH	1:2.5	6.0-7.8	5.0-6.0	7.8-8.4	>8.4
	CEC	C mol (p+)/ Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>150	100-150	50-100	<50
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	>60
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2.0	2-4	4-8	>8.0
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	0-3	3-5	5-10	>10

Table 7.26 Land suitability criteria for Custard apple

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C				
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Mod. well drained	Poorly drained	V.Poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	Scl, cl, sc, c (red), c (black)	-	Sl, ls	-
	pH	1:2.5	6.0-7.3	5.5-6.0 7.3-8.4	5.0-5.5 8.4-9.0	>9.0
	CEC	C mol (p+)/Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>75	50-75	25-50	<25
	Stoniness	%				
	Coarse fragments	Vol %	<15-35	35-60	60-80	-
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2.0	2-4	4-8	>8.0
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	0-3	3-5	>5	-

Table 7.27 Land suitability criteria for Tamarind

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C				
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Mod.well drained	Poorly drained	V.Poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	scl, cl,sc, c (red)	sl, c (black)	ls	-
	pH	1:2.5	6.0-7.3	5.0-6.0 7.3-7.8	7.8-8.4	>8.4
	CEC	C mol (p+)/ Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>150	100-150	75-100	<75
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2	2-4	4-8	>8
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	0-3	3-5	5-10	>10

Table 7.28 Land suitability criteria for Mulberry

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	24–28	22–24; 28–32	32–38; 22–18	>38; <18
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately well drained	Poorly drained	V. Poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	sc, cl, scl	c (red)	c (black), sl, ls	-
	pH	1:2.5	5.5-7.3	5.0-5.5 7.8-8.4	7.3-8.4	>8.4
	CEC	C mol (p+)/Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>100	75-100	50-75	<50
	Stoniness	%				
	Coarse fragments	Vol %	0-35	35-60	60-80	>80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2	2-4	4-8	>8
	Sodicity (ESP)	%	<5	5-10	10-15	>15
Erosion hazard	Slope	%	0-3	3-5	5-10	>10

Table 7.29 Land suitability criteria for Marigold

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	18-23	17-15 24-35	35-40 10-14	>40 <10
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately well drained	Poorly drained	V.Poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	sl,scl, cl, sc, c (red)	c (black)	ls	-
	pH	1:2.5	6.0-7.3	5.0-6.0 7.3-8.4	8.4-9.0	>9.0
	CEC	C mol (p+)/Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>75	50-75	25-50	<25
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2.0	2-4	4-8	>8.0
	Sodicity (ESP)	%				
Erosion hazard	Slope	%	<3	3-5	5-10	>10

Table 7.30 Land suitability criteria for Chrysanthemum

Land use requirement			Rating			
Soil –site characteristics		**Unit**	**Highly suitable (S1)**	**Moderately suitable (S2)**	**Marginally suitable (S3)**	**Not suitable (N1)**
Climatic regime	Mean temperature in growing season	°C	18-23	17-15 24-35	35-40 10-14	>40 <10
	Mean max. temp. in growing season	°C				
	Mean min. tempt. in growing season	°C				
	Mean RH in growing season	%				
	Total rainfall	mm				
	Rainfall in growing season	mm				
Land quality	Soil-site characteristic					
Moisture availability	Length of growing period for short duration	Days				
	Length of growing period for long duration					
	AWC	mm/m				
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately well drained	Poorly drained	V.Poorly drained
	Water logging in growing season	Days				
Nutrient availability	Texture	Class	sl,scl, cl, sc, c (red)	c (black)	ls	-
	pH	1:2.5	6.0-7.3	5.0-6.0 7.3-8.4	8.4-9.0	>9.0
	CEC	C mol (p+)/Kg				
	BS	%				
	CaCO3 in root zone	%		<5	5-10	>10
	OC	%				
Rooting conditions	Effective soil depth	cm	>75	50-75	25-50	<25
	Stoniness	%				
	Coarse fragments	Vol %	<15	15-35	35-60	60-80
Soil toxicity	Salinity (EC saturation extract)	ds/m	<2.0	2-4	4-8	>8.0
	Sodicity (ESP)	%				
Erosion hazard	Slope	%	<3	3-5	5-10	>10

7.30 Land Management Units (LMUs)

The 15 soil map units identified in Mundragi-1 microwatershed have been grouped into 5 Land Management Units (LMU's) for the purpose of preparing a Proposed Crop Plan. Land Management Units are grouped based on the similarities in respect of the type of soil, the depth of the soil, the surface soil texture, gravel content, AWC, slope, erosion etc. and a Land Management Units map (Fig. 7.30) has been generated. These Land Management Units are expected to behave similarly for a given level of management.

The map units that have been grouped into 5 Land Management Units along with brief description of soil and site characteristics are given below.

LUC No.	Soil map units	Soil and site characteristics
1	33.HSLiB2 62.BMNmB2 159.BMNmA1	Moderately deep to very deep (75 to > 150 cm), black clay soils, 0-3 % slopes, non-gravelly (<15%), slight to moderate erosion.
2	42.YDRcB2 59.MDRcB2 60.MDRiA1 61.MDRmB2 133.MDRiB2 148.MDGhB2	Deep to very deep (100 to >150 cm), sandy clay loam to sandy loam soils, 0-3 % slopes, non-gravelly (<15%), slight to moderate erosion.
3	103.TMKhA1	Very deep (>150 cm), lowland clay soils, 0-1% slopes, non-gravelly (<15%), slight erosion.
4	38.BLCiB2	Moderately deep (75 to 100 cm), loamy soils, 1-3 % slopes, non-gravelly (<15%), moderate erosion.
5	17.HLGiB2 18.HLGiB2g1 22.JNKiB2 23.JNKiB2g1	Moderately shallow (50 to 75 cm), loamy soils, 1-3 % slopes, gravelly to non-gravelly (0 to 35%), moderate erosion.

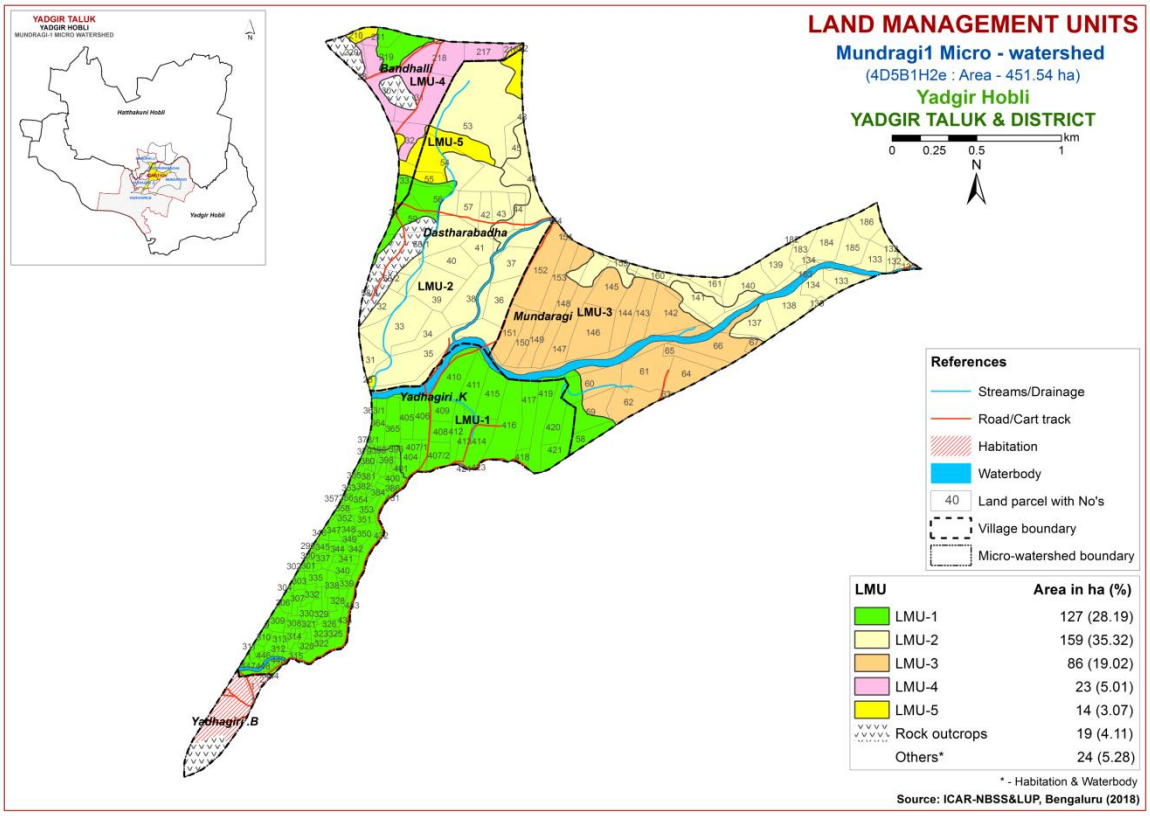


Fig. 7.30 Land Management Units Map- Mundragi-1 Microwatershed

7.31 Proposed Crop Plan for Mundragi-1 Microwatershed

After assessing the land suitability for the 29 crops, the Proposed Crop Plan has been prepared for the 5 identified LMUs by considering only highly (Class S1) and moderately (Class S2) suitable lands for each of the 29 crops. The resultant proposed crop plan is presented below in Table 7.31.

Table 7.31 Proposed Crop Plan for Mundragi-1 Microwatershed

LMU	Soil Map Units	Survey Number	Field Crops/ Commercial crops	Horticulture Crops (Rainfed/Irrigated)	Suitable Interventions
1	33.HSLiB2 62.BMNmB2 159.BMNmA1 (Moderately deep to very deep, black clay soils)	**Mundaragi :**58 **Bandhalli :**211,219,33,34 **Dastharabadha :**56,59 **Yadhagiri.K:**1,2,9,296,298,299,300,301,302,303,304,305.,306,307,308,309,310,311,312,313,314,315,316,317,318/1,318/2,318/3,319,320,321,322,323,324,325,326,327,328,329,330,331,332,333,334,335,336,337,338,339,340,341,342,343,344,345,346,347,348,349,350,351,352,353,354,355,356,357,358,363,363/1,364,364/1,364/2,365,367,373/1,379,380,381,382,383,384,385,386,387,388,389,390,391,392,393,396,397,398,399,400,401,402,403,404,405,406,407/1,407/2,408,409,410,411,412,413,414,415,416,417,418,419,420,421,431,432,434,444,446,447,448,449	Sunflower, Sorghum, Maize, Soybean, Cotton, Bengal gram, Safflower, Linseed, Bajra	**Fruit crops:** Pomegranate, Lime, Musambi, Tamarind, Jamun, Amla, Custard apple **Vegetables:** Drumstick, Chilli, Bhendi, Cluster bean, Coriander **Flowers:** Marigold, Chrysanthemum	Application of FYM, Biofertilizers and micronutrients, drip irrigation, Mulching, suitable soil and water conservation practices
2	42.YDRcB2 59.MDRcB2 60.MDRiA1 61.MDRmB2 133.MDRiB2 148.MDGhB2 (Deep to very deep, sandy clay loam to sandy loam soils)	**Mundaragi:**131,132,133,134,135,137,138,139,140,141,159,160,161,182,183,184,185,186 **Dastharabadha:**28,31,32,33,34,35,36,37,38,39,40, 41,42,43,44,45,46,48,53,57,58/1	Sunflower, Sorghum, Maize, Groundnut, Soybean, Redgram, Safflower, Linseed, Bajra	**Fruit crops:** Mango, Sapota**,** Pomegranate, Guava, Lime, Musambi, Jamun, Jackfruit, Tamarind, Amla, Custard apple **Vegetables:** Onion, Tomato, Bhendi, Drumstick, Chilli, Coriander **Flowers:** Marigold, Chrysanthemum	Application of FYM, Biofertilizers and micronutrients, drip irrigation, Mulching, suitable soil and water conservation practices

3	103.TMKhA1 (Very deep, lowland clay soils)	**Mundaragi :** 59,60,61,62,63,64,65,66,67,142, 143,144,145,146,147,148,149,150,151,152, 153,154	Sorghum, maize, Bajra	**Fruit crops:** Custard Apple, Amla, Ber **Vegetable crops:** Brinjal, Tomato, Chillies, Drumstick, Coriander	Providing proper drainage, addition of organic manures, green leaf manuring, suitable conservation practices
4	38.BLCiB2 (Moderately deep loamy soils)	**Bandhalli :** 28,30,31,32, 216,217,218	Maize, Sorghum, Sunflower, Bajra, Finger millet, Groundnut, Red gram, Cowpea, Field bean, Castor, Mulberry	**Fruit crops:** Mango, Pomegranate, Guava, Sapota, Jackfruit, Jamun, Tamarind, Lime, Musambi, Amla, Custard apple, Cashew **Vegetable crops:** Drumstick, Tomato, Bhendi, Chilli, Brinjal, Onion, Curry leaves **Flower crops:** Marigold, Chrysanthemum, Jasmine, Crossandra	Drip irrigation, mulching, suitable soil and water conservation practices (Crescent Bunding with Catch Pit etc)
5	17.HLGiB2 18.HLGiB2g1 22.JNKiB2 23.JNKiB2g1 (Moderately shallow, loamy soils)	**Bandhalli :** 210 **Dastharabadha :** 52,54,55	Sorghum, Bajra, Coriander	**Fruit crops:** Amla, Custard apple **Vegetables:** Coriander, Bhendi **Flowers:** Marigold, Jasmine Chrysanthemum	Application of FYM, Biofertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices

Chapter 8

SOIL HEALTH MANAGEMENT

8.1 Soil Health

Soil health is basic to plant health and plant health is basic to human and bovine health. Soil is fundamental to crop production. Without soil, no food could be produced nor would livestock be fed on a large scale. Because it is finite and fragile, soil is a precious resource that requires special care from its users.

Soil health or the capacity of the soil to function is critical to human survival. Soil health has been defined as: "the capacity of the soil to function as a living system without adverse effect on the ecosystem". Healthy soils maintain a diverse community of soil organisms that help to form beneficial symbiotic associations with plant roots, recycle essential plant nutrients, improve soil structure with positive repercussions for soil, water and nutrient holding capacity and ultimately improve crop production and also contribute to mitigating climate change by maintaining or increasing its carbon content.

Functional interactions of soil biota with organic and inorganic components, air and water determine a soil's potential to store and release nutrients and water to plants and to promote and sustain plant growth. Thus, maintaining soil health is vital to crop production and conserve soil resource base for sustaining agriculture.

The most important characteristics of a healthy soil are

- Good soil tilth
- Sufficient soil depth
- Good water storage and good drainage
- Adequate supply, but not excess of nutrients
- Large population of beneficial organisms
- Small proportion of plant pathogens and insect pests
- Low weed pressure
- Free of chemicals and toxins that may harm the crop
- Resistance to degradation
- Resilience when unfavorable conditions occur

Characteristics of Mundragi-1 Microwatershed

- The soil phases identified in the microwatershed belonged to the soil series of HLG 2 ha (<1%), JNK 11 ha (2%), HSL 13 ha (3%), BLC 23 ha (5%), YDR 18 ha (4%), MDR 120 ha (27%), BMN 114 ha (25%), MDG 21 ha (5%) and TMK 86 ha (19%).
- As per land capability classification entire area of the microwatershed falls under arable land category (Class II). The major limitations identified in the arable lands were soil erosion and soil limitation.
- On the basis of soil reaction, 199 ha (44%) is neutral (pH 6.5 -7.3), 210 ha (47%) area is slightly alkaline (pH 7.3-7.8) and less than 1 ha (<1%) area is moderately alkaline (pH 7.8-8.4).

Soil Health Management

The following actions are required to improve the current land husbandry practices that provide a sound basis for the successful adoption of sustainable crop production system.

Acid soils

1. Growing of crops suitable for particular soil pH.
2. Ameliorating the soils through the application of amendments (liming materials).

Liming materials:

1. $CaCO_3$ (Calcium Carbonate).
2. Dolomite [Ca Mg $(Co_3)_2$]
3. Quick lime (Cao)
4. Slaked lime [Ca $(OH)_2$]

For normal pH and pH 4.8 (35 t/ha) and pH 6 .0-7.0 (4 t/ha) lime is required.

Alkaline soils

Slightly alkaline to moderately alkaline soils cover about 210 ha area.

1. Regular addition of organic manure, green manuring, green leaf manuring, crop residue incorporation and mulching needs to be taken up to improve the soil organic matter status.
2. Application of biofertilizers (Azospirullum, Azatobacter, Rhizobium).
3. Application of 25% extra N and P (125 % RDN&P).
4. Application of $ZnSO_4$ – 12.5 kg/ha (once in three years).
5. Application of Boron – 5kg/ha (once in three years).

Neutral soils

Neautral soils cover about 199 ha area in the microwatershed.

1. Regular addition of organic manure, green manuring, green leaf manuring, crop residue incorporation and mulching needs to be taken up to improve the soil organic matter status.
2. Application of biofertilizers, (Azospirullum, Azotobacter, Rhizobium).
3. Application of 100 per cent RDF.
4. Need based micronutrient applications.

Besides the above recommendations, the best transfer of technology options are also to be adopted.

Soil Degradation

Soil erosion is one of the major factor affecting the soil health in the microwatershed. Out of total 452 ha area in the microwatershed, an area of about 246 ha is suffering from moderate erosion. These areas need immediate soil and water

conservation and, other land development and land husbandry practices for restoring soil health.

Dissemination of Information and Communication of Benefits

Any large scale implementation of soil health management requires that supporting information is made available widely, particularly through channels familiar to farmers and extension workers. Given the very high priority attached to soil-health especially by the Central Government on issuing Soil-Health Cards to all the farmers, media outlets like Regional, State and National Newspapers, Radio and Dooradarshan programs in local languages but also modern information and communication technologies such as Cellular phones and the Internet, which can be much more effective in reaching the younger farmers.

Inputs for Net Planning (Saturation Plan) and Interventions needed

Net planning (Saturation Plan) in IWMP is focusing on preparation of

1. Soil and Water Conservation Plan for each plot or farm.
2. Productivity enhancement measures/ interventions for existing crops/livestock/other farm enterprises.
3. Diversification of farming mainly with perennial horticultural crops and livestock.
4. Improving livelihood opportunities and income generating activities.

In this connection, how various outputs of Sujala-III are of use in addressing these objectives of Net Planning (Saturation Plan) are briefly presented below.

- **Soil Depth:** The depth of a soil decides the amount of moisture and nutrients it can hold, what crops can be taken up or not, depending on the rooting depth and the length of growing period available for raising any crop. Deeper the soil, better for a wide variety of crops. If sufficient depth is not available for growing deep rooted crops, either choose medium or short duration crops or deeper planting pits need to be opened and additional good quality soil brought from outside has to be filled into the planting pits.
- **Surface Soil Texture:** Lighter soil texture in the top soil means, better rain water infiltration, less run-off and soil moisture conservation, less capillary rise and less evaporation losses. Lighter surface textured soils are amenable to good soil tilth and are highly suitable for crops like groundnut, root vegetables (carrot, raddish, potato etc) but not ideal for crops that need stagnant water like lowland paddy. Heavy textured soils are poor in water infiltration and percolation. They are prone for sheet erosion; such soils can be improved by sand mulching. The technology that is developed by the AICRP-Dryland Agriculture, Vijayapura, Karnataka can be adopted.
- **Gravelliness:** More gravel content is favorable for run-off harvesting but poor in soil moisture storage and nutrient availability. It is a significant parameter that decides the kind of crop to be raised.

- **Land Capability Classification:** The land capability map shows the areas suitable and not suitable for agriculture and the major constraints in each of the plot/survey number. Hence, one can decide what kind of enterprise is possible in each of these units. In general, erosion, wetness and soil are the major constraints in Mundragi-1 microwatershed.
- **Organic Carbon:** The OC content (an index of available Nitrogen) is low (<0.5%) in 72 ha (16%), medium (0.5-0.75%) in 248 ha (55%) and high (>0.75%) in 89 ha (20%). The areas that are medium in OC needs to be further improved by applying farmyard manure and rotating crops with cereals and legumes or mixed cropping.
- **Promoting green manuring:** Growing of green manuring crops costs Rs. 1250/ha (green manuring seeds) and about Rs. 2000/ha towards cultivation that totals to Rs. 3250/- per ha. On the other hand, application of organic manure @ 10 tons/ha costs Rs. 5000/ha. The practice needs to be continued for 2-3 years or more. Nitrogen fertilizer needs to be supplemented by 25% in addition to the recommended level in 320 ha area where OC is low to medium (0-0.75%). For example, for rainfed maize, recommended level is 50 kg N per ha and an additional 12 kg /ha needs to be applied for all the crops grown in these plots.
- **Available Phosphorus**: Available Phosphorus is medium (23-57 kg/ha) in 362 ha (80%) and high (>57 kg/ha) in 47 ha (10%) area of the microwatershed. For all the crops 25% additional P needs to be applied where available P is medium.
- **Available Potassium:** Available potassium is medium (145-337 kg/ha) in an area of 183 ha (41%) and high (>337 kg/ha) 226 ha (50%) area of the microwatershed. All the plots, where available potassium is medium additional 25 % potassium may be applied.
- **Available Sulphur:** Available sulphur is a very critical nutrient for oilseed crops. It is medium in 83 ha (18%) and low in 326 ha (72%). Low and medium areas need to be applied with magnesium sulphate or gypsum or Factamphos (p) fertilizer (13% sulphur) for 2-3 years for the deficiency to be corrected.
- **Available Boron:** An area of 342 ha (76%) is low (<0.5 ppm) and medium (0.5-0.75 ppm) 67 ha (15%) in available boron content. For these areas, application of sodium borate @ 10 kg/ha as soil application or 0.2 % borax as foliar spray is recommended.
- **Available Iron:** An area of 346 ha (77%) is sufficient (>4.5ppm) in available iron and 63 ha (14%) is deficient (<4.5 ppm) in the microwatershed. For the deficient areas, iron sulphate @ 25 kg/ha need to be applied for 2-3 years.
- **Available Zinc:** Entire area of the microwatershed is deficient (<0.6 ppm) in available zinc content. Application of zinc sulphate @25 kg/ha is recommended for the deficient areas.
- **Soil Alkalinity:** The microwatershed has 210 ha (47%) area under slightly to moderately alkaline. These areas need application of gypsum and wherever calcium is in excess, iron pyrites and element sulphur can be recommended. Management

practices like treating repeatedly with good quality water to drain out the excess salts and provision of subsurface drainage and growing of salt tolerant crops like Casuarina, Acasia, Neem, Ber etc, are recommended.

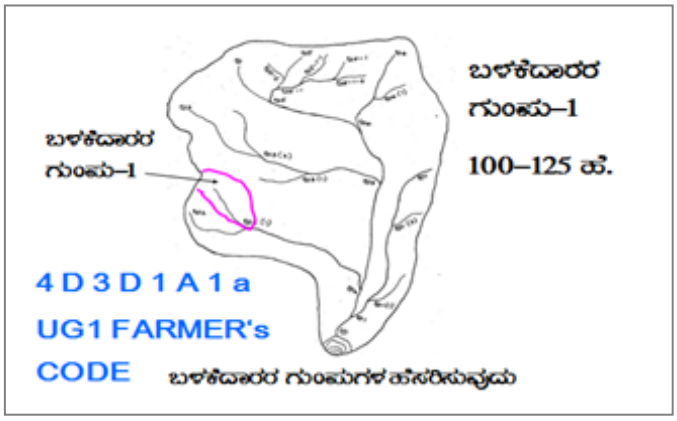
- **Land Suitability for various crops:** Areas that are highly, moderately and marginally suitable for growing various crops are indicated. Along with the suitability, various constraints that are limiting the productivity are also indicated. For example, in case of cotton, gravel content, rooting depth and salinity/alkalinity are the major constraints in various plots. With suitable management interventions, the productivity can be enhanced. In order to increase the water holding capacity of light textured soils, growing of green manure crops and application of organic manure is recommended.

Chapter 9

SOIL AND WATER CONSERVATION TREATMENT PLAN

For preparing soil and water conservation treatment plan for Mundragi-1 microwatershed, the land resource inventory database generated under Sujala-III project has been transformed as information through series of interpretative (thematic) maps using soil phase map as a base. The various thematic maps (1:7920 scale) generated were

- Soil depth
- Surface soil texture
- Available water capacity
- Soil slope
- Soil gravelliness
- Land capability
- Present land use and land cover
- Crop suitability
- Rainfall
- Hydrology
- Water Resources
- Socio-economic data
- Contour plan with existing features- network of waterways, pothissa boundaries, cut up/ minor terraces etc.
- Cadastral map (1:7920 scale)
- Satellite imagery (1:7920 scale)



Apart from these, Hand Level/ Hydro Marker/ Dumpy Level/ Total Station and Kathedars' List to be collected.

Steps for Survey and Preparation of Treatment Plan

The boundaries of Land User Groups' and Survey No. boundaries are traced in the field.

- Naming of user groups and farmers
- Identification of arable and non arable lands
- Identification of drainage lines and gullies
- Identification of non treatable areas
- Identification of priority areas in the arable lands
- Treatment plan for arable lands
- Location of water harvesting and recharge structures

9.1 Treatment Plan

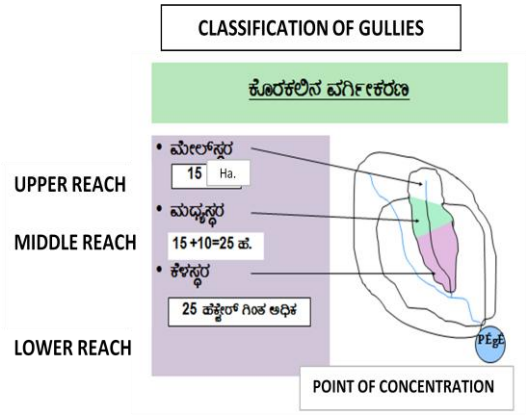
The treatment plan recommended for arable lands is briefly described below

9.1.1 Arable Land Treatment

A. BUNDING

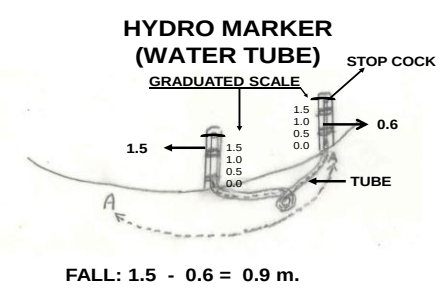
Steps for Survey and Preparation of Treatment Plan	
• Cadastral map (1:7920 scale) is enlarged to a scale of 1:2500 scale • Existing network of waterways, pothissa boundaries, grass belts, natural drainage lines/ watercourse, cut ups/ terraces are marked on the cadastral map to the scale • Drainage lines are demarcated into	
Small gullies	(up to 5 ha catchment)
Medium gullies	(5-15 ha catchment)
Ravines	(15-25 ha catchment) and
Halla/Nala	(more than 25ha catchment)

USER GROUP-1



Measurement of Land Slope

Land slope is estimated or determined by the study and interpretation of contours or by measurement in the field using simple instruments like Hand Level or Hydromarker.



Vertical and Horizontal intervals between bunds as recommended by the Watershed Development Department.

Slope percentage	Vertical interval (m)	Corresponding Horizontal Distance (m)
2 - 3%	0.6	24
3 - 4%	0.9	21
4 - 5%	0.9	21
5 - 6%	1.2	21
6 - 7%	1.2	21

Note: (i) The above intervals are maximum.

(ii) Considering the slope class and erosion status (A1... A=0-1 % slope, 1= slight erosion) the intervals have to be decided.

Bund length recording: Considering the contour plan and the existing grass belts/partitions, the bunds are aligned and lengths are measured.

Section of the Bund

Bund section is decided considering the soil texture class and gravelliness class ($bg_{0...}$ b=loamy sand, g_0 = <15% gravel). The recommended Sections for different soils are given below.

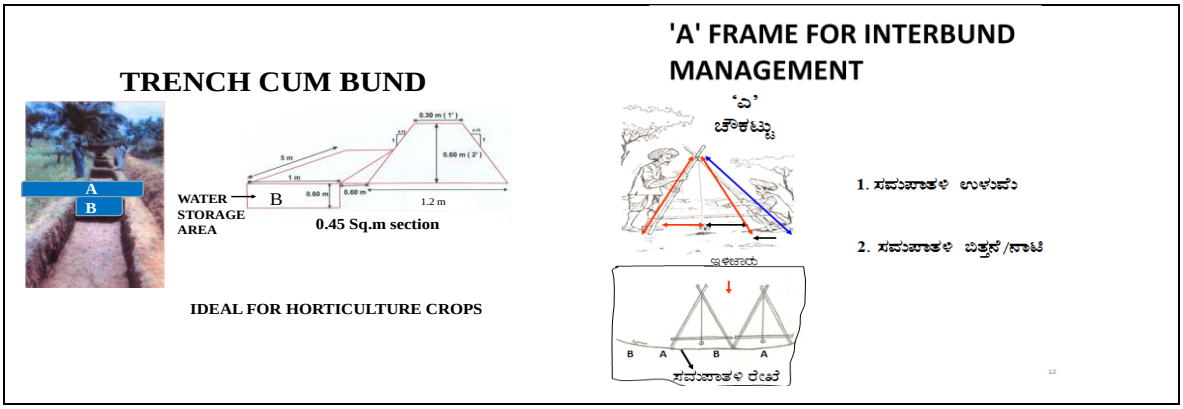
Recommended Bund Section

Top width (m)	Base width (m)	Height (m)	Side slope (Z:1;H:V)	Cross section (sq m)	Soil Texture	Remarks
0.3	0.9	0.3	01:01	0.18	Sandy loam	Vegetative bund
0.3	1.2	0.3	1.5:1	0.225	Sandy clay	
0.3	1.2	0.5	0.9:1	0.375	Red gravelly soils	
0.3	1.2	0.6	0.75:1	0.45		
0.3	1.5	0.6	01:01	0.54	Red sandy loam	
0.3	2.1	0.6	1.5:1	0.72	Very shallow black soils	
0.45	2	0.75	01:01	0.92		
0.45	2.4	0.75	1.3:1	1.07	Shallow black soils	
0.6	3.1	0.7	1.78:1	1.29	Medium black soils	
0.5	3	0.85	1.47:1	1.49		

Formation of Trench cum Bund

Dimensions of the Borrow Pits/Trenches to be excavated (machinery are decided considering the Bund Section).

Details of Borrow Pit dimensions are given below:



Size of Borrow Pits/ Trench recommended for Trench cum Bund (by machinery)

Bund section	Bund length	Earth quantity	Pit				Berm (pit to pit)	Soil depth class
m^2	m	m^3	L(m)	W(m)	D(m)	Quantity (m^3)	m	
0.375	6	2.25	5.85	0.85	0.45	2.24	0.15	Shallow
0.45	6	2.7	5.4	1.2	0.43	2.79	0.6	Shallow
0.45	6	2.7	5	0.85	0.65	2.76	1	Moderately Shallow
0.54	5.6	3.02	5.5	0.85	0.7	3.27	0.1	Moderately shallow
0.54	5.5	2.97	5	1.2	0.5	3	0.5	Shallow
0.72	6.2	4.46	6	1.2	0.7	5.04	0.2	Moderately shallow
0.72	5.2	3.74	5.1	0.85	0.9	3.9	0.1	Moderately deep

B. Water Ways

1. Existing waterways are marked on the cadastral map (1:792 scale) and their dimensions are recorded.
2. Considering the contour plan of the MWS, additional waterways/ modernization of the existing ones can be thought of.
3. The design details are given in the Manual.

C. Farm Ponds

Waterways and the catchment area will give an indication on the size of the Farm Pond. Location of the pond can be decided based on the contour plan/ field condition and farmers' need/desire.

D. Diversion Channel

Existing EPT/ CPT are marked on the cadastral map. Looking to the need, these can be modernized or fresh diversion channel can be proposed and runoff from this can be stored in Gokatte/ Recharge ponds.

9.1.2 Non-Arable Land Treatment

Depending on the gravelliness and crops preferred by the farmers, the concerned authorities can decide appropriate treatment plan. The recommended treatments may be Contour Trench, Staggered Trench, Crescent Bund, Boulder Bund or Pebble Bund.

9.1.3 Treatment of Natural Water Course/ Drainage Lines

a) The cadastral map has to be updated as regards the network of drainage lines (gullies/ *nalas/ hallas*) and existing structures are marked to the scale and storage capacity of the existing water bodies are documented.
b) The drainage line will be demarcated into Upper Reach, Middle Reach and Lower Reach.
c) Considering the Catchment, *Nala* bed and bank conditions, suitable structures are decided.
d) Number of storage structures (Check dam/ *Nala* bund/ Percolation tank) will be decided considering the commitments and available runoff from water budgeting and quality of water in the wells and site suitability.
e) Detailed Levelling Survey using Dumpy Level / Total Station has to be carried out to arrive at the site-specific designs as shown in the Manual.
f) The location of ground water recharge structures are decided by examining the lineaments and fracture zones from geological maps.
g) Rainfall intensity data of the nearest Rain Gauge Station is considered for Hydrologic Designs.
h) Silt load to the Storage/Recharge structures is reduced by providing vegetative, boulder and earthern checks in the natural water course. Location and design details are given in the Manual.

9.2 Recommended Soil and Water Conservation Measures

The appropriate conservation structures best suited for each of the land parcel/ survey number (Appendix-I) are selected based on the slope per cent, severity of erosion, amount of rainfall, land use and soil type. The different kinds of conservation structures recommended are:

1. Graded / Strengthening of Bunds
2. Trench cum Bunds (TCB)
3. Trench cum Bunds / Strengthening
4. Crescent Bunds

A map (Fig. 9.1) showing soil and water conservation plan with different kinds of structures recommended has been prepared which shows the spatial distribution and extent of area. An area of about 23 ha (5%) needs Trench cum bunding, 224 ha (50%) needs Graded Bunding and 163 ha (36%) needs strengthening of existing bunds.

The conservation plan prepared may be presented to all the stakeholders including farmers and after considering their suggestions, the conservation plan for the microwatershed may be finalised in a participatory approach.

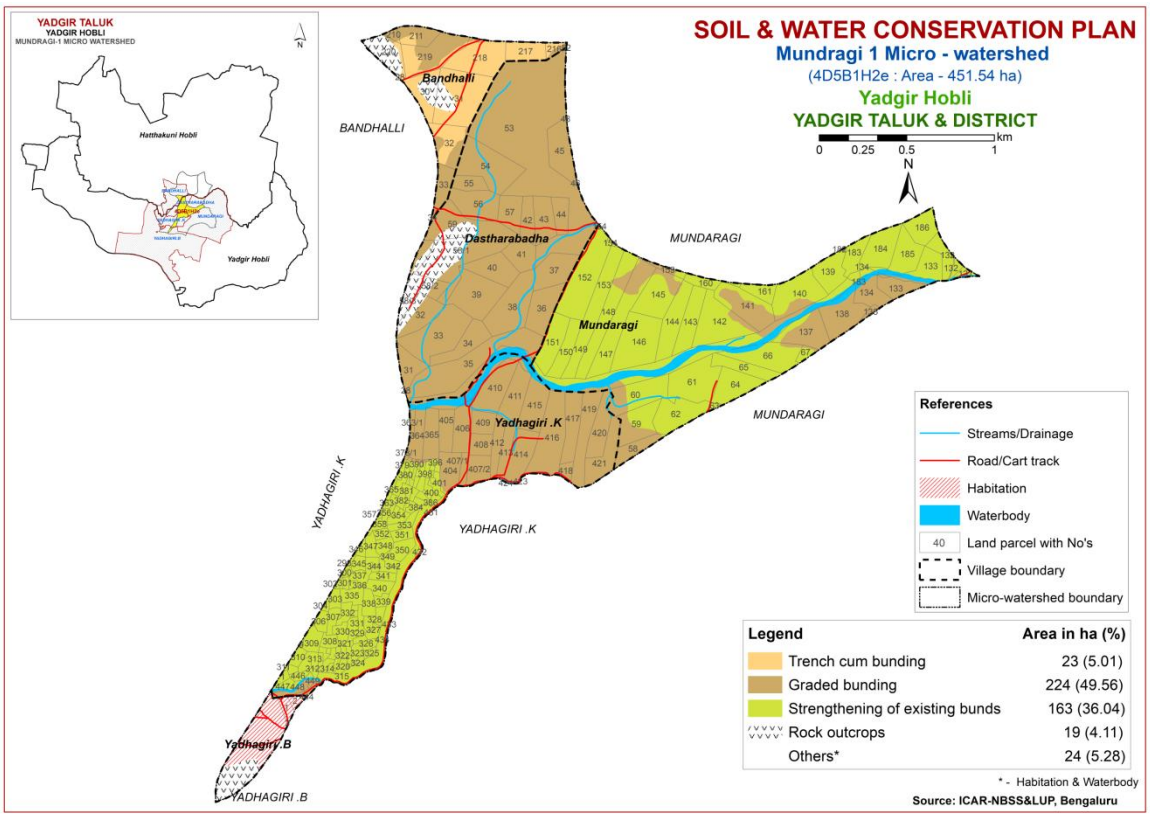


Fig. 9.1 Soil and Water Conservation Plan map of Mundragi-1 Microwatershed

9.3 Greening of Microwatershed

As part of the greening programme in the watersheds, it is envisaged to plant a variety of horticultural and other tree plants that are edible, economical and produce lot of biomass which helps to restore the ecological balance in the watersheds. The lands that are suitable for greening programme are non-arable lands (land capability classes V, VI VII and VIII) and also the lands that are not suitable or marginally suitable and field bunds for growing annual and perennial crops. The method of planting these trees is given below.

It is recommended to open pits during the 1st week of March along the contour and heap the dug-out soil on the lower side of the slope in order to harness the flowing water and facilitate weathering of soil in the pit. Exposure of soil in the pit also prevents spread of pests and diseases due to scorching sun rays. The pits should be filled with mixture of soil and organic manure during the second week of April and keep ready with sufficiently tall seedlings produced either in poly bags or in root trainer nurseries so that planting can be done during the 2nd or 3rd week of April depending on the rainfall.

The tree species suitable for the area considering rainfall, temperature and adaptability is listed below; waterlogged areas are recommended to be planted with species like Nerale (*Sizyzium cumini*) and Bamboo. Dry areas are to be planted with species like Honge, Bevu, Seetaphal *etc*.

Dry Deciduous Species			Temp (°C)	Rainfall (mm)
1.	Bevu	*Azadiracta indica*	21–32	400 –1,200
2.	Tapasi	*Holoptelia integrifolia*	20-30	500 - 1000
3.	Seetaphal	*Anona Squamosa*	20-40	400 - 1000
4.	Honge	*Pongamia pinnata*	20 -50	500– 2,500
5.	Kamara	*Hardwikia binata*	25 -35	400 - 1000
6.	Bage	*Albezzia lebbek*	20 - 45	500 - 1000
7.	Ficus	*Ficus bengalensis*	20 - 50	500–2,500
8.	Sisso	*Dalbargia Sissoo*	20 - 50	500 -2000
9.	Ailanthus	*Ailanthus excelsa*	20 - 50	500 - 1000
10.	Hale	*Wrightia tinctoria*	25 - 45	500 - 1000
11.	Uded	*Steriospermum chelanoides*	25 - 45	500 -2000
12.	Dhupa	*Boswella Serrata*	20 - 40	500 - 2000
13.	Nelli	*Emblica Officinalis*	20 - 50	500 -1500
14.	Honne	*Pterocarpus marsupium*	20 - 40	500 - 2000
Moist Deciduous Species			**Temp (°C)**	**Rainfall (mm)**
15.	Teak	*Tectona grandis*	20 - 50	500-5000
16.	Nandi	*Legarstroemia lanceolata*	20 - 40	500 - 4000
17.	Honne	*Pterocarpus marsupium*	20 - 40	500 - 3000
18.	Mathi	*Terminalia alata*	20 -50	500 - 2000
19.	Shivane	*Gmelina arboria*	20 -50	500 -2000
20.	Kindal	*T.Paniculata*	20 - 40	500 - 1500
21.	Beete	*Dalbargia latifolia*	20 - 40	500 - 1500
22.	Tare	*T. belerica*	20 - 40	500 - 2000
23.	Bamboo	*Bambusa arundinasia*	20 - 40	500 - 2500
24.	Bamboo	*Dendrocalamus strictus*	20 – 40	500 – 2500
25.	Muthuga	*Butea monosperma*	20 - 40	400 - 1500
26.	Hippe	*Madhuca latifolia*	20 - 40	500 - 2000
27.	Sandal	*Santalum album*	20 - 50	400 - 1000
28.	Nelli	*Emblica officinalis*	20 - 40	500 - 2000
29.	Nerale	*Sizyzium cumini*	20 - 40	500 - 2000
30.	Dhaman	*Grevia tilifolia*	20 - 40	500 - 2000
31.	Kaval	*Careya arborea*	20 - 40	500 - 2000
32.	Harada	*Terminalia chebula*	20 - 40	500 - 2000

References

1. FAO (1976) Framework for Land Evaluation, Food and Agriculture Organization, Rome.72 pp.
2. FAO (1983) Guidelines for Land Evaluation for Rainfed Agriculture, FAO, Rome, 237 pp.
3. IARI (1971) Soil Survey Manual, All India Soil and Land Use Survey Organization, IARI, New Delhi, 121 pp.
4. Katyal, J.C. and Rattan, R.K. (2003) Secondary and Micronutrients; Research Gap and Future Needs. Fert. News 48 (4); 9-20.
5. Naidu, L.G.K., Ramamurthy, V., Challa, O., Hegde, R. and Krishnan, P. (2006) Manual Soil Site Suitability Criteria for Major Crops, NBSS Publ. No. 129, NBSS & LUP, Nagpur, 118 pp.
6. Natarajan, A. and Dipak Sarkar (2010) Field Guide for Soil Survey, National Bureau of Soil Survey and Land Use Planning (ICAR), Nagpur, India.
7. Natarajan, A., Rajendra Hegde, Raj, J.N. and Shivananda Murthy, H.G. (2015) Implementation Manual for Sujala-III Project, Watershed Development Department, Bengaluru, Karnataka.
8. Sarma, V.A.K., Krishnan, P. and Budihal, S.L. (1987) Laboratory Manual, Tech. Bull. 23, NBSS &LUP, Nagpur.
9. Sehgal, J.L. (1990) Soil Resource Mapping of Different States of India; Why and How?, National Bureau of Soil Survey and Land Use Planning, Nagpur, 49 pp.
10. Shivaprasad, C.R., R.S. Reddy, J. Sehgal and M. Velayuthum (1998) Soils of Karnataka for Optimizing Land Use, NBSS Publ. No. 47b, NBSS & LUP, Nagpur, India.
11. Soil Survey Staff (2006) Keys to Soil Taxonomy, Tenth edition, U.S. Department of Agriculture/ NRCS, Washington DC, U.S.A.
12. Soil Survey Staff (2012) Soil Survey Manual, Handbook No. 18, USDA, Washington DC, USA.

Appendix I

Mundargi-1 (1H2e) Microwatershed

Soil Phase Information

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Bandhalli	28	0.12	BLCiB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Ro (Rc)	Not Available	IIes	TCB
Bandhalli	30	3.39	BLCiB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	TCB
Bandhalli	31	8.22	BLCiB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut+ Sugarcane (Rg+Gn+Sc)	Not Available	IIes	TCB
Bandhalli	32	3.91	BLCiB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	TCB
Bandhalli	33	2.05	HSLiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Jowar (Ct+Jw)	Not Available	IIes	Graded bunding
Bandhalli	34	0.06	HSLiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Jowar (Ct+Jw)	Not Available	IIes	Graded bunding
Bandhalli	210	0.4	JNKiB2g1	LMU-5	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Ro (Rc)	Not Available	IIes	Graded bunding
Bandhalli	211	2.22	HSLiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut (Rg+Gn)	Not Available	IIes	Graded bunding
Bandhalli	216	0.76	BLCiB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIes	TCB
Bandhalli	217	2.45	BLCiB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIes	TCB
Bandhalli	218	5.41	BLCiB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIes	TCB
Bandhalli	219	5.57	HSLiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Bandhalli	220	3.16	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro (Rc)	Not Available	Ro	Ro
Dastharabadha	28	0.02	MDRcB2	LMU-2	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram+Paddy (Ct+Rg+Pd)	Not Available	IIes	Graded bunding
Dastharabadha	31	2.21	MDRcB2	LMU-2	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIes	Graded bunding
Dastharabadha	32	3.64	MDRcB2	LMU-2	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIes	Graded bunding
Dastharabadha	33	7.24	MDRcB2	LMU-2	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Dastharabadha	34	3.3	MDRcB2	LMU-2	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Cotton (Rg+Ct)	Not Available	IIes	Graded bunding
Dastharabadha	35	10.04	MDRcB2	LMU-2	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Paddy (Ct+Pd)	Not Available	IIes	Graded bunding
Dastharabadha	36	3.93	MDRcB2	LMU-2	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Dastharabadha	37	3.8	MDRcB2	LMU-2	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Dastharabadha	38	6.21	MDRcB2	LMU-2	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut (Rg+Gn)	Not Available	IIes	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Dastharabadha	39	5.81	MDRcB2	LMU-2	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Dastharabadha	40	3.53	MDRcB2	LMU-2	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Dastharabadha	41	2.69	MDRcB2	LMU-2	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Dastharabadha	42	1.91	MDRcB2	LMU-2	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Dastharabadha	43	2.9	MDRcB2	LMU-2	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Dastharabadha	44	1.77	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Dastharabadha	45	3.89	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut (Rg+Gn)	Not Available	IIes	Graded bunding
Dastharabadha	46	0.06	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIes	Graded bunding
Dastharabadha	48	0.04	MDGhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut (Rg+Gn)	Not Available	IIes	Graded bunding
Dastharabadha	52	0	HLGiB2	LMU-5	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut (Rg+Gn)	Not Available	IIes	Graded bunding
Dastharabadha	53	36.09	MDGhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut+Redgram (Ct+Gn+Rg)	1 Borewell	IIes	Graded bunding
Dastharabadha	54	6.8	JNKiB2	LMU-5	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut (Rg+Gn)	Not Available	IIes	Graded bunding
Dastharabadha	55	1.55	JNKiB2	LMU-5	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Dastharabadha	56	4.16	HSLiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	1 Borewell	IIes	Graded bunding
Dastharabadha	57	2.45	MDRcB2	LMU-2	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Dastharabadha	58/1	10.22	MDRcB2	LMU-2	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut (Rg+Gn)	Not Available	IIes	Graded bunding
Dastharabadha	58/2	3.21	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Redgram (Rg)	Not Available	Ro	Ro
Dastharabadha	58/3	1.08	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Groundnut (Gn)	Not Available	Ro	Ro
Dastharabadha	59	4.27	HSLiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Mundaragi	58	2	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Mundaragi	59	3.94	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Cotton (Ct)	Not Available	IIws	Graded bunding
Mundaragi	60	4.85	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIws	Graded bunding
Mundaragi	61	5.81	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram+Cotton (Rg+Ct)	Not Available	IIws	Graded bunding
Mundaragi	62	4.31	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram+Cotton (Rg+Ct)	Not Available	IIws	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Mundaragi	63	0.19	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram+Cotton (Rg+Ct)	Not Available	IIws	Graded bunding
Mundaragi	64	3.69	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram+Cotton (Rg+Ct)	Not Available	IIws	Graded bunding
Mundaragi	65	2.43	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Cotton (Ct)	Not Available	IIws	Graded bunding
Mundaragi	66	5.03	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIws	Graded bunding
Mundaragi	67	0.65	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Cotton (Ct)	Not Available	IIws	Graded bunding
Mundaragi	131	0.5	MDRiA1	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Groundnut (Gn)	Not Available	IIs	Graded bunding
Mundaragi	132	2.08	MDRiA1	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Groundnut (Gn)	Not Available	IIs	Graded bunding
Mundaragi	133	4.54	MDRiA1	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Groundnut (Gn)	Not Available	IIs	Graded bunding
Mundaragi	134	2.64	MDRiB2	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIe	Graded bunding
Mundaragi	135	0.32	MDRiB2	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIe	Graded bunding
Mundaragi	137	4.21	MDRiB2	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIe	Graded bunding
Mundaragi	138	4.7	MDRiB2	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Cotton (Rg+Ct)	Not Available	IIe	Graded bunding
Mundaragi	139	3.02	MDRiA1	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIs	Graded bunding
Mundaragi	140	5.26	MDRiA1	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram+Cotton (Rg+Ct)	Not Available	IIs	Graded bunding
Mundaragi	141	5.04	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Mundaragi	142	6.04	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Cotton (Ct)	Not Available	IIws	Graded bunding
Mundaragi	143	3.45	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram+Cotton (Rg+Ct)	Not Available	IIws	Graded bunding
Mundaragi	144	4.21	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Cotton (Ct)	Not Available	IIws	Graded bunding
Mundaragi	145	4.84	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Cotton (Ct)	Not Available	IIws	Graded bunding
Mundaragi	146	6.74	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Cotton (Ct)	Not Available	IIws	Graded bunding
Mundaragi	147	6.57	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIws	Graded bunding
Mundaragi	148	5.76	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Cotton (Ct)	Not Available	IIws	Graded bunding
Mundaragi	149	2.34	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIws	Graded bunding
Mundaragi	150	2.63	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Cotton (Ct)	Not Available	IIws	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Mundaragi	151	3.5	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Cotton (Ct)	Not Available	IIws	Graded bunding
Mundaragi	152	7.78	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Cotton (Ct)	Not Available	IIws	Graded bunding
Mundaragi	153	3.68	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Cotton (Ct)	Not Available	IIws	Graded bunding
Mundaragi	154	0.19	TMKhA1	LMU-3	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIws	Graded bunding
Mundaragi	159	0.64	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Cotton (Rg+Ct)	Not Available	IIes	Graded bunding
Mundaragi	160	1.23	MDRiA1	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Cotton (Ct)	Not Available	IIs	Graded bunding
Mundaragi	161	1.44	MDRiA1	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIs	Graded bunding
Mundaragi	182	0.04	MDRiA1	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIs	Graded bunding
Mundaragi	183	1.98	MDRiA1	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Cotton (Ct)	Not Available	IIs	Graded bunding
Mundaragi	184	3.71	MDRiA1	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIs	Graded bunding
Mundaragi	185	3.29	MDRiA1	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Groundnut (Gn)	Not Available	IIs	Graded bunding
Mundaragi	186	2.58	MDRiA1	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIs	Graded bunding
Yadagiri.B	1	0.77	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation (Hb)	Not Available	Others	Others
Yadagiri.B	2	0.47	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation (Hb)	Not Available	Others	Others
Yadagiri.B	3	0.05	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation (Hb)	Not Available	Others	Others
Yadagiri.B	6	0.03	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation (Hb)	Not Available	Others	Others
Yadhagiri .K	1	0.36	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	2	0.06	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	9	0.08	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	296	0.21	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	298	0.02	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	299	0.04	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	300	0.21	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	301	0.24	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Yadhagiri .K	302	0.22	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	303	0.68	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	304	0.22	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	305	0.05	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	306	0.76	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	307	0.82	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	308	0.73	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	309	1.24	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	310	0.67	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	311	0.25	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	312	0.46	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	313	0.49	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	314	0.35	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	315	0.22	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	316	0.26	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	317	0.25	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	318/1	0.08	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	318/2	0.22	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	318/3	0.11	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	319	0.28	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	320	0.42	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	321	0.24	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	322	0.29	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	323	0.58	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Yadhagiri .K	324	0.21	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	325	0.27	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	326	0.7	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	327	0.51	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	328	0.96	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	329	0.83	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	330	0.95	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	331	0.45	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	332	0.71	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	333	0.16	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	334	0.12	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	335	1.15	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	336	0.21	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	337	0.95	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	338	1.04	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	339	0.5	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	340	1.12	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	341	0.73	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	342	0.53	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	343	0.17	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	344	0.3	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	345	0.6	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	346	0.4	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	347	0.82	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Yadhagiri .K	348	0.8	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	349	0.47	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	350	1.26	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	351	0.8	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	352	0.5	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	353	0.81	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	354	0.65	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	355	0.18	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	356	0.44	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	357	0.11	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	358	0.5	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	363	0.22	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	363/1	0.43	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Yadhagiri .K	364	2.05	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Yadhagiri .K	364/1	0.16	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	364/2	0.2	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	365	2.74	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Yadhagiri .K	367	0	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	373/1	0.02	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Yadhagiri .K	379	0.39	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	380	0.58	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	381	0.39	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	382	0.37	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	383	0.12	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Yadhagiri .K	384	0.34	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	385	0.23	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	386	0.27	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	387	0.24	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	388	0.16	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	389	0.12	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	390	0.33	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	391	0.2	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	392	0.11	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	393	0.29	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	396	0.36	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	397	0.08	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	398	0.71	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	399	0.13	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	400	0.57	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	401	0.42	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	402	0.1	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	403	0.18	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	404	2.51	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Yadhagiri .K	405	2	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Yadhagiri .K	406	2.81	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Yadhagiri .K	407/1	0.82	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Yadhagiri .K	407/2	2	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Yadhagiri .K	408	1.52	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Yadhagiri .K	409	1.72	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Yadhagiri .K	410	4.29	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Yadhagiri .K	411	3.49	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Yadhagiri .K	412	1.83	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Yadhagiri .K	413	1.78	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Yadhagiri .K	414	3.77	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Yadhagiri .K	415	3.89	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Jowar (Ct+Jw)	Not Available	IIes	Graded bunding
Yadhagiri .K	416	6.75	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut+Cotton (Gn+Ct)	Not Available	IIes	Graded bunding
Yadhagiri .K	417	3.37	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIes	Graded bunding
Yadhagiri .K	418	0.7	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIes	Graded bunding
Yadhagiri .K	419	4.23	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIes	Graded bunding
Yadhagiri .K	420	3.17	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIes	Graded bunding
Yadhagiri .K	421	3.63	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIes	Graded bunding
Yadhagiri .K	423	0	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody (Wb)	Not Available	Others	Others
Yadhagiri .K	424	0	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody (Wb)	Not Available	Others	Others
Yadhagiri .K	431	0.02	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Waterbody (Wb)	Not Available	IIws	Graded bunding
Yadhagiri .K	432	0.2	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Waterbody (Wb)	Not Available	IIws	Graded bunding
Yadhagiri .K	433	0.09	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody (Wb)	Not Available	Others	Others
Yadhagiri .K	434	7.22	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Waterbody (Wb)	Not Available	IIws	Graded bunding
Yadhagiri .K	444	0.36	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Yadhagiri .K	446	0.79	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	447	0.63	BMNmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIws	Graded bunding
Yadhagiri .K	448	0.77	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Yadhagiri .K	449	0.31	BMNmB2	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding

Appendix II

Mundargi-1 Microwatershed

Soil Fertility Informationx

Village	SY No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Bandhalli	28	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Bandhalli	30	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Bandhalli	31	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Bandhalli	32	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Bandhalli	33	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Bandhalli	34	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Bandhalli	210	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Bandhalli	211	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Bandhalli	216	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Bandhalli	217	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Bandhalli	218	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	High (> 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Bandhalli	219	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	High (> 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Bandhalli	220	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Dastharabadha	28	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	31	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	32	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	33	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	34	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	35	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	36	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	37	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	38	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	SY No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Dastharabadha	39	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	40	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	41	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	42	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	43	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	44	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	45	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	46	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	48	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	52	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	53	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	54	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	55	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	56	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	57	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	58/1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Dastharabadha	58/2	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Dastharabadha	58/3	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Dastharabadha	59	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	58	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	59	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	60	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	61	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	62	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	63	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	SY No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Mundaragi	64	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	65	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	66	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	67	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	131	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	132	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	133	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	134	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	135	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	137	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	138	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	139	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	140	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	141	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	142	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	143	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	144	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	145	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	146	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	147	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	148	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	149	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	150	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	151	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	SY No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Mundaragi	152	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	153	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	154	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	159	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	160	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	161	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	182	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	183	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	184	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	185	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Mundaragi	186	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadagiri.B	1	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Yadagiri.B	2	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Yadagiri.B	3	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Yadagiri.B	6	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Yadhagiri .K	1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	2	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	9	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	296	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	298	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	299	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	300	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	301	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	302	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	303	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	SY No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Yadhagiri .K	304	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	305	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	306	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	307	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	308	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	309	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	310	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	311	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	312	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	313	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	314	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	315	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	316	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	317	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	318/1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	318/2	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	318/3	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	319	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	320	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	321	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	322	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	323	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	324	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	325	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	SY No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Yadhagiri .K	326	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	327	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	328	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	329	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	330	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	331	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	332	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	333	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	334	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	335	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	336	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	337	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	338	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	339	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	340	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	341	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	342	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	343	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	344	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	345	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	346	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	347	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	348	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	349	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	SY No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Yadhagiri .K	350	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	351	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	352	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	353	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	354	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	355	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	356	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	357	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	358	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	363	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	363/1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	364	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	364/1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	364/2	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	365	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	367	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	373/1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	379	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	380	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	381	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	382	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	383	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	384	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	385	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	SY No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Yadhagiri .K	386	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	387	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	388	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	389	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	390	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	391	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	392	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	393	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	396	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	397	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	398	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	399	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	400	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	401	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	402	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	403	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	404	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	405	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	406	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	407/1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	407/2	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	408	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	409	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	410	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	SY No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Yadhagiri .K	411	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	412	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	413	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	414	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	415	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	416	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	417	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	418	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	419	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	420	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	421	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	423	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Yadhagiri .K	424	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Yadhagiri .K	431	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	432	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	433	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Yadhagiri .K	434	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	444	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	446	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	447	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	448	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Yadhagiri .K	449	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Appendix III

Mundargi-1 Microwatershed

Soil Suitability Information

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Bandhalli	28	S3rz	S2z	S2rz	S2z	S2rt	S2rz	S3rz	S2rz	S2tz	S2rz	S2rz	S1	S2rz	S1	S2rt	S3rz	S2rz	S2tz	S1	S2tz	S2z	S2tz	S2tz	S2rz	S2z	S1	S1	S2rz	S2rz
Bandhalli	30	S3rz	S2z	S2rz	S2z	S2rt	S2rz	S3rz	S2rz	S2tz	S2rz	S2rz	S1	S2rz	S1	S2rt	S3rz	S2rz	S2tz	S1	S2tz	S2z	S2tz	S2tz	S2rz	S2z	S1	S1	S2rz	S2rz
Bandhalli	31	S3rz	S2z	S2rz	S2z	S2rt	S2rz	S3rz	S2rz	S2tz	S2rz	S2rz	S1	S2rz	S1	S2rt	S3rz	S2rz	S2tz	S1	S2tz	S2z	S2tz	S2tz	S2rz	S2z	S1	S1	S2rz	S2rz
Bandhalli	32	S3rz	S2z	S2rz	S2z	S2rt	S2rz	S3rz	S2rz	S2tz	S2rz	S2rz	S1	S2rz	S1	S2rt	S3rz	S2rz	S2tz	S1	S2tz	S2z	S2tz	S2tz	S2rz	S2z	S1	S1	S2rz	S2rz
Bandhalli	33	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S1	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S1	S2rz	S2rz
Bandhalli	34	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S1	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S1	S2rz	S2rz
Bandhalli	210	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Bandhalli	211	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S1	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S1	S2rz	S2rz
Bandhalli	216	S3rz	S2z	S2rz	S2z	S2rt	S2rz	S3rz	S2rz	S2tz	S2rz	S2rz	S1	S2rz	S1	S2rt	S3rz	S2rz	S2tz	S1	S2tz	S2z	S2tz	S2tz	S2rz	S2z	S1	S1	S2rz	S2rz
Bandhalli	217	S3rz	S2z	S2rz	S2z	S2rt	S2rz	S3rz	S2rz	S2tz	S2rz	S2rz	S1	S2rz	S1	S2rt	S3rz	S2rz	S2tz	S1	S2tz	S2z	S2tz	S2tz	S2rz	S2z	S1	S1	S2rz	S2rz
Bandhalli	218	S3rz	S2z	S2rz	S2z	S2rt	S2rz	S3rz	S2rz	S2tz	S2rz	S2rz	S1	S2rz	S1	S2rt	S3rz	S2rz	S2tz	S1	S2tz	S2z	S2tz	S2tz	S2rz	S2z	S1	S1	S2rz	S2rz
Bandhalli	219	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S1	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S1	S2rz	S2rz
Bandhalli	220	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Dastharabadha	28	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Dastharabadha	31	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Dastharabadha	32	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Dastharabadha	33	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Dastharabadha	34	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Dastharabadha	35	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Dastharabadha	36	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Dastharabadha	37	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Dastharabadha	38	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Dastharabadha	39	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Dastharabadha	40	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Dastharabadha	41	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Dastharabadha	42	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Dastharabadha	43	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Dastharabadha	44	S3tz	S3tz	S2tz	S3tz	S2tz	N1tz	S2rt	S1	N1tz	S3tz	S2tz	S3tz	S3tz	S3tz	S3tz	S2rz	S1	S2tz	S1	S2tz	S2z	S2z	S2z	S2tz	S2z	S2t	S2t	S2tz	S3tz
Dastharabadha	45	S3tz	S3tz	S2tz	S3tz	S2tz	N1tz	S2rt	S1	N1tz	S3tz	S2tz	S3tz	S3tz	S3tz	S3tz	S2rz	S1	S2tz	S1	S2tz	S2z	S2z	S2z	S2tz	S2z	S2t	S2t	S2tz	S3tz
Dastharabadha	46	S3tz	S3tz	S2tz	S3tz	S2tz	N1tz	S2rt	S1	N1tz	S3tz	S2tz	S3tz	S3tz	S3tz	S3tz	S2rz	S1	S2tz	S1	S2tz	S2z	S2z	S2z	S2tz	S2z	S2t	S2t	S2tz	S3tz
Dastharabadha	48	S2r	S2tw	S3t	S1	S3t	S1	S2t	S2z	S1	S1	S2tw	S2t	S3t	S2z	N1t	S2t	S2z	S3tw	S1	S2tw	S3tw	S2tw	S2tw	S2t	S2t	S1	S1	S2tw	S3tw
Dastharabadha	52	N1rz	S2rz	S3rz	S2rz	S3rz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3rz	S2rz	N1tz	S3rz	S3rz	S2rz	S2r	S2rz	S2rz	S2rz	S2rz	S3rz	S2rz	S2r	S2r	S3rz	S3rz
Dastharabadha	53	S2r	S2tw	S3t	S1	S3t	S1	S2t	S2z	S1	S1	S2tw	S2t	S3t	S2z	N1t	S2t	S2z	S3tw	S1	S2tw	S3tw	S2tw	S2tw	S2t	S2t	S1	S1	S2tw	S3tw
Dastharabadha	54	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Dastharabadha	55	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Dastharabadha	56	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S1	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S1	S2rz	S2rz
Dastharabadha	57	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Dastharabadha	58/1	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Dastharabadha	58/2	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Dastharabadha	58/3	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Dastharabadha	59	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S1	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S1	S2rz	S2rz
Mundaragi	58	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Mundaragi	59	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	60	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	61	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	62	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	63	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	64	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	65	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	66	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	67	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Mundaragi	131	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Mundaragi	132	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Mundaragi	133	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Mundaragi	134	S3tz	S2tw	S3t	S1	S3t	S2z	S2t	S2z	S1	S2zw	S2tw	S2t	S3t	S1	N1t	S2t	S2z	S3tw	S1	S2tw	S3tw	S2tw	S2tw	S2t	S2tz	S1	S1	S2tw	S3tw
Mundaragi	135	S3tz	S2tw	S3t	S1	S3t	S2z	S2t	S2z	S1	S2zw	S2tw	S2t	S3t	S1	N1t	S2t	S2z	S3tw	S1	S2tw	S3tw	S2tw	S2tw	S2t	S2tz	S1	S1	S2tw	S3tw
Mundaragi	137	S3tz	S2tw	S3t	S1	S3t	S2z	S2t	S2z	S1	S2zw	S2tw	S2t	S3t	S1	N1t	S2t	S2z	S3tw	S1	S2tw	S3tw	S2tw	S2tw	S2t	S2tz	S1	S1	S2tw	S3tw
Mundaragi	138	S3tz	S2tw	S3t	S1	S3t	S2z	S2t	S2z	S1	S2zw	S2tw	S2t	S3t	S1	N1t	S2t	S2z	S3tw	S1	S2tw	S3tw	S2tw	S2tw	S2t	S2tz	S1	S1	S2tw	S3tw
Mundaragi	139	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Mundaragi	140	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Mundaragi	141	S3tz	S3tz	S2tz	S3tz	S2tz	N1tz	S2rt	S1	N1tz	S3tz	S2tz	S3tz	S3tz	S3tz	S3tz	S2rz	S1	S2tz	S1	S2tz	S2z	S2z	S2z	S2tz	S2z	S2t	S2t	S2tz	S3tz
Mundaragi	142	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	143	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	144	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	145	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	146	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	147	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	148	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	149	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	150	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	151	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	152	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	153	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	154	S3tw	S2tw	S3tw	S1	S3tw	S1	S2tw	S2zw	S1	S2rw	S2tw	S1	S3tw	S1	N1tz	S2tw	S2zw	S3tw	S2t	S2tw	S3tw	S2tw	S2tw	S2tw	S2t	S1	S1	S2tw	S3tw
Mundaragi	159	S3tz	S3tz	S2tz	S3tz	S2tz	N1tz	S2rt	S1	N1tz	S3tz	S2tz	S3tz	S3tz	S3tz	S3tz	S2rz	S1	S2tz	S1	S2tz	S2z	S2z	S2z	S2tz	S2z	S2t	S2t	S2tz	S3tz
Mundaragi	160	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Mundaragi	161	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Mundaragi	182	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Mundaragi	183	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Mundaragi	184	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Mundaragi	185	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Mundaragi	186	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S1	S2tw	S3tw
Yadagiri.B	1	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Yadagiri.B	2	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Yadagiri.B	3	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Yadagiri.B	6	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Yadhagiri .K	1	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	2	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	9	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	296	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	298	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	299	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	300	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	301	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	302	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	303	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	304	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	305	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	306	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	307	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	308	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	309	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	310	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	311	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	312	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Yadhagiri .K	313	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	314	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	315	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	316	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	317	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	318/1	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	318/2	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	318/3	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	319	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	320	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	321	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	322	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	323	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	324	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	325	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	326	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	327	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	328	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	329	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	330	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	331	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	332	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	333	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	334	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	335	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	336	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	337	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Yadhagiri .K	338	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	339	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	340	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	341	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	342	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	343	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	344	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	345	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	346	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	347	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	348	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	349	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	350	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	351	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	352	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	353	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	354	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	355	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	356	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	357	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	358	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	363	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	363/1	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	364	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	364/1	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	364/2	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	365	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Yadhagiri .K	367	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	373/1	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	379	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	380	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	381	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	382	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	383	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	384	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	385	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	386	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	387	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	388	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	389	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	390	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	391	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	392	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	393	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	396	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	397	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	398	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	399	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	400	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	401	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	402	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	403	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	404	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	405	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Yadhagiri .K	406	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	407/1	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	407/2	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	408	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	409	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	410	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	411	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	412	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	413	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	414	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	415	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	416	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	417	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	418	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	419	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	420	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	421	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	423	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Yadhagiri .K	424	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Yadhagiri .K	431	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	432	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	433	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Yadhagiri .K	434	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	444	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	446	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	447	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Yadhagiri .K	448	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Yadhagiri .K	449	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw

Ro-Rock out crops, TCB-Trench cum bunding

PART-B

SOCIO-ECONOMIC STATUS OF FARM HOUSEHOLDS

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Chapter 1

FINDINGS OF THE SOCIO-ECONOMIC SURVEY

- *The survey was conducted in Mundragi-1 is located at North latitude 16^0 48' 22.633" and 16^0 45' 58.37" and East longitude 77^0 10' 52.633" and 77^0 8' 22.747" covering an area of about 451.37 ha coming under Mundaragi, Dastharabadha and Yadhagiri. B Villages of Yadagiri taluk.*
- *Socio-economic analysis of Mundragi-1 micro watersheds of Belagiri sub-watershed, Yadgiri taluk & District indicated that, out of the total sample of 36 farmers were sampled in Mundragi-1 micro-watershed among households surveyed 18 (50.00%) were marginal, 9 (25.00%) were small, 2 (5.56 %) were semi medium and 2 (5.56 %) were medium farmers. 5 landless farmers were also interviewed for the survey.*
- *The population characteristics of households indicated that, there were 75 (55.97%) men and 59 (44.03 %) were women. The average population of landless was 3, marginal farmers were 3.8, small farmers were 3.1, semi medium farmers were 6.5 and medium farmers were 4.5.*
- *Majority of the respondents (47.76%) were in the age group of 16-35 years.*
- *Education level of the sample households indicated that, there were 67.91 per cent illiterates, 28.36 per cent pre university education and 3.73 per cent attained graduation.*
- *About, 69.44 per cent of household heads practicing agriculture and 16.67 per cent of the household heads were engaged as agricultural labourers. Agriculture was the major occupation for 47.76 per cent of the household members.*
- *In the study area, 72.22 per cent of the households possess katcha house and 25.00 per cent possess pucca house.*
- *The durable assets owned by the households showed that, 83.33 per cent possess TV, 8.33 per cent possess mixer grinder, 88.89 per cent possess mobile phones and 5.56 per cent possess motor cycles. Farm implements owned by the households indicated that, 22.22 per cent of the households possess plough, 8.33 per cent possess bullock cart and 2.78 per cent possess sprayer.*
- *Regarding livestock possession by the households, 13.89 per cent possess local cow and 8.33 per cent possess buffalo.*
- *The average labour availability in the study area showed that, own labour men available in the micro watershed was 1.71, women available in the micro watershed was 1.39, hired labour (men) available was 5.48 and hired labour (women) available was 8.74.*
- *Out of the total land holding of the sample respondents 63.47 per cent (26.74 ha) of the area is under dry condition and the remaining 36.53 per cent area is irrigated land.*
- *There were 9.00 live bore wells and 6.00 dry bore wells among the sampled households. Bore/open well was the major source of irrigation for 25.00 per cent of the households.*
- *The major crops grown by sample farmers are Red gram, Groundut, Green gram, Sorghum and Cotton and cropping intensity was recorded as 99.50 per cent.*
- *Out of the sample households 100.00 percent possessed bank account and 36.11 per cent of them have savings in the account. About 30.56 per cent of the respondents*

borrowed credit from various sources. Among the credit borrowed by households, 7.69 per cent have borrowed loan from commercial banks and 23.08 per cent from co-operative/Grameena bank.

- *Majority of the respondents (100.00%) have borrowed loan for agriculture purpose.*
- *Regarding the opinion on institutional sources of credit, 66.67 per cent of the households opined that credit helped to perform timely agricultural operations.*
- *The per hectare cost of cultivation for Red gram, Groundut, Green gram, Sorghum and Cotton was Rs.43279.56, 119183.08, 44891.32, 30259.60 and 58983.03 with benefit cost ratio of 1:1.60, 1: 0.80, 1: 0.80, 1: 1.40 and 1:1.40 respectively.*
- *Further, 16.67 per cent of the households opined that dry fodder was adequate and 8.33 per cent of the households have opined that the green fodder was adequate.*
- *The average annual gross income of the farmers was Rs. 106666.67 in micro-watershed, of which Rs. 48361.11 comes from agriculture.*
- *Sampled households have grown 8 horticulture trees and 57 forestry trees together in the fields and back yards. About 5.56 per cent of the households shown interest to cultivate horticultural crops.*
- *Households have an average investment capacity of Rs. 1250.00 for land development and Rs. 833.33 for irrigation facility. Source of funds for additional investment is concerned, 8.33 per cent depends on bank loan for land development activities.*
- *Regarding marketing channels, 25.00 per cent of the households have sold agricultural produce to the local/village merchants, while, 63.89 per cent have sold in regulated markets.*
- *Further, 86.11 per cent of the households have used tractor for the transport of agriculture commodity.*
- *Majority of the farmers (83.33%) have experienced soil and water erosion problems in the watershed and 86.11 per cent of the households were interested towards soil testing.*
- *Fire was the major source of fuel for domestic use for 66.67 per cent of the households and 36.11 per cent households has LPG connection.*
- *Piped supply was the major source for drinking water for 97.22 per cent of the households. Electricity was the major source of light for 97.22 per cent of the households. In the study area, 30.56 per cent of the households possess toilet facility.*
- *Regarding possession of PDS card, 100.00 per cent of the households possessed BPL card. Households opined that, the requirement of cereals (97.22%), pulses (94.44%) and oilseeds (66.67%) are adequate for consumption.*
- *Farming constraints experienced by households in the micro watersheds were lower fertility status of the soil (88.89%) wild animal menace on farm field (83.33%), frequent incidence of pest and diseases (66.67%), inadequacy of irrigation water (38.89%), high cost of fertilizers and plant protection chemicals (88.89%), high rate of interest on credit (80.56%), low price for the agricultural commodities (80.56%), lack of marketing facilities in the area (83.33%), inadequate extension services (13.89%), lack of transport for safe transport of the agricultural produce to the market (86.11%).*

Chapter 2

INTRODUCTION

Soil and water are the two precious natural resources which are essential for crop production and existence of life on earth. Rainfed agriculture is under severe stress due to various constraints related to agriculture like uneven and erratic distribution of rainfall, indiscriminate use of fertilizers, chemicals and pesticides, adoption of improper land management practices, soil erosion, decline in soil fertility, decline in ground water resources leading to low crop productivity. The area under rainfed agriculture has to be managed effectively using the best available practices to enhance the production of food, fodder and fuel. This is possible if the land resources are characterized at each parcel of land through detailed land resource inventory using the best available techniques of remote sensing, GPS and GIS. The watershed development programs are aimed at the sustainable distribution of its resources and the process of creating and implementing plans, programs, and projects to sustain and enhance watershed functions that affect the plant, animal and human communities within a watershed boundary.

World Bank funded KWDP II, SUJALA III project was implemented in with Broad objective of demonstrating more effective watershed management through greater integration of programmes related to rain-fed agriculture, innovative and science based approaches and strengthen institutional capacities and If successful, it is expected that the systems and tools could be mainstreamed into the overall IWMP in the State of Karnataka and in time, throughout other IWMP operations in India. With this background the socio-economic survey has been carried out with following specific objectives:

1. To understand the demographic features of the households in the micro-watershed
2. To understand the extent of family labour available and additional employment opportunities available within the village.
3. To know the status of assets of households in the micro-watershed for suggesting possible improvements.
4. To study the cropping pattern, cropped area and productivity levels of different households in micro-watershed.
5. To determine the type and extent of livestock owned by different categories of HHs
6. Availability of fodder and level of livestock management.

Scope and importance of survey

Survey helps in identification of different socio-economic and resource use-patterns of farmers at the Micro watershed. Household survey provides demographic features, labor force, and levels of education; land ownership and asset position (including livestock and other household assets) of surveyed households; and cropping patterns, input intensities, and average crop yields from farmers' fields. It also discusses crop utilization and the degree of commercialization of production in the areas; farmers' access to and utilization of credit from formal and informal sources; and the level of adoption and use of soil, water, and pest management technologies.

Chapter 3

METHODOLOGY

The description of the methods, components selected for the survey and procedures followed in conducting the baseline survey are furnished under the following heads.

1. Description of the study area

Yadgir District is one of the 30 districts of Karnataka state in southern India. This district was carved out from the erstwhile Gulbarga district as the 30th district of Karnataka on 10 April 2010. Yadgir town is the administrative headquarters of the district. The district comprises of 3 taluks namely, Shahapur, Yadgiri and Shorapur (There are 16 hoblies, 117 Gram Panchayats, 4 Municipalities,8 Towns/ Urban agglomeration and 487 inhabited & 32 un-inhabited villages The district occupies an area of 5,160.88 km².

Yadgir district is the second smallest district in the state, area wise is very rich in cultural traditions. The vast stretch of fertile black soil of the district is known for bumper red gram and jowar crops. The district is a "Daal bowl" of the state. The district is also known for cluster of cement industries and a distinct stone popularly known as "Malakheda Stone". Two main rivers, Krishna and Bhima, and a few tributaries flow in this region. Krishna and Bhima Rivers drain the district. They constitute the two major river basins of the district. Kagna and Amarja are the two sub - basins of Bhima River, which occur within the geographical area of the district

According to the 2011 census Yadgir district has a population of 1, 172,985, roughly equal to the nation of Timor-Lesteor the US state of Rhode Island. This gives it a ranking of 404th in India (out of a total of 640). The district has a population density of 224 inhabitants per square kilometre (580/sq mi). Its population growth rate over the decade 2001-2011 was 22.67%. Yadgir has a sex ratio of 984 females for every 1000 males, and a literacy rate of 52.36%.

2. Locale of the survey and description of the micro-watershed and

The study was conducted in Mundragi-1 micro-watershed (Belagiri sub-watershed, Yadgiri taluk & District) is located at North latitude 16^0 48’ 22.633” and 16^0 45' 58.37" and East longitude 77^0 10’ 52.633" and 77^0 8’ 22.747”covering an area of about 451.37 ha bounded by unde Mundaragi, Dastharabadha and Yadhagiri. B Villages.

3. Selection of the respondents for the study

The micro-watershed is marked with 320 square meters grids. One farmer from every alternate grid in the micro-watershed was selected for the study and interviewed for socio-economic data. Totally 36 households were interviewed for the survey.

4. The parameters considered for socio-economic survey of households

Two forms of data were collected from the micro-watershed which includes primary data from the farm households and secondary data about the villages under the micro-watershed jurisdiction.

The following parameters were considered for the primary data collection about the socio-economic data of the households, (1) Demographic information, (2) Farm and durable assets owned by households, (3) Livestock possession, (4) Labour availability, (5) Level of migration in the village, Land holding, (7) Cropping pattern, (8) Source of irrigation, (9) Borrowing status, (10) Cost of cultivation of major crops, (11) Economics of subsidiary activities, (12) Fodder availability, (13) Family annual income from different sources, (14) Horticulture and forestry species grown, (15) Additional investment capacity, (16) Marketing practices, (17) Status of soil and water conservation structure, (18) Access to basic needs and (19) Constraints and suggestion.

The following parameters were considered for the secondary data regarding the villages under the micro-watershed jurisdiction, (1) Number of villages in each micro-watershed jurisdiction, (2) Village wise number of households, (3) Geographical area of the villages, (4) Cultivable are a including rainfed and irrigated, (5) Number and type of house in each village, (6) Human and livestock population, (7) Facilities in the village such as roads, transport facility for conveyance, drinking water supply, street light and (8) Community based organizations in the villages.

5. Development of interview schedule and data collection

Taking into the consideration the objectives of the survey, an interview schedule was prepared after thorough consultation with the experts in the field of social sciences. A comprehensive interview schedule covering all the major parameters for measuring the socio-economic situation was developed.

6. Tools used to analyze the data

The statistical components such as frequency and percentage were used to analyze the data.

Abbreviations used in the report

LL=Landless
MF=Marginal Farmers
SF=Small farmers
SMF=Semi medium farmers
MDF=Medium farmers
LF=Large Farmers

Chapter 4

FINDINGS OF THE SURVEY

This chapter deals with systematic presentation of results of the survey. Keeping in view the objectives, the salient features of the survey are presented under the following headings.

Households sampled for socio-economic survey: The data on households sampled for socio economic survey in Mundragi-1 Micro watershed is presented in Table 1 and it indicated that 36 farmers were sampled in Mundragi-1 micro-watershed among households surveyed 18 (50.00%) were marginal, 9 (25.00%) were small, 2 (5.56 %) were semi medium and 2 (5.56 %) were medium farmers. 5 landless farmers were also interviewed for the survey.

Table 1. Households sampled for socio economic survey in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Farmers	5	13.9	18	50	9	25	2	5.56	2	5.56	36	100

Population characteristics: The population characteristics of households sampled for socio-economic survey in Mundragi-1 Micro watershed is presented in Table 2. The data indicated that, there were 75 (55.97%) men and 59 (44.03%) were women. The average population of landless was 3, marginal farmers were 3.8, small farmers were 3.1, semi medium farmers were 6.5 and medium farmers were 4.5.

Table 2. Population characteristics in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (15)		MF (69)		SF (28)		SMF (13)		MDF (9)		All (134)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Men	8	53.3	39	57	16	57	6	46.2	6	66.7	75	56
2	Women	7	46.7	30	43	12	43	7	53.9	3	33.3	59	44
Total		15	100	69	100	28	100	13	100	9	100	134	100
Average		3.0		3.8		3.1		6.5		4.5		3.7	

Age wise classification of population: The age wise classification of household members in Mundragi-1 Micro watershed is presented in Table 3. The indicated that, 18 (13.43%) of population were 0-15 years of age, 64 (47.76%) were 16-35 years of age, 40(29.85%) were 36-60 years of age and 12 (8.96 %) were above 61 years of age.

Table 3: Age wise classification of members of the household in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (15)		MF (69)		SF (28)		SMF (13)		MDF (9)		All (134)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	0-15 years of age	3	20	15	21.7	0	0	0	0	0	0	18	13.43
2	16-35 years of age	8	53.3	28	40.6	15	53.6	8	61.54	5	56	64	47.76
3	36-60 years of age	3	20	21	30.4	11	39.3	2	15.38	3	33	40	29.85
4	> 61 years	1	6.67	5	7.25	2	7.14	3	23.08	1	11	12	8.96
Total		15	100	69	100	28	100	13	100	9	100	134	100

Education level of household members: Education level of household members in Mundragi-1 Micro watershed is presented in Table 4. The results indicated that, there were

67.91 per cent of illiterates, 11.19 per cent of them had primary school education, 3.73 per cent middle school education, 7.46 per cent high school education, 2.99 per cent of them had PUC education, 3.73 per cent attained graduation and 2.24 them had other education.

Table 4. Education level of members of the household in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (15)		MF (69)		SF (28)		SMF (13)		MDF (9)		All (134)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Illiterate	12	80	37	53.6	24	85.7	13	100	5	55.56	91	67.9
2	Primary School	3	20	11	15.9	0	0	0	0	1	11.11	15	11.2
3	Middle School	0	0	4	5.8	1	3.57	0	0	0	0	5	3.73
4	High School	0	0	7	10.1	2	7.14	0	0	1	11.11	10	7.46
5	PUC	0	0	3	4.35	1	3.57	0	0	0	0	4	2.99
6	ITI	0	0	0	0	0	0	0	0	1	11.11	1	0.75
7	Degree	0	0	4	5.8	0	0	0	0	1	11.11	5	3.73
8	Others	0	0	3	4.35	0	0	0	0	0	0	3	2.24
Total		15	100	69	100	28	100	13	100	9	100	134	100

Occupation of head of households: The data regarding the occupation of the household heads in Mundragi-1 Micro watershed is presented in Table 5. The results indicate that, 69.44 per cent of households heads were practicing agriculture, 16.67 per cent of the household heads were agricultural Labour and housewife (5.56%).

Table 5: Occupation of heads of households in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Agriculture	0	0	13	72	8	88.89	2	100	2	100	25	69.44
2	Agricultural Labour	2	40	4	22	0	0	0	0	0	0	6	16.67
3	General Labour	2	40	0	0	0	0	0	0	0	0	2	5.56
4	Trade & Business	0	0	1	5.6	0	0	0	0	0	0	1	2.78
5	Housewife	1	20	0	0	1	11.11	0	0	0	0	2	5.56
Total		5	100	18	100	9	100	2	100	2	100	36	100

Table 6: Occupation of members of the household in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (15)		MF (69)		SF (28)		SMF (13)		MDF (9)		All (134)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Agriculture	0	0	29	42	20	71.43	8	61.54	7	78	64	47.8
2	Agricultural Labour	5	33.3	9	13	0	0	0	0	0	0	14	10.5
3	General Labour	2	13.3	0	0	0	0	0	0	0	0	2	1.49
4	Government Service	0	0	1	1.45	0	0	0	0	0	0	1	0.75
5	Private Service	0	0	1	1.45	0	0	0	0	0	0	1	0.75
6	Trade & Business	0	0	1	1.45	0	0	0	0	0	0	1	0.75
7	Student	3	20	16	23.2	2	7.14	0	0	0	0	21	15.7
8	Housewife	5	33.3	9	13	6	21.43	5	38.46	2	22	27	20.2
9	Children	0	0	3	4.35	0	0	0	0	0	0	3	2.24
Total		15	100	69	100	28	100	13	100	9	100	134	100

Occupation of the members of the household: The data regarding the occupation of the household members in Mundragi-1 Micro watershed is presented in Table 6. The results indicate that, agriculture was the major occupation for 47.76 per cent of the household members, 10.45 per cent were agricultural labour, 1.49 per cent were general labour0.75

per cent were working in government sector, 15.67 per cent were working in pursuing education, 20.15 per cent were involved as housewife and 2.24 per cent were children.

Institutional Participation of household members: The data regarding the institutional participation of the household members in Mundragi-1 Micro watershed is presented in Table 7. The results show that, out of the total family members in the households 100 per cent of them were not participating in any of the institutions.

Table 7: Institutional Participation of household member in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (15)		MF (69)		SF (28)		SMF (13)		MDF (9)		All (134)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	No Participation	15	100	69	100	28	100	13	100	9	100	134	100
Total		15	100	69	100	28	100	13	100	9	100	134	100

Type of house owned: The data regarding the type of house owned by the households in Mundragi-1 Micro watershed is presented in Table 8. The results indicate that, 2.78 percent possess thatched house, 72.22 per cent of the households possess katcha house and 25.00 per cent possess pacca house.

Table 8. Type of house owned by households in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Thatched	0	0	1	5.6	0	0	0	0	0	0	1	2.78
2	Katcha	2	40	14	78	7	77.78	1	50	2	100	26	72.22
3	Pucca/RCC	3	60	3	17	2	22.22	1	50	0	0	9	25
Total		5	100	18	100	9	100	2	100	2	100	36	100

Durable assets owned by the households: The data regarding the Durable Assets owned by the households in Mundragi-1 Micro watershed is presented in Table 9. The results shows that, 83.33 per cent possess TV, 8.33 per cent possess mixer grinder, 5.56 per cent possess motor cycle and 88.89 per cent possess mobile phones.

Table 9. Durable assets owned by households in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Television	4	80	15	83	7	77.8	2	100	2	100	30	83.33
2	Mixer/Grinder	0	0	1	5.6	0	0	1	50	1	50	3	8.33
3	Mobile Phone	5	100	16	89	7	77.8	2	100	2	100	32	88.89
4	Blank	0	0	0	0	1	11.1	0	0	0	0	1	2.78

Table 10. Average value of durable assets owned in Mundragi-1 micro-watershed

Average Value (Rs.)

Sl.No.	Particulars	LL (5)	MF (18)	SF (9)	SMF (2)	MDF (2)	All (36)
1	Television	7500	7066	9285	6500	6500	7566
2	Mixer/Grinder	0	2000	0	1200	1800	1666
3	Motor Cycle	0	35000	0	72000	0	53500
4	Mobile Phone	3142	2296	3636	3200	1750	2722

Average value of durable assets: The data regarding the average value of durable assets owned by the households in Mundragi-1 Micro watershed is presented in Table 10. The

result shows that, the average value of television was Rs.7566.00, mixer grinder was Rs.1666.00, motor cycle was Rs. 53500.00 and mobile phone was Rs.2722.00.

Farm implements owned: The data regarding the farm implements owned by the households in Mundragi-1 Micro watershed is presented in Table 11. About 8.33 per cent of the households possess Bullock Cart, 22.22 per cent possess plough, 2.78 per cent possess Sprayer and 13.89 per cent possess Weeder.

Table 11. Farm implements owned in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Bullock Cart	0	0	1	5.56	1	11.11	1	50	0	0	3	8.33
2	Plough	0	0	3	16.7	2	22.22	1	50	2	100	8	22.22
3	Sprayer	0	0	1	5.56	0	0	0	0	0	0	1	2.78
4	Weeder	0	0	1	5.56	1	11.11	1	50	2	100	5	13.89
5	Maize Huller	0	0	1	5.56	0	0	0	0	0	0	1	2.78
6	Chaff Cutter	0	0	0	0	1	11.11	0	0	0	0	1	2.78
7	Blank	5	100	14	77.8	7	77.78	1	50	0	0	27	75

Average value of farm implements: The data regarding the average value of farm Implements owned by the households in Mundragi-1 Micro watershed is presented in Table 12. The results show that the average value of plough was Rs.2230.00, bullock Cart was Rs.19333.00, seed/fertilizer drill was Rs.7500.00 and weeder was Rs.450.00.

Table 12. Average value of farm implements in Mundragi-1 micro-watershed

Average Value (Rs.)

Sl.No.	Particulars	LL (5)	MF (18)	SF (9)	SMF (2)	MDF (2)	All (36)
1	Bullock Cart	0	10000	24000	24000	0	19333
2	Plough	0	833	2000	7000	4500	2230
3	Sprayer	0	7500	0	0	0	7500
4	Weeder	0	1500	200	200	175	450
5	Maize Huller	0	180	0	0	0	180
6	Chaff Cutter	0	0	1000	0	0	1000

Livestock possession by the households: The data regarding the Livestock possession by the households in Mundragi-1 Micro watershed is presented in Table 13. The indicate that, 25.00 per cent of the households possess bullocks, 13.89 per cent possess local cow, 8.33 per cent possess buffalo, 5.56 per cent possess crossbred cow, 2.78 per cent possess sheep and 2.78 per cent possess goat.

Table 13. Livestock possession by households in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Bullock	0	0	4	22	3	33.33	1	50	1	50	9	25
2	Local cow	0	0	4	22	1	11.11	0	0	0	0	5	13.89
3	Crossbred cow	0	0	1	5.6	0	0	0	0	1	50	2	5.56
4	Buffalo	0	0	1	5.6	1	11.11	0	0	1	50	3	8.33
5	Sheep	0	0	1	5.6	0	0	0	0	0	0	1	2.78
6	Goat	0	0	1	5.6	0	0	0	0	0	0	1	2.78
7	blank	5	100	13	72	6	66.67	1	50	0	0	25	69.44

Average Labour availability: The data regarding the average labour availability in Mundragi-1 Micro watershed is presented in Table 14. The indicated that, own labour men available in the micro watershed was 1.71, women available in the micro watershed was 1.39, hired labour (men) available was 5.48 and hired labour (women) available was 8.74.

Table 14. Average labour availability in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)	MF (18)	SF (9)	SMF (2)	MDF (2)	All (36)
		N	N	N	N	N	N
1	Hired labour Female	0	7.06	7.44	11	27.5	8.74
2	Own Labour Female	0	1.28	1.33	2.5	1.5	1.39
3	Own labour Male	0	1.39	1.78	3.5	2.5	1.71
4	Hired labour Male	0	4.28	5	6.5	17.5	5.48

Adequacy of hired labour: The data regarding the adequacy of hired labour in Mundragi-1 Micro watershed is presented in Table 15. The results indicate that, 86.11 per cent of the household opined that hired labour was adequate.

Table 15. Adequacy of hired labour in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)	
		N	%	N	%	N	%	N	%	N	%
1	Adequate	0	0	18	100	9	100	2	100	2	100

Distribution of land (ha): The data regarding the distribution of land (ha) in Mundragi-1 Micro watershed is presented in Table 16. The results indicate that, 16.97 ha (63.47%) of dry land and 9.77 ha (36.53 %) of irrigated land.

Table 16. Distribution of land (ha) in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Dry	0	0	7.98	99.25	6.56	65.22	2.43	66.67	0	0	16.97	63.47
2	Irrigated	0	0	0.06	0.75	3.5	34.78	1.21	33.33	4.99	100	9.77	36.53
Total		0	100	8.04	100	10.06	100	3.64	100	4.99	100	26.74	100

Average value of land (ha): The data regarding the average land value (Rs./ha) in Mundragi-1 Micro watershed is presented in Table 17. The results show that the average value of dry land was Rs.508841.20 and the average value of irrigated land was Rs.716238.61.

Table 17. Average value of land (ha) in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)	MF (18)	SF (9)	SMF (2)	MDF (2)	All (36)
		N	N	N	N	N	N
1	Dry	0	744006.1	319790.4	247000	0	508841.2
2	Irrigated	0	1646667	599653.2	329333.3	880713.2	716238.6

Table 18. Status of bore wells in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)	MF (18)	SF (9)	SMF (2)	MDF (2)	All (36)
		N	N	N	N	N	N
1	De-functioning	0	3	3	0	0	6
2	Functioning	0	3	4	1	1	9

Status of bore wells: The data regarding the status of bore wells in Mundragi-1 Micro watershed is presented in Table 18. The results indicate that, there were 6 De-functioning

bore wells and 9 functioning bore wells among the sampled households in micro watershed.

Source of irrigation: The data regarding the source of irrigation in Mundragi-1 Micro watershed is presented in Table 19. The results show that, bore well for 25.00 per cent of the households.

Table 19. Source of irrigation in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Bore Well	0	0	3	16.7	4	44.44	1	50	1	50	9	25

Depth of water (Avg. In meters): The data regarding the depth of water in Mundragi-1 Micro watershed is presented in Table 20. The results revealed that, the depth of bore well was 13.94 meter.

Table 20. Depth of water (Avg. In meters) in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)	MF (18)	SF (9)	SMF (2)	MDF (2)	All (36)
		N	N	N	N	N	N
1	Bore Well	0	10.84	18.97	62.48	5.49	13.94

Cropping pattern: The data regarding the cropping pattern in Mundragi-1 Micro watershed is presented in Table 21. The results indicate that, farmers have grown Groundnut (8.69 ha), Red gram (6.37 ha), Cotton (2.91 ha), Groundnut (2.68 ha) Sorghum (1.70 ha) and Green gram (0.51 ha).

Table 21. Cropping pattern in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)	MF (18)	SF (9)	SMF (2)	MDF (2)	All (36)
1	Kharif - Groundnut	0	3.25	2.15	1.21	2.08	8.69
2	Kharif - Red gram	0	1.29	2.65	2.43	0	6.37
3	Rabi - Cotton	0	0	0	0	2.91	2.91
4	Rabi - Groundnut	0	0.95	1.73	0	0	2.68
5	Rabi - Sorghum	0	1.7	0	0	0	1.7
6	Kharif - Cotton	0	0.15	1.21	0	0	1.37
7	Kharif - Green gram	0	0.51	0	0	0	0.51

Cropping intensity: The data regarding the cropping intensity in Mundragi-1 Micro watershed is presented in Table 22. The results indicate that, the cropping intensity was 99.50 per cent.

Table 22. Cropping intensity (%) in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)	MF (18)	SF (9)	SMF (2)	MDF (2)	All (36)
1	Cropping Intensity	0	98.49	100	100	100	99.5

Table 23. Possession of Bank account and savings in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Account	5	100	18	100	9	100	2	100	2	100	36	100
2	Savings	3	60	6	33.33	3	33.33	1	50	0	0	13	36.11

Possession of bank account and savings: The data regarding the possession of bank account and saving in Mundragi-1 micro-watershed is presented in Table 23. The results

indicate that, 100.00 cent of the households posses bank account and 36.11 per cent of them have savings.

Borrowing status: The results indicate (Table 24) that, 30.56 percent of the sample farmers have borrowed credit from different sources.

Table 24. Borrowing status in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Credit Availed	2	40	5	27.78	1	11.1	2	100	1	50	11	30.56

Source of credit: The results show (Table 25) that, 7.69 per cent have borrowed loan from commercial banks and 3.85 per cent have borrowed loan from Cooperative bank, 23.08 per cent have borrowed loan from Grameena Bank, 3.85 per cent have borrowed loan from money lender.

Table 25. Source of credit borrowed by households in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (3)		MF (12)		SF (8)		SMF (2)		MDF (1)		All (26)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Commercial Bank	0	0	1	8.33	0	0	0	0	1	100	2	7.69
2	Cooperative Bank	0	0	1	8.33	0	0	0	0	0	0	1	3.85
3	Grameena Bank	0	0	3	25	2	25	1	50	0	0	6	23.08
4	Money Lender	0	0	1	8.33	0	0	0	0	0	0	1	3.85

Avg. Credit amount: The data regarding the avg. Credit amount in Mundragi-1 micro-watershed is presented in Table 26. The results show that, farmers have borrowed Avg. Credit of Rs.13923.08 from different sources.

Table 26. Avg. Credit amount in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (3)	MF (12)	SF (8)	SMF (2)	MDF (1)	All (26)
		N	N	N	N	N	N
1	Average Credit	0	16000	6250	30000	60000	13923.1

Purpose of credit borrowed (institutional Source): The data regarding the purpose of credit borrowed - Institutional Credit in Mundragi-1 micro-watershed is presented in Table 27. The results indicate that, 100.00 per cent of the households have borrowed loan for agriculture.

Table 27. Purpose of credit borrowed (institutional Source) by households in Mundragi-1 micro-watershed

SN	Particulars	LL (0)		MF (5)		SF (2)		SMF (1)		MDF (1)		All (9)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Agriculture production	0	0	5	100	2	100	1	100	1	100	9	100

Table 28. Purpose of credit borrowed (Private Source) by households in Mundragi-1 micro-watershed

Sl.No.	Particulars	MF (1)		All (1)	
		N	%	N	%
1	Bore well/irrigation related equipments	1	100	1	100

Purpose of credit borrowed (Private Source): The data regarding the purpose of credit borrowed – Private Source in Mundragi-1 micro-watershed is presented in Table 28. The results indicate that, bore well/irrigation related equipments (100.00 %).

Repayment status of household (institutional Source): The data regarding the repayment status of credit borrowed from institutional Source by households in Mundragi-1 micro watershed is presented in Table 29. The results indicate that, 33.33 per cent of the households have partially paid and 66.67 per cent have unpaid.

Table 29. Repayment status of household (institutional Source) in Mundragi-1 micro-watershed

Sl.No.	Particulars	MF (5)		SF (2)		SMF (1)		MDF (1)		All (9)	
		N	%	N	%	N	%	N	%	N	%
1	Partially paid	2	40	0	0	1	100	0	0	3	33.33
2	Un paid	3	60	2	100	0	0	1	100	6	66.67

Repayment status of household (Private Source): The data regarding the repayment status of credit borrowed from private sources by households in Mundragi-1 micro watershed is presented in Table 30. The results indicate that, 100 per cent has unpaid.

Table 30. Repayment status of household (Private Source) in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (0)		MF (1)		SF (0)		SMF (0)		MDF (0)		All (1)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Un paid	0	0	1	100	0	0	0	0	0	0	1	100

Opinion regarding institutional sources of credit: The results indicate (Table 31)that, 66.67 per cent of the households opined that credit helped to perform timely agricultural operations, 22.22 per cent Higher rate of interest and 11.11 per cent Forced to sell the produce at low price to repay loan in time.

Table 31. Opinion regarding institutional sources of credit in Mundragi-1 micro-watershed

Sl. No.	Particulars	MF (5)		SF (2)		SMF (1)		MDF (1)		All (9)	
		N	%	N	%	N	%	N	%	N	%
1	Helped to perform timely agricultural operations	3	60	1	50	1	100	1	100	6	66.7
2	Higher rate of interest	2	40	0	0	0	0	0	0	2	22.2
3	Forced to sell the produce at low price to repay loan in time	0	0	1	50	0	0	0	0	1	11.1

Opinion regarding Non- institutional sources of credit: The results indicate (Table 32) that, 66.67 per cent of the households opined that credit helped to perform timely agricultural operations and 11.11 per cent forced to sell the produce at low price to repay loan in time.

Table 32. Opinion regarding Non- institutional sources of credit in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (0)		MF (1)		SF (0)		SMF (0)		MDF (0)		All (1)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Forced to sell the produce at low price to repay loan in time	0	0	1	100	0	0	0	0	0	0	1	100

Cost of Cultivation of Red gram: The data regarding the cost of cultivation (Rs/ha) of Red gram in Mundragi-1 micro watershed is presented in Table 33.a. The results indicate that, the total cost of cultivation (Rs/ha) for Red gram was Rs. 43279.56. The gross income realized by the farmers was Rs. 68498.76. The net income from Red gram cultivation was Rs.25219.20, thus the benefit cost ratio was found to be 1:1.60.

Table 33(a). Cost of Cultivation of Red gram in Mundragi-1 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	42.15	9239.01	21.35
2	Bullock		Pairs/day	0.95	665.64	1.54
3	Tractor		Hours	5.03	3264.73	7.54
4	Machinery		Hours	0	0	0
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	10.2	2095.53	4.84
7	FYM		Quintal	3.01	7355.6	17
8	Fertilizer + micronutrients		Quintal	5.27	3975.27	9.19
9	Pesticides (PPC)		Kgs / liters	1.96	2059.65	4.76
10	Irrigation		Number	4.37	0	0
11	Repairs			0	571.43	1.32
12	Msc. Charges (Marketing costs etc)			0	35.71	0.08
13	Depreciation charges			0	0.03	0
II	**Cost B1**					
16	Interest on working capital				1858.32	4.29
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				31120.92	71.91
III	**Cost B2**					
18	Rental Value of Land				290.48	0.67
19	**Cost B2 = (Cost B1 + Rental value)**				31411.4	72.58
IV	**Cost C1**					
20	Family Human Labour			31.24	7933.66	18.33
21	**Cost C1 = (Cost B2 + Family Labour)**				39345.06	90.91
V	**Cost C2**					
22	Risk Premium				0	0
23	**Cost C2 = (Cost C1 + Risk Premium)**				39345.06	90.91
VI	**Cost C3**					
24	Managerial Cost				3934.51	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				43279.56	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		13.82	68127.06	
		b) Main Crop Sales Price (Rs.)			4928.57	
	By Product	e) Main Product (q)		1.04	371.69	
		f) Main Crop Sales Price (Rs.)			357.14	
b.	Gross Income (Rs.)				68498.76	
c.	Net Income (Rs.)				25219.2	
d.	Cost per Quintal (Rs./q.)				3131.01	
e.	Benefit Cost Ratio (BC Ratio)				1:1.6	

Cost of Cultivation of Groundut: The data regarding the cost of cultivation (Rs/ha) of Groundut in Mundragi-1 micro watershed is presented in Table 33.b. The results indicate that, the total cost of cultivation (Rs/ha) for Groundut was Rs. 119183.08. The gross income realized by the farmers was Rs. 93110.92. The net income from Groundut cultivation was Rs.-26072.17, thus the benefit cost ratio was found to be 1:0.80.

Table 33(b). Cost of Cultivation of Groundut in Mundragi-1 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	60.46	12447.77	10.44
2	Bullock		Pairs/day	5.96	4588.94	3.85
3	Tractor		Hours	4.4	3423.52	2.87
4	Machinery		Hours	0	0	0
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	75.37	39387.17	33.05
6	Seed Inter Crop		Kgs.	0	0	0
7	FYM		Quintal	5.26	12877.61	10.8
8	Fertilizer + micronutrients		Quintal	9.51	8031.54	6.74
9	Pesticides (PPC)		Kgs / liters	3.04	3039.04	2.55
10	Irrigation		Number	16.3	262.68	0.22
11	Repairs			0	533.33	0.45
13	Depreciation charges			0	111.57	0.09
II	**Cost B1**					
16	Interest on working capital				7600.24	6.38
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				92303.43	77.45
III	**Cost B2**					
18	Rental Value of Land				324.44	0.27
19	**Cost B2 = (Cost B1 + Rental value)**				92627.87	77.72
IV	**Cost C1**					
20	Family Human Labour			59.43	15720.39	13.19
21	**Cost C1 = (Cost B2 + Family Labour)**				108348.26	90.91
V	**Cost C2**					
22	Risk Premium				0	0
23	**Cost C2 = (Cost C1 + Risk Premium)**				108348.26	90.91
VI	**Cost C3**					
24	Managerial Cost				10834.83	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				119183.08	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		17.98	89906.96	
		b) Main Crop Sales Price (Rs.)			5000	
	By Product	e) Main Product (q)		3.1	3203.96	
		f) Main Crop Sales Price (Rs.)			1033.33	
b.	Gross Income (Rs.)				93110.92	
c.	Net Income (Rs.)				-26072.17	
d.	Cost per Quintal (Rs./q.)				6628.13	
e.	Benefit Cost Ratio (BC Ratio)				1:0.8	

Cost of Cultivation of Green gram: The data regarding the cost of cultivation (Rs/ha) of Green gram in Mundragi-1 micro watershed is presented in Table 33.c. The results indicate, the total cost of cultivation (Rs/ha) for Green gram was Rs.44891.32. The gross income realized by the farmers was Rs. 36456.25. The net income from Green gram cultivation was Rs. -8435.07, thus the benefit cost ratio was found to be 1:0.80.

Table 33(c). Cost of Cultivation of Green gram in Mundragi-1 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	32.82	6075.25	13.53
2	Bullock		Pairs/day	2.85	285	0.63
3	Tractor		Hours	7.55	4716.75	10.51
4	Machinery		Hours	0	0	0
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	6.94	770.45	1.72
6	Seed Inter Crop		Kgs.	0	0	0
7	FYM		Quintal	1.57	2683.75	5.98
8	Fertilizer + micronutrients		Quintal	15.49	13257.25	29.53
9	Pesticides (PPC)		Kgs / liters	10.12	5367.5	11.96
10	Irrigation		Number	0	0	0
13	Depreciation charges			0	0.03	0
14	Land revenue and Taxes			0	0	0
II	**Cost B1**					
16	Interest on working capital				2649.47	5.9
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				35805.46	79.76
III	**Cost B2**					
18	Rental Value of Land				283.33	0.63
19	**Cost B2 = (Cost B1 + Rental value)**				36088.79	80.39
IV	**Cost C1**					
20	Family Human Labour			21	4721.5	10.52
21	**Cost C1 = (Cost B2 + Family Labour)**				40810.29	90.91
V	**Cost C2**					
22	Risk Premium				0	0
23	**Cost C2 = (Cost C1 + Risk Premium)**				40810.29	90.91
VI	**Cost C3**					
24	Managerial Cost				4081.03	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				44891.32	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		7.22	36100	
		b) Main Crop Sales Price (Rs.)			5000	
	By Product	e) Main Product (q)		0.95	356.25	
		f) Main Crop Sales Price (Rs.)			375	
b.	Gross Income (Rs.)				36456.25	
c.	Net Income (Rs.)				-8435.07	
d.	Cost per Quintal (Rs./q.)				6217.63	
e.	Benefit Cost Ratio (BC Ratio)				1:0.8	

Cost of Cultivation of Sorghum: The data regarding the cost of cultivation (Rs/ha) of Sorghum in Mundragi-1 micro watershed is presented in Table 33.d. The results indicate that, the total cost of cultivation (Rs/ha) for Sorghum was Rs. 30259.60. The gross income realized by the farmers was Rs.42888.18. The net income from Sorghum cultivation was Rs. 12628.58, thus the benefit cost ratio was found to be 1:1.40.

Table 33(d). Cost of Cultivation of Sorghum in Mundragi-1 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	37.22	6287.27	20.78
2	Bullock		Pairs/day	0	0	0
3	Tractor		Hours	4.72	3076.27	10.17
4	Machinery		Hours	0	0	0
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	4.72	287.42	0.95
6	Seed Inter Crop		Kgs.	0	0	0
7	FYM		Quintal	1.8	4490.91	14.84
8	Fertilizer + micronutrients		Quintal	3.48	2784.36	9.2
9	Pesticides (PPC)		Kgs / liters	4.49	4490.91	14.84
10	Irrigation		Number	0	0	0
13	Depreciation charges			0	0.02	0
14	Land revenue and Taxes			0	0	0
II	**Cost B1**					
16	Interest on working capital				1446.43	4.78
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				22863.6	75.56
III	**Cost B2**					
18	Rental Value of Land				283.33	0.94
19	**Cost B2 = (Cost B1 + Rental value)**				23146.93	76.49
IV	**Cost C1**					
20	Family Human Labour			18.97	4361.8	14.41
21	**Cost C1 = (Cost B2 + Family Labour)**				27508.73	90.91
V	**Cost C2**					
22	Risk Premium				0	0
23	**Cost C2 = (Cost C1 + Risk Premium)**				27508.73	90.91
VI	**Cost C3**					
24	Managerial Cost				2750.87	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				30259.6	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		9.54	38172.73	
		b) Main Crop Sales Price (Rs.)			4000	
	By Product	e) Main Product (q)		2.36	4715.45	
		f) Main Crop Sales Price (Rs.)			2000	
b.	Gross Income (Rs.)				42888.18	
c.	Net Income (Rs.)				12628.58	
d.	Cost per Quintal (Rs./q.)				3170.81	
e.	Benefit Cost Ratio (BC Ratio)				1:1.4	

Cost of Cultivation of Cotton: The data regarding the cost of cultivation (Rs/ha) of Cotton in Mundragi-1 micro watershed is presented in Table 33.e. The results indicate that, the total cost of cultivation (Rs/ha) for Cotton was Rs.58983.03. The gross income realized by the farmers was Rs. 85041.67. The net income from Cotton cultivation was Rs. 26058.64, thus the benefit cost ratio was found to be 1:1.40.

Table 33(e). Cost of Cultivation of Cotton in Mundragi-1 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	60.46	14103.34	23.91
2	Bullock		Pairs/day	5.23	3760.61	6.38
3	Tractor		Hours	0.34	205.83	0.35
4	Machinery		Hours	0	0	0
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	6.87	9911.06	16.8
6	Seed Inter Crop		Kgs.	0	0	0
7	FYM		Quintal	1.37	3430.56	5.82
8	Fertilizer + micronutrients		Quintal	11.64	9958.24	16.88
9	Pesticides (PPC)		Kgs / liters	1.03	1029.17	1.74
10	Irrigation		Number	1.37	0	0
11	Repairs			0	0	0
12	Msc. Charges (Marketing costs etc)			0	0	0
13	Depreciation charges			0	385.26	0.65
14	Land revenue and Taxes			0	0	0
II	**Cost B1**					
16	Interest on working capital				2919.48	4.95
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				45703.55	77.49
III	**Cost B2**					
18	Rental Value of Land				188.89	0.32
19	**Cost B2 = (Cost B1 + Rental value)**				45892.44	77.81
IV	**Cost C1**					
20	Family Human Labour			28.99	7728.5	13.1
21	**Cost C1 = (Cost B2 + Family Labour)**				53620.94	90.91
V	**Cost C2**					
22	Risk Premium				0	0
23	**Cost C2 = (Cost C1 + Risk Premium)**				53620.94	90.91
VI	**Cost C3**					
24	Managerial Cost				5362.09	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				58983.03	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		17.01	85041.67	
		b) Main Crop Sales Price (Rs.)			5000	
b.	Gross Income (Rs.)				85041.67	
c.	Net Income (Rs.)				26058.64	
d.	Cost per Quintal (Rs./q.)				3467.89	
e.	Benefit Cost Ratio (BC Ratio)				1:1.4	

Adequacy of fodder: The data regarding the adequacy of fodder in Mundragi-1 Micro watershed is presented in Table 34. The results indicate that, 16.67 per cent of the households opined that dry fodder was adequate and 5.56 per cent of them opined dry fodder was inadequate. With respect to green fodder availability, 8.33 percent of them opined it was sufficient and 8.33 percent of them opined it was insufficient.

Table 34. Adequacy of fodder in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Adequate-Dry Fodder	0	0	2	11.11	2	22.22	1	50	1	50	6	16.67
2	Inadequate-Dry Fodder	0	0	1	5.56	1	11.11	0	0	0	0	2	5.56
3	Adequate-Green Fodder	0	0	3	16.67	0	0	0	0	0	0	3	8.33
4	Inadequate-Green Fodder	0	0	0	0	3	33.33	0	0	0	0	3	8.33

Average annual gross income: The data regarding the annual gross income in Mundragi-1 Micro watershed is presented in Table 35. The results indicate that, the farmers have annual gross income of Rs. 106666.67 in micro-watershed, of which Rs. 48361.11 is from agriculture itself.

Table 35. Average annual gross income in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)	MF (18)	SF (9)	SMF (2)	MDF (2)	All (36)
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1	Business	0	0	0	60000	0	3333.33
2	Wage	42800	42500	66111.1	100000	40000	51500
3	Agriculture	16000	31611.1	59777.8	152000	125000	48361.1
4	Dairy Farm	0	3333.33	0	0	0	1666.67
5	Goat Farming	0	3611.11	0	0	0	1805.56
Income(Rs.)		58800	81055.6	125889	312000	165000	106667

Average annual Expenditure: The data regarding the average annual expenditure in Mundragi-1 Micro watershed is presented in Table 36. The results indicate that, the farmers have annual gross expenditure of Rs. 416738.89 in micro-watershed, of which Rs. 23277.78 is from agriculture itself.

Table 36. Average annual Expenditure in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)	MF (18)	SF (9)	SMF (2)	MDF (2)	All (36)
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1	Business	0	0	0	53000	0	1472.22
2	Wage	28250	10266.7	10333.3	80000	13500	12972.2
3	Agriculture	42000	14805.6	31333.3	68750	55000	23277.8
4	Dairy Farm	0	2000	0	0	0	55.56
5	Goat Farming	0	7500	0	0	0	416.67
Total		70250	34572.2	41666.7	201750	68500	416739

Horticulture species grown: The data regarding horticulture species grown in Mundragi-1 Micro watershed is presented in Table 37. The results indicate that, the total number of horticultural trees grown (both field and backyard) by the sampled households were Jack fruit (2) and Mango (6).

Table 37. Horticulture species grown in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		F	B	F	B	F	B	F	B	F	B	F	B
1	Jack fruit	0	0	0	0	0	0	0	0	2	0	2	0
2	Mango	0	0	2	0	0	0	0	0	4	0	6	0

***F= Field B=Back Yard**

Interest towards cultivation of horticulture crops: The data regarding Table (38) indicates that, 5.56 percent/ None of the households shown interest to cultivate horticultural crops.

Table 38. Interest towards cultivation of horticulture crops in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)
		N	%	N	%	N	%	N	%	N	N	%
1	Interested towards cultivation of horticulture crops	0	0	1	5.6	0	0	0	0	1	2	5.56

Forest species grown: The data regarding forest species grown in Mundragi-1 Micro watershed is presented in Table 39. The results indicate that, households have planted 55 neem trees, 2 banyan trees together in both field and backyard.

Table 39. Forest species grown in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		F	B	F	B	F	B	F	B	F	B	F	B
1	Neem	0	0	6	3	17	2	12	0	15	0	50	5
2	Banyan	0	0	0	0	2	0	0	0	0	0	2	0

***F= Field B=Back Yard**

Average additional investment capacity: The data regarding average additional investment capacity in Mundragi-1 Micro watershed is presented in Table 40. The results indicate that, households have an average investment capacity of Rs. 1250.00 for land development, Rs. 833.33 for creation of irrigation facility, Rs.277.78 for adoption of improved livestock breeds.

Table 40. Average additional investment capacity of households in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)	MF (18)	SF (9)	SMF (2)	MDF (2)	All (36)
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1	Land development	0	833.33	0	0	15000	1250
2	Irrigation facility	0	0	0	0	15000	833.33
3	Improved crop production	0	277.78	0	0	2500	277.78

Table 41. Source of funds for additional investment in Mundragi-1 micro-watershed

Sl.No	Item	Land development		Irrigation facility		Improved crop production	
		N	%	N	%	N	%
1	Own funds	3	8.33	1	2.78	2	5.56

Source of funds for additional investment: The data regarding source of funds for additional investment in Mundragi-1 Micro watershed is presented in Table 41. The results

indicate that, the sources of finance raised from bank as a loan and from own sources for land development were 8.33.

Marketing of agricultural produce: The data regarding marketing of the agricultural produce in Mundragi-1 Micro watershed is presented in Table 42. The results indicated that, 100.00 percent of output of Cotton was sold in the market with average price of Rs. 3750.00; 55.56 percent of output of Green gram was sold in the market with average price of Rs. 5000.00; 93.17 percent of output of Groundnut was sold in the market with average price of Rs. 5000.00 and 93.33 percent of output of Paddy was sold in the market with average price of Rs. 1200.00.

Table 42. Marketing of agricultural produce in Mundragi-1 micro-watershed

Sl.No	Crops	Output obtained (q)	Output retained (q)	Output sold (q)	Output sold (%)	Avg. Price obtained (Rs/q)
1	Cotton	45	0	45	100	3750
2	Green gram	9	4	5	56	5000
3	Groundnut	161	11	150	93	5000
4	Paddy	15	1	14	93	1200
5	Red gram	90	20	70	78	4929
6	Sorghum	16	5	11	69	4000

Marketing channels used for sale of agricultural produce: The data regarding marketing channels used for sale of agricultural produce in Mundragi-1 Micro watershed is presented in Table 43. The results indicated that, 25.00 cent of the households have sold agricultural produce to the local/village merchants and 63.89 per cent of regulated market.

Table 43. Marketing channels used for sale of agricultural produce in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Local/village Merchant	0	0	7	39	0	0	1	50	1	50	9	25
2	Regulated Market	0	0	12	67	9	100	1	50	1	50	23	63.89

Mode of transport of agricultural produce: The data regarding mode of transport of agricultural produce in Mundragi-1 Micro watershed is presented in Table 44. The results indicated that, 86.11 cent of the households have used tractor for the transport of agriculture commodity.

Table 44. Mode of transport of agricultural produce in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Tractor	0	0	18	100	9	100	2	100	2	100	31	86.11

Incidence of soil and water erosion problems: The data regarding incidence of incidence of soil and water erosion problems in Mundragi-1 Micro watershed is presented in Table 45. The results indicate that, 83.33 per cent of the households have experienced soil and water erosion problems.

Table 45. Incidence of soil and water erosion problems in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Soil and water erosion problems in the farm	0	0	17	94	9	100	2	100	2	100	30	83.33

Interest towards soil testing: The data regarding Interest shown towards soil testing in Mundragi-1 Micro watershed is presented in Table 46. The results indicated that, 86.11 per cent of the households were interested towards soil testing.

Table 46. Interest regarding soil testing in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Interest in soil test	0	0	18	100	9	100	2	100	2	100	31	86.11

Soil and water conservation practices and structures adopted: The data regarding soil and water conservation practices and structures adopted in Mundragi-1 Micro watershed is presented in Table 47. The results indicated that 100 per cent of farmers practicing summer ploughing as soil and water conservation practice.

Table 47. Soil and water conservation practices and structures adopted in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Bore Well Recharge Pit	0	0	0	0	2	22	0	0	0	0	2	5.56

Status of soil and water conservation structures: The data regarding status soil and water conservation structures adopted in Mundragi-1 Micro watershed is presented in Table 48. The results indicated that, the households have adopted field bunding as a soil and water conservation structures out of which 100.00 per cent was in good condition.

Table 48. Status of soil and water conservation structures in Mundragi-1 micro-watershed

Sl.No	Item	Good		Slightly Damaged		Severely Damaged		Full Replacement Required	
		N	%	N	%	N	%	N	%
1	Bore Well Recharge Pit	2	100	0	0	0	0	0	0

Agencies involved in the soil and water conservation structures: The data regarding Agencies involved in the soil and water conservation structures adopted in Mundragi-1 Micro watershed is presented in Table 49. The results indicated that, 2.78 per cent of the households have adopted by their own, 2.78 per cent were done by Govt.

Table 49. Agencies involved in the soil and water conservation structures in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Own	0	0	0	0	1	11.11	0	0	0	0	1	2.78
2	Govt.	0	0	0	0	1	11.11	0	0	0	0	1	2.78

Usage pattern of fuel for domestic use: The data on usage pattern of fuel for domestic use in Mundragi-1 Micro watershed is presented in Table 50. The results indicated that, firewood was the major source of fuel for domestic use for 66.67 per cent of the households followed by LPG (36.11%).

Table 50. Usage pattern of fuel for domestic use in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Fire Wood	3	60	12	66.7	5	55.6	2	100	2	100	24	66.67
2	Kerosene	0	0	2	11.1	0	0	0	0	0	0	2	5.56
3	LPG	2	40	7	38.9	4	44.4	0	0	0	0	13	36.11

Source of drinking water: The data on source of drinking water in Mundragi-1 Micro watershed is presented in Table 51. The results indicated that, tank supply of water was the major source for drinking water for 0.00 per cent of the households followed by piped waters supply (97.22 %), bore well water (2.78%).

Table 51. Source of drinking water in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Piped supply	5	100	18	100	9	100	1	50	2	100	35	97.22
2	Bore Well	0	0	0	0	0	0	1	50	0	0	1	2.78

Source of light: The data on source of light in Mundragi-1 Micro watershed is presented in Table 52. The results indicated that, electricity was the major source of light for 97.22 per cent of the households.

Table 52. Source of light in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Solar Lamp	0	0	0	0	1	11.1	0	0	0	0	1	2.78
2	Electricity	5	100	18	100	8	88.9	2	100	2	100	35	97.2

Existence of sanitary toilet facility: The data on availability of toilet facility in Mundragi-1 Micro watershed is presented in Table 53. The results indicated that, 30.56 per cent of the households possess toilets.

Table 53. Existence of sanitary toilet facility in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Sanitary toilet facility	1	20	4	22	3	33.33	2	100	1	50	11	30.6

Possession of PDS card: The data regarding possession of PDS card in Mundragi-1 Micro watershed is presented in Table 54. The results indicated that, 100.00 per cent of the households possessed BPL card.

Table 54. Possession of PDS card in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	BPL	5	100	18	100	9	100	2	100	2	100	36	100

Participation in NREGA programme: The data regarding Participation in NREGA programme in Mundragi-1 Micro watershed is presented in Table 55. The results indicated that, only 5.56 percent of the households have participated in NREGA programme.

Table 55. Participation in NREGA programme in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Participation in NREGA programme	0	0	0	0	1	11.1	0	0	1	50	2	5.56

Adequacy of food items: The data regarding adequacy of food items in Mundragi-1 Micro watershed is presented in Table 56. The results indicated that, the extent of adequacy of food items for cereals, pulses, Oilseeds and vegetables were 97.22, 94.44, 66.67, 38.89 per cent respectively, similarly for Fruits (13.89%), milk (11.11%), Egg (13.89%) and Meat (8.33%).

Table 56. Adequacy of food items in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Cereals	2	40	19	106	9	100	2	100	3	150	35	97.22
2	Pulses	2	40	18	100	9	100	2	100	3	150	34	94.44
3	Oilseed	1	20	12	66.7	8	88.89	2	100	1	50	24	66.67
4	Vegetables	1	20	6	33.3	5	55.56	2	100	0	0	14	38.89
5	Fruits	0	0	2	11.1	2	22.22	0	0	1	50	5	13.89
6	Milk	0	0	3	16.7	0	0	0	0	1	50	4	11.11
7	Egg	0	0	5	27.8	0	0	0	0	0	0	5	13.89
8	Meat	0	0	2	11.1	1	11.11	0	0	0	0	3	8.33

Inadequacy of food items: The data regarding in adequacy of food items in Mundragi-1 Micro watershed is presented in Table 57. The results indicated that, the extent of in adequacy of food items for cereals, pulses, Oilseeds and vegetables were 5.56, 5.56, 25.00, 52.78 and 83.33 per cent respectively, similarly for fruits (83.33%), milk (86.11%), egg (77.78%) and meat (83.33%).

Table 57. Inadequacy of food items in Mundragi-1 micro-watershed

Sl.No.	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Cereals	2	40	0	0	0	0	0	0	0	0	2	5.56
2	Pulses	2	40	0	0	0	0	0	0	0	0	2	5.56
3	Oilseed	3	60	5	27.8	1	11.11	0	0	0	0	9	25
4	Vegetables	3	60	11	61.1	4	44.44	0	0	1	50	19	52.78
5	Fruits	4	80	16	88.9	7	77.78	2	100	1	50	30	83.33
6	Milk	4	80	15	83.3	9	100	2	100	1	50	31	86.11
7	Egg	4	80	12	66.7	9	100	2	100	1	50	28	77.78
8	Meat	4	80	15	83.3	8	88.89	2	100	1	50	30	83.33

Farming constraints: The data regarding farming constraints experienced by households in Mundragi-1 Micro watershed is presented in Table 58. The results indicated that, lower fertility status of the soil was the constraint experienced by (88.89 %) per cent of the

households, wild animal menace on farm field (83.33%), frequent incidence of pest and diseases (66.67%), inadequacy of irrigation water (38.89%), high cost of fertilizers and plant protection chemicals (88.89%), high rate of interest on credit (80.56%), low price for the agricultural commodities (80.56 %), lack of marketing facilities in the area (83.33%), inadequate extension services (13.89 %) and lack of transport for safe transport of the agricultural produce to the market (86.11%).

Table 58. Farming constraints experienced in Mundragi-1 micro-watershed

SN	Particulars	LL (5)		MF (18)		SF (9)		SMF (2)		MDF (2)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Lower fertility status of the soil	0	0	18	100	10	111.11	2	100	2	100	32	88.89
2	Wild animal menace on farm field	0	0	18	100	9	100	1	50	2	100	30	83.33
3	Frequent incidence of pest and diseases	0	0	17	94.44	3	33.33	2	100	2	100	24	66.67
4	Inadequacy of irrigation water	0	0	6	33.33	6	66.67	1	50	1	50	14	38.89
5	High cost of Fertilizers and plant protection chemicals	0	0	19	105.56	9	100	2	100	2	100	32	88.89
6	High rate of interest on credit	0	0	17	94.44	8	88.89	2	100	2	100	29	80.56
7	Low price for the agricultural commodities	0	0	18	100	7	77.78	2	100	2	100	29	80.56
8	Lack of marketing facilities in the area	0	0	17	94.44	9	100	2	100	2	100	30	83.33
9	Inadequate extension services	0	0	4	22.22	0	0	0	0	1	50	5	13.89
10	Lack of transport for safe transport of the Agril produce to the market.	0	0	18	100	9	100	2	100	2	100	31	86.11

Chapter 5

SUMMARY AND IMPLICATIONS

In order to assess the socio-economic condition of the farmers in the watershed 36 households located in the micro watershed were interviewed for the survey. The study was conducted in Mundragi-1 micro-watershed (Belagiri sub-watershed, Yadgiri taluk & District) is located at North latitude 16^0 48' 22.633" and 16^0 45' 58.37" and East longitude 77^0 10' 52.633" and 77^0 8' 22.747"covering an area of about 451.37 ha bounded by under Mundaragi, Dastharabadha and Yadhagiri. B villages.

Socio-economic analysis of Mundragi-1 micro watersheds of Belagiri sub-watershed, Yadgiri taluk & District indicated that, out of the total sample of 36 farmers were sampled in Mundragi-1 micro-watershed among households surveyed 18 (50.00%) were marginal, 9 (25.00%) were small, 2 (5.56 %) were semi medium and 2 (5.56 %) were medium farmers. 5 landless farmers were also interviewed for the survey. The population characteristics of households indicated that, there were 75 (55.97%) men and 59 (44.03 %) were women. The average population of landless was 3, marginal farmers were 3.8, small farmers were 3.1, semi medium farmers were 6.5 and medium farmers were 4.5. Majority of the respondents (47.76%) were in the age group of 16-35 years.

Education level of the sample households indicated that, there were 67.91 per cent illiterates, 28.36 per cent pre university education and 3.73 per cent attained graduation. About, 69.44 per cent of household heads practicing agriculture and 16.67 per cent of the household heads were engaged as agricultural labourers. Agriculture was the major occupation for 47.76 per cent of the household members.

In the study area, 72.22 per cent of the households possess katcha house and 25.00 per cent possess pucca house. The durable assets owned by the households showed that, 83.33 per cent possess TV, 8.33 per cent possess mixer grinder, 88.89 per cent possess mobile phones and 5.56 per cent possess motor cycles. Farm implements owned by the households indicated that, 22.22 per cent of the households possess plough, 8.33 per cent possess bullock cart and 2.78 per cent possess sprayer.

Regarding livestock possession by the households, 13.89 per cent possess local cow and 8.33 per cent possess buffalo. The average labour availability in the study area showed that**,** own labour men available in the micro watershed was 1.71, women available in the micro watershed was 1.39, hired labour (men) available was 5.48 and hired labour (women) available was 8.74.

Out of the total land holding of the sample respondents 63.47 per cent (26.74 ha) of the area is under dry condition and the remaining 36.53 per cent area is irrigated land. There were 9.00 live bore wells and 6.00 dry bore wells among the sampled households. Bore/open well was the major source of irrigation for 25.00 per cent of the households. The

major crops grown by sample farmers are Red gram, Groundut, Green gram, Sorghum and Cotton and cropping intensity was recorded as 99.50 per cent.

Out of the sample households 100.00 percent possessed bank account and 36.11 per cent of them have savings in the account. About 30.56 per cent of the respondents borrowed credit from various sources. Among the credit borrowed by households, 7.69 per cent have borrowed loan from commercial banks and 23.08 per cent from co-operative/Grameena bank. Majority of the respondents (100.00%) have borrowed loan for agriculture purpose.

Regarding the opinion on institutional sources of credit, 66.67 per cent of the households opined that credit helped to perform timely agricultural operations. The per hectare cost of cultivation for Red gram, Groundut, Green gram, Sorghum and Cotton was Rs.43279.56 , 119183.08, 44891.32, 30259.60 and 58983.03 with benefit cost ratio of 1:1.60, 1: 0.80, 1: 0.80, 1: 1.40 and 1:1.40 respectively.

Further, 16.67 per cent of the households opined that dry fodder was adequate and 8.33 per cent of the households have opined that the green fodder was adequate. The average annual gross income of the farmers was Rs. 106666.67 in micro-watershed, of which Rs. 48361.11 comes from agriculture.

Sampled households have grown 8 horticulture trees and 57 forestry trees together in the fields and back yards. About 5.56 per cent of the households shown interest to cultivate horticultural crops. Households have an average investment capacity of Rs. 1250.00 for land development and Rs. 833.33 for irrigation facility.

Source of funds for additional investment is concerned, 8.33 per cent depends on bank loan for land development activities. Regarding marketing channels, 25.00 per cent of the households have sold agricultural produce to the local/village merchants, while, 63.89 per cent have sold in regulated markets.

Further, 86.11 per cent of the households have used tractor for the transport of agriculture commodity. Majority of the farmers (83.33%) have experienced soil and water erosion problems in the watershed and 86.11 per cent of the households were interested towards soil testing.

Fire was the major source of fuel for domestic use for 66.67 per cent of the households and 36.11 per cent households has LPG connection. Piped supply was the major source for drinking water for 97.22 per cent of the households. Electricity was the major source of light for 97.22 per cent of the households.

In the study area, 30.56 per cent of the households possess toilet facility. Regarding possession of PDS card, 100.00 per cent of the households possessed BPL card. Households opined that, the requirement of cereals (97.22%), pulses (94.44%) and oilseeds (66.67%) are adequate for consumption.

Farming constraints experienced by households in the micro watersheds were lower fertility status of the soil (88.89%) wild animal menace on farm field (83.33%), frequent incidence of pest and diseases (66.67%), inadequacy of irrigation water (38.89%), high cost of fertilizers and plant protection chemicals (88.89%), high rate of interest on credit (80.56%), low price for the agricultural commodities (80.56%), lack of marketing facilities in the area (83.33%), inadequate extension services (13.89%), lack of transport for safe transport of the agricultural produce to the market (86.11%).

Implications of the survey

- ✓ Result indicated that, there were 67.91 per cent were illiterate hence, extension methodologies such as demonstration, street play, drama, video shows will be effective in dissemination of the technologies in the micro watershed.
- ✓ The data indicate that, 72.22 per cent of the households possess katcha house. Hence, the development department while implementing the watershed plan should focus on agriculture to enhance the productivity of major crops in the area to increase the income of the farmers.
- ✓ Results indicated that the local institutional participation of the household members in the micro watershed is minimal hence, activities like membership campaign, awareness creation about the benefits of membership in local institutions and strengths of organized groups must be conveyed.
- ✓ Majority of the households in the watershed have experience in use of mobile phones, and television hence, these mass media can be effectively utilized for transfer of technology as well as for information dissemination.
- ✓ The farm machinery/implement possession in the micro watershed was found to be minimum the reasons may lack of knowledge or lack of financial ability which can be addressed through training on use of different farm implements, providing information on different sources of finance for purchase of farm implements.
- ✓ The possession of livestock such as crossbred cow found is less hence, farmers must be made aware of the benefits of crossbred cow in increased milk production.
- ✓ The possession of livestock such as sheep, goat and poultry was found to be low hence, farmers may be informed the role of subsidiary enterprises in enhancing the income and information on financial support for subsidiary activities.
- ✓ The data indicate that, job/work was the reason for all the migrants hence, farmers may be trained on profitable agriculture or self employment such has animal husbandry, plate making, sheep rearing, goat rearing, rabbit rearing with suitable information on sources of financial support.
- ✓ The results indicate that there was a change in quality of life due to migration hence, the developmental departments should take actions to arrest migration and to improve the quality of the life in rural areas.
- ✓ Households possess 16.97ha (63.47 %) of dry land and 9.77ha (36.53 %) of irrigated land hence, the availability of the dryland agricultural technologies such as short

duration crops, high yielding drought resistance crop varieties, drip irrigation technology and subsidy information will be helpful for the farmers to enhance the productivity of land and as well as farmers income.

- ✓ Few of the bore well in micro watershed found non functional hence, farmers may be trained on possibility of bore well rejuvenation.
- ✓ Bore well was major source of irrigation for 25.00 per cent of the households. hence, in order to increase the area under irrigation as well as to increase the water use efficiency farmers may trained on drip irrigation and provide the information on subsidy for drip irrigation equipment's along with the information on different agencies which provides the financial assistance for drip irrigation.
- ✓ The cropping intensity in the micro watershed was found to be (99.50 %) hence, care must be taken by the implementing agency to bring uncultivated land into cultivation through suitable measures.
- ✓ Many of the household members have borrowed loan from cooperative banks which has higher rate of interest hence, farmers may be sensitized on the different sources of credit with lesser interest rate such SHGs etc.
- ✓ The results indicated the non availability of both green and dry fodder throughout the year hence, fodder development activities can be taken up in the micro watershed.
- ✓ The average annual gross income of the households Rs.48361.11 from agriculture, Rs.3333.33 from business and Rs. 51500.00 from wages and. Agriculture was found to be the major source of income for households hence; the development activities should focus on productivity enhancement, marketing arrangements and agricultural technology dissemination to have a direct impact on the farmers.
- ✓ The cultivation of forest species is found minimal hence, information and production technology related to agro-forestry and integrated farming system.
- ✓ The data indicated that, 83.33 per cent of the households have experienced soil and water erosion problems. Hence, those farmers who reported the soil and water erosion problems may be given attention while implementation of the watershed development plan.
- ✓ The data indicated that, 86.11 per cent of the households have interest in soil testing hence, farmers must be provided with the information on various institutions which are involved in soil testing for the benefit of the farmers.
- ✓ Except summer ploughing the adoption of other soil and water conservation structures is minimum hence, the farmers in the micro watershed should be sensitized on the use of different conservation structures for soil water conservation.
- ✓ Cereals and pulses found be adequate for per cent of the households respectively hence, farm households and the farm women must be trained on importance of balanced nutrition and role of vegetable, milk, egg, meat in balanced diet.
- ✓ Lower fertility status of the soil (88.89%), wild animal menace on farm field (83.33%), frequent incidence of pest and diseases (66.67%), high cost of fertilizers and plant

protection chemicals (88.89%), high rate of interest on credit (80.56%), low price for the agricultural commodities (80.56%), lack of marketing facilities in the area (83.33%), inadequate extension services (13.89%), lack of transport for safe transport of the agricultural produce to the market (86.11%) were the major farming constraints experienced hence, these constraints must be addressed immediately for the welfare of the farmers. Awareness to be created among the farmers to approach nearest KVKs/RSKs and other developmental departments for technical and for subsidized inputs and utilize the well established regulated markets, approaching the contract firms, direct markets to avoid the involvement of middlemen.