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

DUPALLI-1 (4D2D6P1b) MICROWATERSHED

Yadgir Taluk & 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

About ICAR - NBSS&LUP

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

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

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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 Dupalli-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 Dupalli-1 microwatershed is located in the northern part of Karnataka in Yadgir Taluk & District, Karnataka State (Fig.2.1). It comprises parts of Dupalli and Chandapura villages.It lies between 16^0 31'- 16^0 32' North latitudes and 77^0 22'-77^0 23' East longitudes covering an area of about 648 ha. It is about 54 km northeast of Yadgir town and is surrounded by Dupalli on the north, east and southeast, Chandapura on the southern and western side.

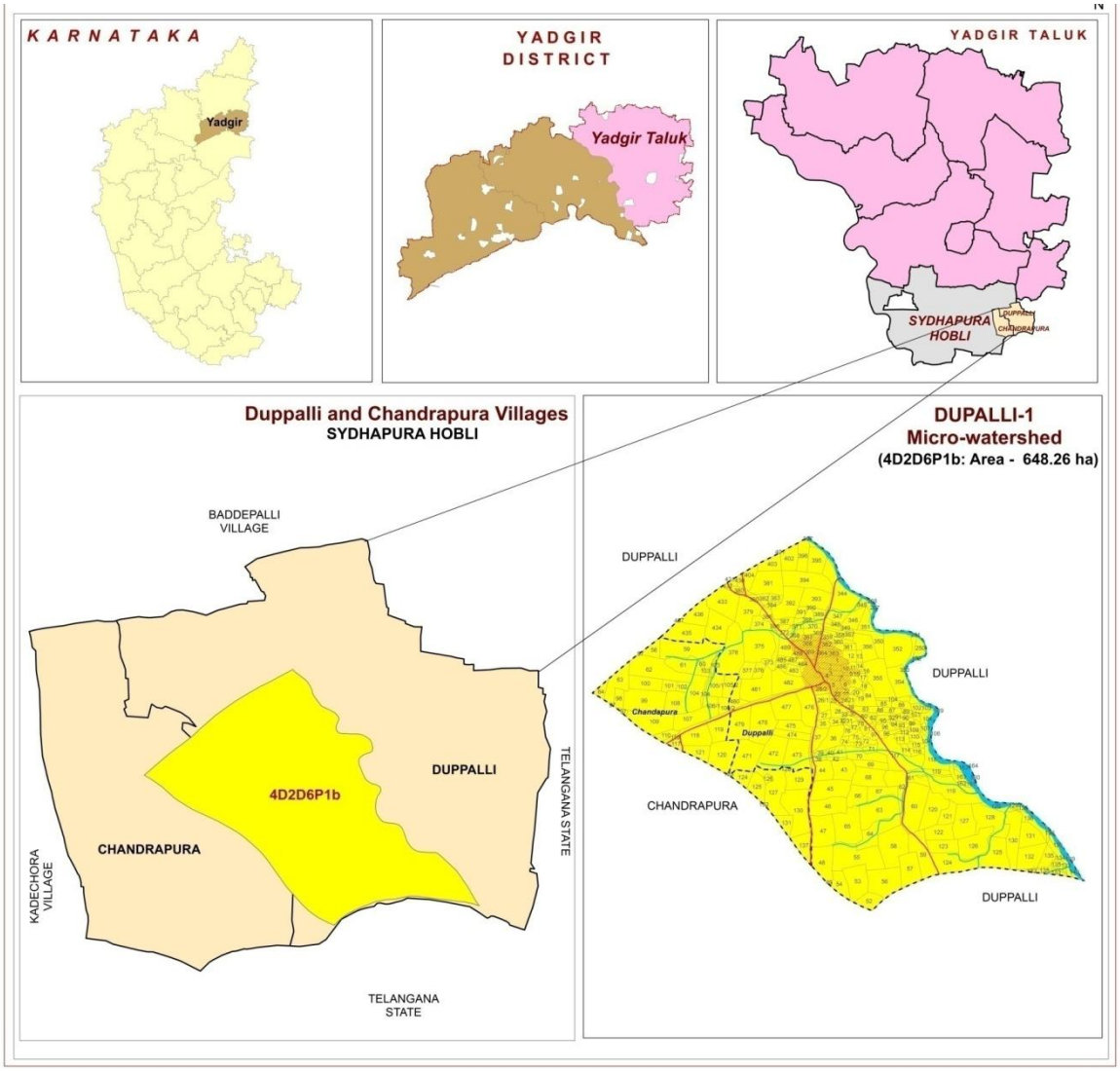


Fig.2.1 Location map of Dupalli-1 Microwatershed

2.2 Geology

Major rock formation observed in the microwatershed is 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 Dupalli-1 microwatershed. Underlying formation is gneiss over limestone and shale.

Fig.2.2 Granite and 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 356-376 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**		

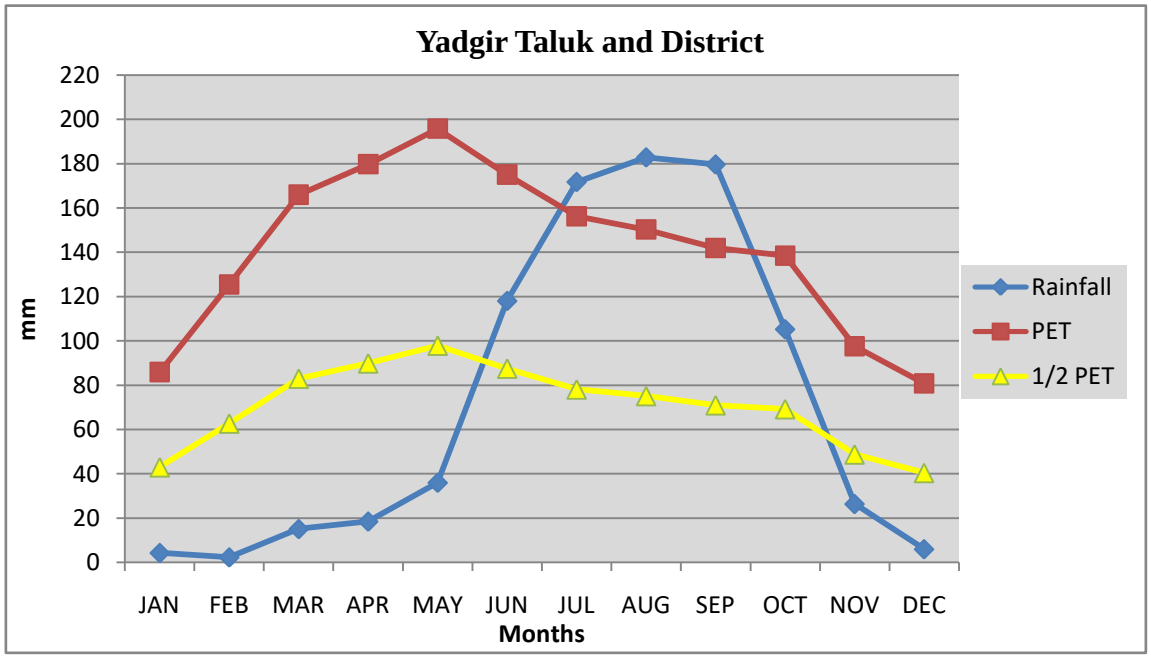


Fig 2.3 Rainfall distribution in Yadgir Taluk, Yadgir District

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 Dupalli-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 Dupalli-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. The location of wells and conservation structures in Dupalli-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

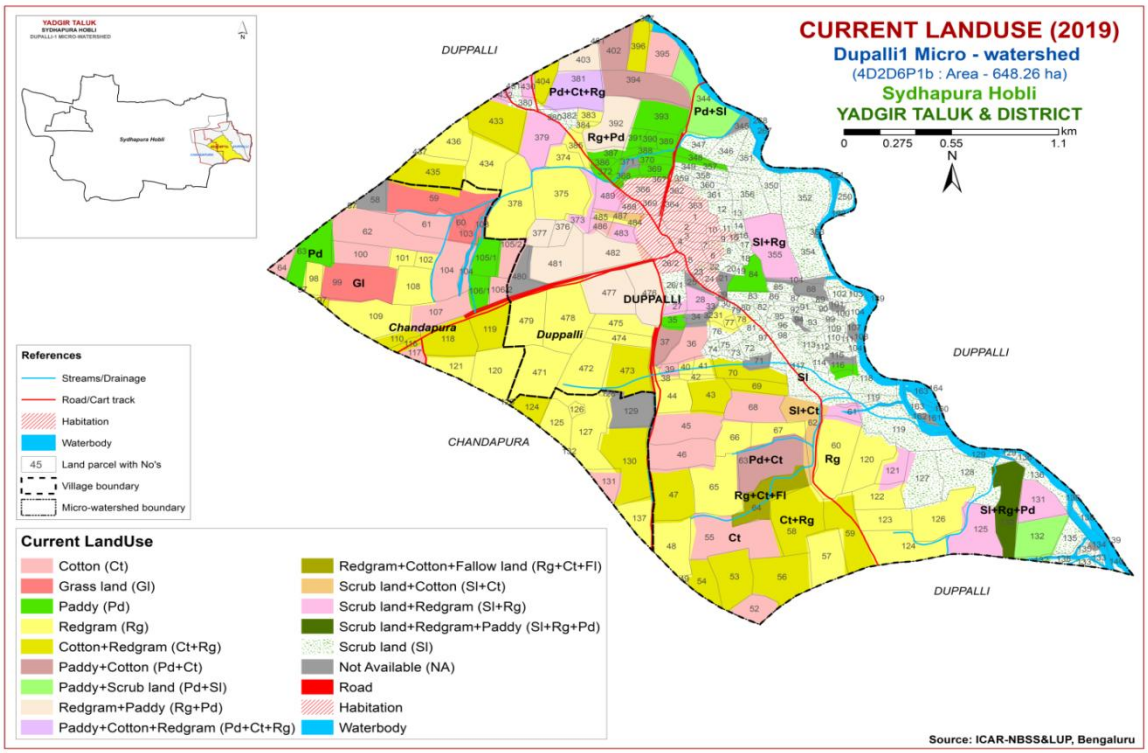


Fig.2.5 Current Land Use map of Dupalli-1 Microwatershed

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

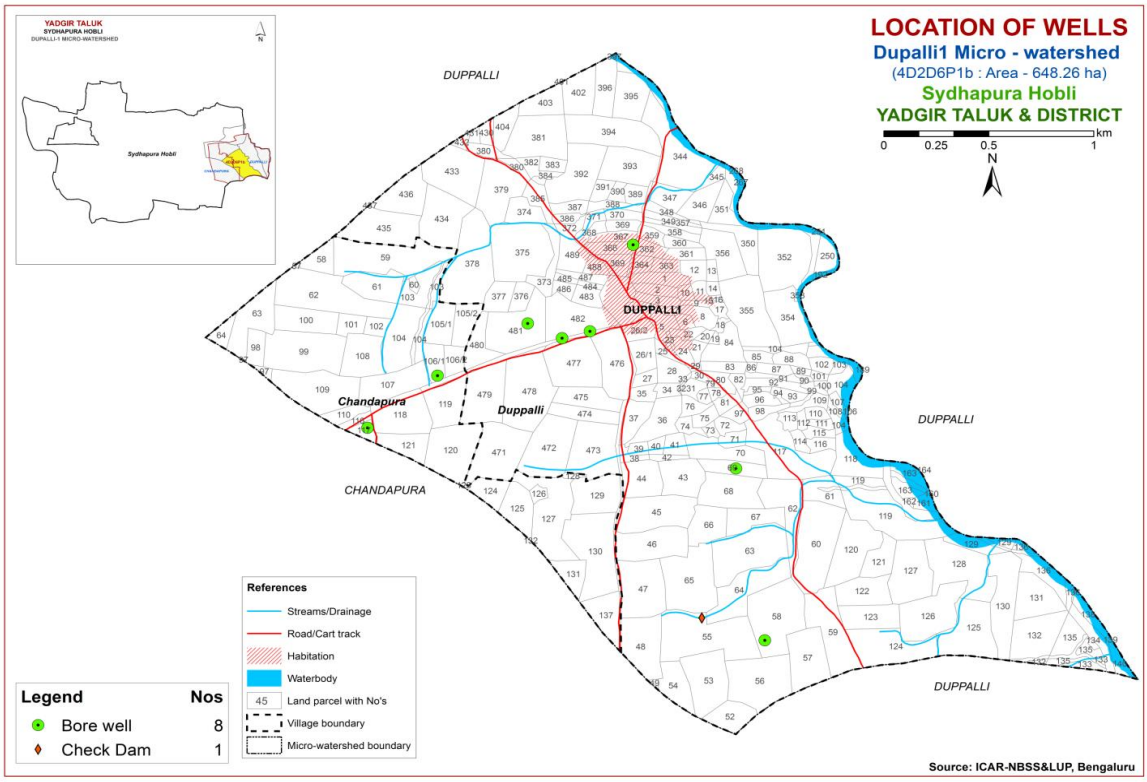


Fig 2.7 Location of wells and conservation structures in Dupalli-1 Microwatershed

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 Dupalli-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 648 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 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

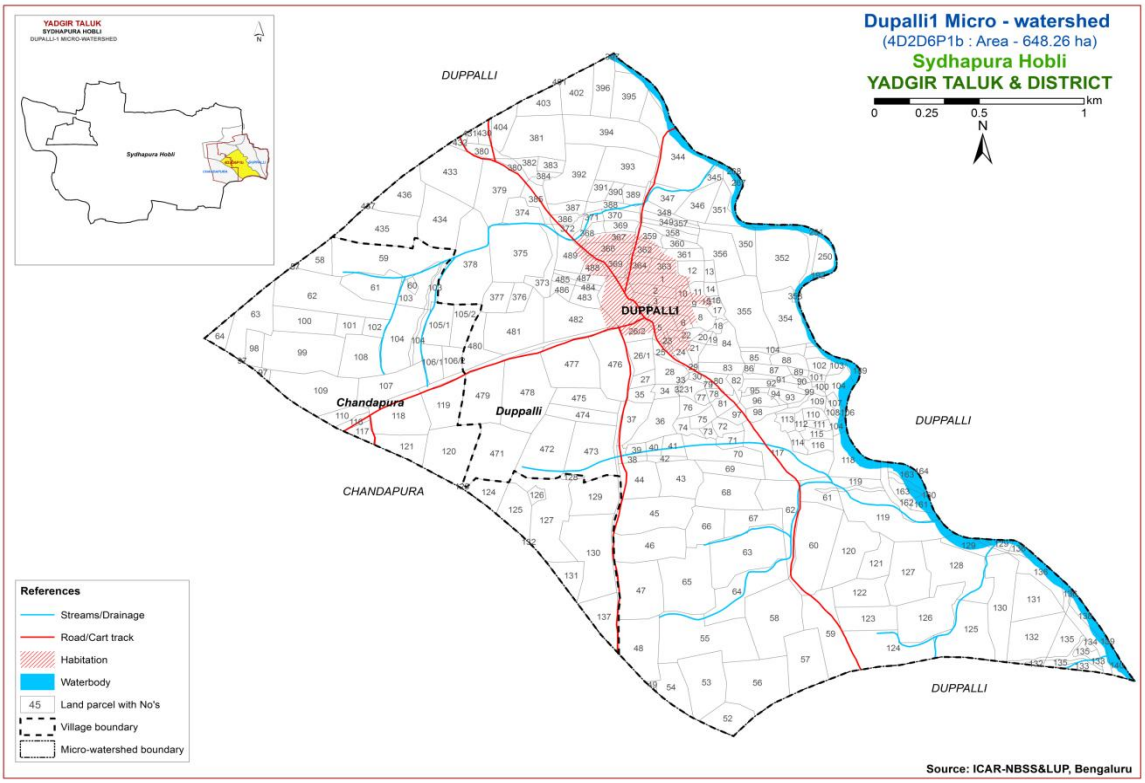


Fig 3.1 Scanned and Digitized Cadastral map of Dupalli-1 Microwatershed

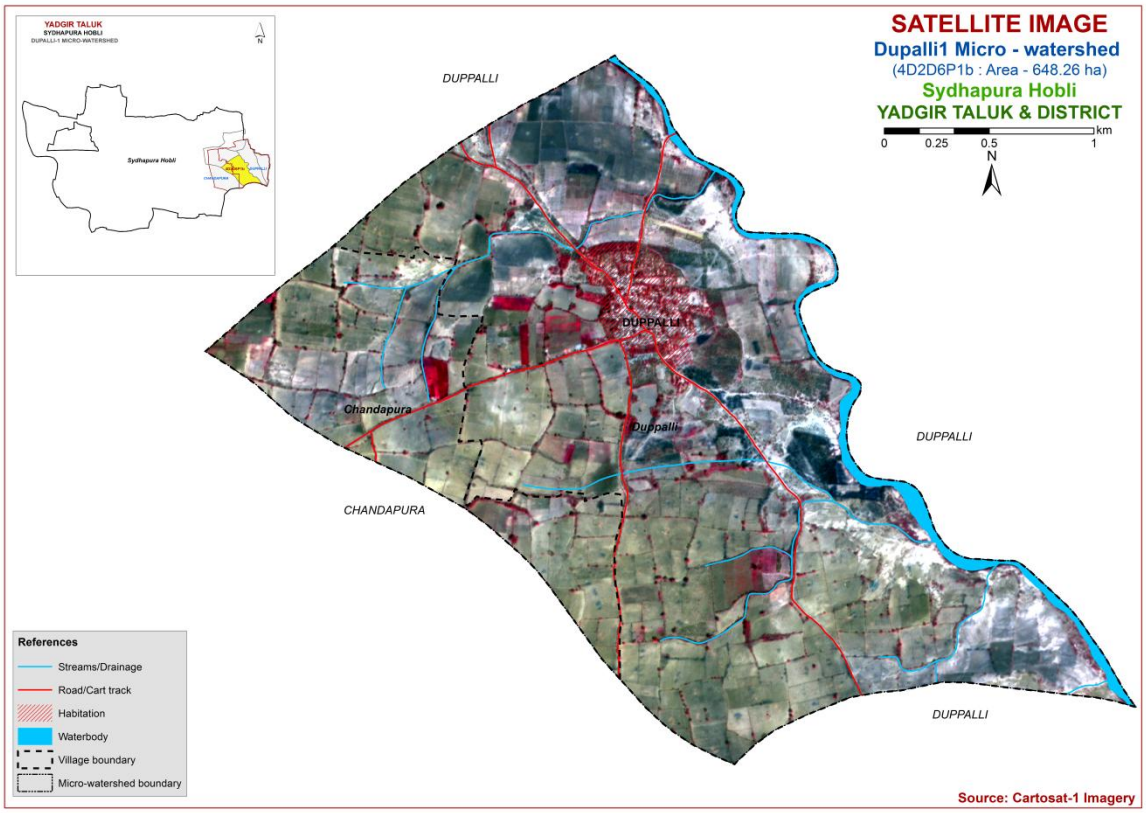


Fig.3.2 Satellite Image of Dupalli-1 Microwatershed

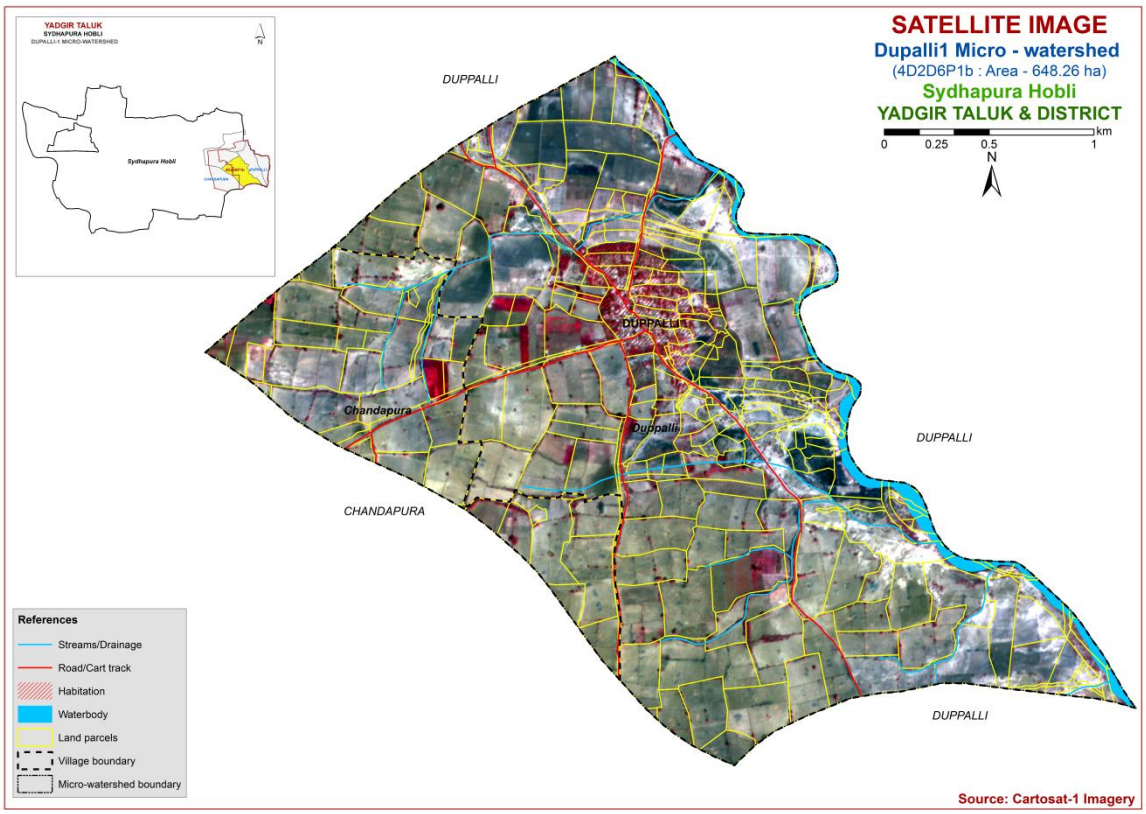


Fig.3.3 Cadastral map overlaid on IRS PAN+LISS IV merged imagery of Dupalli-1 Microwatershed

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).

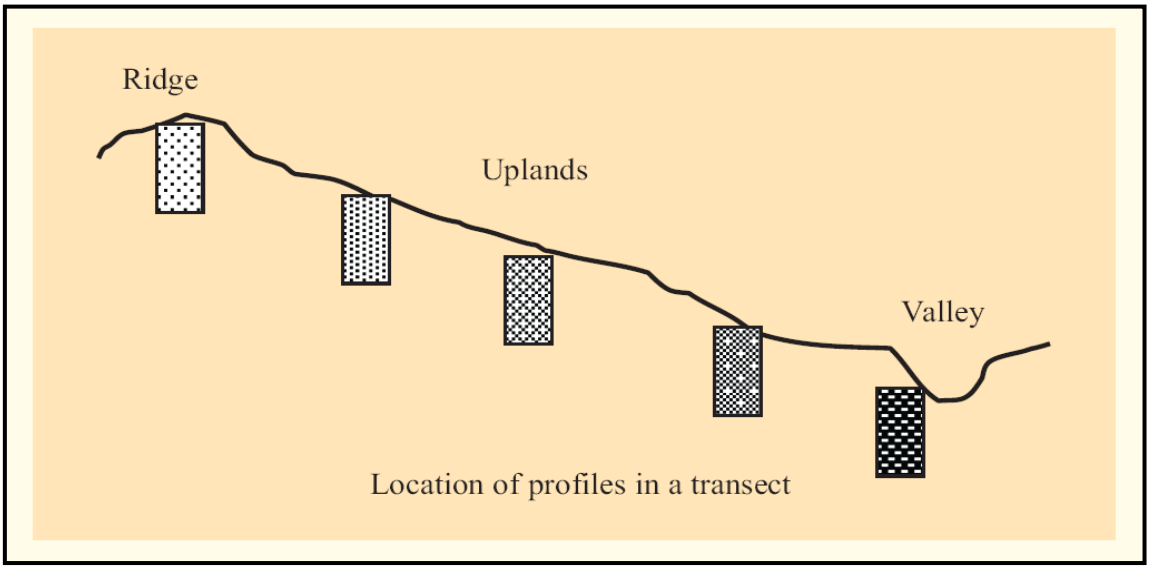


Fig: 3.4. Location of profiles in a transect

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, 11 soil series were identified in the Dupalli-1 microwatershed.

Table 3.1 Differentiating Characteristics used for identifying Soil Series

(Characteristics are of Series Control Section)

Sl. no	Soil Series	Depth (cm)	Colour (moist)	Texture	Gravel (%)	Horizon sequence	Calcareo-usness
Soils of Granite gneiss Landscape							
1	DSB (Dastharabad)	25-50	7.5YR 3/3	g c	35-60	Ap-Bt-Cr	-
2	YLR (Yalleri)	50-75	2.5YR 3/4,4/4 5YR3/4 7.5YR4/4	gc	15-35	Ap-Bt	-
3	HLG (Halagera)	50-75	10YR 3/2,4/4 7.5YR4/3,4/2	scl	-	Ap-Bw	es
4	KBD (Kalebelagundi)	75-100	2.5YR4/4,3/4 5YR4/2,4/3	gscl	35-60	Ap-AB-Bt-BC	-
5	Pogalapur (PGP)	75-100	5YR 4/6,3/3 7.5YR 4/4	sc	-	Ap-Bt	-
6	GWD (Gowdagera)	75-100	10YR 3/1,3/2,4/2	scl	-	Ap-Bw	es
7	HSL (Hosalli)	75-100	10YR 5/4,4/4,4/6	sc	-	Ap-Bw	e
8	BLC (Balichakra)	75-100	2.5YR5/3,2.5/4 5YR4/3,3/3	scl	-	Ap-BA-Bt	-
9	MDG (Mundargi)	100-150	10YR 4/4,3/3 7.5YR4/4	scl	-	Ap-Bw	-
10	ANR (Anur)	100-150	10YR 4/3,4/1	c	-	Ap-Bw	es
11	VKS (Vanakasambar)	100-150	10YR5/3,4/2,2/1,2/2,3/2,4/3	scl	-	Ap-Bw	es

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 11 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 8 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 Dupalli-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 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 Dupalli-1 Microwatershed

*Soil map unit No.	Soil Series	Soil Phase	Mapping Unit Description	Area in ha (%)
Soils of Granite and Granite Gneiss Landscape				
	DSB	Dastharabad soils are shallow (25-50 cm), well drained, have dark brown to very dark brown, gravelly clay soils occurring on very gently to gently sloping uplands under cultivation		**56** (8.59)
108		DSBiB2	Sandy clay surface, slope 1-3%, moderate erosion	56 (8.59)
	YLR	Yalleri soils are moderately shallow (50-75 cm), well drained, have brown to reddish brown and dark reddish brown, gravelly clay red soils occurring on very gently to gently sloping uplands under cultivation		**172** (26.45)
29		YLRcB2g1	Sandy loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	31 (4.78)
31		YLRiB2	Sandy clay surface, slope 1-3%, moderate	103

*Soil map unit No.	Soil Series	Soil Phase	Mapping Unit Description	Area in ha (%)
			erosion	(15.86)
147		YLRmB2g2	Clay surface, slope 1-3%, moderate erosion, very gravelly (35-60%)	38 (5.81)
	HLG	Halagera soils are moderately shallow (50-75 cm), well drained, have very dark grayish brown to dark yellowish brown, calcareous sandy clay loam soils occurring on very gently sloping uplands under cultivation		**5** (0.84)
16		HLGcB2	Sandy loam surface, slope 1-3%, moderate erosion	5 (0.84)
	KBD	Kalabelagundi soils are moderately deep (75-100 cm), well drained, have reddish brown to dark reddish brown and dark reddish gray, gravelly sandy clay loam soils occurring on very gently sloping uplands under cultivation		**65** (9.99)
39		KBDbB3	Loamy sand surface, slope 1-3%, severe erosion	39 (6.03)
130		KBDhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	26 (3.96)
	PGP	Poglapur soils are moderately deep (75-100 cm), well drained, have dark brown to dark reddish brown and yellowish red sandy clay soils occurring on very gently sloping uplands under cultivation		**36** (5.62)
40		PGPcB2	Sandy loam surface, slope 1-3%, moderate erosion	**36** (5.62)
	GWD	Gowdagera soils are moderately deep (75-100 cm), moderately well drained, have dark grayish brown to very dark grayish brown, calcareous sodic sandy clay loam soils occurring on very gently sloping uplands under cultivation		**7** (1.15)
127		GWDmB2	Clay surface, slope 1-3%, moderate erosion	7 (1.15)
	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		**63** (9.67)
126		HSLhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	63 (9.67)
	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		**25** (3.86)
38		BLCiB2	Sandy clay surface, slope 1-3%, moderate erosion	25 (3.86)
	MDG	Mundargi soils are deep (100-150 cm), well drained, have brown to dark yellowish brown, sandy clay loam soils occurring on very gently sloping uplands under		**13** (2.02)

*Soil map unit No.	Soil Series	Soil Phase	Mapping Unit Description	Area in ha (%)
		cultivation		
58		MDGiB2	Sandy clay surface, slope 1-3%, moderate erosion	13 (2.02)
	ANR	Anur soils are deep (100-150 cm), moderately well drained, have dark gray to brown, calcareous sodic cracking clay soils occurring on very gently sloping uplands under cultivation		**50** (7.65)
55		ANRiB2	Sandy clay surface, slope 1-3%, moderate erosion	50 (7.65)
	VKS	Vankasambar soils are deep (100-150 cm), well drained, have very dark brown to brown, sodic calcareous sandy clay loam soils occurring on very gently to gently sloping lowlands under cultivation		**120** (18.44)
117		VKSiB2	Sandy clay surface, slope 1-3%, moderate erosion	86 (13.2)
100		VKSmB1	Clay surface, slope 1-3%, slight erosion	34 (5.24)
1000		Others	Habitation and water body	37 (5.73)

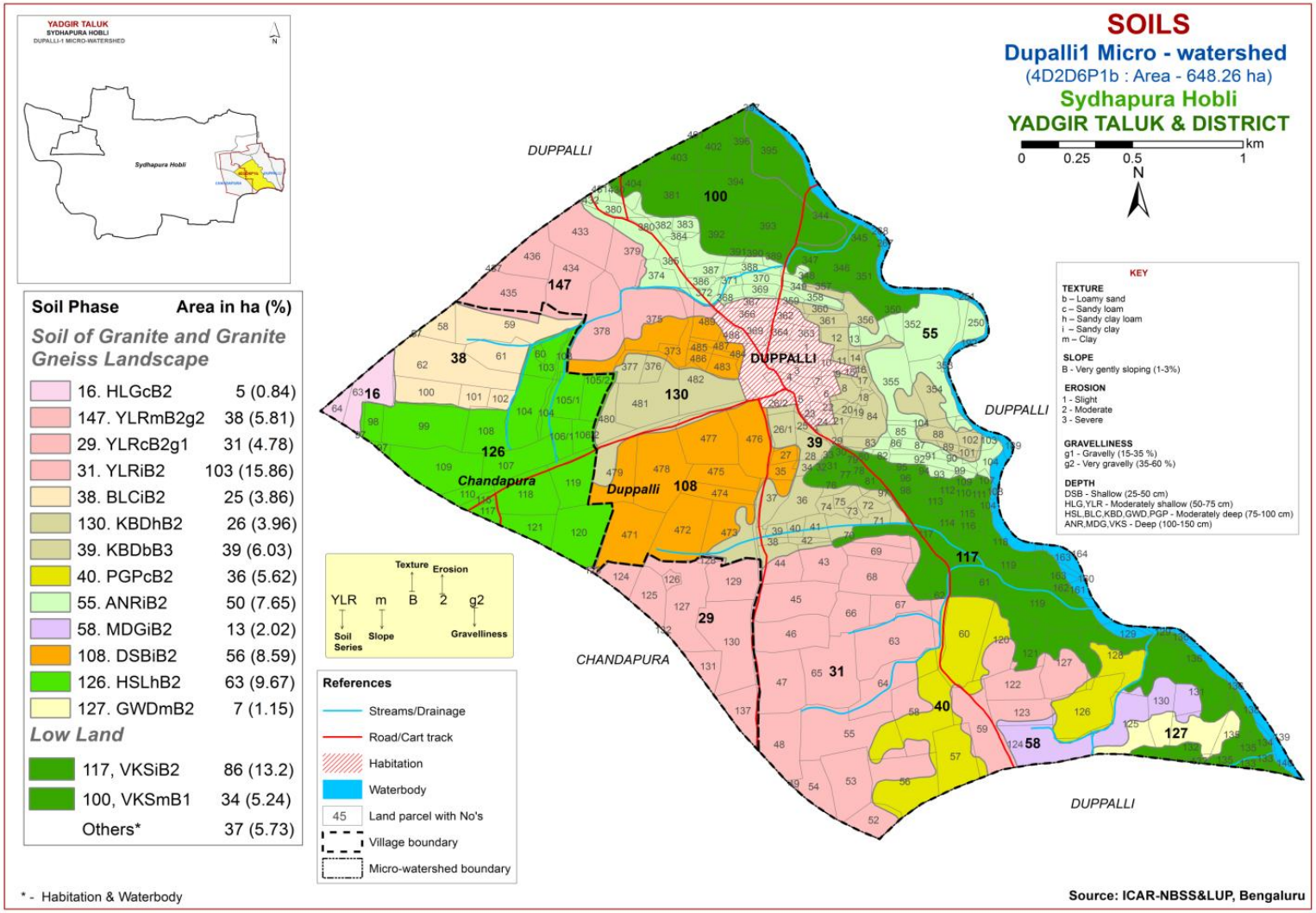


Fig 3.5 Soil Phase or Management Units - Dupalli-1 Microwatershed

Chapter 4

THE SOILS

Detailed information pertaining to the nature, extent and their distribution of different kinds of soils occurring in Dupalli-1 microwatershed is provided in this chapter. The microwatershed area has been identified as granite and gneiss landscape based on geology. In all, 11 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 11 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 Dupalli-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, 11 soil series are identified and mapped. Of these, YLR series occupies maximum area of 122 ha (26%) followed by VKS 120 ha (18%), KBD 65 ha (10%), HSL 63 ha (10%), DSB 56 ha (9%), ANR 50 ha (8%), PGP 36 ha (6%), BLC 25 ha (4%), MDG 13 ha (2%), GWD 7 ha (1%) and HLG 5 ha (<1%). Brief description of each series identified and number of soil phases mapped is given below.

4.1.1 Dastharabad (DSB) Series: Dastharabad soils are shallow (25-50 cm), well drained, have dark brown, gravelly clay soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands under cultivation. The Dastharabad series has been classified as a member of the clayey-skeletal, mixed, isohyperthermic family of (Paralithic) Haplustalfs.

The thickness of the solum ranges from 28 to 50 cm. The thickness of A horizon ranges from 9 to 14 cm. Its colour is in 10 YR and 7.5 YR hue with value and chroma of 3 to 4. The texture varies from sandy loam to sandy clay. The thickness of B horizon ranges from 28 to 40 cm. Its colour is in 7.5 YR hue with value 3 and chroma 3 to 4. The texture is sandy clay to clay with 35-60 per cent gravel. The available water capacity is very low (<50 mm/m). Only one phase was identified and mapped.

Landscape and Soil Profile characteristics of Dastharabad (DSB) Series

4.1.2 Yalleri (YLR) Series: Yalleri soils are moderately shallow (50-75 cm), well drained, have very dark reddish brown to dark brown, gravelly clay soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands under cultivation. The Yalleri series has been classified as a member of the fine, mixed, isohyperthermic family of Typic Paleustalfs.

The thickness of the solum ranges from 50 to 74 cm. The thickness of A horizon ranges from 10 to 13 cm. Its colour is in 7.5 YR and 5 YR hue with value and chroma 2 to 4. The texture is sandy loam, loamy sand, and sandy clay loam. The thickness of B horizon ranges from 45 to 64 cm. Its colour is in 7.5 YR and 5 YR hue with value 2 to 4 and chroma 2 to 4. Its texture is clay with gravel content of 15-35 per cent. The available water capacity is low (51-100 mm/m). Three phases were identified and mapped.

Landscape and Soil Profile characteristics of Yalleri (YLR) Series

4.1.3 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). Only one phase was identified and mapped.

Landscape and Soil Profile characteristics of Halagera (HLG) Series

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

The thickness of the solum ranges from 75 to 98 cm. The thickness of A horizon ranges from 10 to 19 cm. Its colour is in hue 5 YR and 7.5 YR with value 3 to 4 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 70 to 84 cm. Its colour is in hue 5 YR and 2.5YR with value 3 to 4 and chroma 2 to 4. Its texture is sandy clay loam to sandy clay with gravel content of 35-60 per cent. The available water capacity is very low (<50 mm/m). Two phases were identified and mapped.

Landscape and Soil Profile characteristics of Kalabelagundi (KBD) Series

4.1.5 Poglapur (PGP) Series: Poglapur soils are moderately deep (75-100 cm), well drained, have dark brown, dark reddish brown to yellowish red sandy clay red soils. They have developed from granite gneiss and occur on very gently sloping uplands under cultivation. The Poglapur series has been classified as a member of the fine, mixed, isohyperthermic family of Rhodic Paleustalfs.

The thickness of the solum ranges from 78 to 100 cm. The thickness of A horizon ranges from 8 to 17 cm. Its colour is in 7.5 YR hue with value 3 and chroma 3 to 4. Its texture varies from loamy sand to sandy clay loam and sandy clay. The thickness of B horizon ranges from 65 to 92 cm. Its colour is in 2.5 YR, 5 YR and 7.5 YR hue with value 2 to 4 and chroma 2 to 4. Its texture is sandy clay and clay. The available water capacity is medium (101-150 mm/m). Only one phase was identified and mapped.

Landscape and Soil Profile characteristics of Poglapur (PGP) Series

4.1.6 Gowdagera (GWD) Series: Gowdagera soils are moderately deep (75-100 cm), moderately well drained, have very dark gray to dark grayish brown, calcareous, sodic, sandy clay loam soils. They are developed from weathered granite gneiss and occur on very gently sloping uplands under cultivation. The Gowdagera 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 76 to 100 cm. The thickness of A horizon ranges from 8 to 16 cm. Its colour is in hue 10 YR with value 3 to 4 and chroma 2 to 4. Its texture varies from sandy loam to sandy clay loam. The thickness of B horizon ranges from 61 to 91 cm. Its colour is in hue 10 YR with value 2 to 4 and chroma 1 to 4. Its texture is sandy clay loam to sandy clay and is calcareous sodic soils. The available water capacity is medium (101-150 mm/m). Only one phase was identified and mapped.

Landscape and Soil Profile characteristics of Gowdagera (GWD) Series

4.1.7 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

4.1.8 Balichakra (BLC) Series: Balichakra soils are moderately deep (75-100 cm), well drained, have dark reddish brown to reddish brown, 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. 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

4.1.9 Mundargi (MDG) Series: Mundargi soils are deep (100-150 cm), well drained, have 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

4.1.10 Anur (ANR) Series: Anur soils are deep (100-150 cm), moderately well drained, have dark gray to dark brown, calcareous, sodic, clay soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands under cultivation. The Anur series has been classified as a member of the fine, mixed (calcareous), isohyperthermic family of Typic Haplustepts.

The thickness of the solum ranges from 102 to 148 cm. The thickness of A-horizon ranges from 9 to 17 cm. Its colour is in 10 YR hue with value 3 to 4 and chroma 2 to 4. The texture ranges from loamy sand to sandy clay loam and sandy clay and are calcareous. The thickness of B horizon ranges from 102 to 135 cm. Its colour is in 10 YR hue with value 3 to 5 and chroma 1 to 6. Texture is sandy clay loam to sandy clay and clay and is 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 Anur (ANR) Series

4.1.12 Vankasambar (VKS) Series: Vankasambar soils are deep (100-150 cm), well drained, have very dark brown to brown, sodic calcareous sandy clay loam soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping lowlands under cultivation. The Vankasambar series has been classified as a member of the fine-loamy, mixed (calcareous), isohyperthermic family of Fulventic Haplustepts.

The thickness of the solum ranges from 120 to 150 cm. The thickness of A horizon ranges from 9 to 22 cm. Its colour is in 10 YR hue with value 4 to 5 and chroma 2 to 5. The texture varies from loamy sand, sandy clay loam and sandy clay. The thickness of B horizon ranges from 102 to 138 cm. Its colour is in 10 YR hue with value 2 to 5 and chroma 2 to 4. Texture is sandy clay loam to sandy clay and is calcareous sodic soils. The available water capacity is very high (>200 mm/m). Two phases were identified and mapped.

Landscape and Soil Profile characteristics of Vankasambaar (VKS) Series

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

Soil Series: Dastharabad **(**DSB) **Pedon:** R-17

Location: $16^0$31' 98.6"N $77^0$22'93.0"E, Duppalli village, Sydhapura hobli, Yadgir taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Clayey-skeletal, mixed, isohyperthermic (Paralithic) 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
0-6	Ap	90.51	4.84	4.64	7.06	8.07	37.24	26.03	12.11	35	s	5.32	1.59
6-17	Bt1	49.11	8.08	42.81	10.67	15.44	10.00	8.44	4.56	20	sc	20.68	13.16
17-43	Bt2	39.54	2.84	57.63	12.89	9.14	7.71	6.83	2.97	50	c	26.69	18.50

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}							%	%
0-6	5.93	-	-	0.04	0.67	0.00	2.00	0.54	0.07	0.01	2.61	3.60	0.78	73	0.14
6-17	7.31	-	-	0.110	0.91	0.91	11.19	3.37	0.12	0.49	15.00	15.20	0.36	100	3.22
17-43	6.64	-	-	0.048	0.76	0.00	18.81	5.57	0.23	0.09	24.70	24.90	0.43	99	0.38

Contd...

Soil Series: Yalleri (YLR) **Pedon:** R-16

Location: $16^0$32'54.3"N $77^0$22'71.2"E, Duppalli village, Sydhapura hobli, Yadgir taluk and district

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

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
0-5	Ap	81.69	5.44	12.87	6.10	8.65	33.88	21.57	11.50	-	sl	8.60	3.37
5-34	Bt1	38.78	6.73	54.49	3.38	9.91	12.42	8.93	4.14	-	c	25.33	15.82
34-75	Bt2	40.35	2.90	56.75	12.91	6.83	10.30	7.48	2.82	35-60	c	24.49	16.20

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}							%	%
0-5	6.91	-	-	0.069	0.70	0.00	5.29	1.37	0.28	0.03	6.96	6.90	0.54	100	0.45
5-34	7.05	-	-	0.053	0.62	0.00	16.43	3.89	0.26	0.09	20.67	21.60	0.40	96	0.42
34-75	7.25	-	-	0.058	0.59	0.00	15.22	3.46	0.25	0.14	19.06	19.90	0.35	96	0.69

Contd...

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: Kalabelagundi (KBD) **Pedon:** R-13

Location: $16^0$43'78.3"n $77^0$13'71.4"E, Halagera village, Yadgir hobli, Yadgir taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Loamy-skeletal, 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
0-11	Ap	72.35	5.19	22.46	7.19	14.29	19.01	25.28	6.58	15	scl	15.12	8.16
11-35	AB	73.20	5.81	20.99	13.66	18.67	16.79	17.62	6.47	20	scl	11.58	7.29
35-64	Bt	51.68	7.30	41.03	29.41	8.00	4.86	5.62	3.78	40	sc	19.86	14.24
64-89	BC	64.35	3.51	32.15	21.84	12.03	14.87	10.23	5.38	40	scl	16.72	10.36

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	7.84	-	-	0.604	0.88	0.52	8.69	2.17	0.44	0.49	11.78	11.50	0.51	100	4.27
11-35	5.57	-	-	0.181	0.68	0.00	6.40	1.63	0.18	0.14	8.36	9.10	0.43	92	1.57
35-64	7.42	-	-	0.098	0.44	1.05	15.82	2.34	0.12	0.76	19.04	19.60	0.48	97	3.90
64-89	6.66	-	-	0.165	0.56	0.65	10.45	4.00	0.09	0.43	14.97	15.10	0.47	99	2.86

Contd...

Soil Series: Poglapur (PGP) **Pedon:** R-6

Location: $16^0$34'45.2"N $77^0$10'96.4"E, Anura B village, Sydhapura hobli, Yadgir taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Fine, mixed, isohyperthermic Rhodic Paleustalfs

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	91.81	4.70	3.49	17.80	30.23	15.57	20.93	7.28	-	s	4.94	2.29
15-50	Bt1	46.83	4.99	48.17	11.92	16.22	8.59	6.77	3.33	10	sc	24.59	17.37
50-90	Bt2	45.81	4.73	49.46	17.10	14.09	6.45	5.16	3.01	15	sc	24.44	16.57
90-125	Bt3	58.92	5.86	35.22	28.51	10.45	10.98	5.49	3.48	15	sc	21.73	10.30

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	6.83	-	-	0.210	0.76	0.00	1.79	0.88	0.41	0.09	3.16	3.15	0.90	100	2.83
15-50	6.20	-	-	0.105	0.48	0.00	12.27	4.45	0.30	0.39	17.40	17.54	0.36	99	2.22
50-90	6.23	-	-	0.080	0.40	0.00	11.51	3.92	0.28	0.37	16.09	17.33	0.35	93	2.16
90-125	6.49	-	-	0.068	0.20	0.00	11.19	3.62	0.27	0.40	15.49	17.43	0.49	89	2.29

Contd...

Soil Series: Gowdagera (GWD) **Pedon:** R-13

Location: $16^0$38'24.4"N $77^0$21'24.0"E, Madhawara village, Balichakara 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
0-18	Ap	79.61	13.94	6.45	14.17	17.53	23.65	17.02	7.24	-	ls	11.36	3.86
18-42	BW1	69.09	10.58	21.06	10.54	16.58	22.01	14.43	5.53	-	scl	31.62	12.30
42-81	Bw2	51.37	13.51	35.60	7.59	10.55	16.24	11.60	5.38	-	sc	67.57	26.89

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}							%	%
0-18	9.89	-	-	0.74	0.66	1.20	-	-	0.18	3.63	-	8.35	1.29	100	17.40
18-42	10.82	-	-	1.60	0.27	5.76	-	-	0.19	19.23	-	15.84	0.75	100	40.17
42-81	10.83	-	-	2.30	0.27	7.80	-	-	0.40	26.71	-	26.54	0.75	100	40.27

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: 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: Anur (ANR) **Pedon:** R-15

Location: $16^0$32'45.0"N $77^0$23'57.4"E, Duppalli village, Sydhapura hobli, Yadgir taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Fine, 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
0-18	Ap	64.60	13.44	21.96	7.33	10.42	18.68	20.12	8.05	<15	scl	16.59	7.96
18-49	Bw1	56.66	12.19	31.15	4.73	9.80	18.66	17.02	6.45	-	scl	33.38	13.51
49-95	Bw2	39.94	17.81	42.25	3.09	3.30	15.44	10.65	7.45	<15	c	44.68	25.23
95-123	Bw3	30.65	17.58	51.77	1.50	5.57	10.18	9.65	3.75	<15	c	54.94	32.07

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}							%	%
0-18	10.17	-	-	0.365	0.48	6.11	-	-	0.25	3.52	-	19.90	0.91	100	7.08
18-49	10.32	-	-	1.38	0.30	6.76	-	-	0.21	16.03	-	24.60	0.79	100	26.07
49-95	10.08	-	-	2.55	0.17	6.11	-	-	0.33	21.49	-	32.60	0.77	100	26.36
95-123	9.92	-	-	2.56	0.12	7.93	-	-	0.51	26.03	-	36.00	0.70	100	28.92

Contd...

Soil Series: Vankasambar (VKS) **Pedon:** R-11

Location: $16^0$34'49.4"N $77^0$22'46.5"N, Baddepalli village, Sydhapura hobli, Yadgir taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru, Classification**:** Fine-loamy, mixed, (calcareous), isohyperthermic Fulventic 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	61.32	10.31	28.37	7.14	12.07	16.04	19.03	7.05	-	scl	20.65	11.25
14-37	Bw1	62.63	8.72	28.65	9.88	14.50	16.19	15.57	6.49	-	scl	24.37	11.33
37-80	Bw2	61.43	9.14	29.43	4.84	15.45	18.01	16.73	6.40	-	scl	41.96	13.39
80-108	Bw3	55.39	11.75	32.86	4.06	5.99	23.87	15.39	6.08	-	scl	45.20	15.45

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	9.1	-	-	0.586	0.96	5.72	-	-	0.54	1.74	-	17.57	0.62	100	3.97
14-37	10.35	-	-	0.595	0.52	7.80	-	-	0.50	4.24	-	16.65	0.58	100	10.19
37-80	10.39	-	-	2.14	0.28	12.35	-	-	0.64	15.89	-	13.45	0.46	100	47.24
80-108	11.15	-	-	3	0.32	11.70	-	-	0.74	20.69	-	22.58	0.69	100	36.656

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 land capability subclass level.

The 15 soil map units identified in the Dupalli-1 microwatershed are grouped under 3 land capability classes and 4 subclasses. About 612 ha area in the microwatershed is suitable for agriculture (Fig. 5.1).

Good lands (Class II) cover an area of about 52 per cent and are distributed in the major part of the microwatershed with minor problems of soil and erosion. Moderately good lands (Class III) cover an area of about 15 per cent and are distributed in the central and northern part of the microwatershed with moderate problems of soil and erosion. Fairly good lands (Class IV) cover an area of about 27 per cent and are distributed in the northern, central, eastern and southeastern part of the microwatershed with very severe problems of soil and erosion.

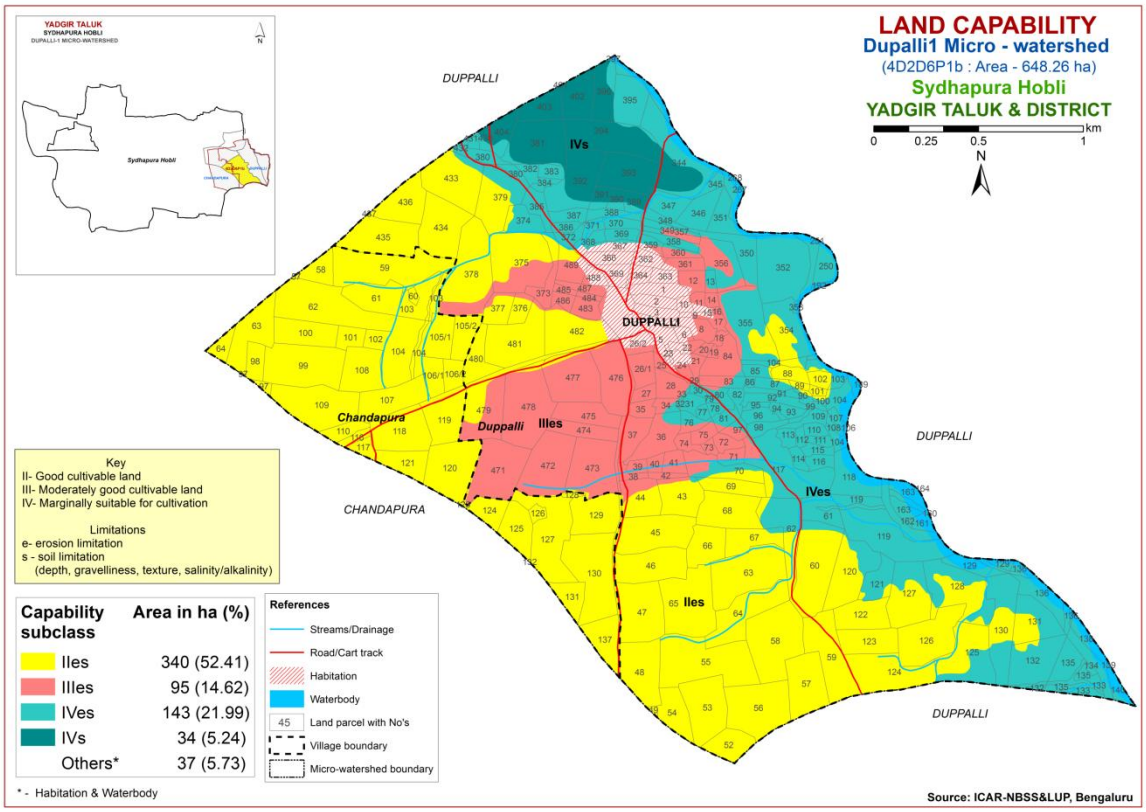


Fig. 5.1 Land Capability map of Dupalli-1 Microwatershed

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.

Shallow (25-50 cm) soils occupy an area of about 56 ha (9%) and are distributed in the central and northern part of the microwatershed. Moderately shallow (50-75 cm) soils occupy an area of about 177 ha (27%) and are distributed in the northern, southern and western part of the microwatershed. Moderately deep (75-100 cm) soils occupy an area of about 196 ha (30%) and are distributed in the central, southeastern, western, eastern and northeastern part of the microwatershed. Deep (100-150 cm) soils cover an area of 182 ha (28%) and are distributed in the eastern, southeastern, northern and central part of the microwatershed.

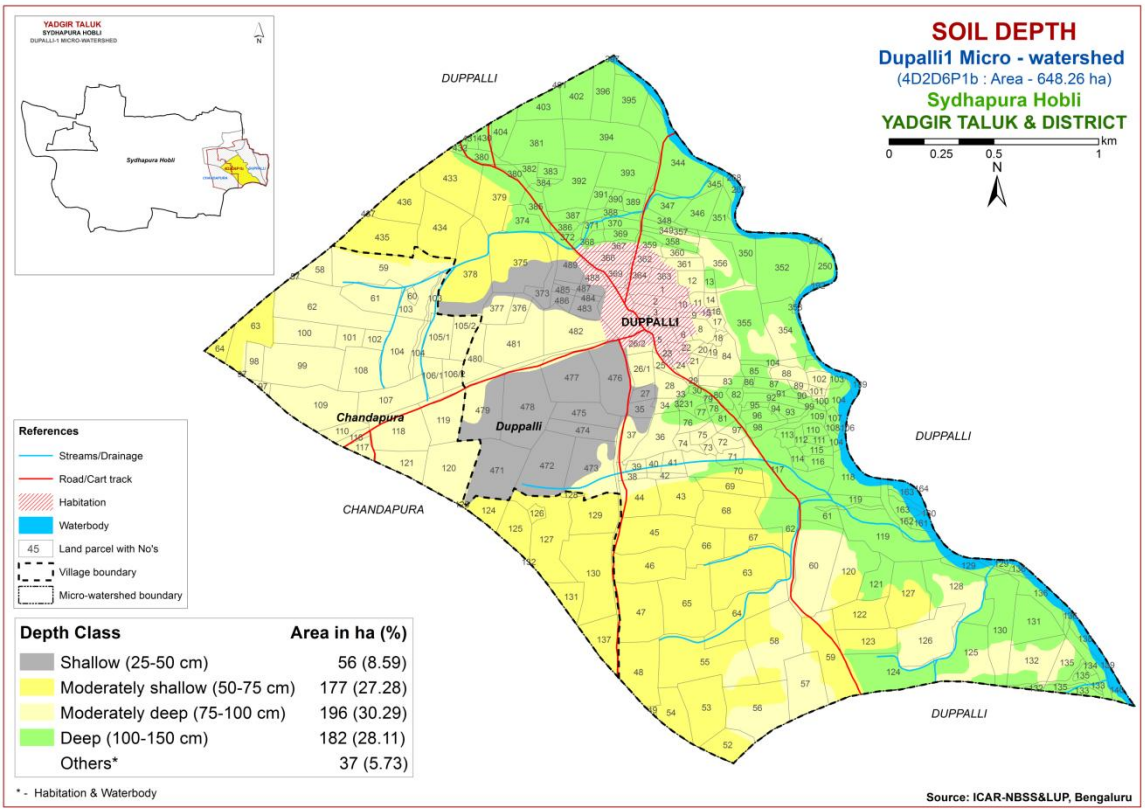


Fig. 5.2 Soil Depth map of Dupalli-1 Microwatershed

The most productive lands cover an area of 182 ha (28%) with respect to soil rooting depth where all climatically adapted annual and perennial crops can be grown are deep (100-150 cm depth) soils occurring in the major part of the microwatershed. Problem soils cover 56 ha (9%) where short or medium duration crops can be grown.

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 39 ha (6%) has soils that are sandy and occur in the central and northern part of the microwatershed. An area of 161 ha (25%) has soils that are loamy and occur in the central, western, southern, southeastern and eastern part of the microwatershed. An area of about 411 ha (63%) is clayey and are distributed in the major part of the microwatershed.

An area of 88% has most productive lands with respect to surface soil texture. The clayey soils (63%) and loamy soils (25%) have high potential for soil-water retention and availability, and nutrient retention and availability, but clayey soils have more problems of drainage, infiltration, workability and other physical problems. The problem soils cover about 6 per cent where only some selected tuber crops can be grown and require more nutrients and more irrigation.

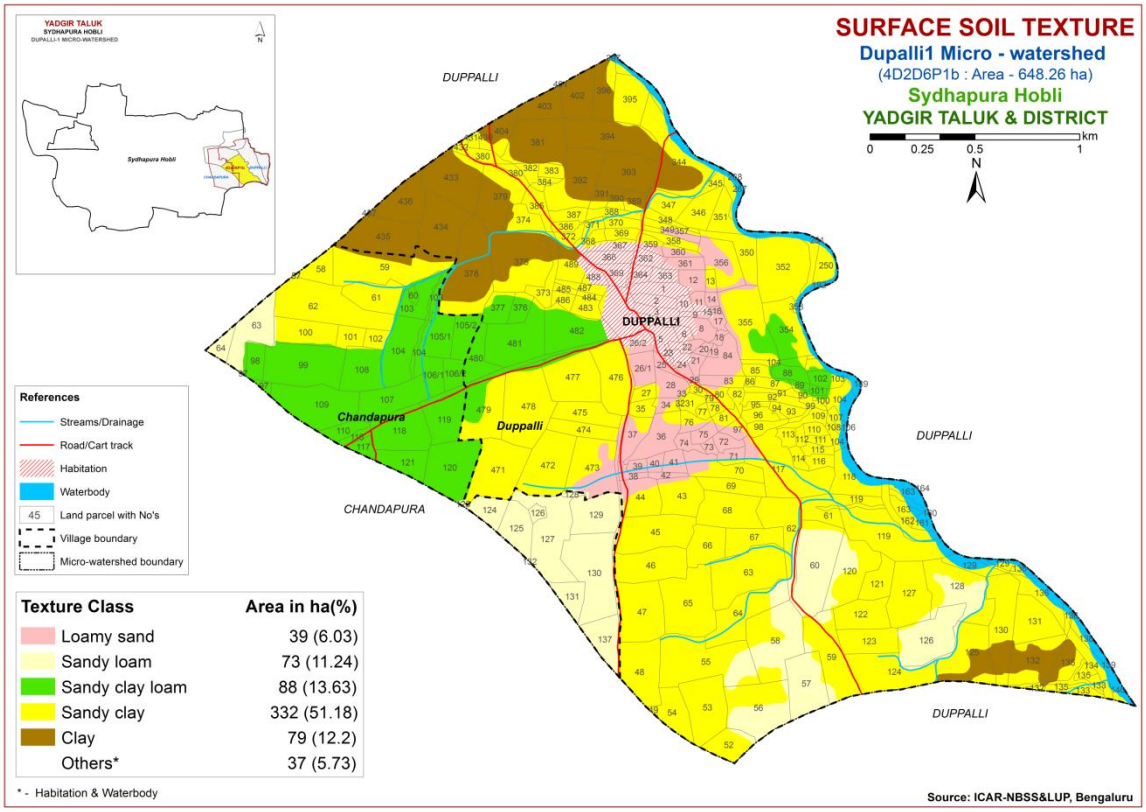


Fig. 5.3 Surface Soil Texture map of Dupalli-1 Microwatershed

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 an area of 542 ha (84%) and are distributed in the major part of the microwatershed. An area of about 31 ha (5%) is gravelly (15-35%) and are distributed in the southern part of the microwatershed. An area of about 38 ha (6%) is very gravelly (35-60%) and are distributed in the northern part of the microwatershed.

The problem soils (11%) that are gravelly (15-60%), where only short or medium duration crops can be grown The most productive soils (84%) that are non gravelly (<15%) where, all climatically adapted long duration crops can be grown.

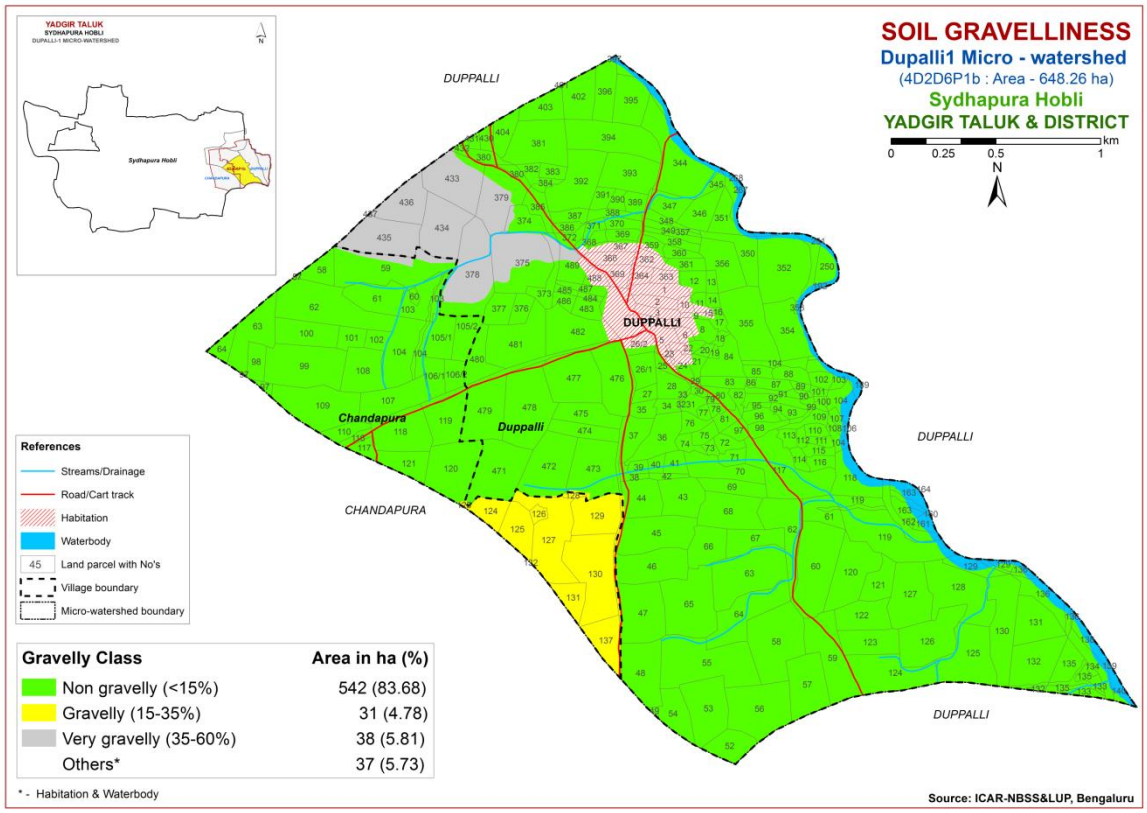


Fig. 5.4 Soil Gravelliness map of Dupalli-1 Microwatershed

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 120 ha (19%) in the microwatershed has soils that are very low (<50 mm/m) in available water capacity and are distributed in the western and central part of the microwatershed. An area of about 238 ha (37%) in the microwatershed has soils that are low (51-100 mm/m) in available water capacity and are distributed in the central, western, northern, southern and southeastern part of the microwatershed. An area of about 70 ha (11%) in the microwatershed has soils that are medium (101-150 mm/m) in available water capacity and are distributed in the western and southeastern part of the

microwatershed. Soils that are very high (>200 mm/m) in available water capacity occur in 182 ha (28%) and are distributed in the northern, eastern and southeastern part of the microwatershed.

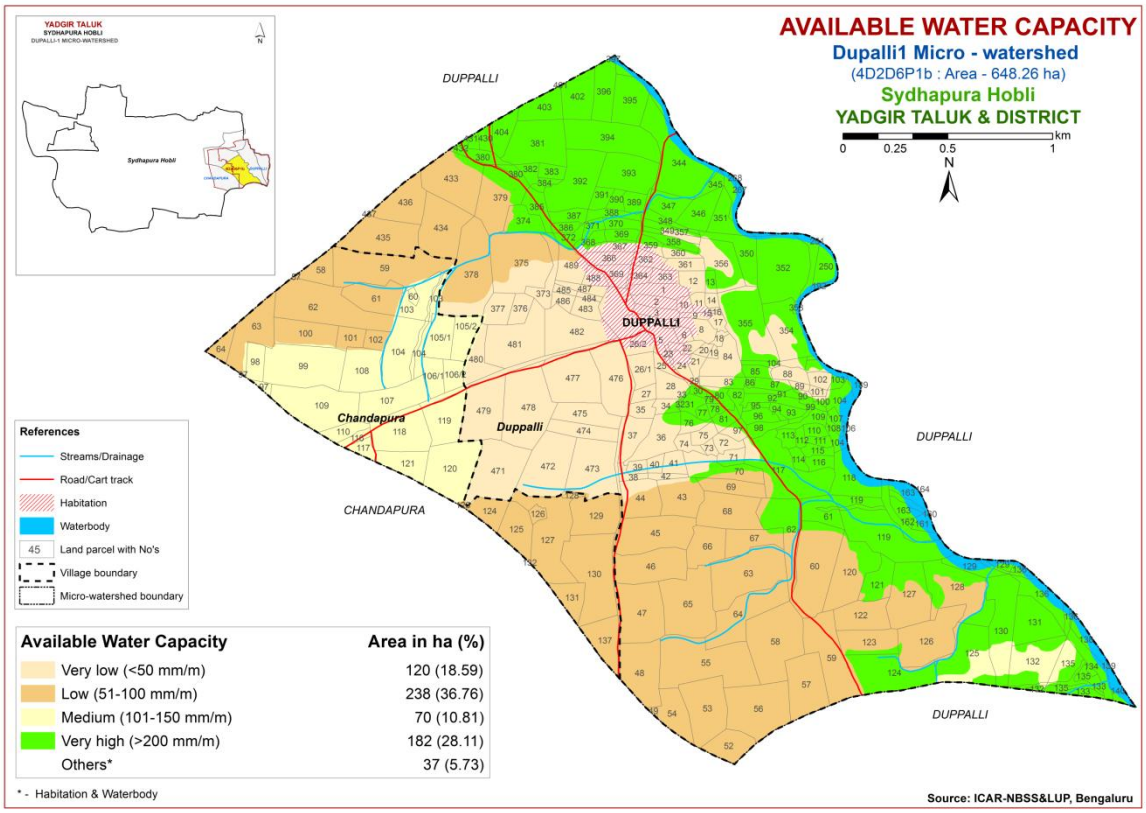


Fig. 5.5 Soil Available Water Capacity map of Dupalli-1 Microwatershed

About 258 ha (55%) 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 182 ha (28%) have 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).

Entire area falls under very gently sloping (1-3% slope) lands in the microwatershed.

In these areas (1-3% slope), all climatically adapted annual and perennial crops can be grown without much soil and water conservation and other land development measures

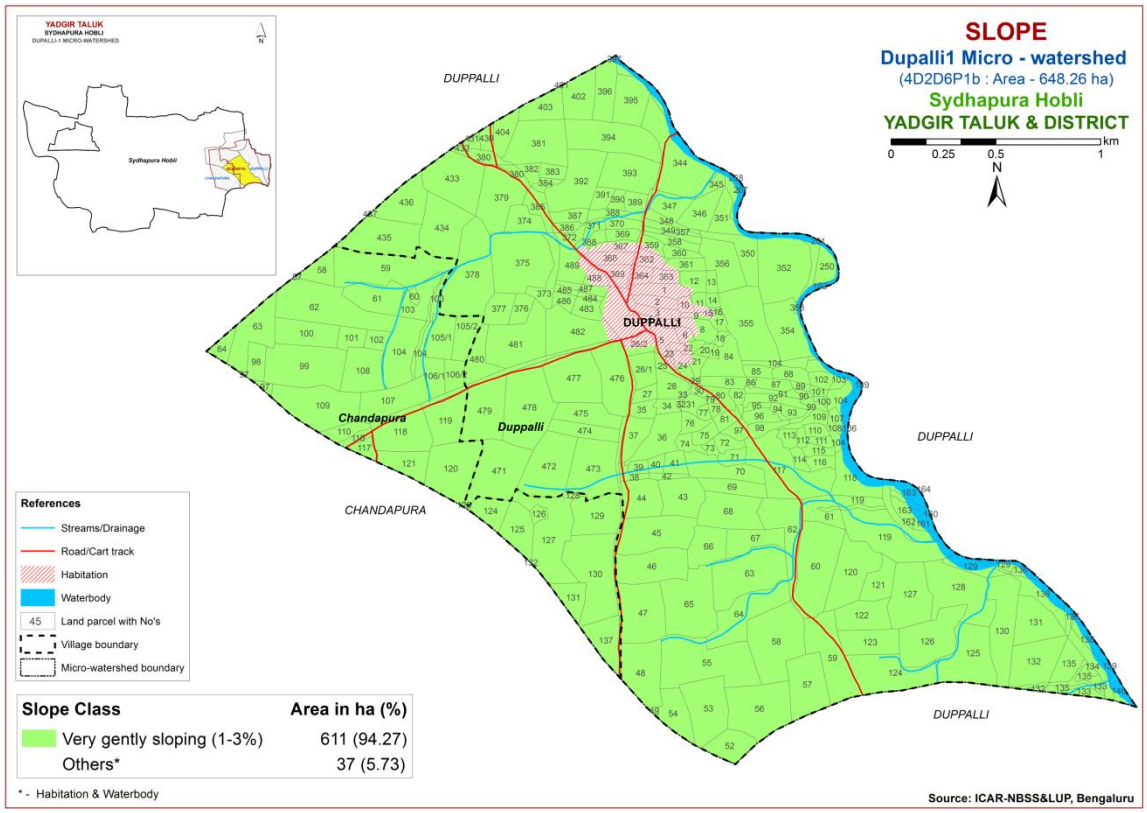


Fig. 5.6 Soil Slope map of Dupalli-1 Microwatershed

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.

Slightly eroded (e1 class) soils cover an area of 34 ha (5%) and are distributed in the northern part of the microwatershed. Moderately eroded (e2 class) soils cover an area of 538 ha (83%) and are distributed in the major part. Severely eroded (e3 class) soils cover an area of 39 ha (6%) and are distributed in the central part of the microwatershed

Maximum area of about 577 ha (89%) in the microwatershed is problematic because of moderate and severe erosion. For these areas, taking up soil and water conservation and other land development measures are needed.

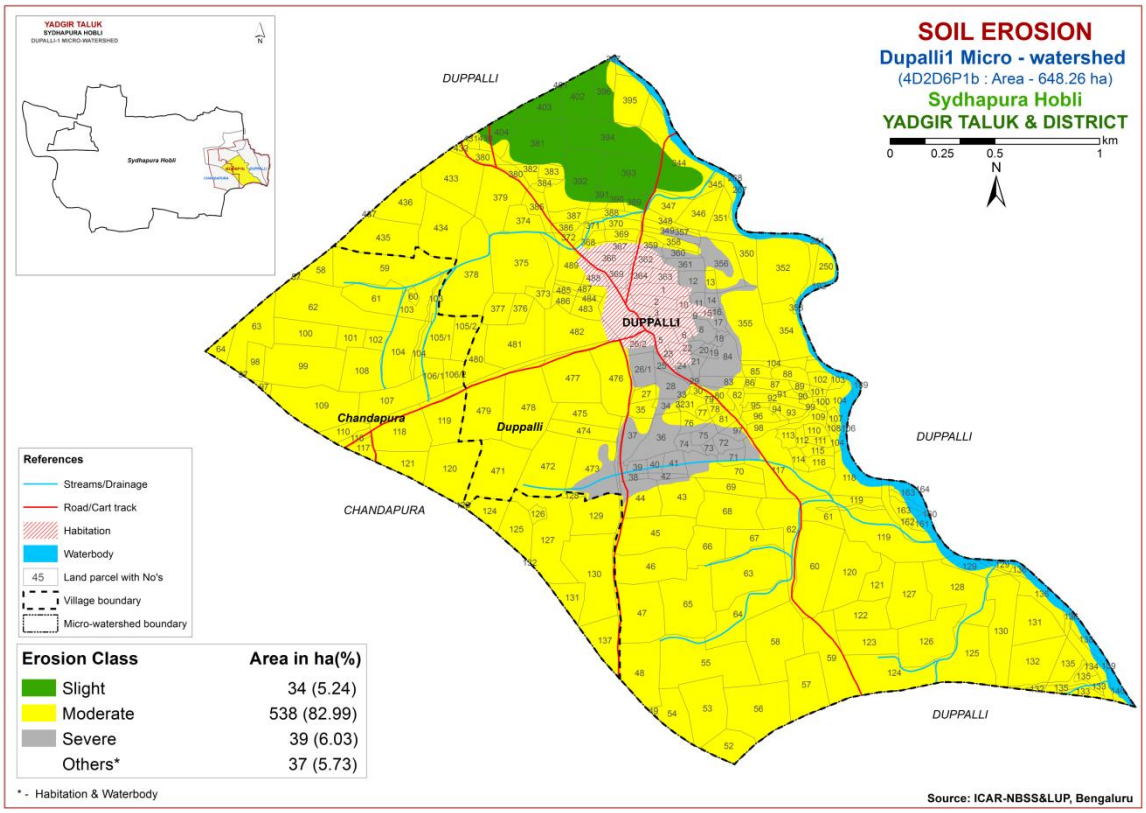


Fig. 5.7 Soil Erosion map of Dupalli-1 Microwatershed

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 Dupalli-1 microwatershed for soil reaction (pH) showed that an area of about 68 ha (10%) is slightly acid (pH 6.0-6.5) and are distributed in the northern, central, southern and western part. An area of about 43 ha (7%) is moderately acid (pH 5.5-6.0) and are distributed in the western and central part. An area of about 121 ha (19%) is neutral (pH 6.5-7.3) and are distributed in the northern, southern, central and western part. An area of about 153 ha (24%) is slightly alkaline (pH 7.3-7.8) and are distributed in the northern, western, central and southern part. An area of about 116 ha (18%) are moderately alkaline (pH 7.8-8.4) and are distributed in the western, northern, eastern, southern and central part. An area of 50 ha (8%) area is strongly alkaline (pH 8.4-9.0) and are distributed in the southern and southeastern part and an area of 60 ha (9%) is very strongly alkaline (pH >9.0) and are distributed in the southeastern part of the microwatershed (Fig.6.1).

6.2 Electrical Conductivity (EC)

The Electrical Conductivity of the soils is low (2-4 dS m^{-1}) in an area of 49 ha (7%) and are distributed in the southeastern part. An area of 563 ha (87%) is <2 dS m^{-1} and are distributed in the major part of the microwatershed and as such the soils are non-saline (Fig 6.2)

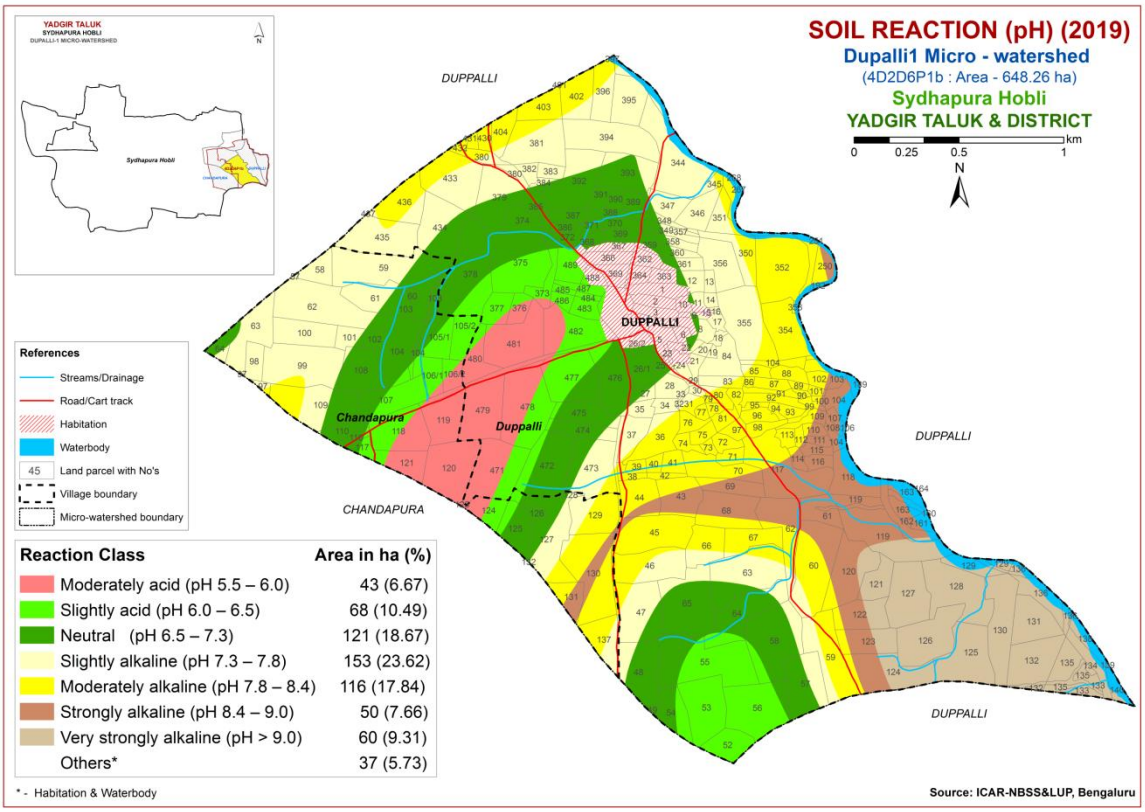


Fig.6.1 Soil Reaction (pH) map of Dupalli-1 Microwatershed

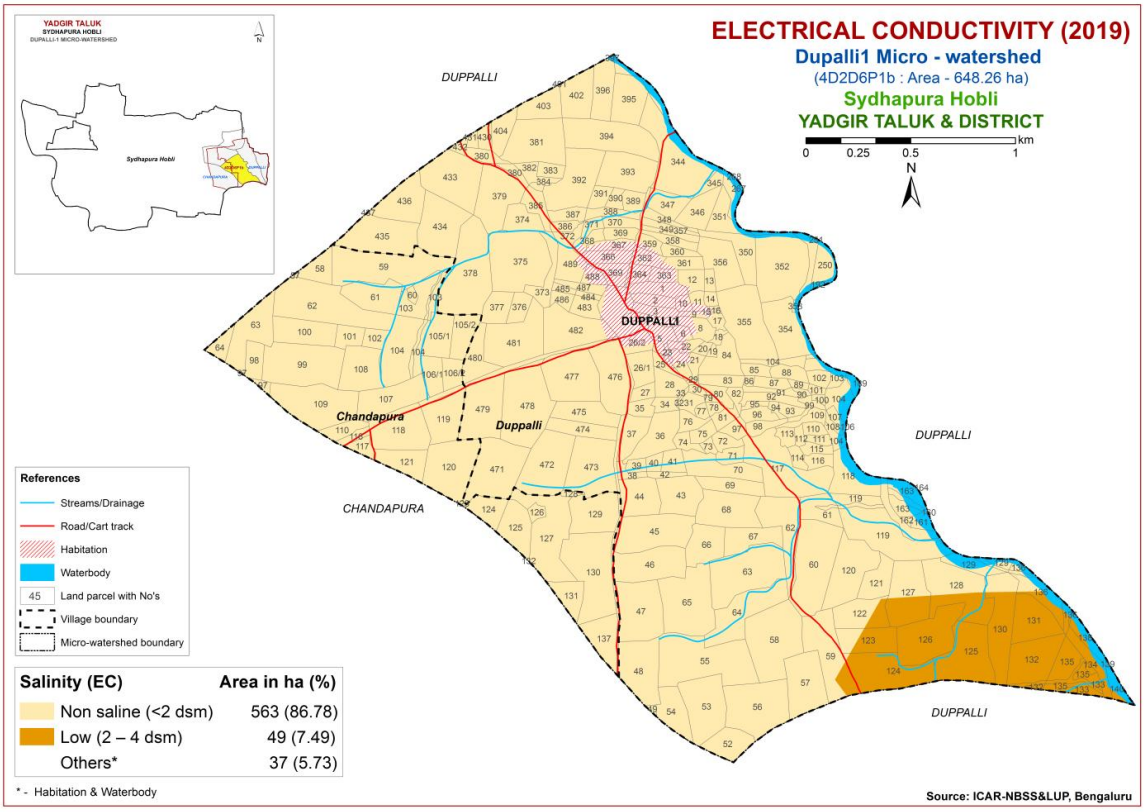


Fig.6.2 Electrical Conductivity (EC) map of Dupalli-1 Microwatershed

6.3 Organic Carbon

The soil organic carbon content (an index of available Nitrogen) is high (>0.75%) in an area of 164 ha (25%) and are distributed in the northern, central and southern part of the microwatershed. Medium (0.5-0.75%) in an area of 282 ha (44%) and are distributed in the central, eastern, southern and northern part. Low (<0.5%) in an area of 165 ha (25%) and are distributed in the western and southeastern part of the microwatershed (Fig. 6.3).

6.4 Available Phosphorus

Low (<23 kg/ha) available phosphorus content occur in an area of 290 ha (45%) and are distributed in the western, northern, central, southern and southeastern part of the microwatershed. Soils which are medium (23-57 kg/ha) in available phosphorus occur in an area of about 318 ha (49%) and are distributed in the major part of the microwatershed. High (>57 kg/ha) available phosphorus content occur in an area of 2 ha (<1%) and are distributed in the southern part of the microwatershed (Fig. 6.4).

6.5 Available Potassium

Available potassium content is medium (145-337 kg/ha) in an area of 376 ha (58%) and are distributed in the major part of the microwatershed. High (>337 kg/ha) available potassium content soils occur in an area of 236 ha (36%) and are distributed in the northern, central, eastern and southern part of the microwatershed (Fig. 6.5).

6.6 Available Sulphur

Entire area is low (<10 ppm) in available sulphur content of the microwatershed (Fig. 6.6).

6.7 Available Boron

Available boron content is low (<0.5 ppm) in an area of 358 ha (55%) and are distributed in the major part of the microwatershed. Medium (0.5-1.0 ppm) an area of 211 ha (33%) and are distributed in the central, eastern, southern and southeastern part. High (>1.0 ppm) an area of 43 ha (7%) and are distributed in the southeastern part of the microwatershed (Fig. 6.7).

6.8 Available Iron

Available iron content is sufficient (>4.5 ppm) in the entire area of the microwatershed (Fig 6.8).

6.9 Available Manganese

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

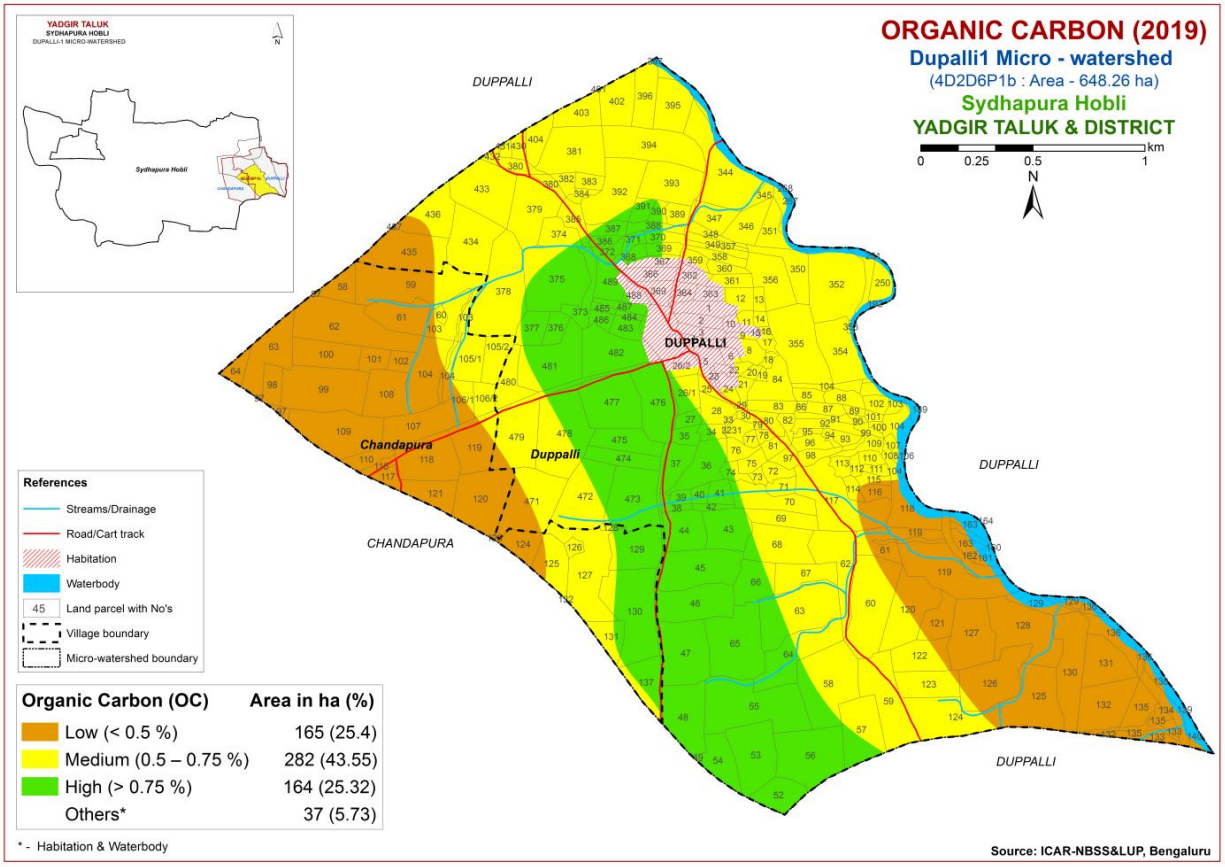


Fig.6.3 Soil Organic Carbon map of Dupalli-1 Microwatershed

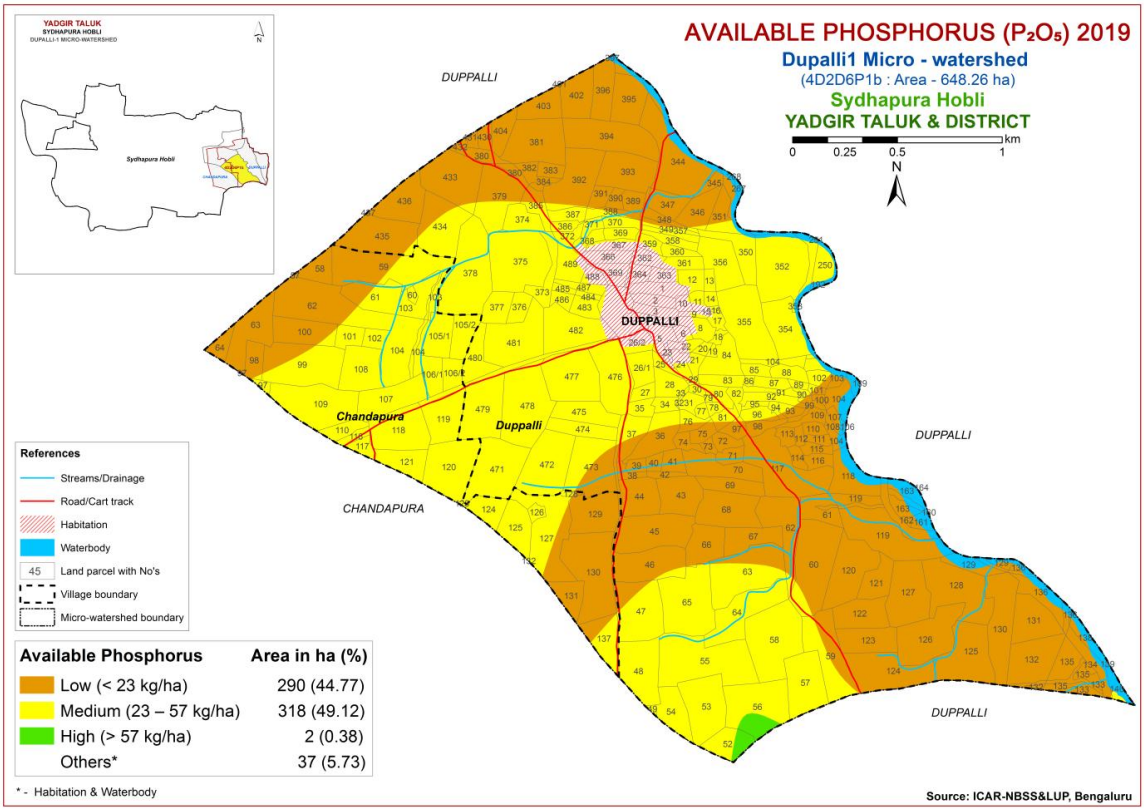


Fig.6.4 Soil Available Phosphorus map of Dupalli-1 Microwatershed

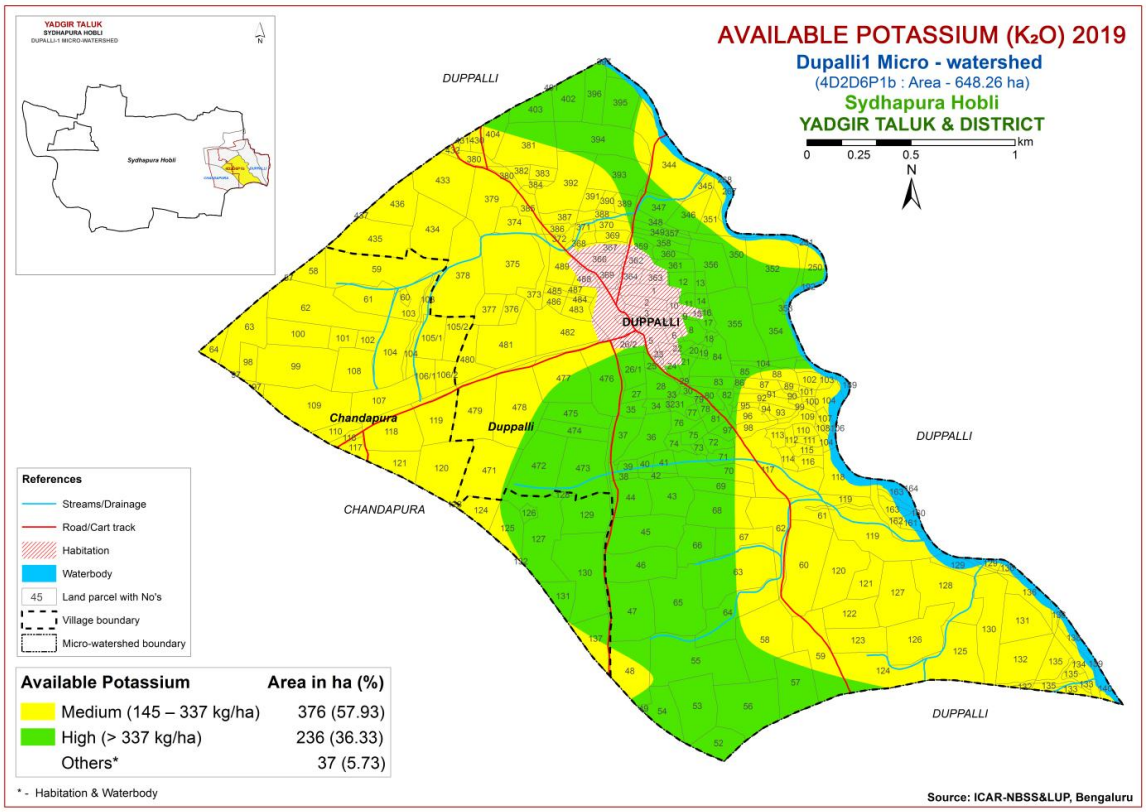


Fig.6.5 Soil Available Potassium map of Dupalli-1 Microwatershed

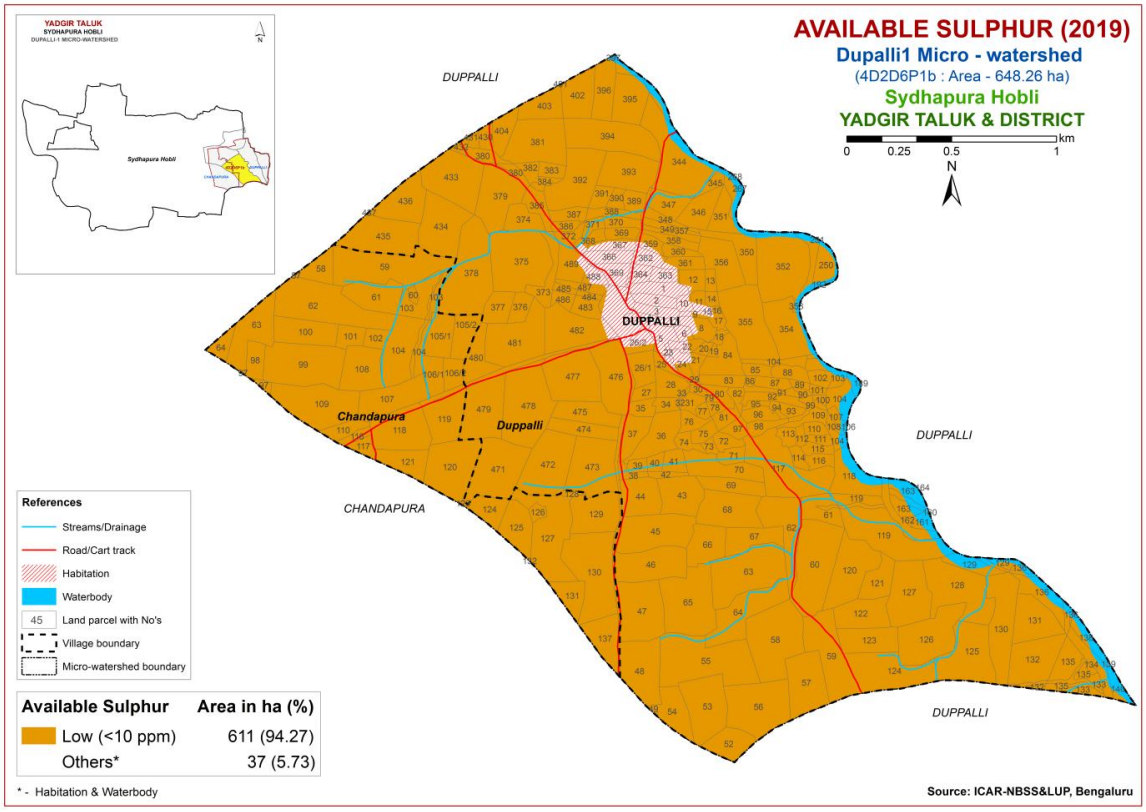


Fig.6.6 Soil Available Sulphur map of Dupalli-1 Microwatershed

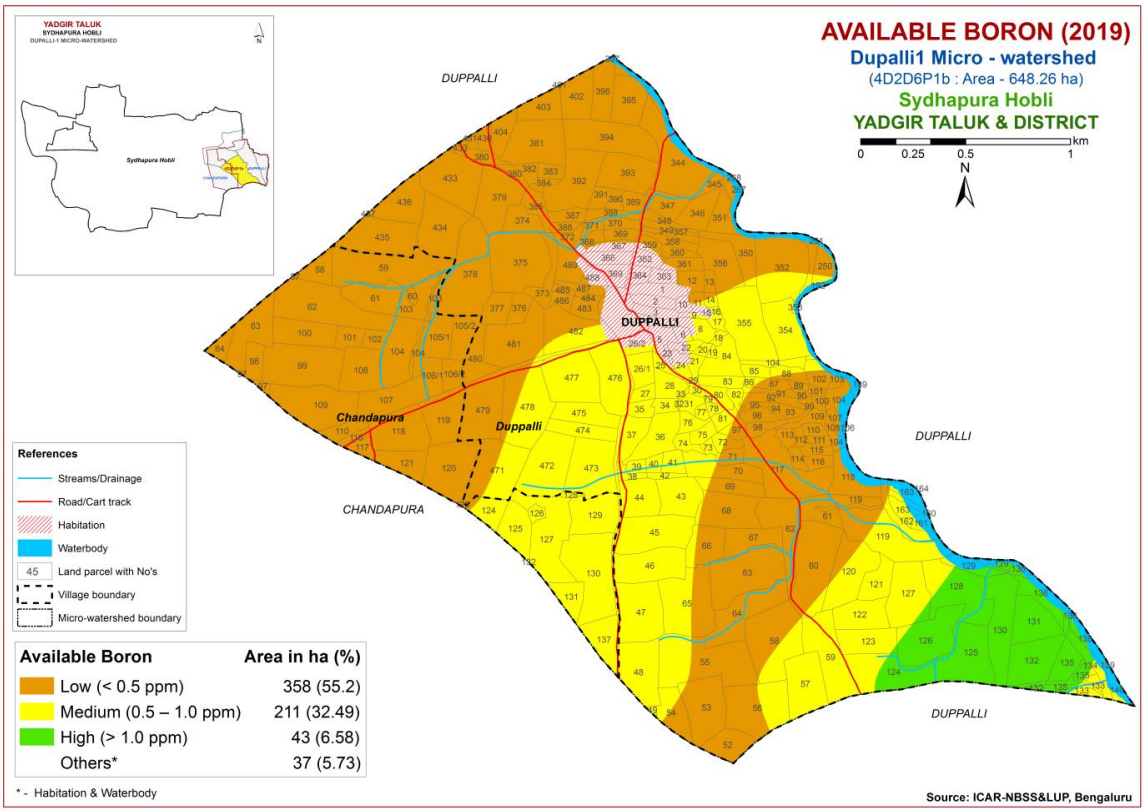


Fig.6.7 Soil Available Boron map of Dupalli-1 Microwatershed

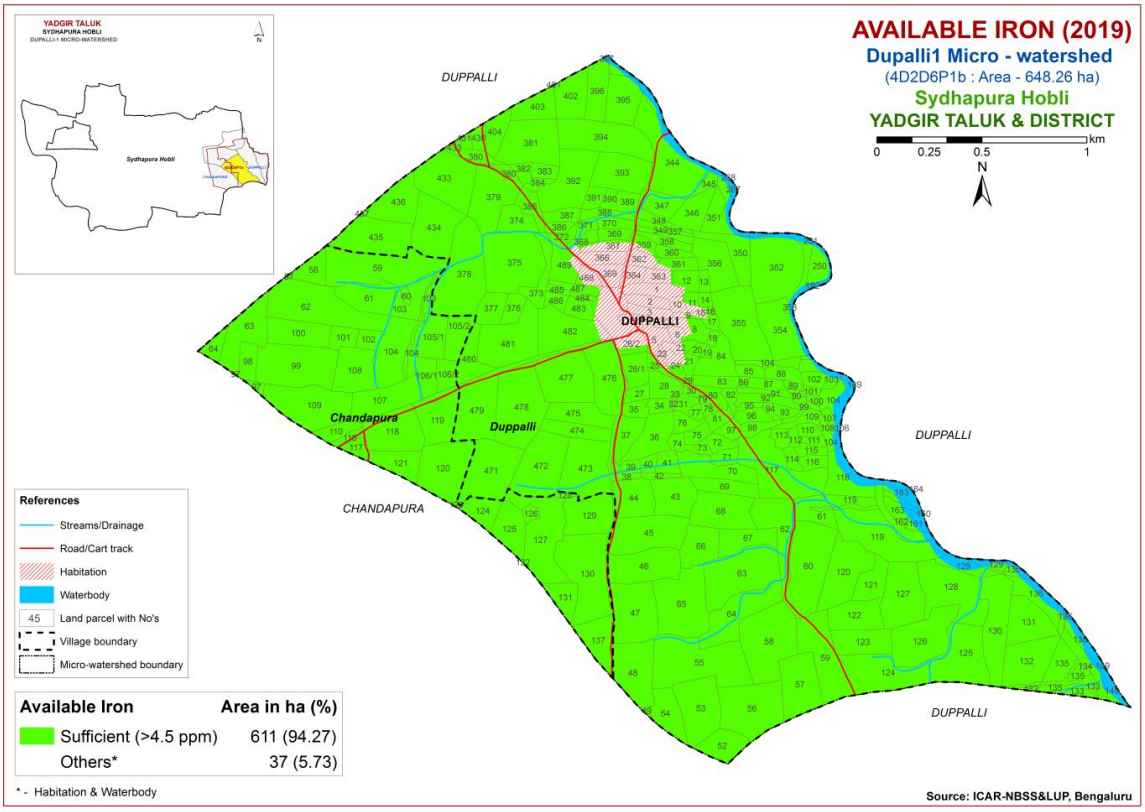


Fig.6.8 Soil Available Iron map of Dupalli-1 Microwatershed

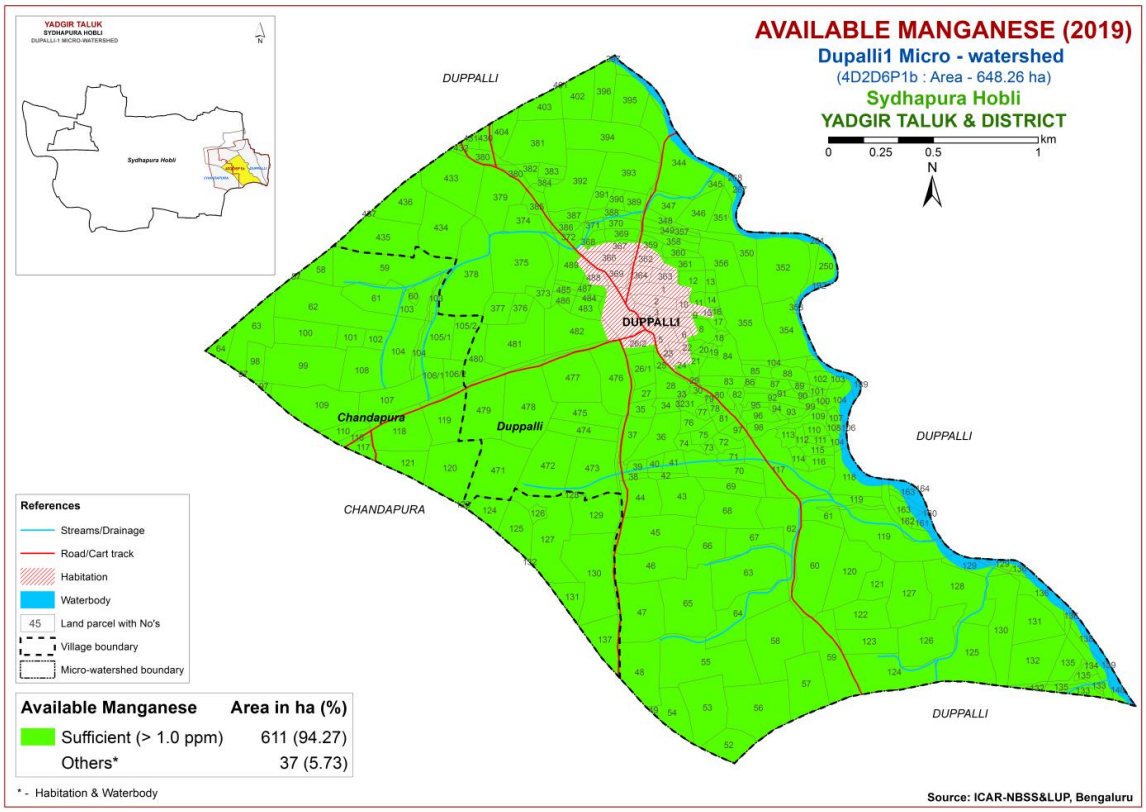


Fig.6.9 Soil Available Manganese map of Dupalli-1 Microwatershed

6.10 Available Copper

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

6.11 Available Zinc

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

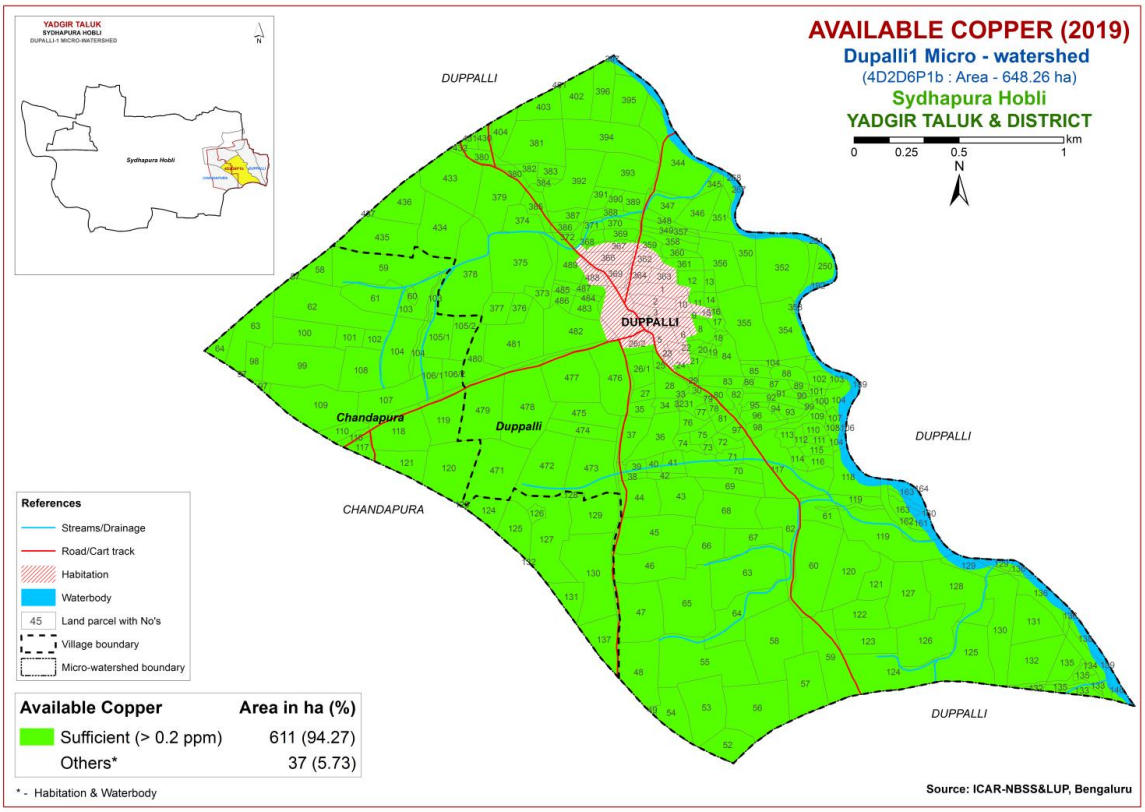


Fig.6.10 Soil Available Copper map of Dupalli-1 Microwatershed

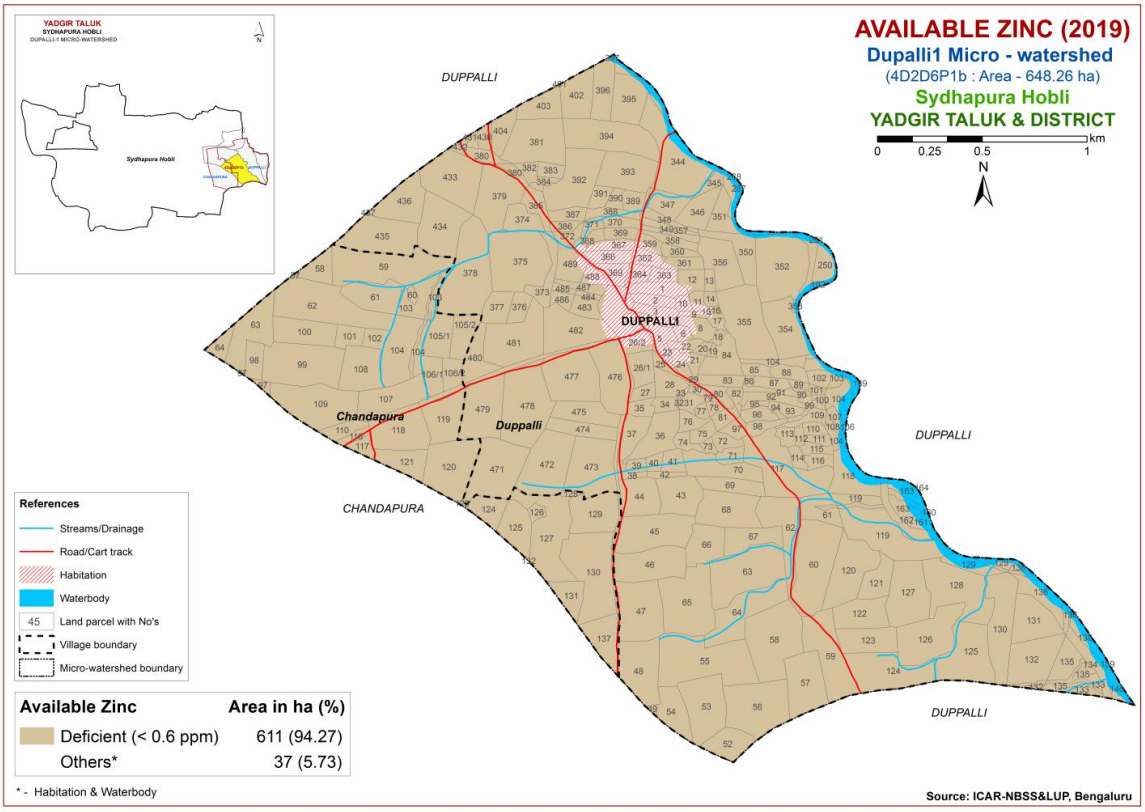


Fig.6.11 Soil Available Zinc map of Dupalli-1 Microwatershed

Chapter 7

LAND SUITABILITY FOR MAJOR CROPS

The soil and land resource units (soil phases) of Dupalli-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 of the chapter. 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 food 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.

Highly suitable (Class S1) lands for growing sorghum occur in an area of 99 ha (15%) and are distributed in the southeastern, southern, western and central part of the microwatershed. An area of about 280 ha (43%) is moderately suitable (Class S2) for

growing sorghum and are distributed in the central, northern, southern, western and southeastern part of the microwatershed. They have minor limitations of texture, gravelliness, calcareousness, nutrient availability and rooting depth. An area of about 232 ha (36%) is marginally suitable (Class S3) for growing sorghum and are distributed in the central, northern, eastern and southeastern part of the microwatershed with moderate limitations of rooting depth, gravelliness, calcareousness and nutrient availability.

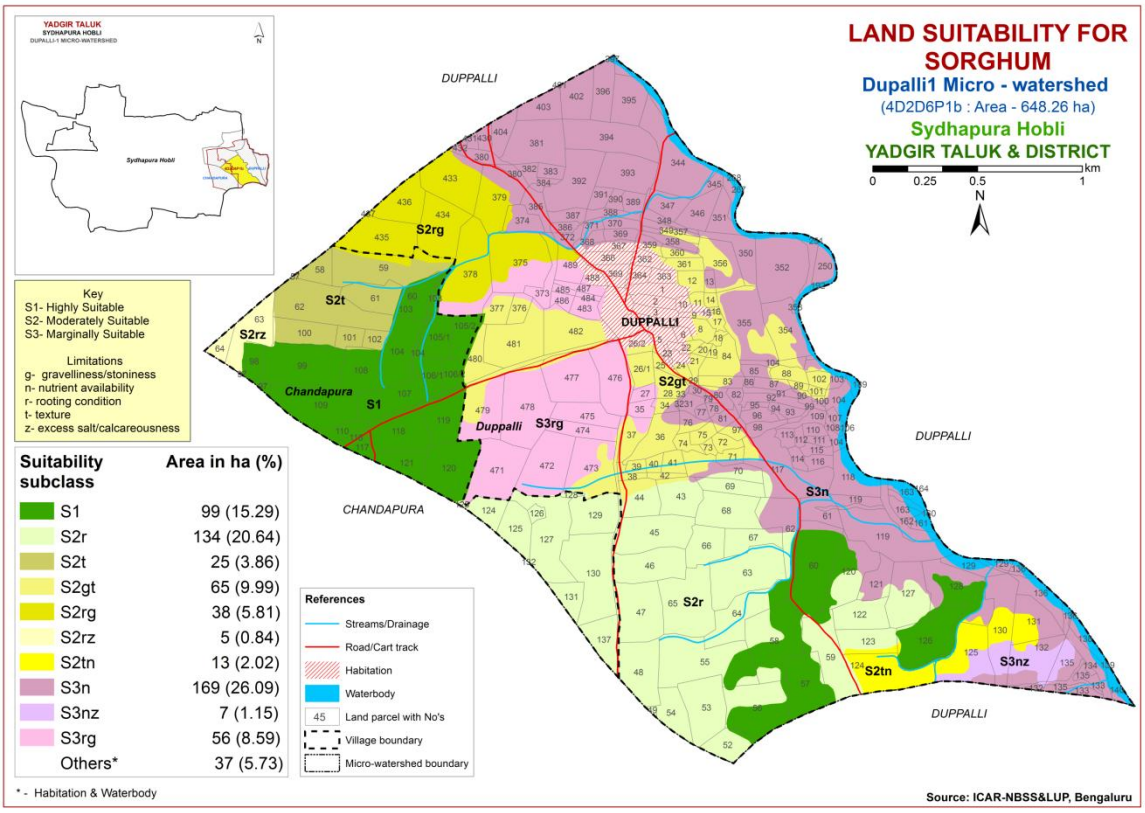


Fig. 7.1 Land Suitability map of Sorghum

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.

Highly suitable (Class S1) lands for growing maize occur in an area of 124 ha (19%) and are distributed in the southeastern, southern, western and central part of the microwatershed. An area of about 255 ha (39%) is moderately suitable (Class S2) for growing maize and are distributed in the central, northern, southern, western and southeastern part of the microwatershed. They have minor limitations of texture, gravelliness, calcareousness, nutrient availability and rooting depth. An area of about 232 ha (36%) is marginally suitable (Class S3) for growing maize and are distributed in the

central, northern, eastern and southeastern part of the microwatershed with moderate limitations of rooting depth, gravelliness, calcareousness and nutrient availability.

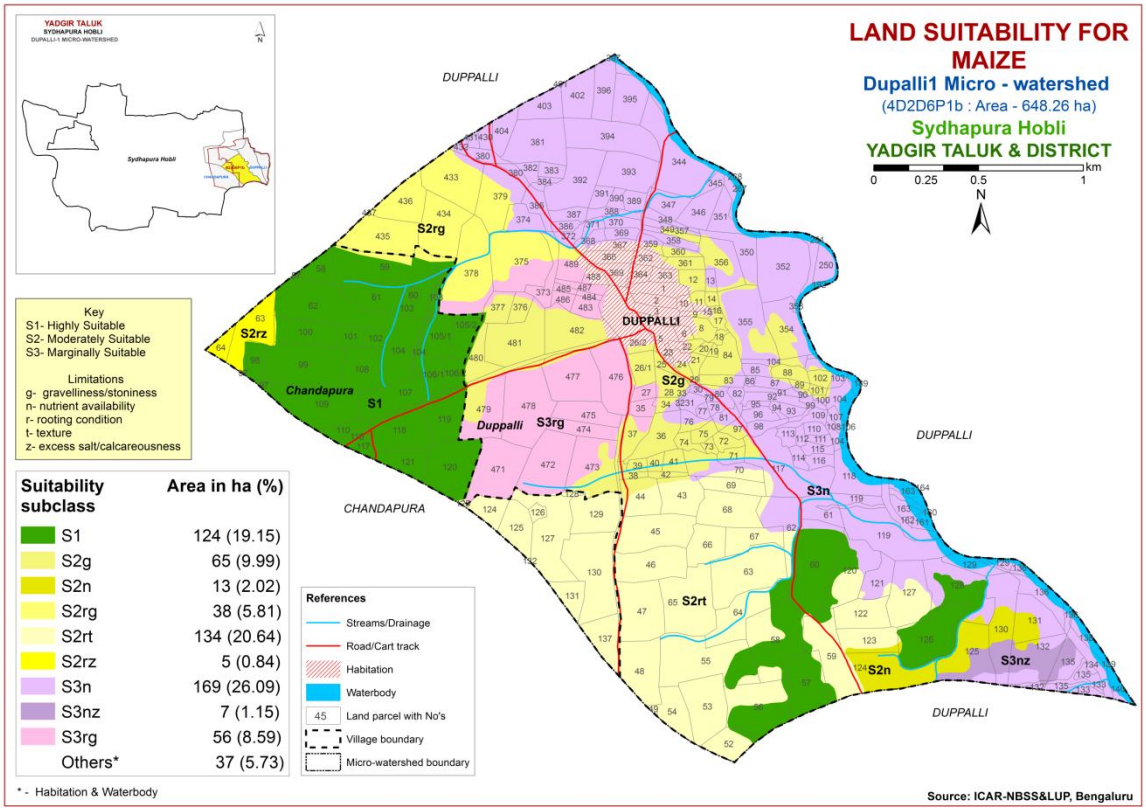


Fig. 7.2 Land Suitability map of Maize

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.

Highly suitable (Class S1) lands for growing bajra occur in an area of 124 ha (19%) and are distributed in the southeastern, southern, western and central part of the microwatershed. An area of about 255 ha (39%) is moderately suitable (Class S2) for growing bajra and are distributed in the central, northern, southern, western and southeastern part of the microwatershed. They have minor limitations of texture, gravelliness, calcareousness, nutrient availability and rooting depth. An area of about 232 ha (36%) is marginally suitable (Class S3) for growing bajra and are distributed in the central, northern, eastern and southeastern part of the microwatershed with moderate limitations of rooting depth, calcareousness and nutrient availability.

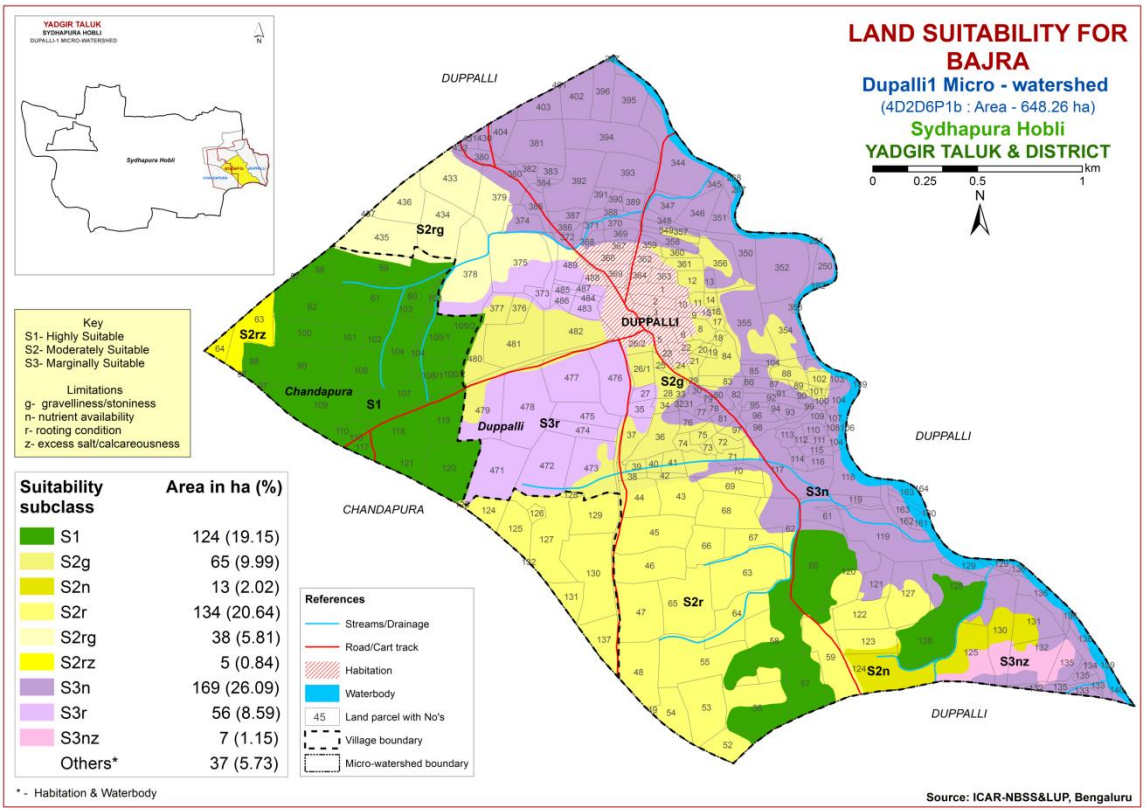


Fig. 7.3 Land Suitability map of Bajra

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.

Highly suitable (Class S1) lands for growing groundnut occur in an area of 25 ha (4%) and are distributed in the western part of the microwatershed. An area of about 169 ha (26%) is moderately suitable (Class S2) for growing groundnut and occur in the central, western, eastern, southern and southeastern part of the microwatershed. It has minor limitations of rooting depth, gravelliness, calcareousness and texture. Marginally suitable lands (Class S3) for growing groundnut occupy an area of about 240 ha (37%) and are distributed in the northern, central, southern and southeastern part of the microwatershed. They have moderate limitations of texture, nutrient availability and rooting depth. An area of about 177 ha (27%) is currently not suitable (Class N1) for growing groundnut and are distributed in the central, eastern, southeastern and northern part of the microwatershed with severe limitation of nutrient availability.

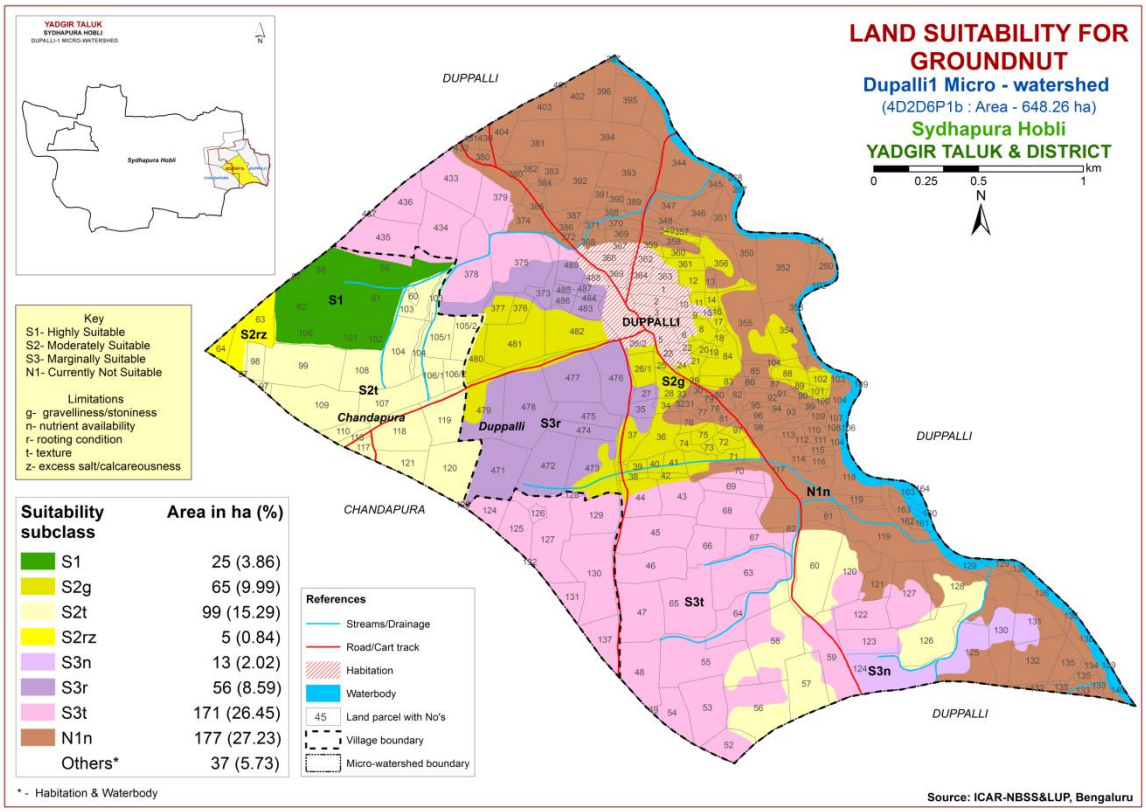


Fig. 7.4 Land Suitability map of Groundnut

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.

An area of about 189 ha (29%) is moderately suitable (Class S2) for growing sunflower and occur in the southeastern, northern, eastern, western and central part of the microwatershed. It has minor limitations of calcareousness and rooting depth. Marginally suitable (Class S3) lands for sunflower are found to occur in an area of about 190 ha (29%) with moderate limitations of rooting depth and nutrient availability and are distributed in the southern, southeastern, northern and western part of the microwatershed. An area of about 233 ha (36%) is currently not suitable (Class N1) for growing sunflower and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

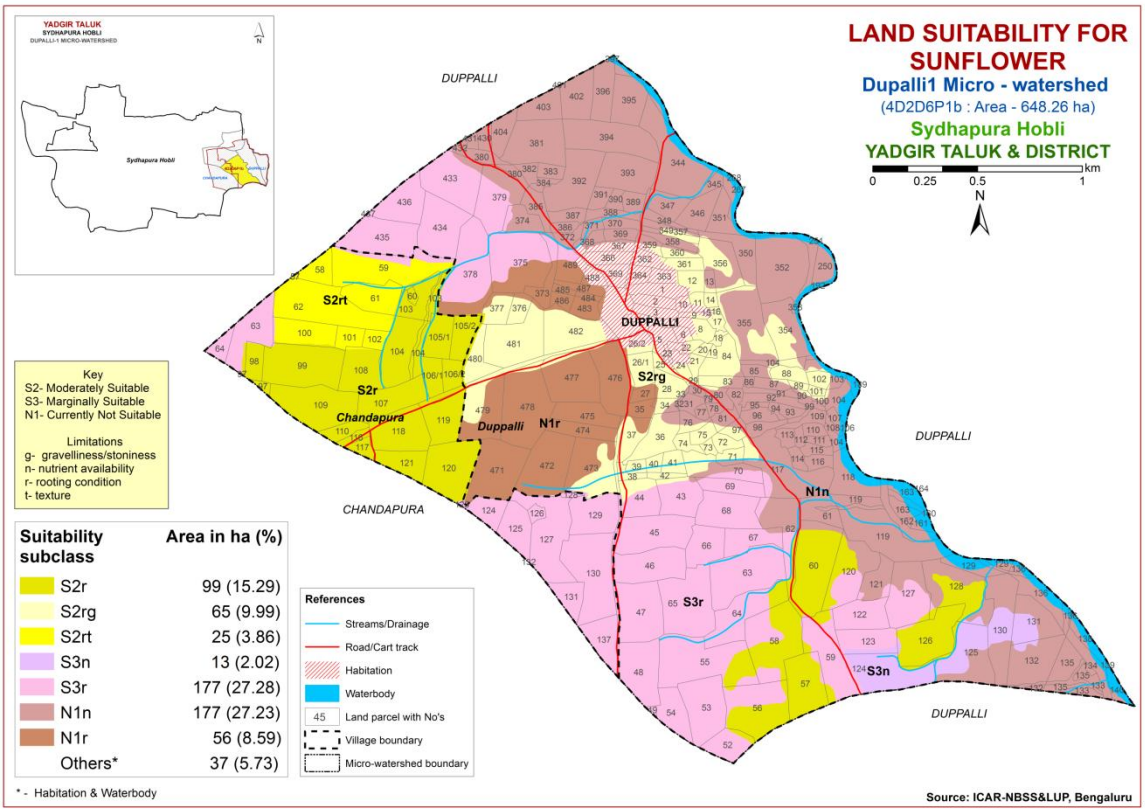


Fig. 7.5 Land Suitability map of Sunflower

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.

An area of about 202 ha (31%) is moderately suitable (Class S2) for growing redgram and occur in the southeastern, northern, eastern, western and central part of the microwatershed. It has minor limitations of gravelliness, nutrient availability, texture and rooting depth. Marginally suitable (Class S3) lands for redgram are found to occur in an area of about 353 ha (55%) with moderate limitations of rooting depth, calcareousness and nutrient availability and are distributed in the southern, southeastern, northern and western part of the microwatershed. An area of about 56 ha (9%) is currently not suitable (Class N1) for growing redgram and are distributed in the central part of the microwatershed with severe limitation of rooting depth.

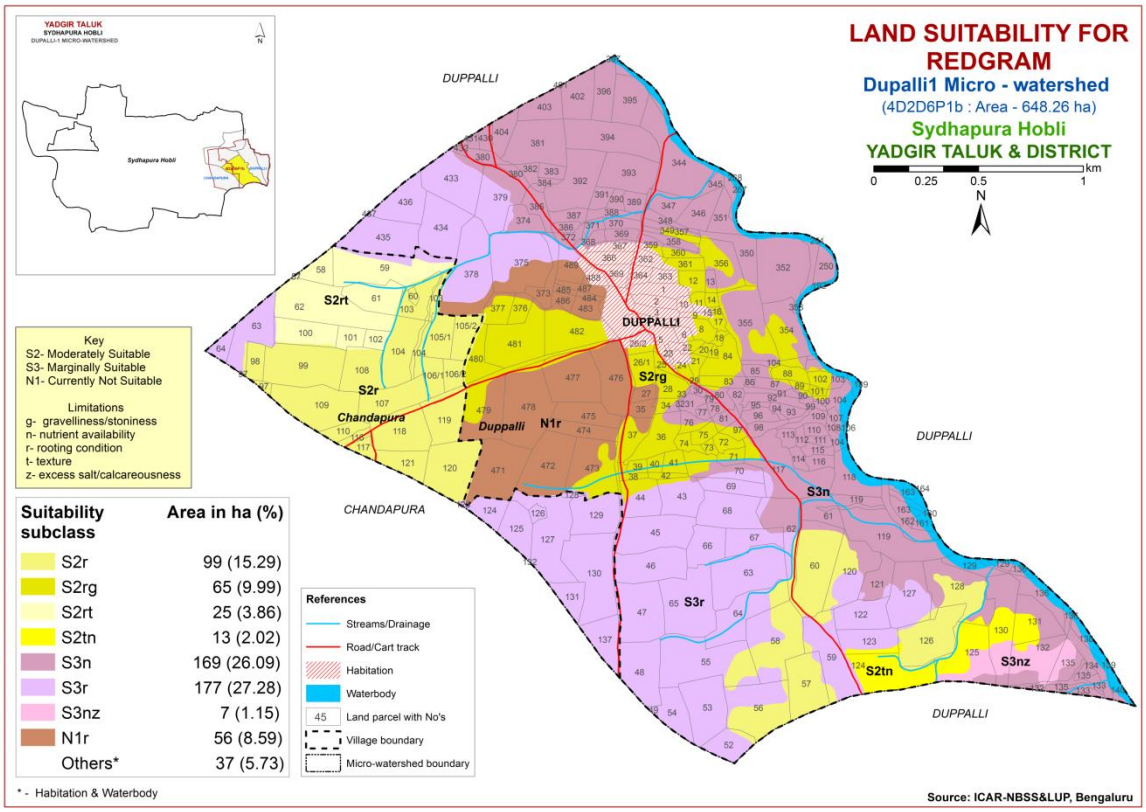


Fig. 7.6 Land Suitability map of Redgram

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.

Marginally suitable lands (Class S3) for growing Bengal gram occupy an entire area of the microwatershed. They have moderate limitations of texture, rooting depth, calcareousness and nutrient availability.

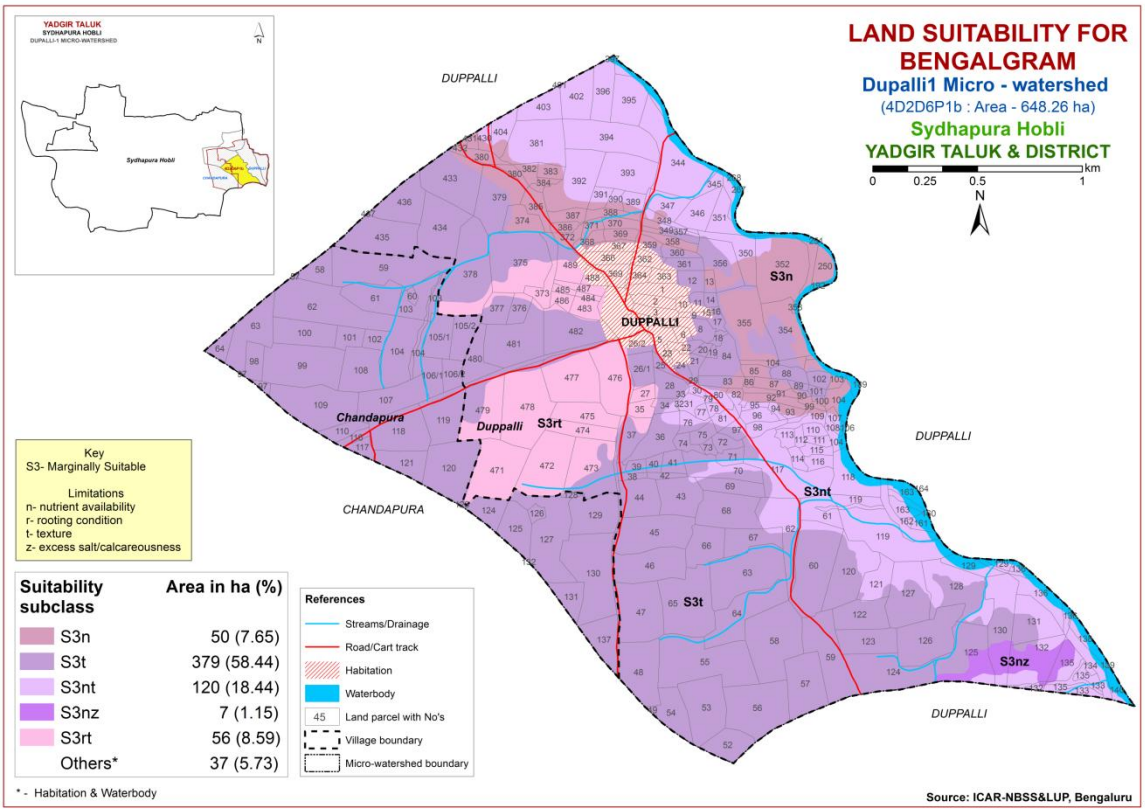


Fig. 7.7 Land Suitability map of Bengal gram.

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.

An area of about 271 ha (42%) is moderately suitable (Class S2) for growing cotton and occur in the southeastern, northern, western and central part of the microwatershed. It has minor limitations of gravelliness and rooting depth. Marginally suitable (Class S3) lands for cotton are found to occur in an area of about 341 ha (53%) with moderate limitations of rooting depth, gravelliness, texture, calcareousness and nutrient availability and are distributed in the major part of the microwatershed.

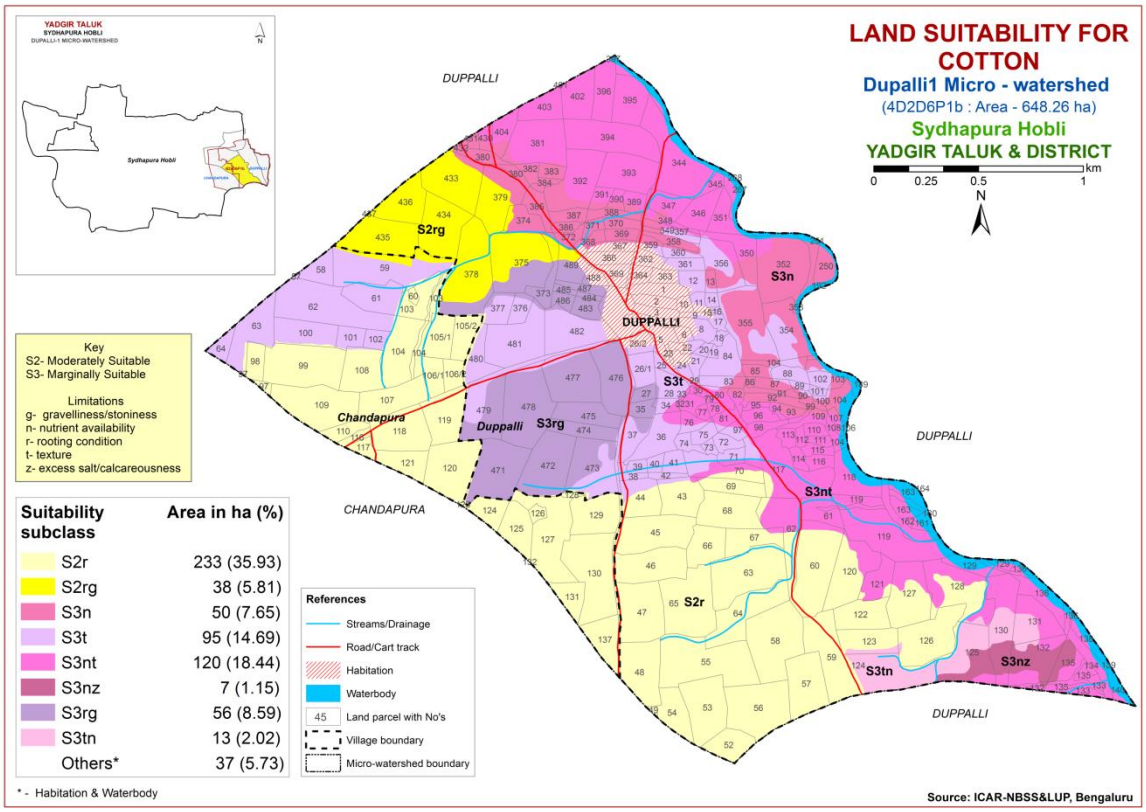


Fig. 7.8 Land Suitability map of Cotton

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.

Highly suitable (Class S1) lands for growing chilli occur in an area of 124 ha (19%) and are distributed in the southeastern, southern and western part of the microwatershed. An area of about 139 ha (21%) is moderately suitable (Class S2) for growing chilli and are distributed in the western, southern and southeastern part of the microwatershed. They have minor limitations of gravelliness, calcareousness and rooting depth. An area of about 171 ha (26%) is marginally suitable (Class S3) for growing chilli and are distributed in the western, eastern, central, northern and southeastern part of the microwatershed with moderate limitations of rooting depth, gravelliness and nutrient availability. An area of about 177 ha (27%) is currently not suitable (Class N1) for growing chilli and are distributed in the central, eastern, southeastern and northern part of the microwatershed with severe limitation of nutrient availability.

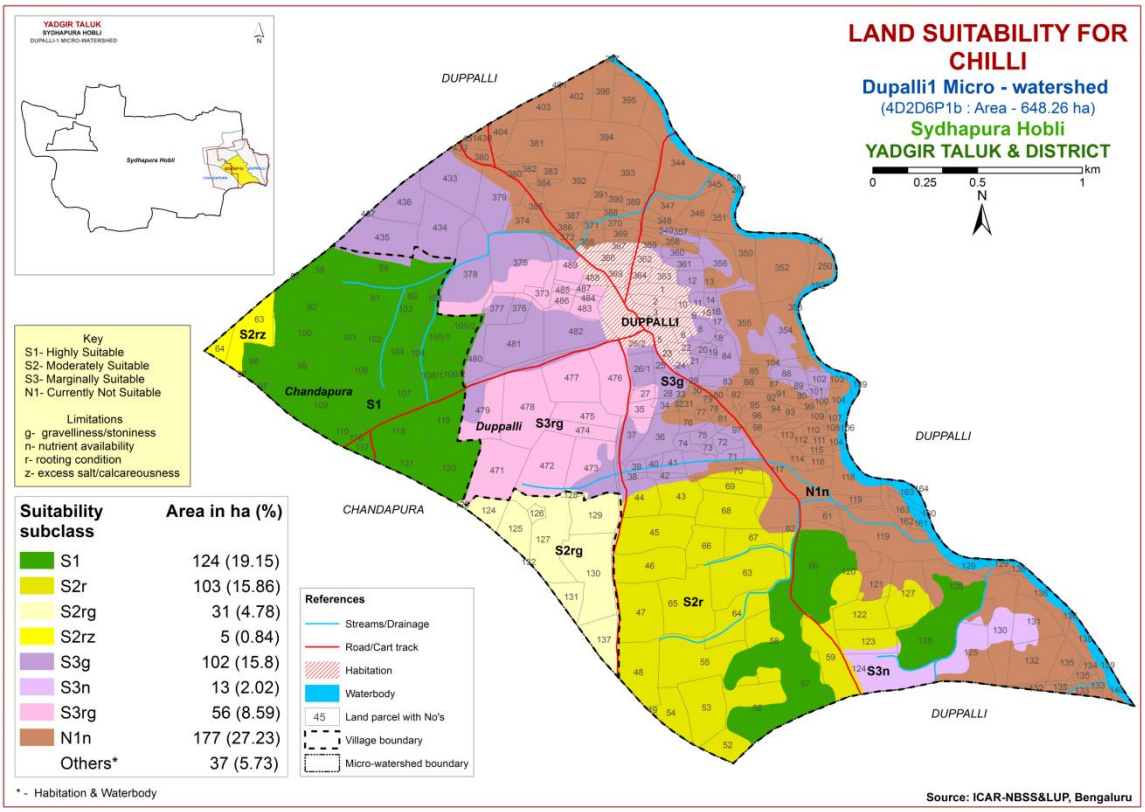


Fig 7.9 Land Suitability map of Chilli

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.

Highly suitable (Class S1) lands for growing tomato occur in an area of 124 ha (19%) and are distributed in the southeastern, southern and western part of the microwatershed. An area of about 139 ha (21%) is moderately suitable (Class S2) for growing tomato and are distributed in the western, southern and southeastern part of the microwatershed. They have minor limitations of gravelliness, calcareousness and rooting depth. An area of about 171 ha (26%) is marginally suitable (Class S3) for growing tomato and are distributed in the western, eastern, central, northern and southeastern part of the microwatershed with moderate limitations of rooting depth, gravelliness and nutrient availability. An area of about 177 ha (27%) is currently not suitable (Class N1) for growing tomato and are distributed in the central, eastern, southeastern and northern part of the microwatershed with severe limitation of nutrient availability.

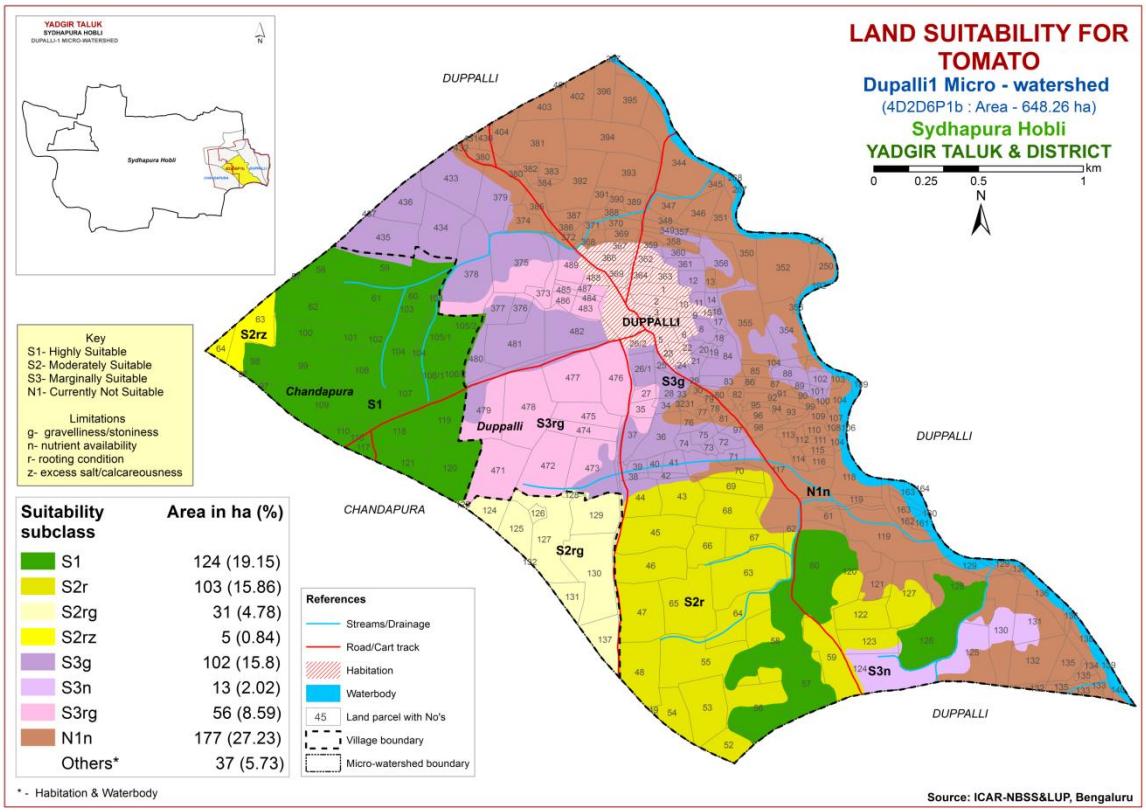


Fig 7.10 Land Suitability map of Tomato

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 suitable (Class S1) lands for growing brinjal occur in an area of 124 ha (19%) and are distributed in the southeastern, southern and western part of the microwatershed. An area of about 139 ha (21%) is moderately suitable (Class S2) for growing brinjal and are distributed in the western, southern and southeastern part of the microwatershed. They have minor limitations of gravelliness, calcareousness and rooting depth. An area of about 171 ha (26%) is marginally suitable (Class S3) for growing brinjal and are distributed in the western, eastern, central, northern and southeastern part of the microwatershed with moderate limitations of rooting depth, gravelliness and nutrient availability. An area of about 177 ha (27%) is currently not suitable (Class N1) for growing brinjal and are distributed in the central, eastern, southeastern and northern part of the microwatershed with severe limitation of nutrient availability.

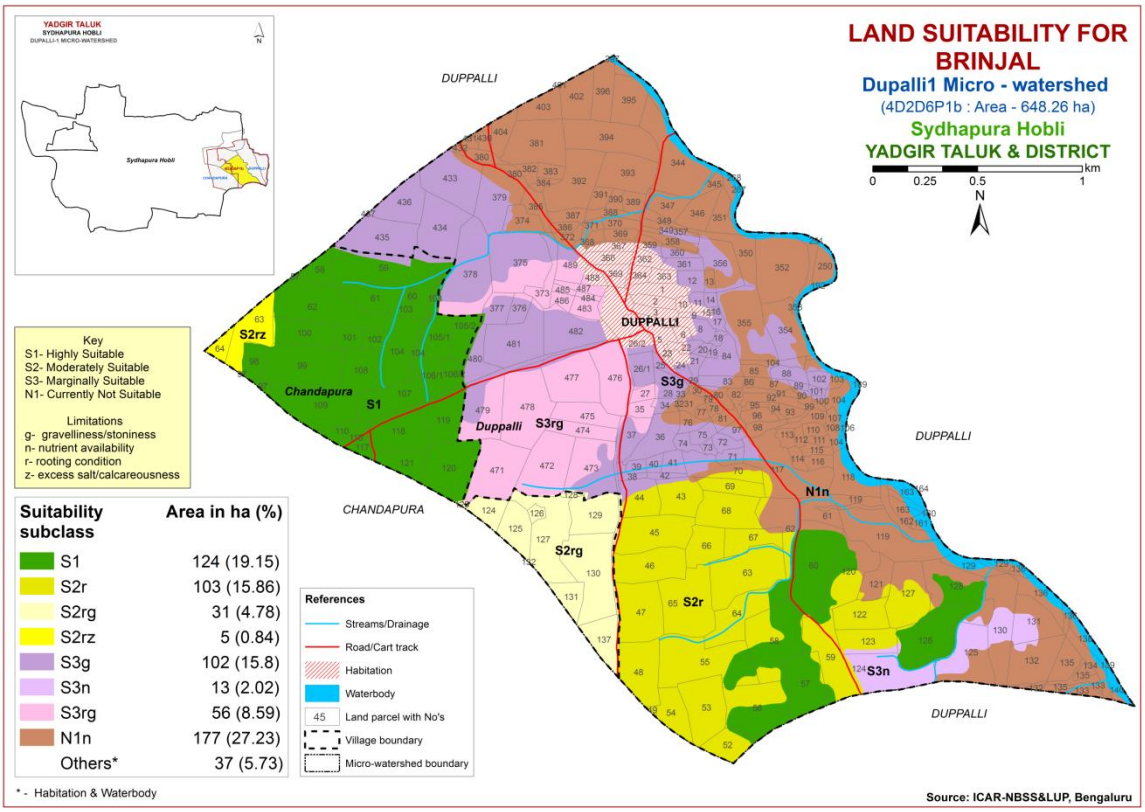


Fig 7.11 Land Suitability map of Brinjal

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 suitable (Class S1) lands for growing onion occur in an area of 124 ha (19%) and are distributed in the southeastern, southern and western part of the microwatershed. An area of about 139 ha (21%) is moderately suitable (Class S2) for growing onion and are distributed in the western, southern and southeastern part of the microwatershed. They have minor limitations of gravelliness, calcareousness and rooting depth. An area of about 158 ha (24%) is marginally suitable (Class S3) for growing onion and are distributed in the western, eastern, central, northern and southeastern part of the microwatershed with moderate limitations of rooting depth and gravelliness. An area of about 190 ha (29%) is currently not suitable (Class N1) for growing onion and are distributed in the central, eastern, northern, southeastern part of the microwatershed with severe limitation of nutrient availability.

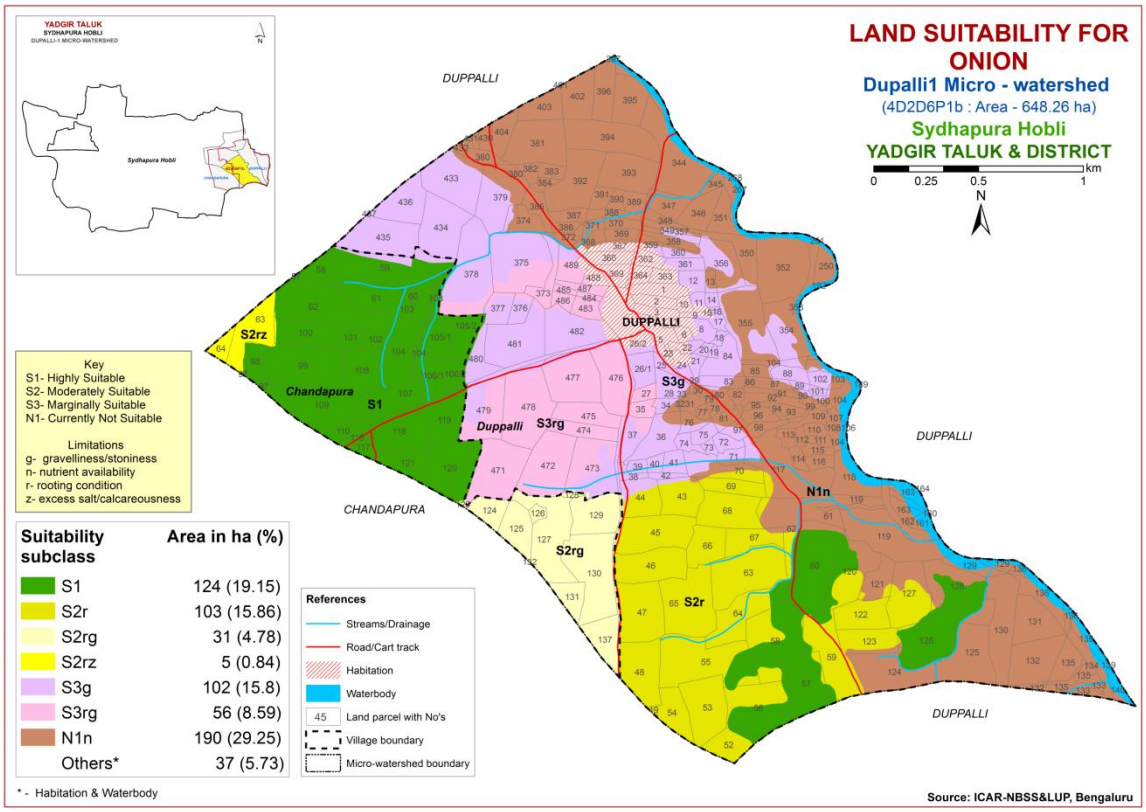


Fig 7.12 Land Suitability map of Onion

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 suitable (Class S1) lands for growing bhendi occur in an area of 124 ha (19%) and are distributed in the southeastern, southern and western part of the microwatershed. An area of about 139 ha (21%) is moderately suitable (Class S2) for growing bhendi and are distributed in the western, southern and southeastern part of the microwatershed. They have minor limitations of gravelliness, calcareousness and rooting depth. An area of about 171 ha (26%) is marginally suitable (Class S3) for growing bhendi and are distributed in the western, eastern, central, northern and southeastern part of the microwatershed with moderate limitations of rooting depth, gravelliness and nutrient availability. An area of about 177 ha (27%) is currently not suitable (Class N1) for growing bhendi and are distributed in the central, eastern, southeastern and northern part of the microwatershed with severe limitation of nutrient availability.

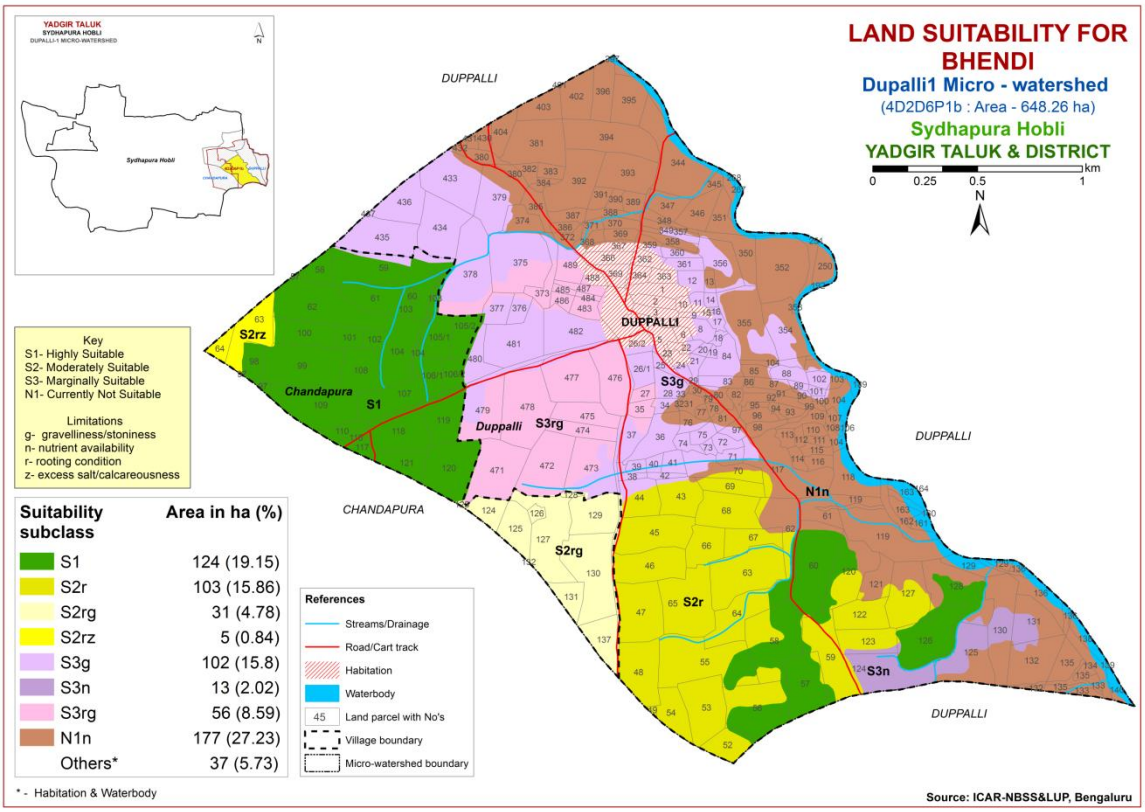


Fig 7.13 Land Suitability map of Bhendi

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.

An area of about 189 ha (29%) is moderately suitable (Class S2) for growing drumstick and are distributed in the western, northern, central and southeastern part of the microwatershed. It has minor limitation of rooting depth. An area of about 176 ha (27%) is marginally suitable (Class S3) for growing drumstick and are distributed in the major part of the microwatershed with moderate limitations of rooting depth and calcareousness. An area of about 246 ha (38%) is currently not suitable (Class N1) for growing drumstick and are distributed in the central, eastern, southeastern and northern part of the microwatershed with severe limitations of rooting depth and nutrient availability.

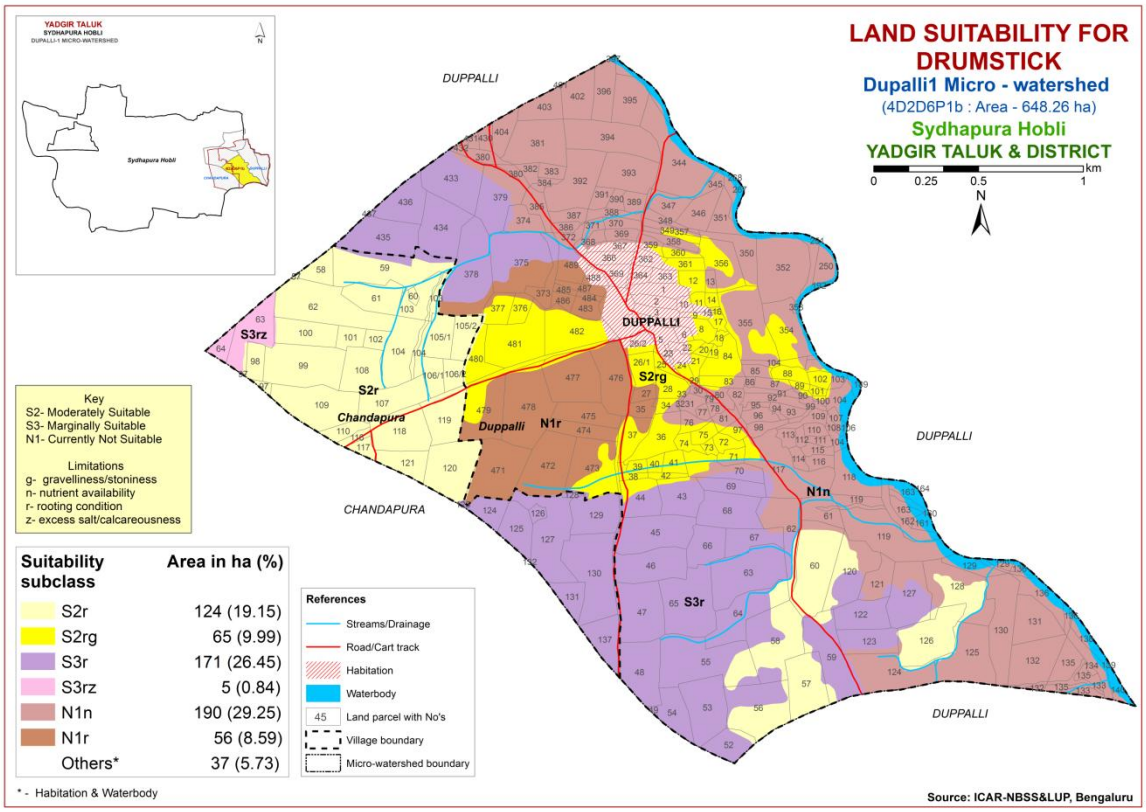


Fig 7.14 Land Suitability map of Drumstick

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 202 ha (31%) is marginally suitable (Class S3) for growing mango and are distributed in the western, central, eastern, southern and southeastern part of the microwatershed. They have moderate limitations of rooting depth and nutrient availability. An area of about 410 ha (63%) is currently not suitable (Class N1) for growing mango and distributed in the major part of the microwatershed. They have severe limitations of rooting depth and nutrient availability.

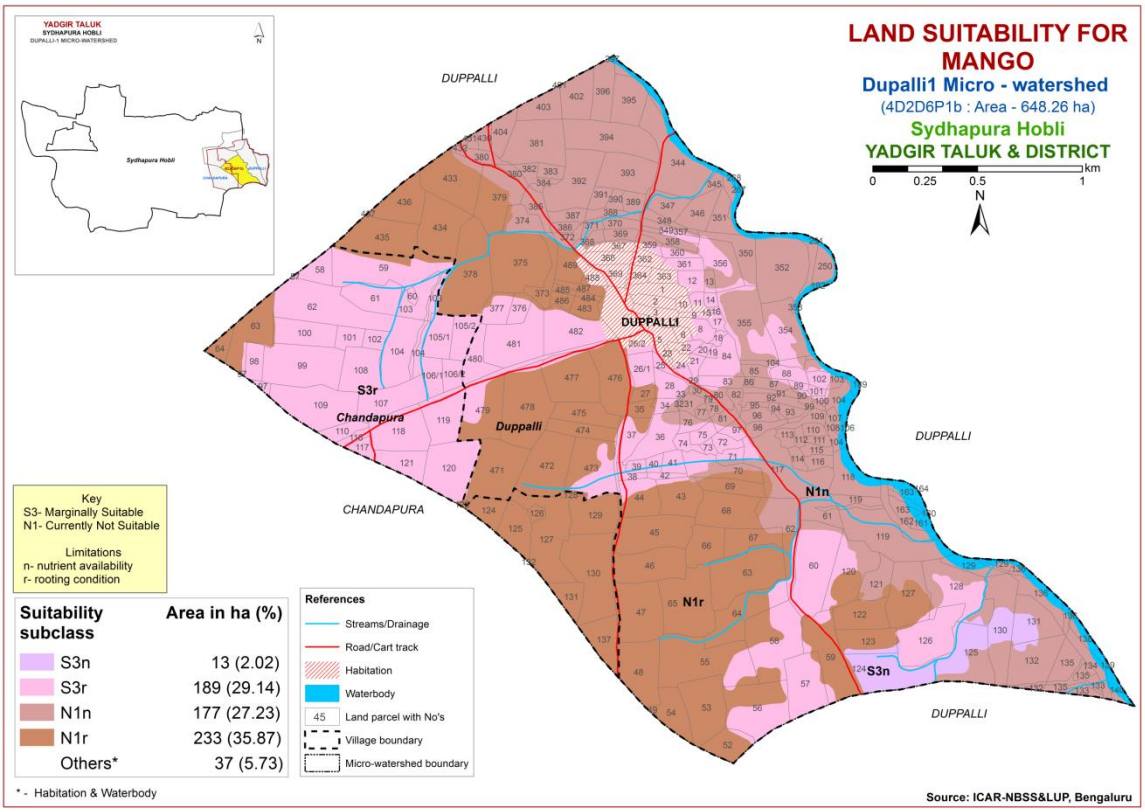


Fig. 7.15 Land Suitability map of Mango

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 189 ha (29%) is moderately suitable (Class S2) for growing guava and occur in the southeastern, northern, eastern, western and central part of the microwatershed. It has minor limitations of gravelliness and rooting depth. Marginally suitable (Class S3) lands for guava are found to occur in an area of about 190 ha (29%) with moderate limitations of rooting depth and nutrient availability and are distributed in the southern, southeastern, northern and western part of the microwatershed. An area of about 233 ha (36%) is currently not suitable (Class N1) for growing guava and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

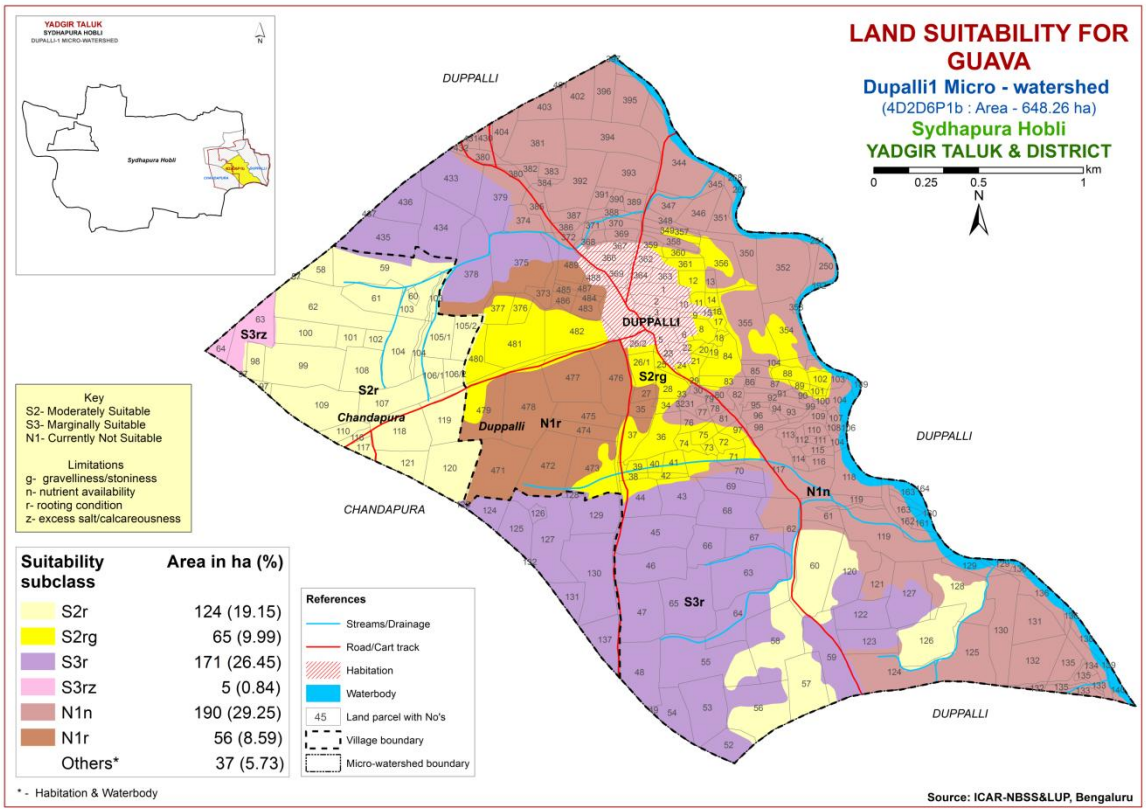


Fig. 7.16 Land Suitability map of Guava

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 189 ha (29%) is moderately suitable (Class S2) for growing sapota and occur in the southeastern, northern, eastern, western and central part of the microwatershed. It has minor limitations of gravelliness and rooting depth. Marginally suitable (Class S3) lands for sapota are found to occur in an area of about 190 ha (29%) with moderate limitations of rooting depth and nutrient availability and are distributed in the southern, southeastern, northern and western part of the microwatershed. An area of about 233 ha (36%) is currently not suitable (Class N1) for growing sapota and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

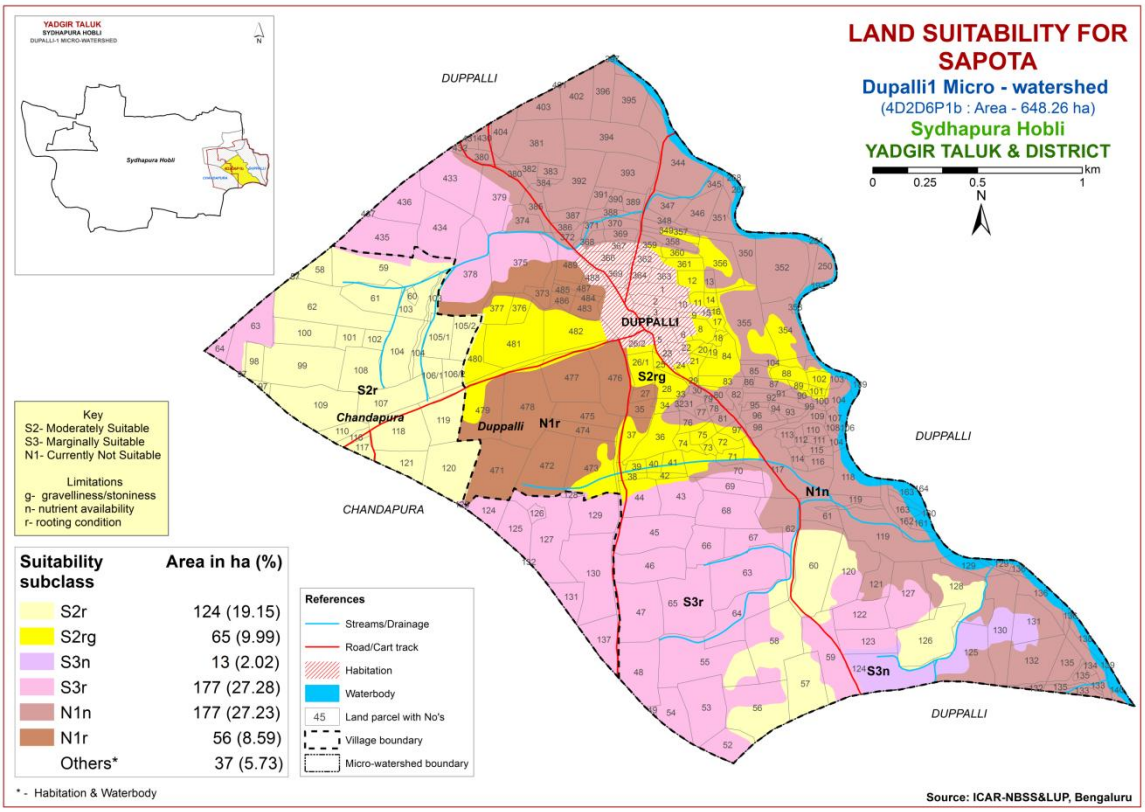


Fig. 7.17 Land Suitability map of Sapota

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.

An area of about 189 ha (29%) is moderately suitable (Class S2) for growing pomegranate and occur in the southeastern, northern, eastern, western and central part of the microwatershed. It has minor limitations of gravelliness and rooting depth. Marginally suitable (Class S3) lands for pomegranate are found to occur in an area of about 190 ha (29%) with moderate limitations of rooting depth and nutrient availability and are distributed in the southern, southeastern, northern and western part of the microwatershed. An area of about 233 ha (36%) is currently not suitable (Class N1) for growing pomegranate and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

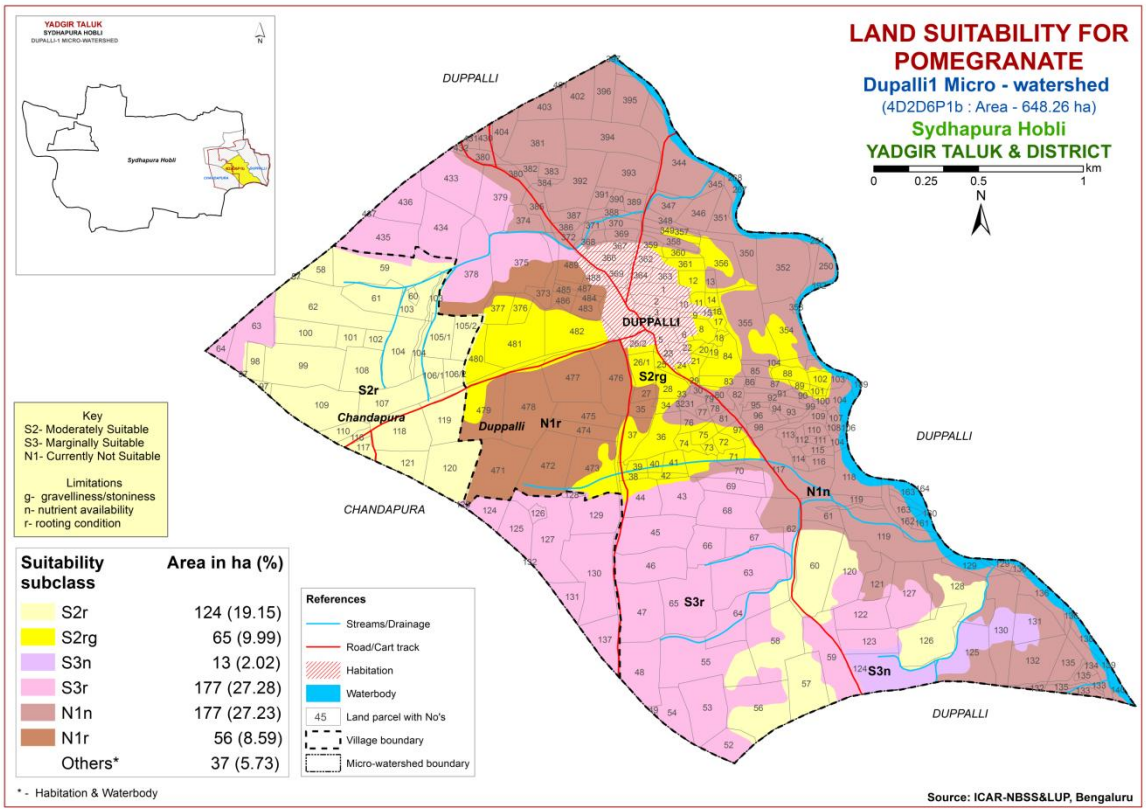


Fig 7.18 Land Suitability map of Pomegranate

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.

An area of about 189 ha (29%) is moderately suitable (Class S2) for growing musambi and occur in the southeastern, northern, eastern, western and central part of the microwatershed. It has minor limitations of gravelliness and rooting depth. Marginally suitable (Class S3) lands for musambi are found to occur in an area of about 190 ha (29%) with moderate limitations of rooting depth and nutrient availability and are distributed in the southern, southeastern, northern and western part of the microwatershed. An area of about 233 ha (36%) is currently not suitable (Class N1) for growing musambi and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

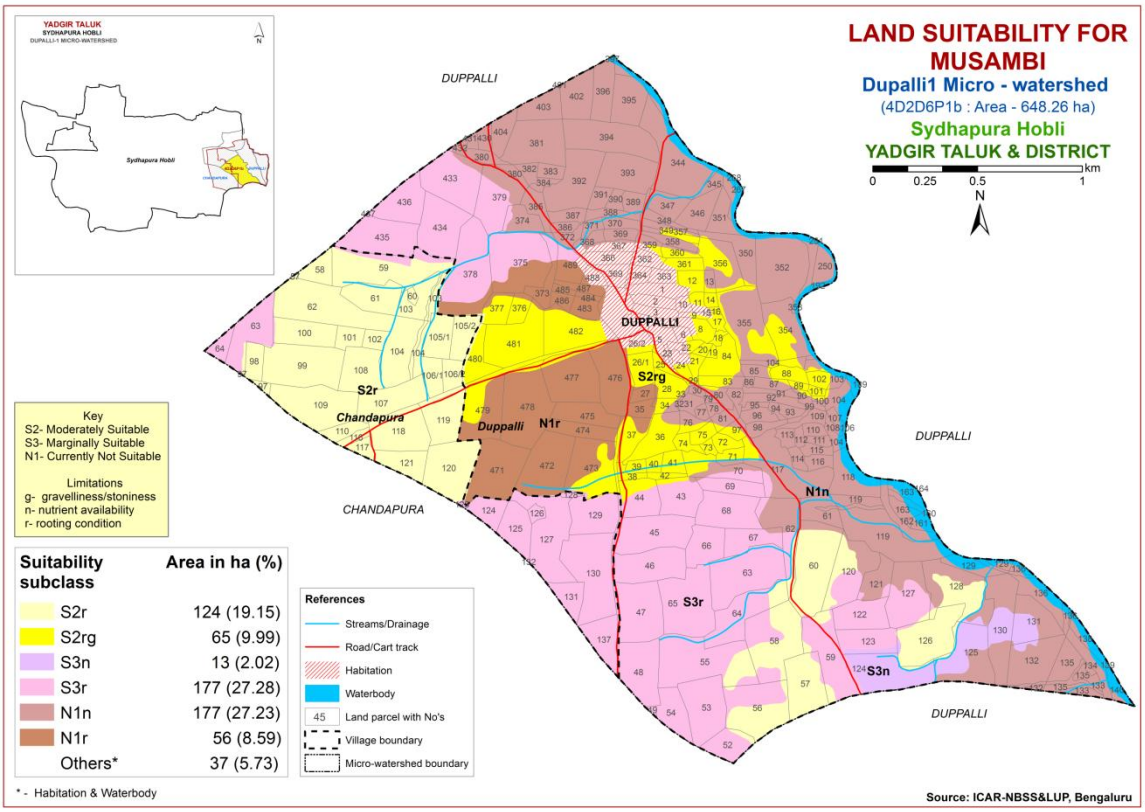


Fig. 7.19 Land Suitability map of Musambi

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.

An area of about 189 ha (29%) is moderately suitable (Class S2) for growing lime and occur in the southeastern, northern, eastern, western and central part of the microwatershed. It has minor limitations of gravelliness and rooting depth. Marginally suitable (Class S3) lands for lime are found to occur in an area of about 190 ha (29%) with moderate limitations of rooting depth and nutrient availability and are distributed in the southern, southeastern, northern and western part of the microwatershed. An area of about 233 ha (36%) is currently not suitable (Class N1) for growing lime and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

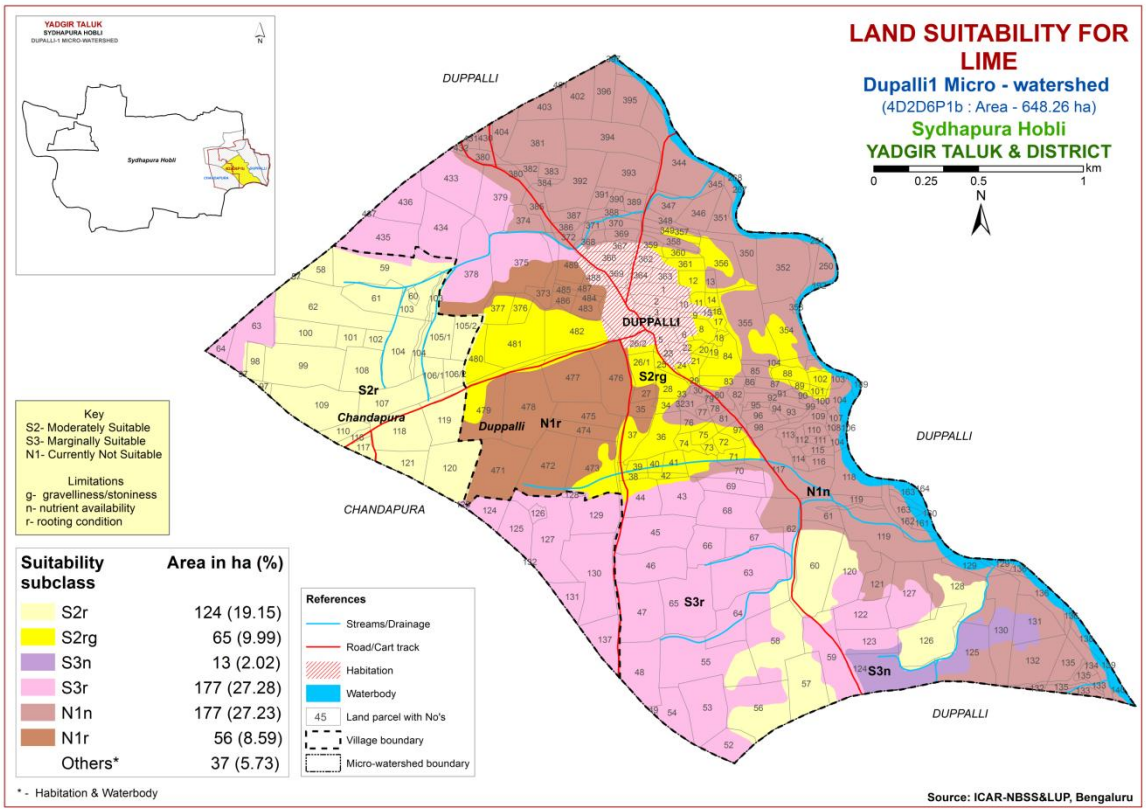


Fig. 7.20 Land Suitability map of Lime

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.

Highly suitable (Class S1) lands for growing amla occur in an area of 124 ha (19%) and are distributed in the southeastern, southern, western and central part of the microwatershed. An area of about 242 ha (37%) is moderately suitable (Class S2) for growing amla and are distributed in the central, northern, southern, western and southeastern part of the microwatershed. They have minor limitations of gravelliness, calcareousness and rooting depth. An area of about 56 ha (9%) is marginally suitable (Class S3) for growing amla and are distributed in the northern and central part of the microwatershed with moderate limitation of rooting depth. An area of about 190 ha (29%) is currently not suitable (Class N1) for growing onion and are distributed in the central, eastern, northern, southeastern part of the microwatershed with severe limitation of nutrient availability.

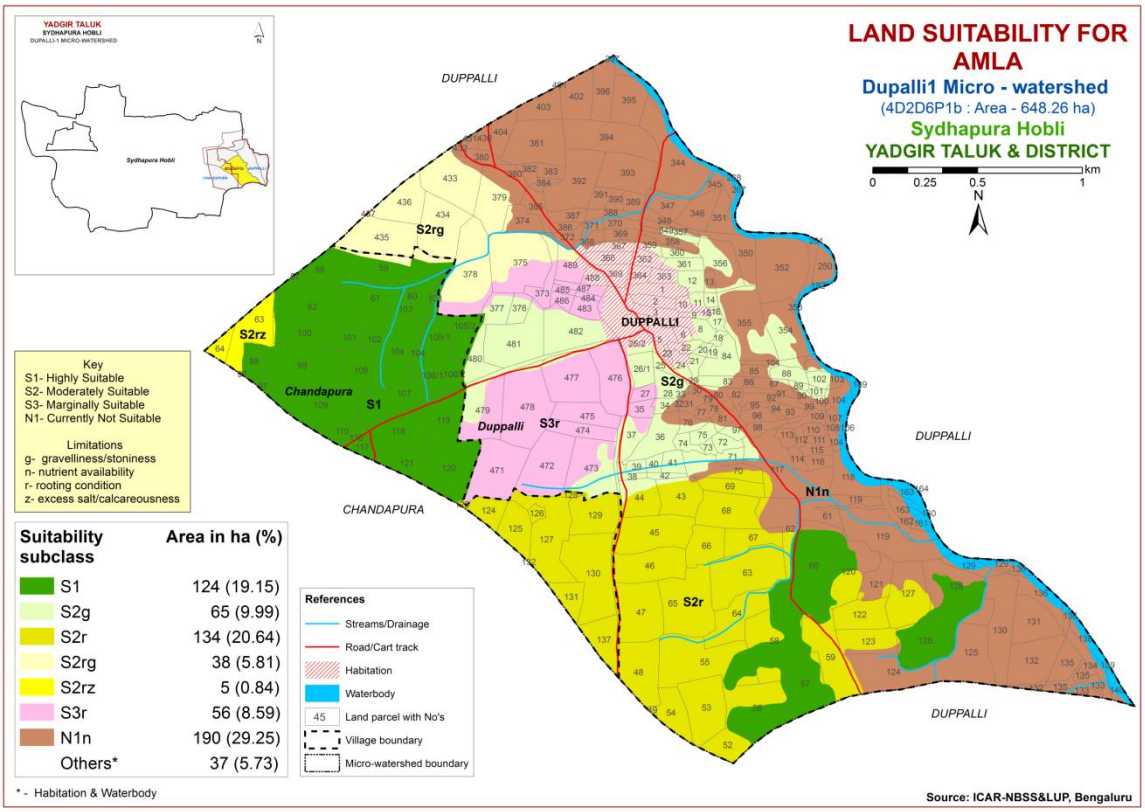


Fig. 7.21 Land Suitability map of Amla

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 61 ha (9%) is moderately suitable (Class S2) for growing cashew and are distributed in the western and southeastern part of the microwatershed. They have minor limitations of nutrient availability and rooting depth. An area of about 299 ha (46%) is marginally suitable (Class S3) for growing cashew and are distributed in the western, northern, southern, central, eastern and central part of the microwatershed with moderate limitations of nutrient availability, rooting depth and gravelliness. An area of about 251 ha (39%) is currently not suitable (Class N1) for growing cashew and are distributed in the northern, eastern, central, western and southeastern part of the microwatershed with severe limitations of rooting depth, nutrient availability and texture.

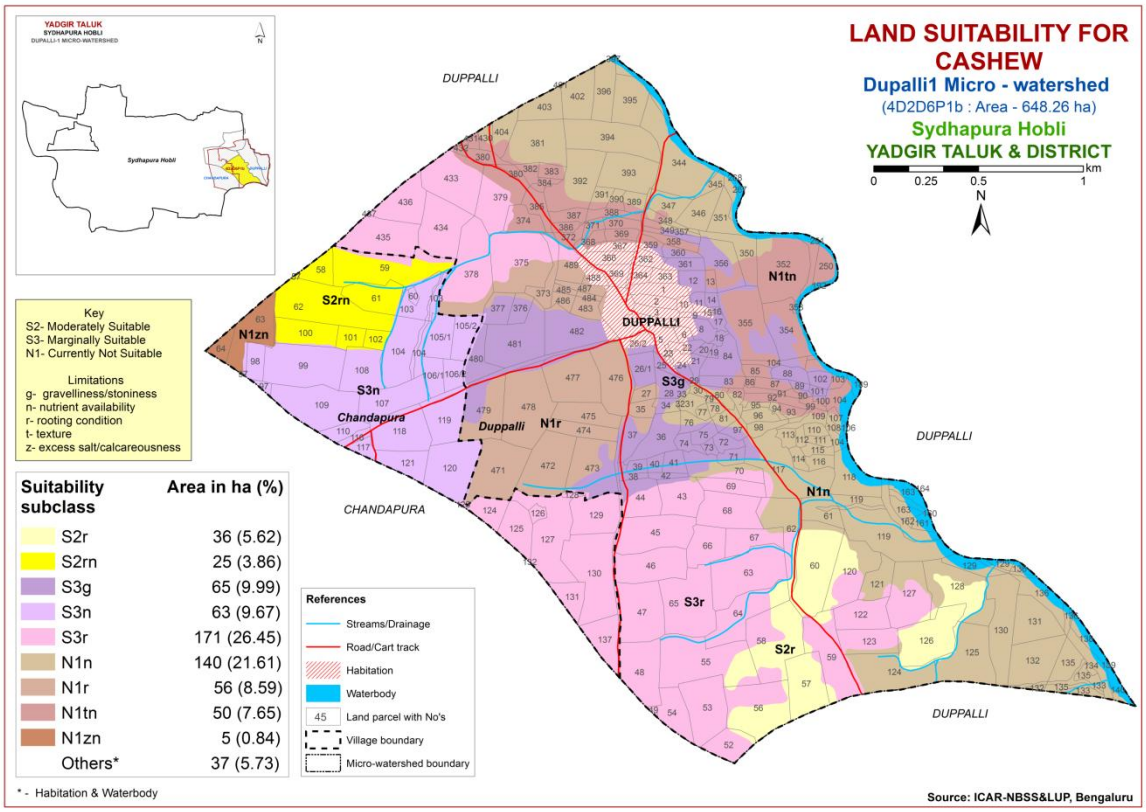


Fig. 7.22 Land Suitability map of Cashew

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 189 ha (29%) is moderately suitable (Class S2) for growing jackfruit and occur in the southeastern, northern, eastern, western and central part of the microwatershed. It has minor limitations of gravelliness and rooting depth. Marginally suitable (Class S3) lands for jackfruit are found to occur in an area of about 176 ha (27%) with moderate limitations of rooting depth and calcareousness and are distributed in the southern, southeastern, northern and western part of the microwatershed. An area of about 246 ha (38%) is currently not suitable (Class N1) for growing jackfruit and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

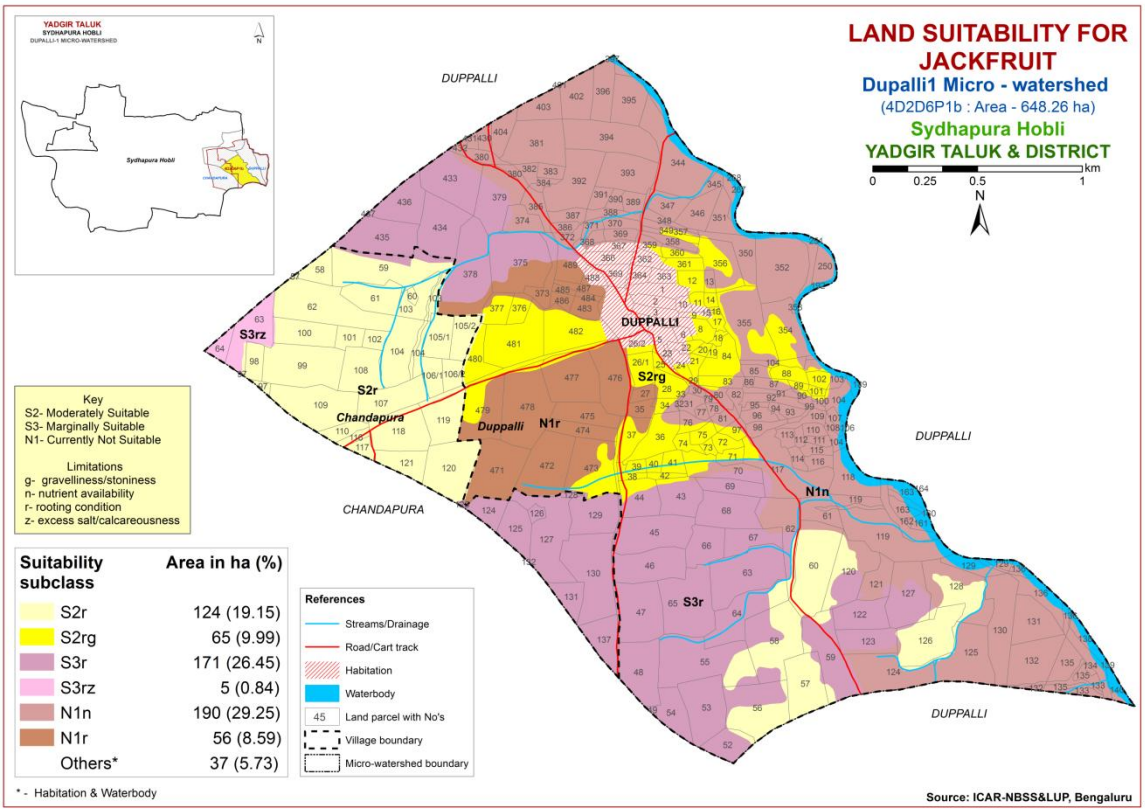


Fig. 7.23 Land Suitability map of Jackfruit

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.

Marginally suitable lands (Class S3) for growing jamun occupy an area of about 365 ha (56%) and occur in the major part of the microwatershed. They have moderate limitations of rooting depth and calcareousness. An area of about 246 ha (38%) is currently not suitable (Class N1) for growing jamun and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

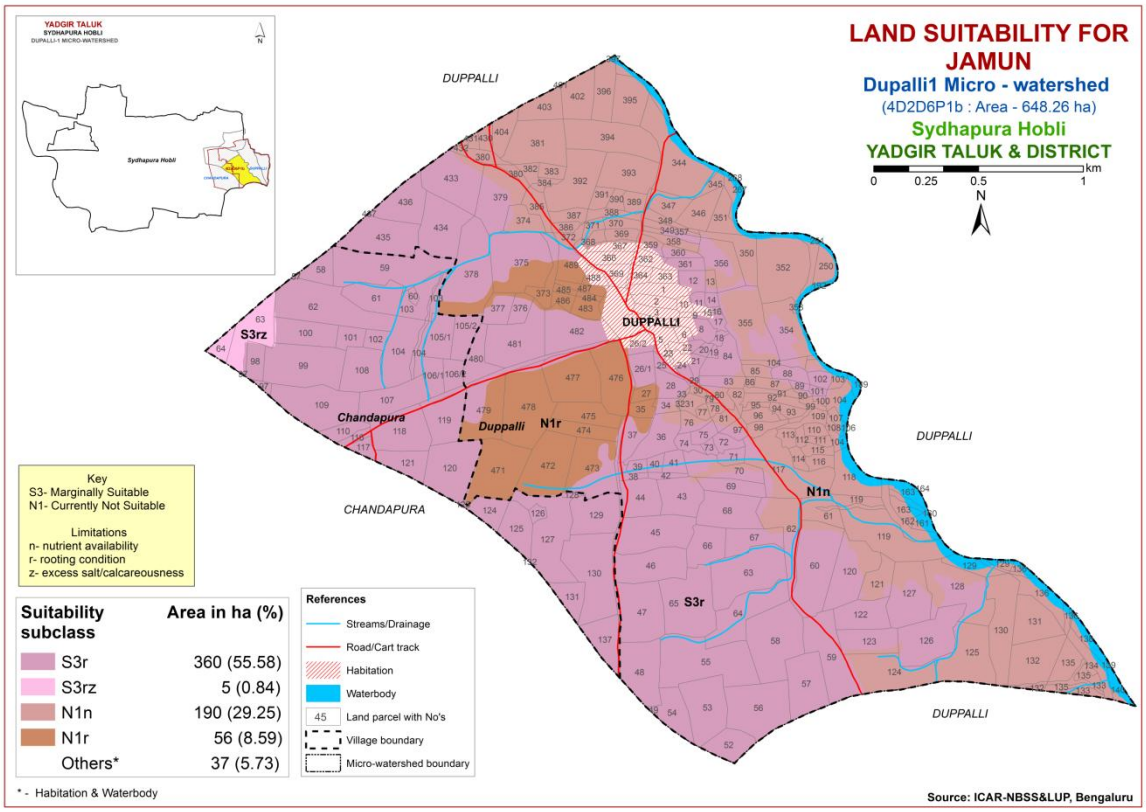


Fig. 7.24 Land Suitability map of Jamun

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.

Highly suitable (Class S1) lands for growing custard apple occur in an area of 61 ha (9%) and are distributed in the southeastern and western part of the microwatershed. An area of about 304 ha (47%) is moderately suitable (Class S2) for growing custard apple and are distributed in the western, southern, central, northern, eastern and southeastern part of the microwatershed. They have minor limitations of gravelliness, calcareousness and rooting depth. An area of about 69 ha (11%) is marginally suitable (Class S3) for growing custard apple and are distributed in the western, eastern, central, northern and southeastern part of the microwatershed with moderate limitations of rooting depth and gravelliness. An area of about 190 ha (29%) is currently not suitable (Class N1) for growing custard apple and are distributed in the central, eastern, northern, southeastern part of the microwatershed with severe limitation of nutrient availability.

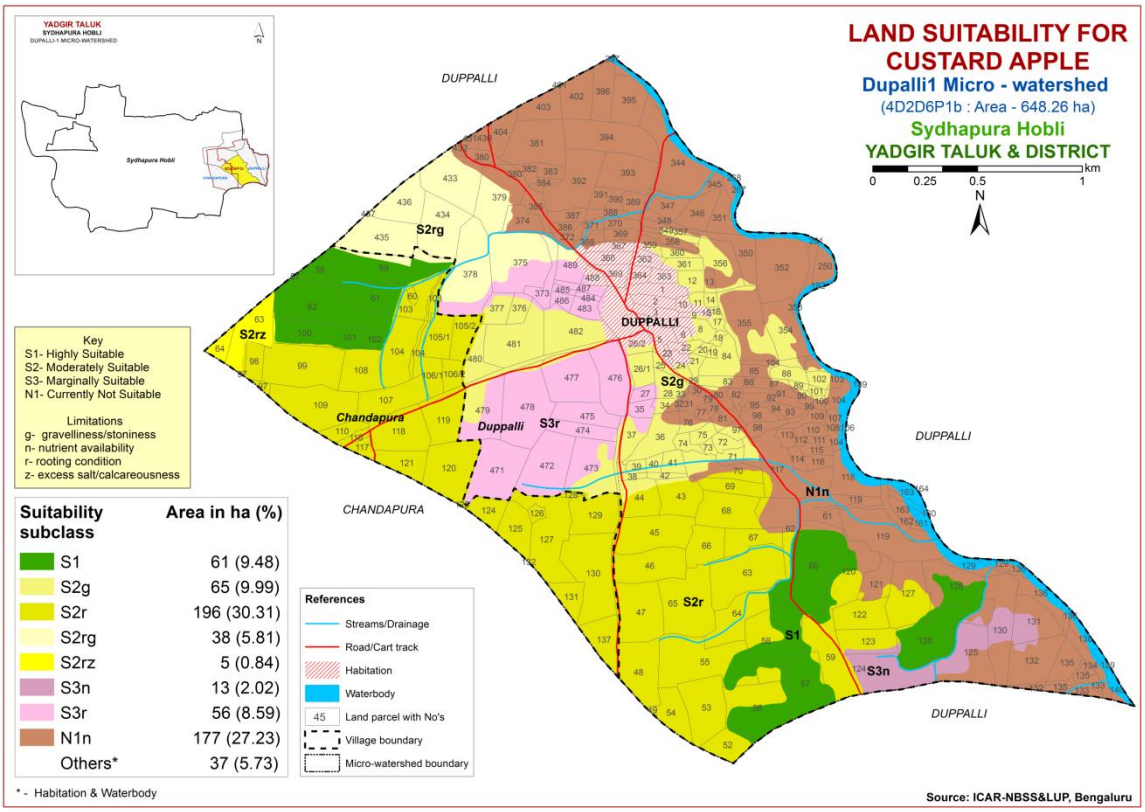


Fig. 7.25 Land Suitability map of Custard Apple

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.

Marginally suitable lands (Class S3) for growing tamarind occupy an area of about 189 ha (29%) and occur in the western, northern, central, eastern and southeastern part of the microwatershed. They have moderate limitations of calcareousness and rooting depth. An area of about 423 ha (65%) is currently not suitable (Class N1) for growing tamarind and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

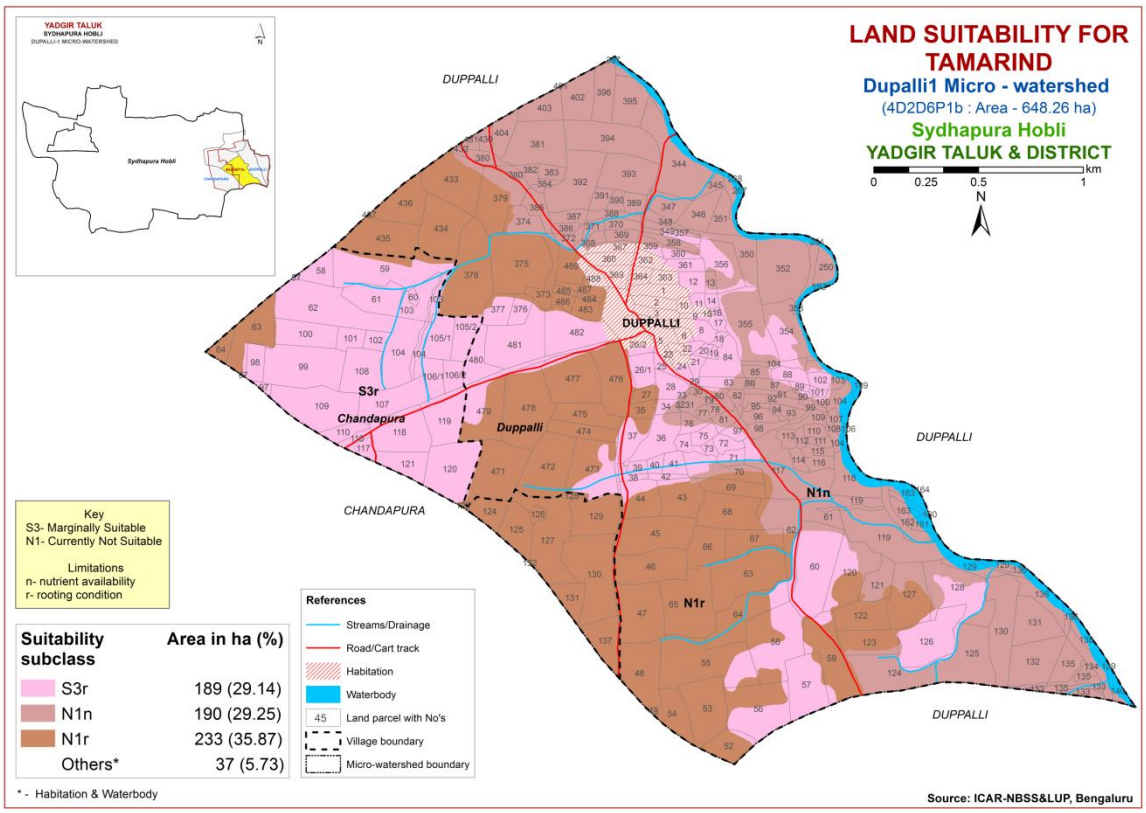


Fig. 7.26 Land Suitability map of Tamarind

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 189 ha (29%) is moderately suitable (Class S2) for growing mulberry and occur in the southeastern, northern, eastern, western and central part of the microwatershed. It has minor limitations of gravelliness and rooting depth. Marginally suitable (Class S3) lands for mulberry are found to occur in an area of about 176 ha (27%) with moderate limitations of rooting depth and calcareousness and are distributed in the southern, southeastern, northern and western part of the microwatershed. An area of about 246 ha (38%) is currently not suitable (Class N1) for growing mulberry and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

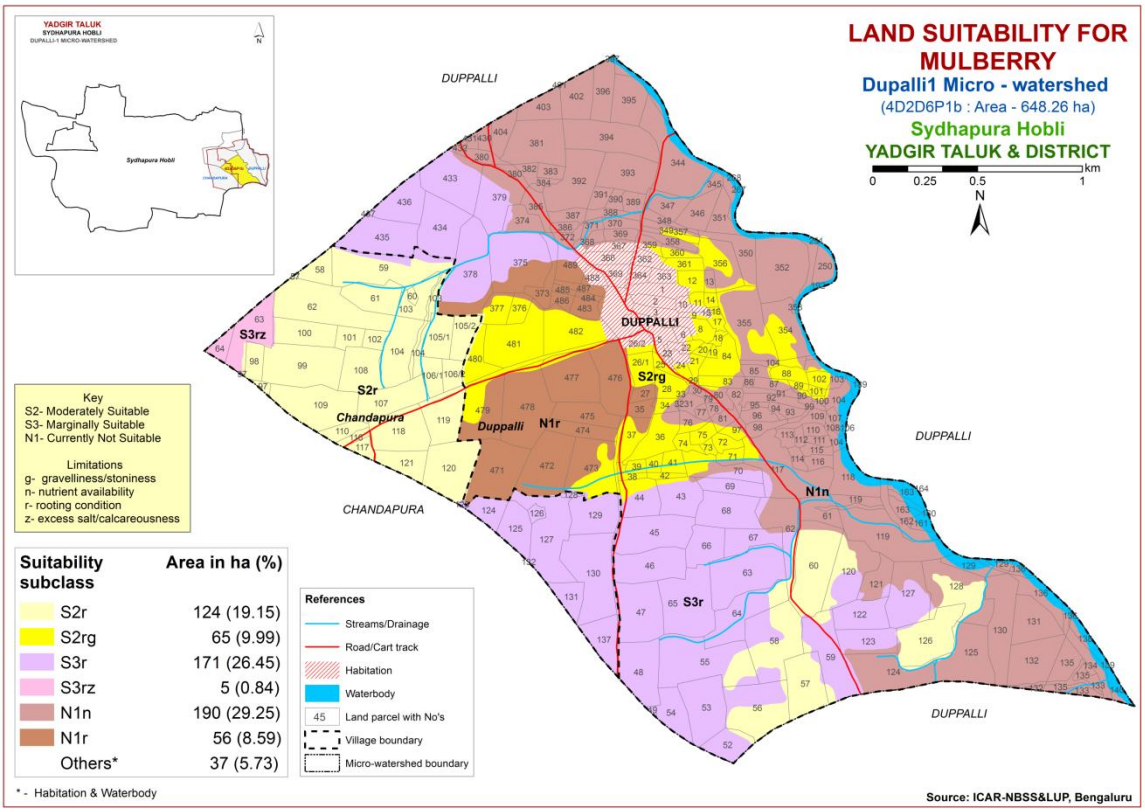


Fig 7.27 Land Suitability map of Mulberry

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.

Highly suitable (Class S1) lands for growing marigold occur in an area of 124 ha (19%) and are distributed in the southeastern, southern and western part of the microwatershed. An area of about 139 ha (21%) is moderately suitable (Class S2) for growing marigold and are distributed in the western, southern and southeastern part of the microwatershed. They have minor limitations of gravelliness, calcareousness and rooting depth. An area of about 158 ha (24%) is marginally suitable (Class S3) for growing marigold and are distributed in the western, eastern, central, northern and southeastern part of the microwatershed with moderate limitations of rooting depth, nutrient availability and gravelliness. An area of about 190 ha (29%) is currently not suitable (Class N1) for growing marigold and are distributed in the central, eastern, northern, southeastern part of the microwatershed with severe limitation of nutrient availability.

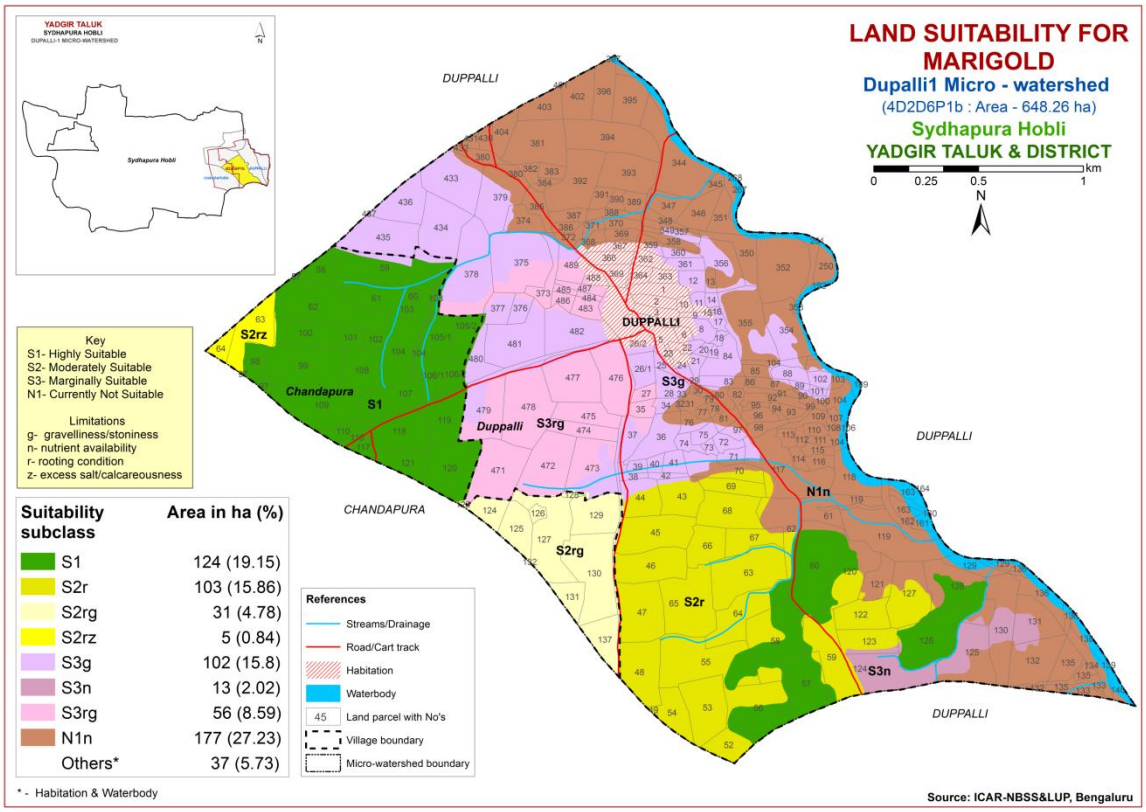


Fig. 7.28 Land Suitability map of Marigold

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.

Highly suitable (Class S1) lands for growing chrysanthemum occur in an area of 124 ha (19%) and are distributed in the southeastern, southern and western part of the microwatershed. An area of about 139 ha (21%) is moderately suitable (Class S2) for growing chrysanthemum and are distributed in the western, southern and southeastern part of the microwatershed. They have minor limitations of gravelliness, calcareousness and rooting depth. An area of about 158 ha (24%) is marginally suitable (Class S3) for growing chrysanthemum and are distributed in the western, eastern, central, northern and southeastern part of the microwatershed with moderate limitations of rooting depth, nutrient availability and gravelliness. An area of about 190 ha (29%) is currently not suitable (Class N1) for growing chrysanthemum and are distributed in the central, eastern, northern, southeastern part of the microwatershed with severe limitation of nutrient availability.

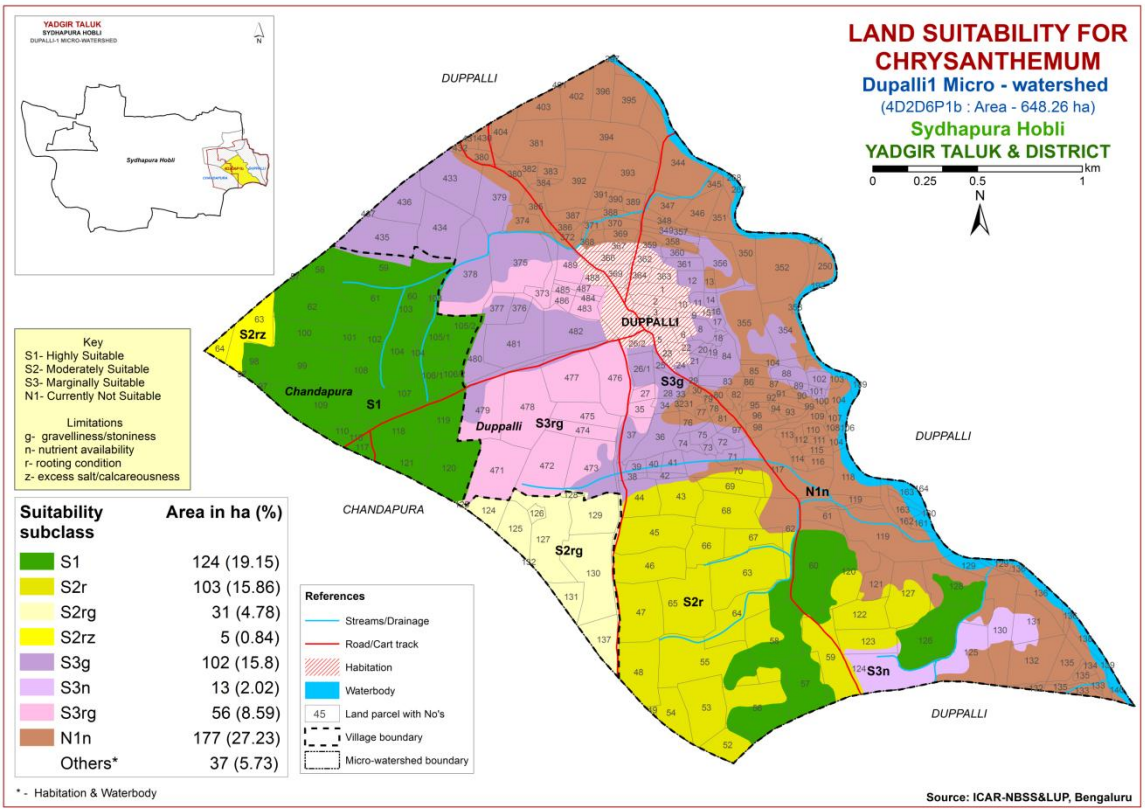


Fig. 7.29 Land Suitability map of Chrysanthemum

Table 7.1 Soil-Site Characteristics of Dupalli-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 (%)								
DSBiB1	866	150	WD	25-50	sc	g c	<15	35-60	<50	1-3	moderate	5.93	0.04	0.14	3.60	73
YLRiB2	866	150	W	50-75	sc	c	-	15-35	51-100	3-5	moderate	6.91	0.069	0.45	6.90	100
YLRcB2g1	866	150	W	50-75	sl	c	15-35	15-35	51-100	3-5	moderate	6.91	0.069	0.45	6.90	100
YLRmB2g2	866	150	W	50-75	sl	c	35-60	15-35	51-100	3-5	moderate	6.91	0.069	0.45	6.90	100
HLGcB2	866	150	WD	50-75	sl	scl	<15	<15	51-100	1-3	moderate	8.49	0.185	0.69	8.80	100
KBDhB2	866	150	WD	75-100	scl	gscl	<15	35-60	<50	1-3	moderate	7.84	0.604	4.27	11.50	100
KBDbB3	866	150	WD	75-100	ls	gscl	<15	35-60	<50	1-3	severe	7.84	0.604	4.27	11.50	100
GWDmB2	866	150	MW	75-100	c	scl	<15	<15	101-150	1-3	moderate	9.89	0.74	17.40	8.35	100
HSLhB2	866	150	MW	75-100	scl	sc	<15	<15	101-150	1-3	moderate	7.16	0.117	5.94	4.90	97
PGPcB2	866	150	WD	75-100	sl	sc	<15	<15	51-100	1-3	moderate	6.83	0.210	2.83	3.15	100
BLCiB2	866	150	WD	75-100	sc	scl	<15	<15	51-100	1-3	moderate	6.75	0.19	1.31	16.80	95
ANRiB2	866	150	MW	100-150	sc	sc	<15	<15	>200	1-3	moderate	10.17	0.365	7.08	19.90	100
MDGiB2	866	150	WD	100-150	sc	scl	<15	<15	>200	1-3	moderate	8.2	0.399	3.08	4.90	100
VKSiB2	866	150	WD	100-150	sc	scl	<15	<15	>200	1-3	moderate	9.1	0.586	3.97	17.57	100
VKSmB1	866	150	WD	100-150	c	scl	<15	<15	>200	0-1	slight	9.1	0.586	3.97	17.57	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 Dupalli-1 microwatershed have been grouped into 8 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 8 Land Management Units along with brief description of soil and site characteristics are given below.

LMU	Soil map units	Soil and site characteristics
1	55.ANRiB2 117.VKSiB2 100.VKSmB1 127.GWDmB2	Moderately deep to deep (75-150 cm), sodic soils, 1-3% slopes, non gravelly (<15%), slight to moderate erosion.
2	58.MDGiB2	Deep (100 to 150 cm), sandy clay loam soils, strongly alkaline, 0-3 % slopes, non-gravelly (<15%), moderate erosion.
3	38.BLCiB2 40.PGPcB2	Moderately deep (75-100 cm), red sandy clay soils, 1-3% slopes, non gravelly (<15%), moderate erosion.
4	126.HSLhB2	Moderately deep (75-100 cm), black clay soils, 1-3% slopes, non gravelly (<15%), moderate erosion.
5	39.KBDbB3 130.KBDhB2	Moderately deep (75-100 cm), red gravelly sandy clay loam soils, 1-3% slopes, non gravelly (<15%), moderate to severe erosion.
6	29.YLRcB2g1 31.YLRiB2 147.YLRmB2g2	Moderately shallow (50-75 cm), red clay soils, 1-3% slopes, non-gravelly to gravelly (<15-60%), moderate erosion.
7	16.HLGcB2	Moderately shallow (50-75 cm), calcareous sandy clay loam soils, 1-3% slopes, non-gravelly (<15%), moderate erosion.
8	108.DSBiB2	Shallow (25 to 50 cm), clay soils, 1-3% slopes, non-gravelly (<15%), moderate erosion.

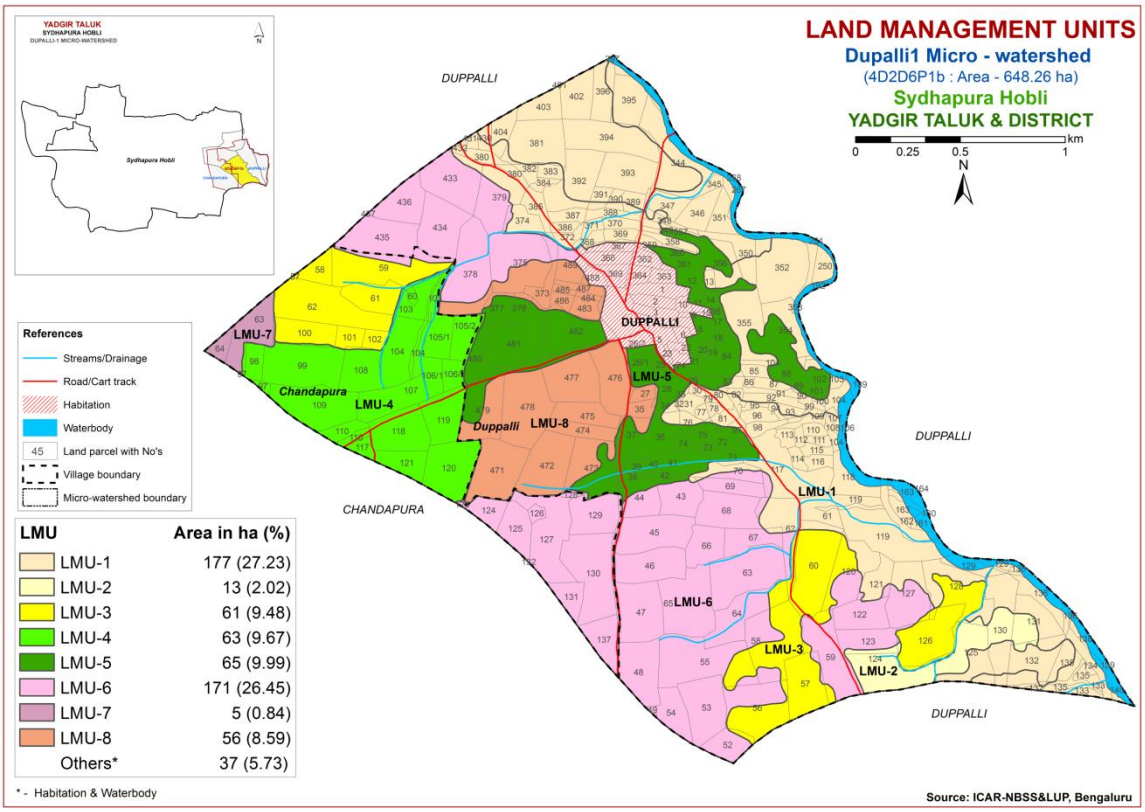


Fig. 7.30 Land Management Units Map- Dupalli-1 Microwatershed

7.31 Proposed Crop Plan for Dupalli-1 Microwatershed

After assessing the land suitability for the 29 crops, the Proposed Crop Plan has been prepared for the 8 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 Dupalli-1 Microwatershed

LMU	Soil Map Units	Survey Number	Field Crops/ Commercial crops	Horticulture Crops (Rainfed/Irrigated)	Suitable Interventions
1	55.ANRiB2 117.VKSiB2 100.VKSmB1 127.GWDmB2 (Moderately deep to deep, sodic soils)	**Duppalli:**13,30,31,32,33,61,62,77, 78,79,80,81,82,85,86,87,90,91,92,93,94,95,96,98,99,100,103,104,107,108,109,110,111,112,113,114,115,116,117,118,119,121,129,130,131,132,133,134,135,136,162,250,344,345, 346,347,348,349,350,351,352,354,355,358,359,368,370,371,372,374,380,381,382,383,384,385,386,387,388,389,390,391,392,393,394,395,396, 401,402,403,404,430, 431,432	-	**Agri-Silvi-Pasture:** Ber, Aonla, Acacia sp, Dhaincha, Rhodes grass, Para grass, Bermuda grass	Application of gypsum, iron pyrites and elemental sulphur. Addition of farm yard manure, green manure and providing subsurface drainage
2	58.MDGiB2 (Deep, sandy clay loam and strongly alkaline soils)	**Duppalli :** 124,125	Sorghum, Maize, Bajra	**Agri-Silvi-Pasture:** Ber, Aonla, Acacia sp, Dhaincha, Rhodes grass, Para grass, Bermuda grass	Application of FYM, Biofertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices
3	38.BLCiB2 40.PGPcB2 (Moderately deep red sandy clay soils)	**Chandapura:**57,58,59,61,62,100,101,102 **Duppalli:** 56,57,58,60,126,128	Sunflower, Sorghum, Maize, Groundnut, Red gram, Bajra	**Fruit crops:** Mango, Musambi, Sapota, Amla, Tamarind, Pomegranate, Custard apple, Guava, Jackfruit, Jamun, Lime **Vegetables:** Tomato, Onion**,** Bhendi, Chilli, Brinjal, Drumstick, Coriander **Flowers:** Marigold, Chrysanthemum	Application of FYM, Biofertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices
4	126.HSLhB2	**Chandapura:**60,97,98,99,103,104,	Maize, Sorghum,	**Fruit crops: Lime,**	Application of FYM,

LMU	Soil Map Units	Survey Number	Field Crops/ Commercial crops	Horticulture Crops (Rainfed/Irrigated)	Suitable Interventions
	(Moderately deep, black clay soils)	105/1,105/2,106/1,106/2,107,108,109,110,116,117,118,119, 120,121	Sunflower, Cotton, Red gram, Bengalgram, Bajra	Musambi, Custard apple, Pomegranate **Vegetables:** Chilli, Bhendi **Flowers:** Marigold, Chrysanthemum	Biofertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices
5	39.KBDbB3 130.KBDhB2 (Moderately deep, red gravelly sandy clay loam soils)	**Duppalli:**8,11,12,14,15,16,17,18,19,20,21,24,25,26/1,28,29,34,36,37, 38,39,40,41,42,71,72,73,74,75,76,83,84,88,89,97,356,357,360,361,376, 377, 473,480,481,482	Groundnut, Bajra, Horse gram, Castor, Mulberry	**Fruit crops:** Musambi, Lime, Jamun, Jackfruit, Amla, Custard apple, Tamarind **Vegetable crops**: Drumstick, Curry leaves	Drip irrigation, mulching, suitable soil and water conservation practises (Crescent Bunding with Catch Pit etc)
6	29.YLRcB2g1 31.YLRiB2 147.YLRmB2g2 (Moderately shallow, red clay soils)	**Chandapura:**123,124,125,126,127,128,129, 130,131,132,137 **Duppalli:**43,44,45,46,47,48,49,52, 53,54,55,59,63,64,65,66,67,68,69,70,120,122,123,127,375,378,379,433,434,435,436, 437	Maize, Sorghum, Cotton, Bajra	**Fruit crops:** Amla, Custard apple **Vegetables**: Tomato, Onion, Bhendi, Chilli, Brinjal **Flowers**: Marigold, Chrysanthemum	Drip irrigation, mulching, suitable soil and water conservation practices (Crescent Bunding with Catch Pit etc)
7	16.HLGcB2 (Moderately shallow, calcareous sandy clay loam soils)	**Chandapura :** 63,64	Maize, Sorghum Groundnut, Bajra	**Fruit crops:** Amla, Custard apple **Vegetables:** Tomato, Chilli, Brinjal, Bhendi, Onion **Flowers**: Marigold, Chrysanthemum	Application of FYM, Biofertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices
8	108.DSBiB2 (Shallow, gravelly clay soils)	**Duppalli:**27,35,373,471,472,474,475,476,477,478,479,483,484,485,486,487,489	-	**Agri-Silvi-Pasture:** Hybrid Napier, *Styloxanthes hamata, Styloxanthes scabra*	Use of short duration varieties, sowing across the slope, drip irrigation is recommended

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 Dupalli-1 Microwatershed

- The soil phases identified in the microwatershed belonged to the soil series of YLR series occupies maximum area of 122 ha (26%) followed by VKS 120 ha (18%), KBD 65 ha (10%), HSL 63 ha (10%), DSB 56 ha (9%), ANR 50 ha (8%), PGP 36 ha (6%), BLC 25 ha (4%), MDG 13 ha (2%), GWD 7 ha (1%) and HLG 5 ha (<1%).
- As per land capability classification, entire area of the microwatershed falls under arable land category (Class II, III & IV). The major limitations identified in the arable lands were soil erosion and soil limitation.
- On the basis of soil reaction, an area of 10 per cent is slightly acid (pH 6.0-6.5). An area of about 7 per cent is moderately acid (pH 5.5-6.0). An area of about 19 per cent

is neutral (pH 6.5-7.3). An area of about 24 per cent is slightly alkaline (pH 7.3-7.8). An area of about 18 per cent is moderately alkaline (pH 7.8-8.4). An area of 8 per cent is strongly alkaline (pH 8.4-9.0) and 9 per cent area is very strongly alkaline (pH >9.0) in the microwatershed.

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

Acid soils occur in 111 ha area in the microwatershed.

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

Alkaline soils occur in 379 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, 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

Neutral soils cover in 121 ha area of 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 648 ha area in the microwatershed, an area of about 34 ha is suffering from slight erosion, 538 ha is suffering from moderate erosion and 39 ha is suffering from severe erosion. The areas which are under moderate to severe erosion 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 Dupalli-1 microwatershed.
- **Organic Carbon:** The OC content (an index of available Nitrogen) is high (>0.75%) in an area of 164 ha (25%). Medium (0.5-0.75%) in an area of 282 ha (44%) and low (<0.5%) in an area of 165 ha (25%) of the microwatershed. The areas that are medium and low 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 an area where OC is low and medium (<0.5-0.75%). 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 an area of 318 ha (49%). High (>57 kg/ha) in an area of 2 ha (<1%) and low (<23 kg/ha) in 290 ha (45%) area of the microwatershed. For all the crops, 25% additional P needs to be applied where available P is medium and low.
- **Available Potassium:** Available potassium is high (>337 kg/ha) in an area of about 236 ha (36%) and medium (145-337 kg/ha) in an area of 376 ha (58%) of the microwatershed. All the plots, where available potassium is medium, for all the crops, additional 25 % potassium may be applied.
- **Available Sulphur:** Available sulphur is a very critical nutrient for oilseed crops. Entire area is low (<10 ppm) in available sulphur content in the microwatershed. Low 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 358 ha (55%) is low (<0.5 ppm). An area of 211 ha (32%) is medium (0.5-1.0 ppm) and 43 ha (7%) is high (>1.0 ppm) 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.

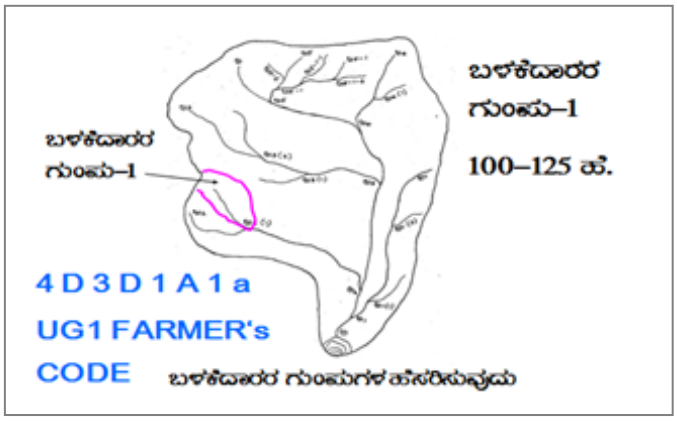
- **Available Iron:** Entire area is sufficient (>4.5 ppm) in available iron content of the microwatershed. For the deficient areas, iron sulphate @ 25 kg/ha need to be applied for 2-3 years.
- **Available Manganese and Copper** are sufficient in the entire cultivated area of the microwatershed.
- **Available Zinc:** Entire area is deficient (<0.6 ppm) in available zinc content of the microwatershed. Application of zinc sulphate @25 kg/ha is recommended for the deficient areas.
- **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 Dupalli-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

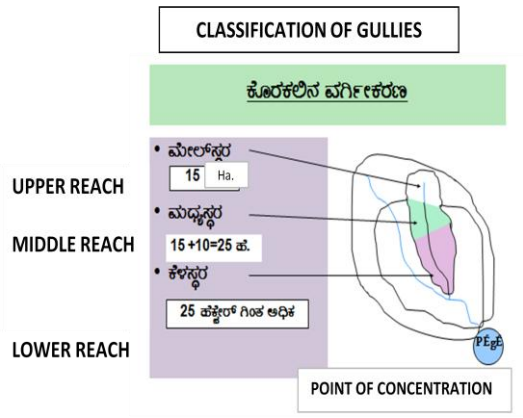
The treatment plan recommended for arable lands is briefly described below

9.1.1 Arable Land Treatment

A. BUNDING

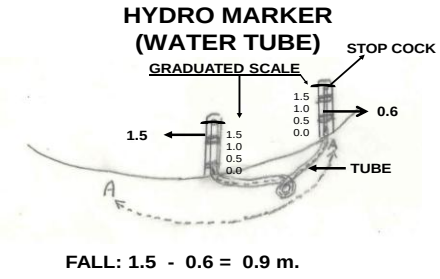
Steps for Survey and Preparation of Treatment Plan	
• Cadastral map (1:7920 scale) is enlarged to a scale of 1:2500 scale • Existing network of waterways, pothissa boundaries, grass belts, natural drainage lines/ watercourse, cut ups/ terraces are marked on the cadastral map to the scale • Drainage lines 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.

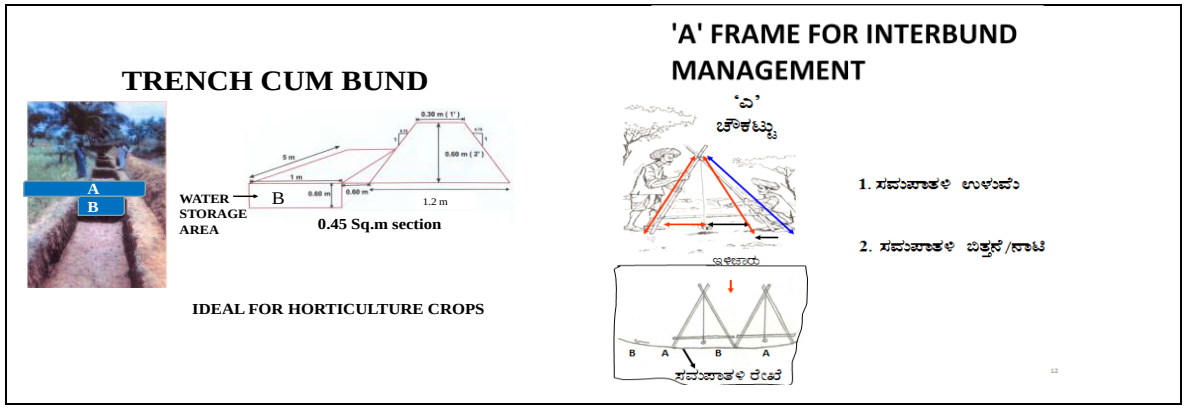
Recommended Bund Section

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 258 ha (40%) needs Graded Bunding and 353 ha (55%) needs Trench cum Bunding.

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.

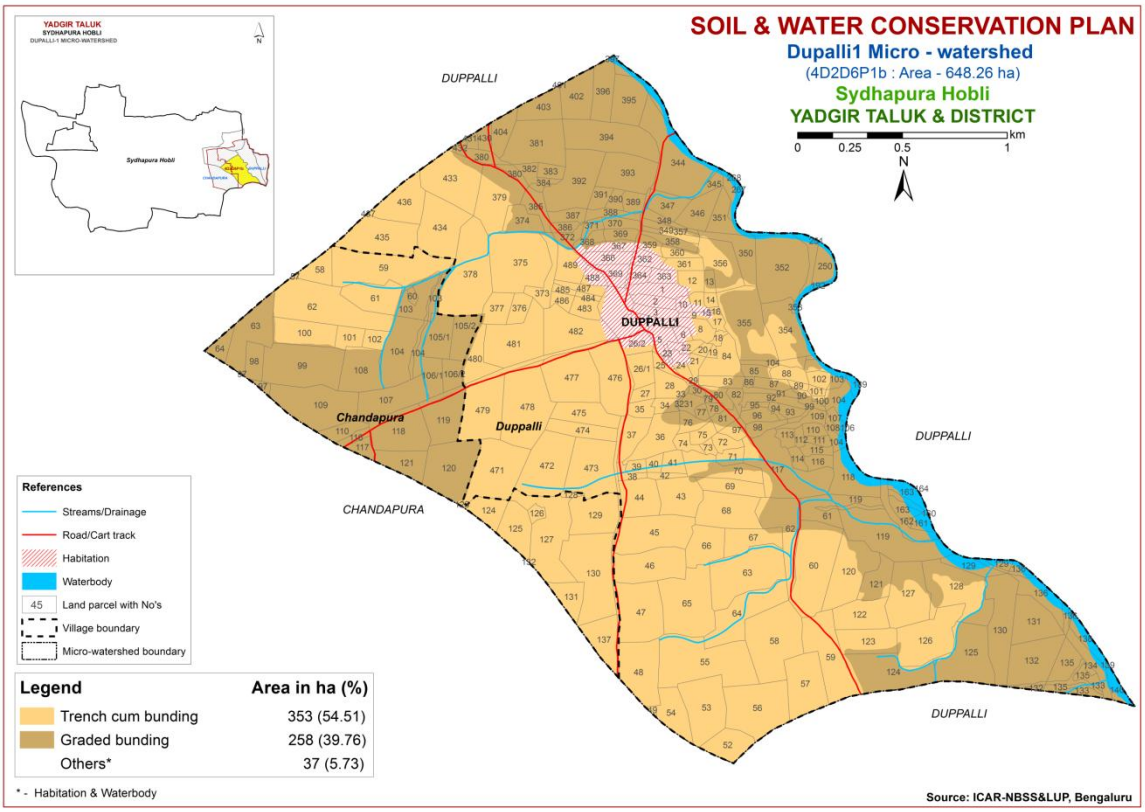


Fig. 9.1 Soil and Water Conservation Plan map of Dupalli-1 Microwatershed

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

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

DUPALLI-1 (4D2D6P1b) MICROWATERSHED

Yadgir Taluk & 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

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 for Dupalli-1 microwatershed in 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
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PART-A

LAND RESOURCE INVENTORY

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EXECUTIVE SUMMARY

The land resource inventory of Dupalli-1Microwatershed 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 648 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 612 ha in the microwatershed is covered by soils and 37 ha by others (habitation and water bodies). The salient findings from the land resource inventory are summarized briefly below.

- *The soils belong to 11 soil series and 15 soil phases (management units) and 8 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.*
- *About 612 ha area in the microwatershed is suitable for agriculture.*
- *About 28 per cent area of the microwatershed has soils that are deep (100 -150 cm), 30 per cent area is moderately deep (75-100 com), 27 per cent area is moderately shallow (50-75 com) and 9 per cent soils are shallow (25-50 cm).*
- *About 6 per cent area in the microwatershed has sandy soils, 25 per cent loamy soils and 63 per cent clayey soils.*
- *Non gravelly (<15%) soils occur in 84 per cent area and gravelly (15-60%) soils occur in 11 per cent area of the microwatershed.*
- *About 28 per cent area of the microwatershed is very high (>200 mm/m) in available water capacity, 11 per cent area medium (101-150 mm/m), 37 per cent area low (51-100 mm/m) and 19 per cent area very low (<50 mm/m) in available water capacity.*
- *Entire area is very gently sloping (1-3% slope) lands in the microwatershed.*

- *An area of about 5 per cent is slightly eroded (e1), 83 per cent area is moderately (e2) eroded and 6 per cent area is severely (e3) eroded.*
- *An area of about 10 per cent is slightly acid (pH 6.0-6.5), 7 per cent is moderately acid (pH 5.5-6.0), 19 per cent is neutral (pH 6.5-7.3), 24 per cent is slightly alkaline (pH 7.3-7.8), 18 per cent moderately alkaline (pH 7.8-8.4), 8 per cent is strongly alkaline (pH 8.4-9.0) and 9 per cent is very strongly alkaline (pH >9.0) in soil reaction.*
- *The Electrical Conductivity of the soils is low (2-4 dS m^{-1}) in an area of 7 per cent and 87 per cent area is <2 dS m^{-1} and as such the soils are non-saline*
- *About 25 per cent area of the microwatershed is high (>0.75%) in organic carbon content, low (<0.5%) in 25 per cent area and medium (0.5-0.75%) in 44 per cent area of the microwatershed.*
- *About 49 per cent area is medium (23-57 kg/ha), <1 per cent area is high (>57 kg/ha) and 45 per cent area is low (<23 kg/ha) in available phosphorus.*
- *An area 36 per cent is high (>337 kg/ha) and 58 per cent is medium (145-337 kg/ha) in available potassium in the microwatershed.*
- *Available sulphur is low (<10 ppm) in the entire area of the microwatershed.*
- *Available boron is low (<0.5 ppm) in 55 per cent, high (>1.0 ppm) in 7 per cent area and medium (0.5-1.0 ppm) in 32 per cent area of the microwatershed.*
- *Available iron is sufficient (>4.5 ppm) in the entire area of the microwatershed.*
- *Available manganese and copper are sufficient in the entire cultivated area of the microwatershed.*
- *Available zinc is deficient (<0.6 ppm) in the 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	*99(15)*	*280(43)*		*Guava*	-	*189(29)*
Maize	*124(19)*	*255(39)*		*Sapota*	-	*189(29)*
Bajra	*124(19)*	*255(39)*		*Pomegranate*	-	*189(29)*
Groundnut	*25(4)*	*169(26)*		*Musambi*	-	*189(29)*
Sunflower	-	*189(29)*		*Lime*	-	*189(29)*
Redgram	-	*202(31)*		*Amla*	*124(19)*	*244(37)*
Bengal gram	-	-		*Cashew*	-	*61(9)*
Cotton	-	*271(42)*		*Jackfruit*	-	*189(29)*
Chilli	*124(19)*	*139(21)*		*Jamun*	-	-
Tomato	*124(19)*	*139(21)*		*Custard apple*	*61(9)*	*304(47)*
Brinjal	*124(19)*	*139(21)*		*Tamarind*	-	-
Onion	*124(19)*	*139(21)*		*Mulberry*	-	*189(29)*
Bhendi	*124(19)*	*139(21)*		*Marigold*	*124(19)*	*139(21)*
Drumstick	-	*189(29)*		*Chrysanthemum*	*124(19)*	*139(21)*
Mango	-	-				

- *Apart from the individual crop suitability, a proposed crop plan has been prepared for the identified LMUs 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 for 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.*

Appendix I

Dupalli -1 (6P1b) Microwatershed

Soil Phase Information

Village	Survey NO	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Chandapura	57	BLCiB2	LMU-3	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	Trench cum bunding
Chandapura	58	BLCiB2	LMU-3	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	Trench cum bunding
Chandapura	59	BLCiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Grass land (Gl)	Not Available	IIes	Trench cum bunding
Chandapura	60	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Grass land (Gl)	Not Available	IIes	Graded bunding
Chandapura	61	BLCiB2	LMU-3	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	Trench cum bunding
Chandapura	62	BLCiB2	LMU-3	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	Trench cum bunding
Chandapura	63	HLGcB2	LMU-7	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Chandapura	64	HLGcB2	LMU-7	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Chandapura	97	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IIes	Graded bunding
Chandapura	98	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Chandapura	99	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Grass land (Gl)	Not Available	IIes	Graded bunding
Chandapura	100	BLCiB2	LMU-3	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	Trench cum bunding
Chandapura	101	BLCiB2	LMU-3	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	Trench cum bunding
Chandapura	102	BLCiB2	LMU-3	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	Trench cum bunding
Chandapura	103	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Grass land (Gl)	Not Available	IIes	Graded bunding
Chandapura	104	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Chandapura	105/1	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Chandapura	105/2	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Chandapura	106/1	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	1 Bore well	IIes	Graded bunding
Chandapura	106/2	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Chandapura	107	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Chandapura	108	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding

Village	Survey NO	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Chandapura	109	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Chandapura	110	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IIes	Graded bunding
Chandapura	116	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IIes	Graded bunding
Chandapura	117	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	1 Bore well	IIes	Graded bunding
Chandapura	118	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IIes	Graded bunding
Chandapura	119	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IIes	Graded bunding
Chandapura	120	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Chandapura	121	HSLhB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Chandapura	123	YLRcB2g1	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Chandapura	124	YLRcB2g1	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IIes	Trench cum bunding
Chandapura	125	YLRcB2g1	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Chandapura	126	YLRcB2g1	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Chandapura	127	YLRcB2g1	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Chandapura	128	YLRcB2g1	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Trench cum bunding
Chandapura	129	YLRcB2g1	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Trench cum bunding
Chandapura	130	YLRcB2g1	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IIes	Trench cum bunding
Chandapura	131	YLRcB2g1	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Trench cum bunding
Chandapura	132	YLRcB2g1	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Chandapura	137	YLRcB2g1	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Duppalli	1	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Duppalli	2	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Duppalli	3	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Duppalli	4	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Duppalli	5	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others

Village	Survey NO	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Duppalli	6	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Duppalli	7	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Duppalli	8	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	9	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Duppalli	10	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Duppalli	11	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	12	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	13	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	14	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	15	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	16	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	17	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	18	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	19	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	20	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	21	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Not Available (NA)	Not Available	IIIes	Trench cum bunding
Duppalli	22	Habitation	Others	Others	Others	Others	Others	Others	Others	Scrub land (Sl)	Not Available	Others	Others
Duppalli	23	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Duppalli	24	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Habitation	Not Available	IIIes	Trench cum bunding
Duppalli	25	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Not Available (NA)	Not Available	IIIes	Trench cum bunding
Duppalli	26/1	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	26/2	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Duppalli	27	DSBiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrubland+Redgram (Sl+Rg)	Not Available	IIIes	Trench cum bunding

Village	Survey NO	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Duppalli	28	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrubland+Redgram (Sl+Rg)	Not Available	IIIes	Trench cum bunding
Duppalli	29	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Not Available (NA)	Not Available	IIIes	Trench cum bunding
Duppalli	30	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	31	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Duppalli	32	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Duppalli	33	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Duppalli	34	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Not Available (NA)	Not Available	IIIes	Trench cum bunding
Duppalli	35	DSBiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIIes	Trench cum bunding
Duppalli	36	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Cotton (Ct)	Not Available	IIIes	Trench cum bunding
Duppalli	37	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Paddy+Cotton (Pd+Ct)	Not Available	IIIes	Trench cum bunding
Duppalli	38	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Redgram (Rg)	Not Available	IIIes	Trench cum bunding
Duppalli	39	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Cotton (Ct)	Not Available	IIIes	Trench cum bunding
Duppalli	40	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Redgram (Rg)	Not Available	IIIes	Trench cum bunding
Duppalli	41	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Redgram (Rg)	Not Available	IIIes	Trench cum bunding
Duppalli	42	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Redgram (Rg)	Not Available	IIIes	Trench cum bunding
Duppalli	43	YLRiB2	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IIes	Trench cum bunding
Duppalli	44	YLRiB2	LMU-6	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	Trench cum bunding
Duppalli	45	YLRiB2	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Trench cum bunding
Duppalli	46	YLRiB2	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Trench cum bunding
Duppalli	47	YLRiB2	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IIes	Trench cum bunding
Duppalli	48	YLRiB2	LMU-6	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	Trench cum bunding
Duppalli	49	YLRiB2	LMU-6	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	Trench cum bunding
Duppalli	52	YLRiB2	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Trench cum bunding
Duppalli	53	YLRiB2	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IIes	Trench cum bunding

Village	Survey NO	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Duppalli	54	YLRiB2	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IIes	Trench cum bunding
Duppalli	55	YLRiB2	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	1 Check Dam	IIes	Trench cum bunding
Duppalli	56	PGPcB2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IIes	Trench cum bunding
Duppalli	57	PGPcB2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Duppalli	58	PGPcB2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	1 Bore well	IIes	Trench cum bunding
Duppalli	59	YLRiB2	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IIes	Trench cum bunding
Duppalli	60	PGPcB2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Duppalli	61	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land+Redgram (Sl+Rg)	Not Available	IVes	Graded bunding
Duppalli	62	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land+Cotton (Sl+Ct)	Not Available	IVes	Graded bunding
Duppalli	63	YLRiB2	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy+Cotton (Pd+Ct)	Not Available	IIes	Trench cum bunding
Duppalli	64	YLRiB2	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Cotton+ Fallow land (Rg+Ct+Fl)	Not Available	IIes	Trench cum bunding
Duppalli	65	YLRiB2	LMU-6	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	Trench cum bunding
Duppalli	66	YLRiB2	LMU-6	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	Trench cum bunding
Duppalli	67	YLRiB2	LMU-6	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	Trench cum bunding
Duppalli	68	YLRiB2	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Trench cum bunding
Duppalli	69	YLRiB2	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	1 Bore well	IIes	Trench cum bunding
Duppalli	70	YLRiB2	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IIes	Trench cum bunding
Duppalli	71	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Not Available (NA)	Not Available	IIIes	Trench cum bunding
Duppalli	72	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	73	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	74	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	75	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	76	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding

Village	Survey NO	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Duppalli	77	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Duppalli	78	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Duppalli	79	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	80	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	81	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	82	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	83	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	84	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Paddy (Pd)	Not Available	IIIes	Trench cum bunding
Duppalli	85	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	86	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	87	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	88	KBDhB2	LMU-5	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Trench cum bunding
Duppalli	89	KBDhB2	LMU-5	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIes	Trench cum bunding
Duppalli	90	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	91	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	92	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	93	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	94	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Duppalli	95	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	96	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	97	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	98	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	99	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	100	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding

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Duppalli	101	KBDhB2	LMU-5	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Trench cum bunding
Duppalli	102	KBDhB2	LMU-5	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIes	Trench cum bunding
Duppalli	103	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	104	Waterbody	Others	Others	Others	Others	Others	Others	Others	Scrub land (Sl)	Not Available	Others	Others
Duppalli	106	Waterbody	Others	Others	Others	Others	Others	Others	Others	Not Available (NA)	Not Available	Others	Others
Duppalli	107	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Duppalli	108	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Duppalli	109	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	110	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	111	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	112	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	113	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	114	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	115	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Duppalli	116	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Duppalli	117	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	118	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	119	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	120	YLRiB2	LMU-6	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	Trench cum bunding
Duppalli	121	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land+Redgram (Sl+Rg)	Not Available	IVes	Graded bunding
Duppalli	122	YLRiB2	LMU-6	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	Trench cum bunding
Duppalli	123	YLRiB2	LMU-6	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	Trench cum bunding
Duppalli	124	MDGiB2	LMU-2	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding

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Duppalli	125	MDGiB2	LMU-2	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrubland+Redgram (Sl+Rg)	Not Available	IIes	Graded bunding
Duppalli	126	PGPcB2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Duppalli	127	YLRiB2	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIes	Trench cum bunding
Duppalli	128	PGPcB2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIes	Trench cum bunding
Duppalli	129	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	130	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land+Redgram+Paddy (Sl+Rg+Pd)	Not Available	IVes	Graded bunding
Duppalli	131	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land+Redgram (Sl+Rg)	Not Available	IVes	Graded bunding
Duppalli	132	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy+Scrub land (Pd+Sl)	Not Available	IVes	Graded bunding
Duppalli	133	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	134	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Duppalli	135	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	136	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	137	Waterbody	Others	Others	Others	Others	Others	Others	Others	Scrub land (Sl)	Not Available	Others	Others
Duppalli	138	Waterbody	Others	Others	Others	Others	Others	Others	Others	Scrub land (Sl)	Not Available	Others	Others
Duppalli	139	Waterbody	Others	Others	Others	Others	Others	Others	Others	Scrub land (Sl)	Not Available	Others	Others
Duppalli	140	Waterbody	Others	Others	Others	Others	Others	Others	Others	Scrub land (Sl)	Not Available	Others	Others
Duppalli	161	Waterbody	Others	Others	Others	Others	Others	Others	Others	Not Available (NA)	Not Available	Others	Others
Duppalli	162	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Duppalli	163	Waterbody	Others	Others	Others	Others	Others	Others	Others	Scrub land (Sl)	Not Available	Others	Others
Duppalli	189	Waterbody	Others	Others	Others	Others	Others	Others	Others	Scrub land+Redgram (Sl+Rg)	Not Available	Others	Others
Duppalli	192	Waterbody	Others	Others	Others	Others	Others	Others	Others	Scrub land (Sl)	Not Available	Others	Others
Duppalli	250	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	251	Waterbody	Others	Others	Others	Others	Others	Others	Others	Scrub land (Sl)	Not Available	Others	Others

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Duppalli	267	Waterbody	Others	Others	Others	Others	Others	Others	Others	Not Available (NA)	Not Available	Others	Others
Duppalli	268	Waterbody	Others	Others	Others	Others	Others	Others	Others	Scrub land (Sl)	Not Available	Others	Others
Duppalli	344	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy+Scrub land (Pd+Sl)	Not Available	IVes	Graded bunding
Duppalli	345	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Duppalli	346	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	347	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	348	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Duppalli	349	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Duppalli	350	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	351	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	352	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	353	Waterbody	Others	Others	Others	Others	Others	Others	Others	Not Available (NA)	Not Available	Others	Others
Duppalli	354	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	355	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land+Redgram (Sl+Rg)	Not Available	IVes	Graded bunding
Duppalli	356	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	357	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	358	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	359	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	360	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	361	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Scrub land (Sl)	Not Available	IIIes	Trench cum bunding
Duppalli	362	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Duppalli	363	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Duppalli	364	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Duppalli	366	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others

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Duppalli	367	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	1 Bore well	Others	Others
Duppalli	368	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Duppalli	369	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Duppalli	370	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Duppalli	371	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Duppalli	372	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Duppalli	373	DSBiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land+Redgram (Sl+Rg)	Not Available	IIIes	Trench cum bunding
Duppalli	374	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Duppalli	375	YLRmB2g2	LMU-6	Moderately shallow (50-75 cm)	Clay	Very gravelly (35-60%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Duppalli	376	KBDhB2	LMU-5	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Paddy (Rg+Pd)	Not Available	IIes	Trench cum bunding
Duppalli	377	KBDhB2	LMU-5	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Paddy (Rg+Pd)	Not Available	IIes	Trench cum bunding
Duppalli	378	YLRmB2g2	LMU-6	Moderately shallow (50-75 cm)	Clay	Very gravelly (35-60%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Duppalli	379	YLRmB2g2	LMU-6	Moderately shallow (50-75 cm)	Clay	Very gravelly (35-60%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land+Redgram (Sl+Rg)	Not Available	IIes	Trench cum bunding
Duppalli	380	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	381	VKSmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Paddy+Cotton+Redgram (Pd+Ct+Rg)	Not Available	IVs	Graded bunding
Duppalli	382	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	383	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Duppalli	384	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Duppalli	385	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Duppalli	386	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Duppalli	387	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Duppalli	388	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Duppalli	389	VKSmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding

Village	Survey NO	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Duppalli	390	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Duppalli	391	VKSmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Duppalli	392	VKSmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Paddy (Rg+Pd)	Not Available	IVs	Graded bunding
Duppalli	393	VKSmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Duppalli	394	VKSmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Paddy+Cotton (Pd+Ct)	Not Available	IVs	Graded bunding
Duppalli	395	VKSiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Duppalli	396	VKSmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Cotton+Redgram (Ct+Rg)	Not Available	IVs	Graded bunding
Duppalli	397	Waterbody	Others	Others	Others	Others	Others	Others	Others	Scrub land (Sl)	Not Available	Others	Others
Duppalli	401	VKSmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Scrub land+Redgram (Sl+Rg)	Not Available	IVs	Graded bunding
Duppalli	402	VKSmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Paddy+Cotton (Pd+Ct)	Not Available	IVs	Graded bunding
Duppalli	403	VKSmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Paddy (Rg+Pd)	Not Available	IVs	Graded bunding
Duppalli	404	VKSmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Cotton+Redgram (Ct+Rg)	Not Available	IVs	Graded bunding
Duppalli	430	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land+Redgram (Sl+Rg)	Not Available	IVes	Graded bunding
Duppalli	431	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Duppalli	432	ANRiB2	LMU-1	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land+Redgram (Sl+Rg)	Not Available	IVes	Graded bunding
Duppalli	433	YLRmB2g2	LMU-6	Moderately shallow (50-75 cm)	Clay	Very gravelly (35-60%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IIes	Trench cum bunding
Duppalli	434	YLRmB2g2	LMU-6	Moderately shallow (50-75 cm)	Clay	Very gravelly (35-60%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Duppalli	435	YLRmB2g2	LMU-6	Moderately shallow (50-75 cm)	Clay	Very gravelly (35-60%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IIes	Trench cum bunding
Duppalli	436	YLRmB2g2	LMU-6	Moderately shallow (50-75 cm)	Clay	Very gravelly (35-60%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Duppalli	437	YLRmB2g2	LMU-6	Moderately shallow (50-75 cm)	Clay	Very gravelly (35-60%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Duppalli	471	DSBiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Trench cum bunding
Duppalli	472	DSBiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Trench cum bunding
Duppalli	473	KBDbB3	LMU-5	Moderately deep (75-100 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Cotton+Redgram (Ct+Rg)	Not Available	IIIes	Trench cum bunding

Village	Survey NO	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Duppalli	474	DSBiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Trench cum bunding
Duppalli	475	DSBiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Trench cum bunding
Duppalli	476	DSBiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Paddy (Rg+Pd)	Not Available	IIIes	Trench cum bunding
Duppalli	477	DSBiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Paddy (Rg+Pd)	Not Available	IIIes	Trench cum bunding
Duppalli	478	DSBiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Trench cum bunding
Duppalli	479	DSBiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Trench cum bunding
Duppalli	480	KBDhB2	LMU-5	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Trench cum bunding
Duppalli	481	KBDhB2	LMU-5	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Paddy (Rg+Pd)	1 Bore well	IIes	Trench cum bunding
Duppalli	482	KBDhB2	LMU-5	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Paddy (Rg+Pd)	2 Bore well	IIes	Trench cum bunding
Duppalli	483	DSBiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land+Redgram (Sl+Rg)	Not Available	IIIes	Trench cum bunding
Duppalli	484	DSBiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Trench cum bunding
Duppalli	485	DSBiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Trench cum bunding
Duppalli	486	DSBiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIIes	Trench cum bunding
Duppalli	487	DSBiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land+Cotton (Sl+Ct)	Not Available	IIIes	Trench cum bunding
Duppalli	488	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Duppalli	489	DSBiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land+Redgram (Sl+Rg)	Not Available	IIIes	Trench cum bunding

Appendix II

Dupalli-1 (6P1b) Microwatershed

Soil Fertility Information

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Chand apura	57	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 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)
Chand apura	58	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 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)
Chand apura	59	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 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)
Chand apura	60	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)
Chand apura	61	Slightly alkaline (pH 7.3 – 7.8)	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)
Chand apura	62	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 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)
Chand apura	63	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 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)
Chand apura	64	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 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)
Chand apura	97	Slightly alkaline (pH 7.3 – 7.8)	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)
Chand apura	98	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 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)
Chand apura	99	Slightly alkaline (pH 7.3 – 7.8)	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)
Chand apura	100	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 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)
Chand apura	101	Slightly alkaline (pH 7.3 – 7.8)	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)
Chand apura	102	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)
Chand apura	103	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)
Chand apura	104	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)
Chand apura	105/1	Slightly acid (pH 6.0 – 6.5)	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)
Chand apura	105/2	Slightly acid (pH 6.0 – 6.5)	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)
Chand apura	106/1	Slightly acid (pH 6.0 – 6.5)	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)
Chand apura	106/2	Moderately acid (pH 5.5 – 6.0)	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)
Chand apura	107	Slightly acid (pH 6.0 – 6.5)	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)
Chand apura	108	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)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Chand apura	109	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)
Chand apura	110	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)
Chand apura	116	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)
Chand apura	117	Slightly acid (pH 6.0 – 6.5)	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)
Chand apura	118	Slightly acid (pH 6.0 – 6.5)	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)
Chand apura	119	Moderately acid (pH 5.5 – 6.0)	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)
Chand apura	120	Moderately acid (pH 5.5 – 6.0)	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)
Chand apura	121	Moderately acid (pH 5.5 – 6.0)	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)
Chand apura	123	Moderately acid (pH 5.5 – 6.0)	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)
Chand apura	124	Slightly acid (pH 6.0 – 6.5)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chand apura	125	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chand apura	126	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chand apura	127	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chand apura	128	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chand apura	129	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chand apura	130	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chand apura	131	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chand apura	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chand apura	137	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	1	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	2	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	3	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	4	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	5	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Duppalli	6	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	7	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	8	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	9	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	10	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	11	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)
Duppalli	12	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)
Duppalli	13	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)
Duppalli	14	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	15	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	16	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	17	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	18	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	19	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	20	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	21	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	22	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	23	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	24	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	25	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	26/1	Neutral (pH 6.5 – 7.3)	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	26/2	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	27	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	28	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Duppalli	29	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	30	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	31	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	32	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	33	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	34	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	35	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	36	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	37	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	38	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	39	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	40	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	41	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	42	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	43	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	44	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	45	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	46	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	47	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	48	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	49	Neutral (pH 6.5 – 7.3)	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	52	Slightly acid (pH 6.0 – 6.5)	Non saline (<2 dsm)	High (> 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)
Duppalli	53	Slightly acid (pH 6.0 – 6.5)	Non saline (<2 dsm)	High (> 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)
Duppalli	54	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Duppalli	55	Slightly acid (pH 6.0 – 6.5)	Non saline (<2 dsm)	High (> 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)
Duppalli	56	Slightly acid (pH 6.0 – 6.5)	Non saline (<2 dsm)	High (> 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)
Duppalli	57	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	58	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)
Duppalli	59	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	60	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	61	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 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)
Duppalli	62	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	63	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)
Duppalli	64	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Duppalli	65	Neutral (pH 6.5 – 7.3)	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	66	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 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)
Duppalli	67	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	68	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	69	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	70	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	71	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	72	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	73	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	74	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	75	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	76	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	77	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	78	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Duppalli	79	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	80	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	81	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	82	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	83	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	84	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	85	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	86	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	87	Moderately alkaline (pH 7.8 – 8.4)	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)
Duppalli	88	Moderately alkaline (pH 7.8 – 8.4)	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)
Duppalli	89	Moderately alkaline (pH 7.8 – 8.4)	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)
Duppalli	90	Moderately alkaline (pH 7.8 – 8.4)	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)
Duppalli	91	Moderately alkaline (pH 7.8 – 8.4)	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)
Duppalli	92	Moderately alkaline (pH 7.8 – 8.4)	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)
Duppalli	93	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	94	Moderately alkaline (pH 7.8 – 8.4)	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)
Duppalli	95	Moderately alkaline (pH 7.8 – 8.4)	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)
Duppalli	96	Moderately alkaline (pH 7.8 – 8.4)	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)
Duppalli	97	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	98	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	99	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	100	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	101	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	102	Moderately alkaline (pH 7.8 – 8.4)	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)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Duppalli	103	Moderately alkaline (pH 7.8 – 8.4)	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)
Duppalli	104	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	106	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	107	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	108	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	109	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	110	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	111	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	112	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	113	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	114	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	115	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 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)
Duppalli	116	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 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)
Duppalli	117	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	118	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 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)
Duppalli	119	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	120	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	121	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	122	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	123	Strongly alkaline (pH 8.4 – 9.0)	Low (2 – 4 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	124	Very strongly alkaline (pH > 9.0)	Low (2 – 4 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	High (> 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	125	Very strongly alkaline (pH > 9.0)	Low (2 – 4 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	High (> 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	126	Very strongly alkaline (pH > 9.0)	Low (2 – 4 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	High (> 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	127	Very strongly alkaline (pH > 9.0)	Low (2 – 4 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Duppalli	128	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	High (> 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	129	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	High (> 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	130	Very strongly alkaline (pH > 9.0)	Low (2 – 4 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	High (> 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	131	Very strongly alkaline (pH > 9.0)	Low (2 – 4 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	High (> 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	132	Very strongly alkaline (pH > 9.0)	Low (2 – 4 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	High (> 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	133	Very strongly alkaline (pH > 9.0)	Low (2 – 4 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	134	Very strongly alkaline (pH > 9.0)	Low (2 – 4 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	135	Very strongly alkaline (pH > 9.0)	Low (2 – 4 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	High (> 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	136	Very strongly alkaline (pH > 9.0)	Low (2 – 4 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	High (> 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	137	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	138	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	139	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	140	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	161	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	162	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	163	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	189	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	192	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	250	Strongly alkaline (pH 8.4 – 9.0)	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)
Duppalli	251	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	267	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	268	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	344	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	345	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Duppalli	346	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	347	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	348	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	349	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	350	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)
Duppalli	351	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	352	Moderately alkaline (pH 7.8 – 8.4)	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)
Duppalli	353	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	354	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	355	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	356	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)
Duppalli	357	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)
Duppalli	358	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)
Duppalli	359	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)
Duppalli	360	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)
Duppalli	361	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)
Duppalli	362	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	363	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	364	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	366	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	367	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	368	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)
Duppalli	369	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	370	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)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Duppalli	371	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)
Duppalli	372	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)
Duppalli	373	Slightly acid (pH 6.0 – 6.5)	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)
Duppalli	374	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)
Duppalli	375	Slightly acid (pH 6.0 – 6.5)	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)
Duppalli	376	Moderately acid (pH 5.5 – 6.0)	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)
Duppalli	377	Slightly acid (pH 6.0 – 6.5)	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)
Duppalli	378	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)
Duppalli	379	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	380	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	381	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	382	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	383	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	384	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	385	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)
Duppalli	386	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)
Duppalli	387	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)
Duppalli	388	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)
Duppalli	389	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	390	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 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)
Duppalli	391	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 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)
Duppalli	392	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	393	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	394	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Duppalli	395	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	396	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	397	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	401	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	402	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	403	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	404	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	430	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	431	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	432	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	433	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	434	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)
Duppalli	435	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 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)
Duppalli	436	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Duppalli	437	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 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)
Duppalli	471	Moderately acid (pH 5.5 – 6.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	472	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	473	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	474	Neutral (pH 6.5 – 7.3)	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	475	Neutral (pH 6.5 – 7.3)	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	476	Neutral (pH 6.5 – 7.3)	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	477	Slightly acid (pH 6.0 – 6.5)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	478	Moderately acid (pH 5.5 – 6.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	479	Moderately acid (pH 5.5 – 6.0)	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)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Duppalli	480	Moderately acid (pH 5.5 – 6.0)	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)
Duppalli	481	Moderately acid (pH 5.5 – 6.0)	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)
Duppalli	482	Slightly acid (pH 6.0 – 6.5)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Duppalli	483	Slightly acid (pH 6.0 – 6.5)	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)
Duppalli	484	Slightly acid (pH 6.0 – 6.5)	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)
Duppalli	485	Slightly acid (pH 6.0 – 6.5)	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)
Duppalli	486	Slightly acid (pH 6.0 – 6.5)	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)
Duppalli	487	Slightly acid (pH 6.0 – 6.5)	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)
Duppalli	488	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Duppalli	489	Slightly acid (pH 6.0 – 6.5)	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)

Appendix III

Dupalli-1 (6P1b) 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
Chandapura	57	S3r	S1	S2r	S2t	S2r	S3t	S3r	S2r	S3t	S2rt	S2rt	S1	S2r	S1	S2rn	S3r	S2r	S1	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	58	S3r	S1	S2r	S2t	S2r	S3t	S3r	S2r	S3t	S2rt	S2rt	S1	S2r	S1	S2rn	S3r	S2r	S1	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	59	S3r	S1	S2r	S2t	S2r	S3t	S3r	S2r	S3t	S2rt	S2rt	S1	S2r	S1	S2rn	S3r	S2r	S1	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	60	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	61	S3r	S1	S2r	S2t	S2r	S3t	S3r	S2r	S3t	S2rt	S2rt	S1	S2r	S1	S2rn	S3r	S2r	S1	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	62	S3r	S1	S2r	S2t	S2r	S3t	S3r	S2r	S3t	S2rt	S2rt	S1	S2r	S1	S2rn	S3r	S2r	S1	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	63	N1r	S2rz	S3r	S2rz	S3rz	S3t	N1r	S3r	S3t	S3r	S3r	S2rz	S3rz	S2rz	N1zn	S3rz	S3r	S2rz	S2rz	S2rz	S2rz	S2rz	S2rz	S3r	S2rz	S2rz	S2rz	S3rz	S3rz
Chandapura	64	N1r	S2rz	S3r	S2rz	S3rz	S3t	N1r	S3r	S3t	S3r	S3r	S2rz	S3rz	S2rz	N1zn	S3rz	S3r	S2rz	S2rz	S2rz	S2rz	S2rz	S2rz	S3r	S2rz	S2rz	S2rz	S3rz	S3rz
Chandapura	97	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	98	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	99	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	100	S3r	S1	S2r	S2t	S2r	S3t	S3r	S2r	S3t	S2rt	S2rt	S1	S2r	S1	S2rn	S3r	S2r	S1	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	101	S3r	S1	S2r	S2t	S2r	S3t	S3r	S2r	S3t	S2rt	S2rt	S1	S2r	S1	S2rn	S3r	S2r	S1	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	102	S3r	S1	S2r	S2t	S2r	S3t	S3r	S2r	S3t	S2rt	S2rt	S1	S2r	S1	S2rn	S3r	S2r	S1	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	103	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	104	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	105/1	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	105/2	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	106/1	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r

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
Chandapura	106/2	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	107	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	108	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	109	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	110	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	116	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	117	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	118	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	119	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	120	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	121	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S2r	S3n	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Chandapura	123	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2rg	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2rg	S2rg	S3r	S3r
Chandapura	124	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2rg	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2rg	S2rg	S3r	S3r
Chandapura	125	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2rg	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2rg	S2rg	S3r	S3r
Chandapura	126	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2rg	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2rg	S2rg	S3r	S3r
Chandapura	127	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2rg	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2rg	S2rg	S3r	S3r
Chandapura	128	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2rg	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2rg	S2rg	S3r	S3r
Chandapura	129	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2rg	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2rg	S2rg	S3r	S3r
Chandapura	130	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2rg	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2rg	S2rg	S3r	S3r
Chandapura	131	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2rg	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2rg	S2rg	S3r	S3r
Chandapura	132	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2rg	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2rg	S2rg	S3r	S3r

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
Chandapura	137	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2rg	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2rg	S2rg	S3r	S3r
Duppalli	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
Duppalli	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
Duppalli	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
Duppalli	4	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
Duppalli	5	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
Duppalli	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
Duppalli	7	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
Duppalli	8	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	9	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
Duppalli	10	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
Duppalli	11	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	12	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	13	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	14	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	15	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	16	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	17	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	18	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	19	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	20	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	21	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	22	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
Duppalli	23	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

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
Duppalli	24	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	25	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	26/1	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	26/2	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
Duppalli	27	N1r	S3rg	N1r	S3rg	N1r	S3rg	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3r	S3rg	S3rg	N1r	N1r
Duppalli	28	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	29	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	30	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	31	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	32	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	33	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	34	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	35	N1r	S3rg	N1r	S3rg	N1r	S3rg	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3r	S3rg	S3rg	N1r	N1r
Duppalli	36	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	37	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	38	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	39	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	40	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	41	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	42	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	43	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	44	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	45	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	46	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	47	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	48	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r

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
Duppalli	49	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	52	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	53	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	54	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	55	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	56	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S1	S2r	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Duppalli	57	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S1	S2r	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Duppalli	58	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S1	S2r	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Duppalli	59	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	60	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S1	S2r	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Duppalli	61	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	62	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	63	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	64	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	65	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	66	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	67	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	68	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	69	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	70	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	71	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	72	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	73	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	74	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	75	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	76	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg

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
Duppalli	77	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	78	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	79	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	80	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	81	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	82	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	83	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	84	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	85	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	86	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	87	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	88	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	89	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	90	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	91	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	92	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	93	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	94	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	95	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	96	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	97	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	98	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	99	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	100	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	101	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	102	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg

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
Duppalli	103	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	104	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
Duppalli	106	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
Duppalli	107	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	108	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	109	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	110	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	111	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	112	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	113	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	114	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	115	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	116	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	117	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	118	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	119	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	120	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	121	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	122	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	123	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	124	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Duppalli	125	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Duppalli	126	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S1	S2r	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Duppalli	127	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Duppalli	128	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S1	S2r	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Duppalli	129	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n

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
Duppalli	130	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	131	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	132	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Duppalli	133	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	134	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	135	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	136	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	137	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
Duppalli	138	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
Duppalli	139	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
Duppalli	140	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
Duppalli	161	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
Duppalli	162	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	163	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
Duppalli	189	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
Duppalli	192	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
Duppalli	250	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	251	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
Duppalli	267	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
Duppalli	268	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
Duppalli	344	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	345	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	346	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	347	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n

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
Duppalli	348	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	349	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	350	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	351	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	352	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	353	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
Duppalli	354	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	355	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	356	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	357	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	358	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	359	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	360	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	361	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	362	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
Duppalli	363	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
Duppalli	364	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
Duppalli	366	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
Duppalli	367	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
Duppalli	368	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	369	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
Duppalli	370	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	371	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	372	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	373	N1r	S3rg	N1r	S3rg	N1r	S3rg	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3r	S3rg	S3rg	N1r	N1r

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
Duppalli	374	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	375	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S3t	S3r	S3r	S2rg	S3r	S2rg	S3r	S3r	S3r	S3t	S3g	S3g	S3g	S3g	S3g	S3r	S2rg	S3g	S3g	S3r	S3r
Duppalli	376	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	377	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	378	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S3t	S3r	S3r	S2rg	S3r	S2rg	S3r	S3r	S3r	S3t	S3g	S3g	S3g	S3g	S3g	S3r	S2rg	S3g	S3g	S3r	S3r
Duppalli	379	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S3t	S3r	S3r	S2rg	S3r	S2rg	S3r	S3r	S3r	S3t	S3g	S3g	S3g	S3g	S3g	S3r	S2rg	S3g	S3g	S3r	S3r
Duppalli	380	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	381	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	382	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	383	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	384	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	385	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	386	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	387	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	388	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	389	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	390	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	391	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	392	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	393	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	394	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	395	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	396	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	397	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
Duppalli	401	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	402	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n

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
Duppalli	403	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	404	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	430	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	431	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	432	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Duppalli	433	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S3t	S3r	S3r	S2rg	S3r	S2rg	S3r	S3r	S3r	S3t	S3g	S3g	S3g	S3g	S3g	S3r	S2rg	S3g	S3g	S3r	S3r
Duppalli	434	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S3t	S3r	S3r	S2rg	S3r	S2rg	S3r	S3r	S3r	S3t	S3g	S3g	S3g	S3g	S3g	S3r	S2rg	S3g	S3g	S3r	S3r
Duppalli	435	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S3t	S3r	S3r	S2rg	S3r	S2rg	S3r	S3r	S3r	S3t	S3g	S3g	S3g	S3g	S3g	S3r	S2rg	S3g	S3g	S3r	S3r
Duppalli	436	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S3t	S3r	S3r	S2rg	S3r	S2rg	S3r	S3r	S3r	S3t	S3g	S3g	S3g	S3g	S3g	S3r	S2rg	S3g	S3g	S3r	S3r
Duppalli	437	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S3t	S3r	S3r	S2rg	S3r	S2rg	S3r	S3r	S3r	S3t	S3g	S3g	S3g	S3g	S3g	S3r	S2rg	S3g	S3g	S3r	S3r
Duppalli	471	N1r	S3rg	N1r	S3rg	N1r	S3rg	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3r	S3rg	S3rg	N1r	N1r
Duppalli	472	N1r	S3rg	N1r	S3rg	N1r	S3rg	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3r	S3rg	S3rg	N1r	N1r
Duppalli	473	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	474	N1r	S3rg	N1r	S3rg	N1r	S3rg	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3r	S3rg	S3rg	N1r	N1r
Duppalli	475	N1r	S3rg	N1r	S3rg	N1r	S3rg	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3r	S3rg	S3rg	N1r	N1r
Duppalli	476	N1r	S3rg	N1r	S3rg	N1r	S3rg	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3r	S3rg	S3rg	N1r	N1r
Duppalli	477	N1r	S3rg	N1r	S3rg	N1r	S3rg	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3r	S3rg	S3rg	N1r	N1r
Duppalli	478	N1r	S3rg	N1r	S3rg	N1r	S3rg	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3r	S3rg	S3rg	N1r	N1r
Duppalli	479	N1r	S3rg	N1r	S3rg	N1r	S3rg	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3r	S3rg	S3rg	N1r	N1r
Duppalli	480	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	481	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	482	S3r	S2g	S2rg	S2gt	S2rg	S3t	S3r	S2rg	S3t	S2rg	S2rg	S2g	S2rg	S2g	S3g	S3r	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S2rg	S2rg
Duppalli	483	N1r	S3rg	N1r	S3rg	N1r	S3rg	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3r	S3rg	S3rg	N1r	N1r
Duppalli	484	N1r	S3rg	N1r	S3rg	N1r	S3rg	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3r	S3rg	S3rg	N1r	N1r
Duppalli	485	N1r	S3rg	N1r	S3rg	N1r	S3rg	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3r	S3rg	S3rg	N1r	N1r
Duppalli	486	N1r	S3rg	N1r	S3rg	N1r	S3rg	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3r	S3rg	S3rg	N1r	N1r

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
Duppalli	487	N1r	S3rg	N1r	S3rg	N1r	S3rg	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3r	S3rg	S3rg	N1r	N1r
Duppalli	488	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	Others
Duppalli	489	N1r	S3rg	N1r	S3rg	N1r	S3rg	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3r	S3rg	S3rg	N1r	N1r

Project Team

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Chapter 1

FINDINGS OF THE SOCIO-ECONOMIC SURVEY

- *The survey was conducted in Dupalli-1 is located at North latitude 16^0 32' 55.784" and 16^0 31' 9.82" and East longitude 77^0 24' 37.573" and 77^0 22' 5.889" covering an area of about 658.76 ha coming unde Duppalli and Chandapura Villages of Yadagiri taluk.*
- *Socio-economic analysis of Dupalli-1 micro watersheds of Ajalapur sub-watershed, Yadgiri taluk & District indicated that, out of the total sample of 35 farmers were sampled in Dupalli-1 micro-watershed among households surveyed 13 (37.14%) were marginal, 12 (34.29%) were small, 2 (5.71 %) were semi medium and 2 (5.71 %) were medium farmers. 6 landless farmers were also interviewed for the survey.*
- *The population characteristics of households indicated that, there were 89 (60.54%) men and 58 (39.46 %) were women. The average population of landless was 3.8, marginal farmers were 4.2, small farmers were 4.6, semi medium farmers were 3.5 and medium farmers were 4.2.*
- *Majority of the respondents (36.73%) were in the age group of 16-35 years.*
- *Education level of the sample households indicated that, there were 61.22 per cent illiterates, 2.04 percent were functional literates, 32.64 per cent pre university education and 5.44 per cent attained graduation.*
- *About, 71.43 per cent of household heads practicing agriculture and 17.14 per cent of the household heads were engaged as agricultural labourers.*
- *Agriculture was the major occupation for 51.70 per cent of the household members.*
- *In the study area, 71.43 per cent of the households possess katcha house and 20.00 per cent possess pucca house.*
- *The durable assets owned by the households showed that, 51.43 per cent possess TV, 8.57 per cent possess mixer grinder, 91.43 per cent possess mobile phones and 17.14 per cent possess motor cycles.*
- *Farm implements owned by the households indicated that, 11.43 per cent of the households possess plough, 2.86 per cent possess tractor, 5.71 per cent possess bullock cart and 5.71 per cent possess sprayer.*
- *Regarding livestock possession by the households, 22.86 per cent possess local cow and 2.86 per cent possess buffalo.*
- *The average labour availability in the study area showed that, own labour men available in the micro watershed was 1.43, women available in the micro watershed was 1.20, hired labour (men) available was 5.77 and hired labour (women) available was 5.77.*
- *Further, 14.29 per cent of the households opined that hired labour was inadequate during the agricultural season.*

- *In the study area, about 1.36 per cent of the respondents migrated from the micro watershed in search of jobs with an average distance of 1400.00 kms for about 12.00 months.*
- *Out of the total land holding of the sample respondents 69.79 per cent (38.92 ha) of the area is under dry condition and the remaining 25.78 per cent area is irrigated land.*
- *There were 6.00 live bore wells and 6.00 dry bore wells among the sampled households.*
- *Bore well was the major source of irrigation for 17.14 per cent of the households.*
- *The major crops grown by sample farmers are Red gram, Cotton, Groundnut, Green gram and Paddy and cropping intensity was recorded as 100.00 per cent.*
- *Out of the sample households 80.00 percent possessed bank account and 57.14 per cent of them have savings in the account.*
- *About 57.14 per cent of the respondents borrowed credit from various sources.*
- *Among the credit borrowed by households, 5.00 per cent have borrowed loan from commercial banks and 10.00 per cent from co-operative/Grameena bank.*
- *Majority of the respondents (33.33%) have borrowed loan for agriculture purpose.*
- *Regarding the opinion on institutional sources of credit.*
- *The per hectare cost of cultivation for Red gram, Cotton, Groundnut, Green gram and Paddy was Rs.32519.84, 37121.71, 22099.58, 20642.46 and 38671.35 with benefit cost ratio of 1:1.80, 1: 1.90, 1: 2.50, 1: 2.50 and 1:2.49 respectively.*
- *Further, 17.14 per cent of the households opined that dry fodder was adequate and 8.57 per cent of the households have opined that the green fodder was adequate.*
- *The average annual gross income of the farmers was Rs. 94451.43 in micro-watershed, of which Rs. 56480.00 comes from agriculture.*
- *Sampled households have grown 2 horticulture trees and 72 forestry trees together in the fields and back yards.*
- *Households have an average investment capacity of Rs. 1257.14 for land development and Rs. 2857.14 for irrigation facility.*
- *Source of funds for additional investment is concerned, 11.43 per cent depends on own funds.*
- *Regarding marketing channels, 40.00 per cent of the households have sold agricultural produce to the local/village merchants, while, 37.14 per cent have sold in regulated markets.*
- *Further, 65.71 per cent of the households have used tractor for the transport of agriculture commodity.*
- *Majority of the farmers (62.86%) have experienced soil and water erosion problems in the watershed and 80.00 per cent of the households were interested towards soil testing.*

- *Fire was the major source of fuel for domestic use for 62.86 per cent of the households and 37.14 per cent households has LPG connection.*
- *Piped supply was the major source for drinking water for 94.29 per cent of the households.*
- *Electricity was the major source of light for 100.00 per cent of the households.*
- *In the study area, 51.43 per cent of the households possess toilet facility.*
- *Regarding possession of PDS card, 91.43 per cent of the households possessed BPL card, 2.86 per cent of the household's possessed APL card and 5.71 per cent of the household's were not having ration cards.*
- *Households opined that, the requirement of cereals (77.14%), pulses (80.00%) and oilseeds (57.14%) are adequate for consumption.*
- *Farming constraints experienced by households in the micro watersheds were lower fertility status of the soil (74.29%) wild animal menace on farm field (68.57%), frequent incidence of pest and diseases (74.29%), inadequacy of irrigation water (71.43%), high cost of fertilizers and plant protection chemicals (68.57%), high rate of interest on credit (68.57%), low price for the agricultural commodities (68.57%), lack of marketing facilities in the area (34.29%), inadequate extension services (51.43%), lack of transport for safe transport of the agricultural produce to the market (68.57%).*

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, labour 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 Dupalli-1 micro-watershed (Ajalapur sub-watershed, Yadgiri taluk & District) is located at North latitude 16^0 32’ 55.784” and 16^0 31' 9.82" and East longitude 77^0 24’ 37.573" and 77^0 22’ 5.889”covering an area of about 658.76 ha bounded by unde Duppalli and Chandapura 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 35 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 Dupalli-1 Micro watershed is presented in Table 1 and it indicated that 35 farmers were sampled in Dupalli-1 micro-watershed among households surveyed 13 (37.14%) were marginal, 12 (34.29%) were small, 2 (5.71 %) were semi medium and 2 (5.71 %) were medium farmers. 6 landless farmers were also interviewed for the survey.

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

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Farmers	6	17.1	13	37.1	12	34.3	2	5.71	2	5.71	35	100

Population characteristics: The population characteristics of households sampled for socio-economic survey in Dupalli-1 Micro watershed is presented in Table 2. The data indicated that, there were 89 (60.54%) men and 58 (39.46%) were women. The average population of landless was 3.8, marginal farmers were 4.2, small farmers were 4.6, semi medium farmers were 3.5 and medium farmers were 4.2.

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

Sl.No.	Particulars	LL (23)		MF (55)		SF (55)		SMF (7)		MDF (7)		All (147)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Men	14	60.9	37	67	30	55	4	57.1	4	57.1	89	60.5
2	Women	9	39.1	18	33	25	45	3	42.9	3	42.9	58	39.5
Total		23	100	55	100	55	100	7	100	7	100	147	100
Average		3.8		4.2		4.6		3.5		3.5		4.2	

Age wise classification of population: The age wise classification of household members in Dupalli-1 Micro watershed is presented in Table 3. The indicated that, 35 (23.81%) of population were 0-15 years of age, 54 (36.73%) were 16-35 years of age, 49(33.33%) were 36-60 years of age and 9 (6.12 %) were above 61 years of age.

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

Sl.No.	Particulars	LL (23)		MF (55)		SF (55)		SMF (7)		MDF (7)		All (147)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	0-15 years of age	8	34.8	8	14.6	18	32.7	0	0	1	14	35	23.81
2	16-35 years of age	5	21.7	24	43.6	20	36.4	4	57.14	1	14	54	36.73
3	36-60 years of age	10	43.5	18	32.7	14	25.5	3	42.86	4	57	49	33.33
4	> 61 years	0	0	5	9.09	3	5.45	0	0	1	14	9	6.12
Total		23	100	55	100	55	100	7	100	7	100	147	100

Education level of household members: Education level of household members in Dupalli-1 Micro watershed is presented in Table 4. The results indicated that, there were 61.22 per cent of illiterates, 2.04 per cent of functional literate, 8.84 per cent of them had primary school education, 10.88 per cent middle school education, 7.48 per cent high school education, 2.72 per cent of them had PUC education, 5.44 per cent attained graduation and 1.36 them had other education.

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

Sl.No.	Particulars	LL (23)		MF (55)		SF (55)		SMF (7)		MDF (7)		All (147)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Illiterate	14	60.9	36	65.5	33	60	5	71.4	2	28.57	90	61.2
2	Functional Literate	0	0	2	3.64	0	0	1	14.3	0	0	3	2.04
3	Primary School	3	13	2	3.64	7	12.7	0	0	1	14.29	13	8.84
4	Middle School	4	17.4	6	10.9	6	10.9	0	0	0	0	16	10.9
5	High School	2	8.7	4	7.27	5	9.09	0	0	0	0	11	7.48
6	PUC	0	0	0	0	2	3.64	0	0	2	28.57	4	2.72
7	Degree	0	0	3	5.45	2	3.64	1	14.3	2	28.57	8	5.44
8	Others	0	0	2	3.64	0	0	0	0	0	0	2	1.36
Total		23	100	55	100	55	100	7	100	7	100	147	100

Occupation of head of households: The data regarding the occupation of the household heads in Dupalli-1 Micro watershed is presented in Table 5. The results indicate that, 71.43 per cent of households heads were practicing agriculture, 17.14 per cent of the household heads were agricultural Labour.

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

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Agriculture	0	0	11	85	11	91.67	1	50	2	100	25	71.43
2	Agricultural Labour	6	100	0	0	0	0	0	0	0	0	6	17.14
3	Student	0	0	1	7.7	0	0	0	0	0	0	1	2.86
Total		6	100	12	100	11	100	1	100	2	100	32	100

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

Sl.No.	Particulars	LL (23)		MF (55)		SF (55)		SMF (7)		MDF (7)		All (147)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Agriculture	0	0	38	69.1	28	50.91	5	71.43	5	71	76	51.7
2	Agricultural Labour	13	56.5	2	3.64	1	1.82	1	14.29	0	0	17	11.6
3	General Labour	1	4.35	0	0	0	0	0	0	0	0	1	0.68
4	Household industry	1	4.35	0	0	0	0	0	0	0	0	1	0.68
5	Student	8	34.8	5	9.09	19	34.55	1	14.29	2	29	35	23.8
6	Others	0	0	5	9.09	5	9.09	0	0	0	0	10	6.8
7	Housewife	0	0	3	5.45	2	3.64	0	0	0	0	5	3.4
8	Children	0	0	2	3.64	0	0	0	0	0	0	2	1.36
Total		23	100	55	100	55	100	7	100	7	100	147	100

Occupation of the members of the household: The data regarding the occupation of the household members in Dupalli-1 Micro watershed is presented in Table 6. The results indicate that, agriculture was the major occupation for 51.70 per cent of the household

members, 11.56 per cent were agricultural labour, 0.68 per cent were general labour0.00 per cent were working in government sector, 23.81 per cent were working in pursuing education, 3.40 per cent were involved as housewife, and 1.36 per cent were children.

Institutional Participation of household members: The data regarding the institutional participation of the household members in Dupalli-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 Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (23)		MF (55)		SF (55)		SMF (7)		MDF (7)		All (147)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	No Participation	23	100	55	100	55	100	7	100	7	100	147	100
Total		23	100	55	100	55	100	7	100	7	100	147	100

Type of house owned: The data regarding the type of house owned by the households in Dupalli-1 Micro watershed is presented in Table 8. The results indicate that, 11.43 percent possess thatched house, 71.43 per cent of the households possess katcha house, 20.00 per cent possess pacca house.

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

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Thatched	0	0	3	23	1	8.33	0	0	0	0	4	11.43
2	Katcha	7	117	8	62	8	66.67	2	100	0	0	25	71.43
3	Pucca/RCC	0	0	2	15	3	25	0	0	2	100	7	20
Total		7	100	13	100	12	100	2	100	2	100	36	100

Durable assets owned by the households: The data regarding the Durable Assets owned by the households in Dupalli-1 Micro watershed is presented in Table 9. The results shows that, 51.43 per cent possess TV, 8.57 per cent possess mixer grinder, 2.86 per cent possess refrigerator, 2.86 per cent possess Bicycle, 17.14 per cent possess motor cycle, 91.43 per cent possess mobile phones.

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

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Television	1	17	6	46	7	58.3	2	100	2	100	18	51.43
2	Mixer/Grinder	0	0	2	15	1	8.33	0	0	0	0	3	8.57
3	Refrigerator	0	0	0	0	1	8.33	0	0	0	0	1	2.86
4	Bicycle	0	0	0	0	1	8.33	0	0	0	0	1	2.86
5	Motor Cycle	0	0	0	0	3	25	1	50	2	100	6	17.14
6	Auto	0	0	1	7.7	0	0	0	0	0	0	1	2.86
7	Tempo	0	0	1	7.7	0	0	0	0	0	0	1	2.86
8	Mobile Phone	5	83	12	92	11	91.7	2	100	2	100	32	91.43
9	Blank	1	17	1	7.7	1	8.33	0	0	0	0	3	8.57

Average value of durable assets: The data regarding the average value of durable assets owned by the households in Dupalli-1 Micro watershed is presented in Table 10. The result shows that, the average value of television was Rs.6555.00, mixer grinder was Rs.3466.00, refrigerator was 9000.00, bicycle was Rs.2500.00, motor cycle was Rs. 55666.00, mobile phone was Rs.2670.00.

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

Average Value (Rs.)

Sl.No.	Particulars	LL (6)	MF (13)	SF (12)	SMF (2)	MDF (2)	All (35)
1	Television	3000	6166	7000	6000	8500	6555
2	Mixer/Grinder	0	4200	2000	0	0	3466
3	Refrigerator	0	0	9000	0	0	9000
4	Bicycle	0	0	2500	0	0	2500
5	Motor Cycle	0	0	51333	40000	70000	55666
6	Auto	0	74000	0	0	0	74000
7	Tempo	0	650000	0	0	0	650000
8	Mobile Phone	2840	2385	2445	5500	3500	2670

Farm implements owned: The data regarding the farm implements owned by the households in Dupalli-1 Micro watershed is presented in Table 11. About 5.71 per cent of the households possess Bullock Cart, 11.43 per cent possess plough and 2.86 per cent possess Seed/Fertilizer Drill and Sprinkler, 5.71 per cent possess Sprayer, 14.29 per cent possess Weeder, 2.86 per cent possess tractor.

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

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Bullock Cart	0	0	1	7.69	1	8.33	0	0	0	0	2	5.71
2	Plough	0	0	2	15.4	2	16.67	0	0	0	0	4	11.43
3	Seed/Fertilizer Drill	0	0	0	0	1	8.33	0	0	0	0	1	2.86
4	Tractor	0	0	0	0	0	0	0	0	1	50	1	2.86
5	Sprayer	0	0	1	7.69	1	8.33	0	0	0	0	2	5.71
6	Weeder	0	0	3	23.1	2	16.67	0	0	0	0	5	14.29
7	Thresher	0	0	1	7.69	0	0	0	0	0	0	1	2.86
8	Maize Huller	0	0	1	7.69	0	0	0	0	0	0	1	2.86
9	Blank	6	100	10	76.9	9	75	2	100	1	50	28	80

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

Average Value (Rs.)

Sl.No.	Particulars	LL (6)	MF (13)	SF (12)	SMF (2)	MDF (2)	All (35)
1	Bullock Cart	0	13000	25000	0	0	19000
2	Plough	0	3875	13500	0	0	7083
3	Seed/Fertilizer Drill	0	0	6000	0	0	6000
4	Tractor	0	0	0	0	400000	400000
5	Sprayer	0	4200	4000	0	0	4100
6	Weeder	0	2775	180	0	0	1776
7	Thresher	0	20000	0	0	0	20000
8	Maize Huller	0	250	0	0	0	250

Average value of farm implements: The data regarding the average value of farm Implements owned by the households in Dupalli-1 Micro watershed is presented in Table 12. The results show that the average value of plough was Rs.7083.00, bullock Cart was Rs.19000.00, seed/fertilizer drill was Rs.4100.00, weeder was Rs.1776.00 and tractor Rs. 400000.

Livestock possession by the households: The data regarding the Livestock possession by the households in Dupalli-1 Micro watershed is presented in Table 13. The indicate that, 25.71 per cent of the households possess bullocks, 22.86 per cent possess local cow, 2.86 per cent possess buffalo, 2.86 per cent possess sheep and 2.86 per cent were poultry birds.

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

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Bullock	0	0	3	23	5	41.67	0	0	1	50	9	25.71
2	Local cow	0	0	4	31	3	25	0	0	1	50	8	22.86
3	Buffalo	0	0	1	7.7	0	0	0	0	0	0	1	2.86
4	Sheep	0	0	0	0	1	8.33	0	0	0	0	1	2.86
5	Poultry birds	0	0	1	7.7	0	0	0	0	0	0	1	2.86
6	blank	6	100	8	62	6	50	2	100	1	50	23	65.71

Average Labour availability: The data regarding the average labour availability in Dupalli-1 Micro watershed is presented in Table 14. The indicated that, own labour men available in the micro watershed was 1.43, women available in the micro watershed was 1.20, hired labour (men) available was 5.77 and hired labour (women) available was 5.77.

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

Sl.No.	Particulars	LL (6)	MF (13)	SF (12)	SMF (2)	MDF (2)	All (35)
		N	N	N	N	N	N
1	Hired labour Female	1	6.23	6.08	5	12.5	5.57
2	Own Labour Female	1	1.23	1.17	2	1	1.2
3	Own labour Male	1	1.77	1.33	1.5	1	1.43
4	Hired labour Male	1	6.54	6.33	5	12.5	5.77

Adequacy of hired labour: The data regarding the adequacy of hired labour in Dupalli-1 Micro watershed is presented in Table 15. The results indicate that, 85.71 per cent of the household opined that hired labour was adequate, 14.29 per cent of the household opined that hired labour was Inadequate.

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

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Adequate	1	17	13	100	12	100	2	100	2	100	30	85.7
2	Inadequate	5	83	0	0	0	0	0	0	0	0	5	14.3

Migration among the households: The data regarding the migration (Table 16) indicate that, 1.36 percent of the population was being migrated from the micro watershed.

Table 16. Migration among the households in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (23)		MF (55)		SF (55)		SMF (7)		MDF (7)		All (147)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Migration	0	0.00	2	3.64	0	0.00	0	0.00	0	0.00	2	1.36

Average distance and duration of migration: The data regarding the average distance and duration of migration (Table 17) indicate that, people migrated to a distance of 1400 kms on an average for 12 months.

Table 17. Average distance and duration of migration in Dupalli-1 micro-watershed

Sl. No.	Particulars	LL (23)	MF (55)	SF (55)	SMF (7)	MDF (7)	All(147)
		N	N	N	N	N	N
1	Avg. Distance (kms)	0	1400	0	0	0	1400
2	Avg. Duration (months)	0	12	0	0	0	12

Distribution of land (ha): The data regarding the distribution of land (ha) in Dupalli-1 Micro watershed is presented in Table 18. The results indicate that, 27.16 ha (69.79%) of dry land and 10.04 ha (25.78 %) of irrigated land.

Table 18. Distribution of land (ha) in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Dry	0	0	9.56	84.72	17.6	95.06	0	0	0	0	27.16	69.79
2	Irrigated	0	0	0	0	0.91	4.94	3.35	100	5.78	100	10.04	25.78
3	Permanent Fallow	0	0	1.72	15.28	0	0	0	0	0	0	1.72	4.43
Total		0	100	11.3	100	18.52	100	3.35	100	5.78	100	38.92	100

Average value of land (ha): The data regarding the average land value (Rs./ha) in Dupalli-1 Micro watershed is presented in Table 19. The results show that the average value of dry land was Rs.475820.92 and the average value of irrigated land was Rs.288830.65.

Table 19. Average value of land (ha) in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)	MF (13)	SF (12)	SMF (2)	MDF (2)	All (35)
		N	N	N	N	N	N
1	Dry	0	630571.6	391793.1	0	0	475820.9
2	Irrigated	0	0	109292	418137.9	242326.6	288830.7
3	Permanent Fallow	0	695774.7	0	0	0	695774.7

Status of bore wells: The data regarding the status of bore wells in Dupalli-1 Micro watershed is presented in Table 20. The results indicate that, there were 6 De-functioning bore wells and 6 functioning bore wells among the sampled households in micro watershed.

Table 20. Status of bore wells in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)	MF (13)	SF (12)	SMF (2)	MDF (2)	All (35)
		N	N	N	N	N	N
1	De-functioning	0	0	2	2	2	6
2	Functioning	0	0	2	2	2	6

Source of irrigation: The data regarding the source of irrigation in Dupalli-1 Micro watershed is presented in Table 21. The results that bore well were major source of irrigation for 17.14 per cent of the households.

Table 21. Source of irrigation in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Bore Well	0	0	0	0	2	16.67	2	100	2	100	6	17.14

Depth of water (Avg. In meters): The data regarding the depth of water in Dupalli-1 Micro watershed is presented in Table 22. The results revealed that, the depth of bore well was 10.36 meter.

Table 22. Depth of water (Avg. In meters) in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)	MF (13)	SF (12)	SMF (2)	MDF (2)	All (35)
		N	N	N	N	N	N
1	Bore Well	0	0	10.16	79.25	41.15	10.36

Irrigated Area (ha): The results (Table 23) indicate that, the availability of irrigation water was used for kharif crops was 9.52 ha.

Table 23. Irrigated Area (ha) in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)	MF (13)	SF (12)	SMF (2)	MDF (2)	All (35)
1	Kharif	0	0	1.72	2.02	5.78	9.52

Cropping pattern: The data regarding the cropping pattern in Dupalli-1 Micro watershed is presented in Table 24. The results indicate that, farmers have grown Cotton (12.35 ha), Red gram (9.98 ha), Paddy (6.18 ha), Green gram (3.46 ha) and Groundnut (2.43 ha).

Table 24. Cropping pattern in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)	MF (13)	SF (12)	SMF (2)	MDF (2)	All (35)
1	Kharif - Cotton	0	5.24	7.11	0	0	12.35
2	Kharif - Red gram	0	3.73	6.25	0	0	9.98
3	Kharif - Paddy	0	0	0	0.4	5.78	6.18
4	Kharif - Green gram	0	0.85	2.61	0	0	3.46
5	Kharif - Groundnut	0	0	0.81	1.62	0	2.43
Total		0	9.83	16.78	2.02	5.78	34.4

Table 25. Cropping intensity (%) in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)	MF (13)	SF (12)	SMF (2)	MDF (2)	All (35)
1	Cropping Intensity	0	100	100	100	100	100

Cropping intensity: The data regarding the cropping intensity in Dupalli-1 Micro watershed is presented in Table 25. The results indicate that, the cropping intensity was 100.00 per cent.

Possession of bank account and savings: The data regarding the possession of bank account and saving in Dupalli-1 micro-watershed is presented in Table 26. The results indicate that, 80.00 cent of the households posses bank account and 57.14 per cent of them have savings.

Table 26. Possession of Bank account and savings in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Account	0	0	12	92.31	12	100	2	100	2	100	28	80
2	Savings	0	0	9	69.23	8	66.67	2	100	1	50	20	57.14

Borrowing status:. The results (Table 27) indicate that, 57.14 percent of the sample farmers have borrowed credit from different sources.

Table 27. Borrowing status in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Credit Availed	0	0	11	84.62	7	58.3	2	100	0	0	20	57.14

Source of credit: The data regarding the source of credit availed by households in Dupalli-1 micro-watershed is presented in Table 28. The results show that, 5.00 per cent have borrowed loan from commercial banks and 5.00 per cent have borrowed loan from Cooperative bank, 10.00 per cent have borrowed loan from Grameena Bank, 5.00 per cent have borrowed loan from money lender.

Table 28. Source of credit borrowed by households in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (0)		MF (11)		SF (7)		SMF (2)		All (20)	
		N	%	N	%	N	%	N	%	N	%
1	Commercial Bank	0	0	0	0	0	0	0	0	1	5
2	Cooperative Bank	0	0	0	0	1	14.3	0	0	1	5
3	Grameena Bank	0	0	1	9.09	0	0	0	0	2	10
4	Money Lender	0	0	0	0	1	14.3	0	0	1	5

Avg. Credit amount: The data regarding the avg. Credit amount in Dupalli-1 micro-watershed is presented in Table 29. The results show that, farmers have borrowed Avg. Credit of Rs.53500.00 from different sources.

Table 29. Avg. Credit amount in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (0)	MF (11)	SF (7)	SMF (2)	MDF (0)	All (20)
		N	N	N	N	N	N
1	Average Credit	0	18181.8	50000	0	0	53500

Purpose of credit borrowed (institutional Source): The data regarding the purpose of credit borrowed - Institutional Credit in Dupalli-1 micro-watershed is presented in Table 30. The results indicate that, 33.33 per cent of the households have borrowed loan for agriculture, household consumption (33.33%) and social functions like marriage (33.33%).

Table 30. Purpose of credit borrowed (institutional Source) by households in Dupalli-1 micro-watershed

SN	Particulars	LL (0)		MF (1)		SF (1)		MDF (1)		All (3)	
		N	%	N	%	N	%	N	%	N	%
1	Agriculture production	0	0	0	0	0	0	1	100	1	33.3
2	Household consumption	0	0	0	0	1	100	0	0	1	33.3
3	Social functions like marriage	0	0	1	100	0	0	0	0	1	33.3

Purpose of credit borrowed (Private Source): The data regarding the purpose of credit borrowed – Private Source in Dupalli-1 micro-watershed is presented in Table 31. The results indicate that, 100.00 per cent of the households have borrowed loan for agriculture.

Table 31. Purpose of credit borrowed (Private Source) by households in Dupalli-1 micro-watershed

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

Repayment status of household (institutional Source): The data regarding the repayment status of credit borrowed from institutional Source by households in Dupalli-1 micro watershed is presented in Table 32. The results indicate that, 100.00 per cent of the households have partially paid.

Table 32. Repayment status of household (institutional Source) in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (0)		MF (1)		SF (1)		SMF (0)		MDF (2)		All (4)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Partially paid	0	0	1	100	1	100	0	0	2	100	4	100

Repayment status of household (Private Source): The results (Table 33)indicate that, 100.00 per cent of the households have partially paid and 100.00 percent have fully paid.

Table 33. Repayment status of household (Private Source) in Dupalli-1 micro-watershed

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

Opinion regarding institutional sources of credit: The results (Table 34) indicate that, 100.00 per cent easy accessibility of credit, 25.00 per cent higher rate of interest.

Table 34. Opinion regarding institutional sources of credit in Dupalli-1 micro-watershed

Sl.No.	Particulars	MF (1)		SF (1)		MDF (2)		All (4)	
		N	%	N	%	N	%	N	%
1	Easy accessibility of credit	1	100	1	100	1	50	3	75
2	Higher rate of interest	0	0	0	0	1	50	1	25

Opinion regarding Non- institutional sources of credit: The data regarding the opinion on non-institutional sources of credit in Dupalli-1 micro watershed is presented in Table 35. The results indicate that, 100.00 per cent easy accessibility of credit.

Table 35. Opinion regarding Non- institutional sources of credit in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (0)		MF (0)		SF (1)		SMF (0)		MDF (0)		All (1)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Easy accessibility of credit	0	0	0	0	1	100	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 Dupalli-1 micro watershed is presented in Table 36.a. The results indicate that, the total cost of cultivation (Rs/ha) for Red gram was Rs. 32519.84. The gross income realized by the farmers was Rs. 57861.17. The net income from Red gram cultivation was Rs.25341.32, thus the benefit cost ratio was found to be 1:1.80.

Table 36(a). Cost of Cultivation of Red gram in Dupalli-1 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	28.98	5790.15	17.8
2	Bullock		Pairs/day	4.24	3369.3	10.36
3	Tractor		Hours	0.96	631.22	1.94
4	Machinery		Hours	0.09	91.48	0.28
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	12.32	1181.26	3.63
6	Seed Inter Crop		Kgs.	0	0	0
7	FYM		Quintal	3.63	5441.1	16.73
8	Fertilizer + micronutrients		Quintal	5.42	4951.46	15.23
9	Pesticides (PPC)		Kgs / liters	1.48	1301.5	4
13	Depreciation charges			0	143.86	0.44
14	Land revenue and Taxes			0	0	0
II	**Cost B1**					
16	Interest on working capital				1546.24	4.75
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				24447.57	75.18
III	**Cost B2**					
18	Rental Value of Land				166.67	0.51
19	**Cost B2 = (Cost B1 + Rental value)**				24614.24	75.69
IV	**Cost C1**					
20	Family Human Labour			21.63	4939.25	15.19
21	**Cost C1 = (Cost B2 + Family Labour)**				29553.49	90.88
V	**Cost C2**					
22	Risk Premium				10	0.03
23	**Cost C2 = (Cost C1 + Risk Premium)**				29563.49	90.91
VI	**Cost C3**					
24	Managerial Cost				2956.35	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				32519.84	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		11.91	57296.89	
		b) Main Crop Sales Price (Rs.)			4811.11	
	By Product	e) Main Product (q)		1.27	564.27	
		f) Main Crop Sales Price (Rs.)			444.44	
b.	Gross Income (Rs.)				57861.17	
c.	Net Income (Rs.)				25341.32	
d.	Cost per Quintal (Rs./q.)				2730.63	
e.	Benefit Cost Ratio (BC Ratio)				1:1.8	

Cost of Cultivation of Cotton: The data regarding the cost of cultivation (Rs/ha) of Cotton in Dupalli-1 micro watershed is presented in Table 36.b. The results indicate that, the total cost of cultivation (Rs/ha) for Cotton was Rs. 37121.71. The gross income realized by the farmers was Rs. 72144.88. The net income from Cotton cultivation was Rs.35023.16, thus the benefit cost ratio was found to be 1:1.90.

Table 36(b). Cost of Cultivation of Cotton in Dupalli-1 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	33.68	6918.79	18.64
2	Bullock		Pairs/day	3.76	3322.99	8.95
3	Tractor		Hours	0.92	706.96	1.9
4	Machinery		Hours	0	0	0
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	29.01	4292.54	11.56
6	Seed Inter Crop		Kgs.	0	0	0
7	FYM		Quintal	2.49	3867.15	10.42
8	Fertilizer + micronutrients		Quintal	7.02	6778.51	18.26
9	Pesticides (PPC)		Kgs / liters	1.75	1579.32	4.25
10	Irrigation		Number	1.1	0	0
13	Depreciation charges			0	102.83	0.28
II	**Cost B1**					
16	Interest on working capital				1983.3	5.34
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				29552.39	79.61
III	**Cost B2**					
18	Rental Value of Land				166.67	0.45
19	**Cost B2 = (Cost B1 + Rental value)**				29719.06	80.06
IV	**Cost C1**					
20	Family Human Labour			15.25	4017.95	10.82
21	**Cost C1 = (Cost B2 + Family Labour)**				33737.01	90.88
V	**Cost C2**					
22	Risk Premium				10	0.03
23	**Cost C2 = (Cost C1 + Risk Premium)**				33747.01	90.91
VI	**Cost C3**					
24	Managerial Cost				3374.7	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				37121.71	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		12.17	72133.39	
		b) Main Crop Sales Price (Rs.)			5925	
	By Product	e) Main Product (q)		0.09	11.49	
		f) Main Crop Sales Price (Rs.)			125	
b.	Gross Income (Rs.)				72144.88	
c.	Net Income (Rs.)				35023.16	
d.	Cost per Quintal (Rs./q.)				3049.16	
e.	Benefit Cost Ratio (BC Ratio)				1:1.9	

Cost of Cultivation of Groundnut: The data regarding the cost of cultivation (Rs/ha) of Groundnut in Dupalli-1 micro watershed is presented in Table 36.c. The results indicate, the total cost of cultivation (Rs/ha) for Groundnut was Rs.22099.58. The gross income realized by the farmers was Rs. 55575.00. The net income from Groundnut cultivation was Rs. 33475.42, thus the benefit cost ratio was found to be 1:2.50.

Table 36(c). Cost of Cultivation of Groundnut in Dupalli-1 micro-watershed

Sl.No	Particulars	Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**				
1	Hired Human Labour	Man days	24.7	5705.7	25.82
2	Bullock	Pairs/day	2.47	1482	6.71
3	Tractor	Hours	0	0	0
4	Machinery	Hours	0	0	0
5	Seed Main Crop (Establishment and Maintenance)	Kgs (Rs.)	24.7	3705	16.77
6	Seed Inter Crop	Kgs.	0	0	0
7	FYM	Quintal	1.24	1852.5	8.38
8	Fertilizer + micronutrients	Quintal	3.71	3495.05	15.82
9	Pesticides (PPC)	Kgs / liters	0.62	555.75	2.51
10	Irrigation	Number	0	0	0
13	Depreciation charges		0	0.01	0
14	Land revenue and Taxes		0	0	0
II	**Cost B1**				
16	Interest on working capital			1154.2	5.22
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**			17950.21	81.22
III	**Cost B2**				
18	Rental Value of Land			166.67	0.75
19	**Cost B2 = (Cost B1 + Rental value)**			18116.88	81.98
IV	**Cost C1**				
20	Family Human Labour		7.41	1963.65	8.89
21	**Cost C1 = (Cost B2 + Family Labour)**			20080.53	90.86
V	**Cost C2**				
22	Risk Premium			10	0.05
23	**Cost C2 = (Cost C1 + Risk Premium)**			20090.53	90.91
VI	**Cost C3**				
24	Managerial Cost			2009.05	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**			22099.58	100
VII	**Economics of the Crop**				
a.	Main Product	a) Main Product (q)	9.88	49400	
		b) Main Crop Sales Price (Rs.)		5000	
	By Product	e) Main Product (q)	3.09	6175	
		f) Main Crop Sales Price (Rs.)		2000	
b.	Gross Income (Rs.)			55575	
c.	Net Income (Rs.)			33475.42	
d.	Cost per Quintal (Rs./q.)			2236.8	
e.	Benefit Cost Ratio (BC Ratio)			1:2.5	

Cost of Cultivation of Green gram: The data regarding the cost of cultivation (Rs/ha) of Green gram in Dupalli-1 micro watershed is presented in Table 36.d. The results indicate that, the total cost of cultivation (Rs/ha) for Green gram was Rs. 20642.46. The gross income realized by the farmers was Rs.51834.06. The net income from Green gram cultivation was Rs. 31191.60, thus the benefit cost ratio was found to be 1:2.50.

Table 36(d). Cost of Cultivation of Green gram in Dupalli-1 micro-watershed

Sl.No	Particulars	Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**				
1	Hired Human Labour	Man days	21.17	3561.24	17.25
2	Bullock	Pairs/day	2.4	1925.47	9.33
3	Tractor	Hours	1.22	853.83	4.14
4	Machinery	Hours	0	0	0
5	Seed Main Crop (Establishment and Maintenance)	Kgs (Rs.)	7.21	461.98	2.24
6	Seed Inter Crop	Kgs.	0	0	0
7	FYM	Quintal	2.35	3528.57	17.09
8	Fertilizer + micronutrients	Quintal	3.62	3127.58	15.15
9	Pesticides (PPC)	Kgs / liters	1.81	1627.06	7.88
10	Irrigation	Number	0	0	0
13	Depreciation charges		0	2.45	0.01
14	Land revenue and Taxes		0	0	0
II	**Cost B1**				
16	Interest on working capital			1050.62	5.09
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**			16138.81	78.18
III	**Cost B2**				
18	Rental Value of Land			166.67	0.81
19	**Cost B2 = (Cost B1 + Rental value)**			16305.47	78.99
IV	**Cost C1**				
20	Family Human Labour		10.11	2450.4	11.87
21	**Cost C1 = (Cost B2 + Family Labour)**			18755.87	90.86
V	**Cost C2**				
22	Risk Premium			10	0.05
23	**Cost C2 = (Cost C1 + Risk Premium)**			18765.87	90.91
VI	**Cost C3**				
24	Managerial Cost			1876.59	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**			20642.46	100
VII	**Economics of the Crop**				
a.	Main Product	a) Main Product (q)	10.91	51834.06	
		b) Main Crop Sales Price (Rs.)		4750	
b.	Gross Income (Rs.)			51834.06	
c.	Net Income (Rs.)			31191.6	
d.	Cost per Quintal (Rs./q.)			1891.65	
e.	Benefit Cost Ratio (BC Ratio)			1:2.5	

Cost of Cultivation of Paddy: The data regarding the cost of cultivation (Rs/ha) of Paddy in Dupalli-1 micro watershed is presented in Table 36.e. The results indicate that, the total cost of cultivation (Rs/ha) for Paddy was Rs.38671.35. The gross income realized by the farmers was Rs. 96466.62. The net income from Paddy cultivation was Rs. 57795.27, thus the benefit cost ratio was found to be 1:2.49.

Table 36(e). Cost of Cultivation of Paddy in Dupalli-1 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	35.25	8178.35	21.15
2	Bullock		Pairs/day	3.29	1976	5.11
3	Tractor		Hours	0.72	430.97	1.11
4	Machinery		Hours	0	0	0
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	34.02	5588.1	14.45
6	Seed Inter Crop		Kgs.	0	0	0
7	FYM		Quintal	2.71	4068.24	10.52
8	Fertilizer + micronutrients		Quintal	7.96	7318.69	18.93
9	Pesticides (PPC)		Kgs / liters	1.43	1290.33	3.34
10	Irrigation		Number	1.37	0	0
13	Depreciation charges			0	718.3	1.86
14	Land revenue and Taxes			0	0	0
II	**Cost B1**					
16	Interest on working capital				2193.04	5.67
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				31762.02	82.13
III	**Cost B2**					
18	Rental Value of Land				111.11	0.29
19	**Cost B2 = (Cost B1 + Rental value)**				31873.13	82.42
IV	**Cost C1**					
20	Family Human Labour			12.3	3272.64	8.46
21	**Cost C1 = (Cost B2 + Family Labour)**				35145.77	90.88
V	**Cost C2**					
22	Risk Premium				10	0.03
23	**Cost C2 = (Cost C1 + Risk Premium)**				35155.77	90.91
VI	**Cost C3**					
24	Managerial Cost				3515.58	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				38671.35	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		32.04	95051.64	
		b) Main Crop Sales Price (Rs.)			2966.67	
	By Product	e) Main Product (q)		0.77	1414.97	
		f) Main Crop Sales Price (Rs.)			1833.33	
b.	Gross Income (Rs.)				96466.62	
c.	Net Income (Rs.)				57795.27	
d.	Cost per Quintal (Rs./q.)				1206.98	
e.	Benefit Cost Ratio (BC Ratio)				1:2.49	

Adequacy of fodder: The data regarding the adequacy of fodder in Dupalli-1 Micro watershed is presented in Table 37. The results indicate that, 17.14 per cent of the households opined that dry fodder was adequate and 8.57 per cent of them opined dry fodder was inadequate. With respect to green fodder availability, 8.57 percent of them opined it was sufficient and 8.57 percent of them opined it was insufficient.

Table 37. Adequacy of fodder in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Adequate-Dry Fodder	0	0	2	15.38	2	16.67	0	0	2	100	6	17.14
2	Inadequate-Dry Fodder	0	0	1	7.69	2	16.67	0	0	0	0	3	8.57
3	Adequate-Green Fodder	0	0	2	15.38	1	8.33	0	0	0	0	3	8.57
4	Inadequate-Green Fodder	0	0	1	7.69	2	16.67	0	0	0	0	3	8.57

Average annual gross income: The data regarding the annual gross income in Dupalli-1 Micro watershed is presented in Table 38. The results indicate that, the farmers have annual gross income of Rs. 94451.43 in micro-watershed, of which Rs. 56480.00 is from agriculture itself.

Table 38. Average annual gross income in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)	MF (13)	SF (12)	SMF (2)	MDF (2)	All (35)
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1	Service/salary	0	3846.15	4166.67	0	0	2857.14
2	Wage	0	21846.2	32083.3	80000	20000	24828.6
3	Agriculture	0	42215.4	92166.7	61000	100000	56480
4	Dairy Farm	0	25384.6	0	0	0	9428.57
5	Goat Farming	0	0	2500	0	0	857.14
Income(Rs.)		0	93292.3	130917	141000	120000	94451.4

Average annual Expenditure: The data regarding the average annual expenditure in Dupalli-1 Micro watershed is presented in Table 39. The results indicate that, the farmers have annual gross expenditure of Rs. 403174.24 in micro-watershed, of which Rs. 22628.57 is from agriculture itself.

Table 39. Average annual Expenditure in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)	MF (13)	SF (12)	SMF (2)	MDF (2)	All (35)
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1	Service/salary	0	20000	20000	0	0	1142.86
2	Wage	0	46250	18333.3	37500	20000	12714.3
3	Agriculture	0	21545.5	39545.5	35000	50000	22628.6
4	Dairy Farm	0	80000	0	0	0	4571.43
5	Goat Farming	0	0	15000	0	0	428.57
Total		0	167795	92878.8	72500	70000	403174

Horticulture species grown: The data regarding horticulture species grown in Dupalli-1 Micro watershed is presented in Table 40. The results indicate that, the total number of horticultural trees grown (both field and backyard) by the sampled households were Mango (2).

Table 40. Horticulture species grown in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		F	B	F	B	F	B	F	B	F	B	F	B
1	Mango	0	0	2	0	0	0	0	0	0	0	2	0

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

Forest species grown: The data regarding forest species grown in Dupalli-1 Micro watershed is presented in Table 41. The results indicate that, households have planted 2 teak trees, 64 neem trees, 1 tamarind trees and 5 banyan trees together in both field and backyard.

Table 41. Forest species grown in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		F	B	F	B	F	B	F	B	F	B	F	B
1	Teak	0	0	0	0	0	0	2	0	0	0	2	0
2	Neem	0	0	24	1	30	2	2	1	4	0	60	4
3	Tamarind	0	0	1	0	0	0	0	0	0	0	1	0
4	Banyan	0	0	1	0	4	0	0	0	0	0	5	0

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

Average additional investment capacity: The data regarding average additional investment capacity in Dupalli-1 Micro watershed is presented in Table 42. The results indicate that, households have an average investment capacity of Rs. 1257.14 for land development, Rs. 2857.14 for creation of irrigation facility and Rs.1428.57 for adoption of improved crop production activities.

Table 42. Average additional investment capacity of households in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)	MF (13)	SF (12)	SMF (2)	MDF (2)	All (35)
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1	Land development	0	1846.15	1666.67	0	0	1257.14
2	Irrigation facility	0	7692.31	0	0	0	2857.14
3	Improved livestock management	0	0	4166.67	0	0	1428.57

Source of funds for additional investment: The data regarding source of funds for additional investment in Dupalli-1 Micro watershed is presented in Table 43. The results indicate that, the sources of finance raised from bank as a loan for irrigation facility was 2.86.

Table 43. Source of funds for additional investment in Dupalli-1 micro-watershed

Sl.No	Item	Land development		Irrigation facility		Improved crop production		Improved livestock management	
		N	%	N	%	N	%	N	%
1	Loan from bank	0	0	1	2.86	0	0	1	2.86

Marketing of agricultural produce: The data regarding marketing of the agricultural produce in Dupalli-1 Micro watershed is presented in Table 44. The results indicated that, 100.00 percent of output of Cotton was sold in the market with average price of Rs. 5925.00; 69.70 percent of output of Green gram was sold in the market with average price

of Rs. 4750.00; 68.75 percent of output of Paddy was sold in the market with average price of Rs. 5000.00 and 72.53 percent of output of Red gram was sold in the market with average price of Rs. 2966.67.

Table 44. Marketing of agricultural produce in Dupalli-1 micro-watershed

Sl.No	Crops	Output obtained (q)	Output retained (q)	Output sold (q)	Output sold (%)	Avg. Price obtained (Rs/q)
1	Cotton	154	0	154	100	5925
2	Green gram	33	10	23	70	4750
3	Groundnut	16	5	11	69	5000
4	Paddy	91	25	66	73	2967
5	Red gram	123	25	98	80	4811

Marketing channels used for sale of agricultural produce: The data regarding marketing channels used for sale of agricultural produce in Dupalli-1 Micro watershed is presented in Table 45. The results indicated that, 40.00 cent of the households have sold agricultural produce to the local/village merchants, 37.14 per cent of regulated market.

Table 45. Marketing channels used for sale of agricultural produce in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Local/village Merchant	0	0	6	46	7	58.3	0	0	1	50	14	40
2	Regulated Market	0	0	5	38	5	41.7	2	100	1	50	13	37.14

Mode of transport of agricultural produce: The data regarding mode of transport of agricultural produce in Dupalli-1 Micro watershed is presented in Table 46. The results indicated that, 65.71 cent of the households have used tractor, 5.71 per cent have used Cart, 2.86 per cent carry by Bus for the transport of agriculture commodity.

Table 46. Mode of transport of agricultural produce in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Cart	0	0	0	0	2	16.7	0	0	0	0	2	5.71
2	Tractor	0	0	10	77	9	75	2	100	2	100	23	65.71
3	Bus	0	0	0	0	1	8.33	0	0	0	0	1	2.86
4	Truck	0	0	1	7.7	0	0	0	0	0	0	1	2.86

Table 47. Incidence of soil and water erosion problems in Dupalli-1 micro-watershed

Sl. No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Soil and water erosion problems in the farm	0	0	8	62	11	91.7	2	100	1	50	22	62.86

Incidence of soil and water erosion problems: The data regarding incidence of incidence of soil and water erosion problems in Dupalli-1 Micro watershed is presented in Table 47. The results indicate that, 62.86 per cent of the households have experienced soil and water erosion problems.

Interest towards soil testing: The data regarding Interest shown towards soil testing in Dupalli-1 Micro watershed is presented in Table 48. The results indicated that, 80.00 per cent of the households were interested towards soil testing.

Table 48. Interest regarding soil testing in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Interest in soil test	0	0	12	92	12	100	2	100	2	100	28	80

Usage pattern of fuel for domestic use: The data on usage pattern of fuel for domestic use in Dupalli-1 Micro watershed is presented in Table 49. The results indicated that, firewood was the major source of fuel for domestic use for 62.86 per cent of the households followed by LPG (37.14%).

Table 49. Usage pattern of fuel for domestic use in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Fire Wood	5	83.3	8	61.5	7	58.3	1	50	1	50	22	62.86
2	LPG	1	16.7	5	38.5	5	41.7	1	50	1	50	13	37.14

Source of drinking water: The data on source of drinking water in Dupalli-1 Micro watershed is presented in Table 50. The results indicated that, piped waters supply was the major source for drinking water for 94.29 per cent of the households followed by bore well water (5.71%).

Table 50. Source of drinking water in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Piped supply	6	100	12	92.3	11	91.67	2	100	2	100	33	94.29
2	Bore Well	0	0	1	7.69	1	8.33	0	0	0	0	2	5.71

Source of light: The data on source of light in Dupalli-1 Micro watershed is presented in Table 51. The results indicated that, electricity was the major source of light for 100.00 per cent of the households.

Table 51. Source of light in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Electricity	6	100	13	100	12	100	2	100	2	100	35	100

Table 52. Existence of sanitary toilet facility in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Sanitary toilet facility	3	50	7	54	4	33.33	2	100	2	100	18	51.4

Existence of sanitary toilet facility: The data on availability of toilet facility in Dupalli-1 Micro watershed is presented in Table 52. The results indicated that, 51.43 per cent of the households possess toilets.

Possession of PDS card: The data regarding possession of PDS card in Dupalli-1 Micro watershed is presented in Table 53. The results indicated that, 91.43 per cent of the

households possessed BPL card, 2.86 per cent possessed APL card and 5.71 per cent do not possess PDS card.

Table 53. Possession of PDS card in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	APL	0	0	0	0	0	0	0	0	1	50	1	2.86
2	BPL	6	100	12	92.3	12	100	1	50	1	50	32	91.43
3	Not Possessed	0	0	1	7.69	0	0	1	50	0	0	2	5.71

Participation in NREGA programme: The data regarding Participation in NREGA programme in Dupalli-1 Micro watershed is presented in Table 54. The results indicated that, only 5.71 percent of the households have participated in NREGA programme.

Table 54. Participation in NREGA programme in Dupalli-1 micro-watershed

Sl. No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Participation in NREGA programme	0	0	1	7.69	1	8.33	0	0	0	0	2	5.71

Adequacy of food items: The data regarding adequacy of food items in Dupalli-1 Micro watershed is presented in Table 55. The results indicated that, the extent of adequacy of food items for cereals, pulses, Oilseeds and vegetables were 77.14, 80.00, 57.14, 51.43 per cent respectively, similarly for Fruits (5.71%), milk (31.43%), Egg (37.14%), and Meat (8.57%).

Table 55. Adequacy of food items in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Cereals	1	16.7	10	76.9	12	100	2	100	2	100	27	77.14
2	Pulses	1	16.7	11	84.6	12	100	2	100	2	100	28	80
3	Oilseed	0	0	8	61.5	8	66.67	2	100	2	100	20	57.14
4	Vegetables	0	0	8	61.5	7	58.33	1	50	2	100	18	51.43
5	Fruits	0	0	0	0	1	8.33	1	50	0	0	2	5.71
6	Milk	0	0	5	38.5	3	25	1	50	2	100	11	31.43
7	Egg	0	0	6	46.2	5	41.67	1	50	1	50	13	37.14
8	Meat	0	0	1	7.69	1	8.33	1	50	0	0	3	8.57

Table 56. Inadequacy of food items in Dupalli-1 micro-watershed

Sl.No.	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Cereals	6	100	3	23.1	0	0	0	0	0	0	9	25.71
2	Pulses	5	83.3	2	15.4	0	0	0	0	0	0	7	20
3	Oilseed	6	100	5	38.5	4	33.33	0	0	0	0	15	42.86
4	Vegetables	6	100	5	38.5	5	41.67	1	50	0	0	17	48.57
5	Fruits	6	100	12	92.3	9	75	1	50	2	100	30	85.71
6	Milk	6	100	8	61.5	9	75	1	50	0	0	24	68.57
7	Egg	6	100	7	53.9	6	50	1	50	1	50	21	60
8	Meat	6	100	12	92.3	8	66.67	1	50	2	100	29	82.86

Inadequacy of food items: The data regarding in adequacy of food items in Dupalli-1 Micro watershed is presented in Table 56. The results indicated that, the extent of in adequacy of food items for cereals, pulses, Oilseeds and vegetables were 25.71, 20.00, 42.86, 48.57 and 82.86 per cent respectively, similarly for fruits (85.71%), milk (68.57%), egg (60.00%) and meat (82.86%).

Farming constraints: The data regarding farming constraints experienced by households in Dupalli-1 Micro watershed is presented in Table 57. The results indicated that, lower fertility status of the soil was the constraint experienced by (74.29 %) per cent of the households, wild animal menace on farm field (68.57%), frequent incidence of pest and diseases (74.29%), inadequacy of irrigation water (71.43%), high cost of fertilizers and plant protection chemicals (68.57%), high rate of interest on credit (68.57%), low price for the agricultural commodities (68.57 %), lack of marketing facilities in the area (34.29%), inadequate extension services (51.43 %) and lack of transport for safe transport of the agricultural produce to the market (68.57%).

Table 57. Farming constraints experienced in Dupalli-1 micro-watershed

SN	Particulars	LL (6)		MF (13)		SF (12)		SMF (2)		MDF (2)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Lower fertility status of the soil	0	0	11	84.62	11	91.67	2	100	2	100	26	74.29
2	Wild animal menace on farm field	0	0	10	76.92	10	83.33	2	100	2	100	24	68.57
3	Frequent incidence of pest and diseases	0	0	11	84.62	12	100	1	50	2	100	26	74.29
4	Inadequacy of irrigation water	0	0	9	69.23	12	100	2	100	2	100	25	71.43
5	High cost of Fertilizers and plant protection chemicals	0	0	11	84.62	10	83.33	1	50	2	100	24	68.57
6	High rate of interest on credit	0	0	10	76.92	10	83.33	2	100	2	100	24	68.57
7	Low price for the agricultural commodities	0	0	10	76.92	11	91.67	2	100	1	50	24	68.57
8	Lack of marketing facilities in the area	0	0	5	38.46	6	50	0	0	1	50	12	34.29
9	Inadequate extension services	0	0	7	53.85	7	58.33	2	100	2	100	18	51.43
10	Lack of transport for safe transport of the Agril produce to the market.	0	0	9	69.23	11	91.67	2	100	2	100	24	68.57

Chapter 5

SUMMARY AND IMPLICATIONS

In order to assess the socio-economic condition of the farmers in the watershed 35 households located in the micro watershed were interviewed for the survey. The study was conducted in Dupalli-1 micro-watershed (Ajalapur sub-watershed, Yadgiri taluk & District) is located at North latitude 16^0 32' 55.784" and 16^0 31' 9.82" and East longitude 77^0 24' 37.573" and 77^0 22' 5.889"covering an area of about 658.76 ha bounded by unde Duppalli and Chandapura Villages.

Socio-economic analysis of Dupalli-1 micro watersheds of Ajalapur sub-watershed, Yadgiri taluk & District indicated that, out of the total sample of 35 farmers were sampled in Dupalli-1 micro-watershed among households surveyed 13 (37.14%) were marginal, 12 (34.29%) were small, 2 (5.71 %) were semi medium and 2 (5.71 %) were medium farmers. 6 landless farmers were also interviewed for the survey. The population characteristics of households indicated that, there were 89 (60.54%) men and 58 (39.46 %) were women. The average population of landless was 3.8, marginal farmers were 4.2, small farmers were 4.6, semi medium farmers were 3.5 and medium farmers were 4.2. Majority of the respondents (36.73%) were in the age group of 16-35 years.

Education level of the sample households indicated that, there were 61.22 per cent illiterates, 2.04 percent were functional literates, 32.64 per cent pre university education and 5.44 per cent attained graduation. About, 71.43 per cent of household heads practicing agriculture and 17.14 per cent of the household heads were engaged as agricultural labourers. Agriculture was the major occupation for 51.70 per cent of the household members.

In the study area, 71.43 per cent of the households possess katcha house and 20.00 per cent possess pucca house. The durable assets owned by the households showed that, 51.43 per cent possess TV, 8.57 per cent possess mixer grinder, 91.43 per cent possess mobile phones and 17.14 per cent possess motor cycles.

Farm implements owned by the households indicated that, 11.43 per cent of the households possess plough, 2.86 per cent possess tractor, 5.71 per cent possess bullock cart and 5.71 per cent possess sprayer. Regarding livestock possession by the households, 22.86 per cent possess local cow and 2.86 per cent possess buffalo.

The average labour availability in the study area showed that**,** own labour men available in the micro watershed was 1.43, women available in the micro watershed was 1.20, hired labour (men) available was 5.77 and hired labour (women) available was 5.77. Further, 14.29 per cent of the households opined that hired labour was inadequate during the agricultural season.

In the study area, about 1.36 per cent of the respondents migrated from the micro watershed in search of jobs with an average distance of 1400.00 kms for about 12.00

months. Out of the total land holding of the sample respondents 69.79 per cent (38.92 ha) of the area is under dry condition and the remaining 25.78 per cent area is irrigated land. There were 6.00 live bore wells and 6.00 dry bore wells among the sampled households. Bore well was the major source of irrigation for 17.14 per cent of the households.

The major crops grown by sample farmers are Red gram, Cotton, Groundnut, Green gram and Paddy and cropping intensity was recorded as 100.00 per cent. Out of the sample households 80.00 percent possessed bank account and 57.14 per cent of them have savings in the account.

About 57.14 per cent of the respondents borrowed credit from various sources. Among the credit borrowed by households, 5.00 per cent have borrowed loan from commercial banks and 10.00 per cent from co-operative/Grameena bank. Majority of the respondents (33.33%) have borrowed loan for agriculture purpose. Regarding the opinion on institutional sources of credit.

The per hectare cost of cultivation for Red gram, Cotton, Groundnut, Green gram and Paddy was Rs.32519.84 , 37121.71, 22099.58, 20642.46 and 38671.35 with benefit cost ratio of 1:1.80, 1: 1.90, 1: 2.50, 1: 2.50 and 1:2.49 respectively. Further, 17.14 per cent of the households opined that dry fodder was adequate and 8.57 per cent of the households have opined that the green fodder was adequate.

The average annual gross income of the farmers was Rs. 94451.43 in micro-watershed, of which Rs. 56480.00 comes from agriculture. Sampled households have grown 2 horticulture trees and 72 forestry trees together in the fields and back yards. Households have an average investment capacity of Rs. 1257.14 for land development and Rs. 2857.14 for irrigation facility. Source of funds for additional investment is concerned, 11.43 per cent depends on own funds.

Regarding marketing channels, 40.00 per cent of the households have sold agricultural produce to the local/village merchants, while, 37.14 per cent have sold in regulated markets. Further, 65.71 per cent of the households have used tractor for the transport of agriculture commodity.

Majority of the farmers (62.86%) have experienced soil and water erosion problems in the watershed and 80.00 per cent of the households were interested towards soil testing. Fire was the major source of fuel for domestic use for 62.86 per cent of the households and 37.14 per cent households has LPG connection. Piped supply was the major source for drinking water for 94.29 per cent of the households. Electricity was the major source of light for 100.00 per cent of the households.

In the study area, 51.43 per cent of the households possess toilet facility. Regarding possession of PDS card, 91.43 per cent of the households possessed BPL card, 2.86 per cent of the household's possessed APL card and 5.71 per cent of the household's

were not having ration cards. Households opined that, the requirement of cereals (77.14%), pulses (80.00%) and oilseeds (57.14%) are adequate for consumption.

Farming constraints experienced by households in the micro watersheds were lower fertility status of the soil (74.29%) wild animal menace on farm field (68.57%), frequent incidence of pest and diseases (74.29%), inadequacy of irrigation water (71.43%), high cost of fertilizers and plant protection chemicals (68.57%), high rate of interest on credit (68.57%), low price for the agricultural commodities (68.57%), lack of marketing facilities in the area (34.29%), inadequate extension services (51.43%), lack of transport for safe transport of the agricultural produce to the market (68.57%).

Implications of the survey

- ✓ Result indicated that, there were 61.22 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, 71.43 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 27.16ha (69.79 %) of dry land and 10.04ha (25.78 %) 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 17.14 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 (100.00 %) 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.56480.00 from agriculture, Rs. 24828.57 from wages. 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, 62.86 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, 80.00 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 (74.29%), wild animal menace on farm field (68.57%), frequent incidence of pest and diseases (74.29%), high cost of fertilizers and plant protection chemicals (68.57%), high rate of interest on credit (68.57%), low price for the agricultural commodities (68.57%), lack of marketing facilities in the area (34.29%), inadequate extension services (51.43%), lack of transport for safe transport of the agricultural produce to the market (68.57%) 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.