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

CHIK SULIKERI (4D3A9N2d) MICRO WATERSHED

Irakallagada Hobli, Koppal Taluk and District, Karnataka

Karnataka Watershed Development Project – II

SUJALA – III

World Bank funded Project

The World Bank

ICAR – NATIONAL BUREAU OF SOIL SURVEY AND LAND USE PLANNING

ICAR - NBSS & LUP

WATERSHED DEVELOPMENT DEPARTMENT
GOVT. OF KARNATAKA, BANGALORE

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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PREFACE

In Karnataka, as in other Indian States, the livelihoods of rural people are intertwined with farming pursuits. Thechallenges 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 Chik Sulikeri microwatershed in Koppal Taluk, Koppal 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 **S.K. SINGH**

Date: 10-07-2019 Director, ICAR - NBSS&LUP, Nagpur

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PART-A

LAND RESOURCE INVENTORY

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EXECUTIVE SUMMARY

The land resource inventory of Chik Sulikeri microwatershed was conducted using village cadastral maps and IRS satellite imagery on 1:7920 scale. The false colour composites of IRS imagery were interpreted for physiography and these 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 540 ha in Koppal taluk and district, Karnataka. The climate is semiarid and categorized as drought - prone with an average annual rainfall of 662 mm, of which about 424 mm is received during south–west monsoon, 161 mm during north-east and the remaining 77 mm during the rest of the year.

An area of 93 per cent is covered by soils, 5 per cent by rock outcrops and 2 per cent is by water bodies. The salient findings from the land resource inventory are summarized briefly below.

- *The soils belong to 18 soil series and 35 soil phases (management units) and 8 land management units.*
- *The length of crop growing period is <90 days and starts from 2nd week of August to 2nd week of November.*
- *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 31 major agricultural and horticultural crops were assessed and maps showing the degree of suitability along with constraints were generated.*
- *An area of about 93 per cent is suitable for agriculture.*
- *About 58 per cent of the soils are shallow to moderately shallow (25-75 cm), 29 per cent of the soils are moderately deep to deep (75-150 cm) and 6 per cent soils are very deep (>150 cm).*
- *About 4 per cent area in the microwatershed has sandy soils, 36 per cent area in the microwatershed has loamy soils and 54 per cent clayey soils at the surface.*
- *About 23 per cent area has non-gravelly (<15% gravel) soils, 70 per cent has gravelly to very gravelly (15-60%) soils).*
- *About 82 per cent area is very low to low (<50-100 mm/m), 9 per cent area is medium to high (101-200 mm/m) and 2 per cent area is very high (>200 mm/m) in available water capacity.*

- *About 13 per cent area of the microwatershed has nearly level (0-1% slope) lands, 73 per cent area of the microwatershed has very gently sloping(1-3% slope) lands and 7 per cent area of microwatershed has gently sloping (3-5% slope) lands.*
- *An area of about 52 per cent area is moderately (e2) eroded and about 41 per cent area is slightly (e1) eroded.*
- *An area of about <1 per cent soils are slightly acid (pH 6.0-6.5), 62 per cent soils are neutral (pH 6.5-7.3) and 31 per cent soil are slightly to moderately alkaline (pH 7.3-8.4) in soil reaction.*
- *The Electrical Conductivity (EC) of the soils in the entire cultivated area of the microwatershed is dominantly <2 dsm^{-1} indicating that the soils are non-saline.*
- *Organic carbon is medium (0.5-0.75%) in 78 per cent area and high (>0.75%) in 15 per cent area.*
- *An area of about 93 per cent is medium (23-57 kg/ha) and <1 per cent is high (>57 kg/ha) in available phosphorus.*
- *An area of about 33 per cent is low (<145 kg/ha), 54 per cent is medium (145-337 kg/ha) and 6 per cent is high (>337 kg/ha) in available potassium.*
- *Available sulphur is low (<10 ppm) in an area of about 20 per cent, medium (10 -20 ppm) in 68 per cent and high (>20 ppm) in 5 per cent area of the microwatershed.*
- *Available boron is low (<0.5 ppm) in an area about 65 per cent and medium (0.5-1.0 ppm) in 28 per cent area of the microwatershed.*
- *An area of about 77 per cent is sufficient (>4.5 ppm) and 16 per cent is deficient (<4.5 ppm) in available iron content.*
- *Entire cultivated area is sufficient (>1.0 ppm) in available manganese content.*
- *Entire cultivated area is sufficient (>0.2 ppm) in available copper content.*
- *An area of about 25 per cent is deficient (<0.6 ppm) and 68 per cent is sufficient (>0.6 ppm) in available zinc content.*
- *The land suitability for 31 major crops grown in the microwatershed was 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	*24(4)*	*188(35)*		*Sapota*	*15(3)*	*65(12)*
Maize	*15(3)*	*198(37)*		*Pomegranate*	*15(3)*	*97(18)*
Bajra	*37(7)*	*235(44)*		*Guava*	*15(3)*	*65(12)*
Groundnut	*37(7)*	*227(42)*		*Jackfruit*	*15(3)*	*65(12)*
Sunflower	*24(4)*	*60(11)*		*Jamun*	-	*111(20)*
Cotton	*9(2)*	*204(38)*		*Musambi*	*24(4)*	*88(16)*
Red gram	*15(3)*	*69(13)*		*Lime*	*24(4)*	*88(16)*
Bengalgram	*13(2)*	*218(40)*		*Cashew*	*13(2)*	*52(9)*
Chilli	*15(3)*	*151(28)*		*Custard apple*	*59(11)*	*294(54)*
Tomato	*15(3)*	*151(28)*		*Amla*	*59(11)*	*294(54)*
Brinjal	*36(7)*	*216(40)*		*Tamarind*	-	*61(11)*
Onion	*36(7)*	*164(30)*		*Marigold*	*15(3)*	*198(37)*
Bhendi	*36(7)*	*216(40)*		*Chrysanthemum*	*15(3)*	*198(37)*
Drumstick	*28(5)*	*136(25)*		*Jasmine*	*15(3)*	*166(31)*
Mulberry	*28(5)*	*155(29)*		*Crossandra*	*15(3)*	*141(26)*
Mango	-	*29(5)*				

- *Apart from the individual crop suitability, a proposed crop plan has been prepared for the 8 identified LMU s by considering only the highly and moderately suitable lands for different crops and cropping systems with food, fodder, fibre and other horticulture crops.*
- *Maintaining soil-health is vital for crop production and conserves soil and land resource base for maintaining ecological balance and to mitigate climate change. For this, several ameliorative measures have been suggested for 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 submarginal lands, field bunds and also in the hillocks, mounds and ridges. That would help in supplementing the farm income, provide fodder and fuel, and generate lot of biomass which in turn would help in maintaining the ecological balance and contribute to mitigating the climate change.*

Chapter 1

INTRODUCTION

Soil is a finite natural resource that is central to sustainable agriculture and food security. Over the years, this precious resource is faced with the problems of erosion, salinity, alkalinity, degradation, depletion of nutrients and even decline in availability of land for agriculture. It is a known fact, that it takes thousands of years to form a few centimetres of soil, thus, soil is a precious gift of nature. 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. However, the capacity of a soil to produce is limited and the limits to the production are set by its intrinsic characteristics, agro-climatic setting, and use and management. There is, therefore, tremendous pressure on land and water resources, which is causing decline in soil-health and stagnation in productivity. As much as 121 m ha of land is reportedly degraded which leads to impaired soil quality. It is imperative that steps are urgently taken to check and reverse land degradation without any further loss of time. The improvements in productivity will have to come from sustainable intensification measures that make the most effective use of land and water resources. 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.

Added to this, every year there is a significant diversion of farm lands and water resources for non-agricultural purposes. Thus, developing strategies to slow down the degradation process or reclaim the soils to normal condition and ensure sustainability of production system are the major issues today. This demands a systematic appraisal of our soil and land resources with respect to their extent, geographic distribution, characteristics, behaviour and uses potential, which is very important for developing an effective land use and cropping systems for augmenting agricultural production on a sustainable basis. The soil and land resource inventories made so far in Karnataka had limited utility because the surveys were of different types, scales and intensities carried out at different times with specific objectives. Hence, there is an urgent need to generate

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 all the parameters which are critical for productivity *viz.,* soils, site characteristics like slope, erosion, gravelliness and stoniness, climate, water, 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 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 was 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 Chik Sulikeri microwatershed in Koppal Taluk and 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 scales 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 Chik Sulikeri Microwatershed is located in the central part of northern Karnataka in Koppal Taluk, Koppal District, Karnataka State (Fig.2.1). It comprises parts of Chikkasoolikeri and Upalapura villages. It lies between $15^0$32' – $15^0$34' North latitudes and $76^0$15'– $76^0$17' East longitudes and covers an area of 540 ha. It is about 35 km north of Koppal town and is surrounded by Chellari village on the northern, Hiresoolikeri village on the southwestern, Hasagala village on the southern, Ganganahala village on the southeastern, Archara Timmapur village on western side of the microwatershed.

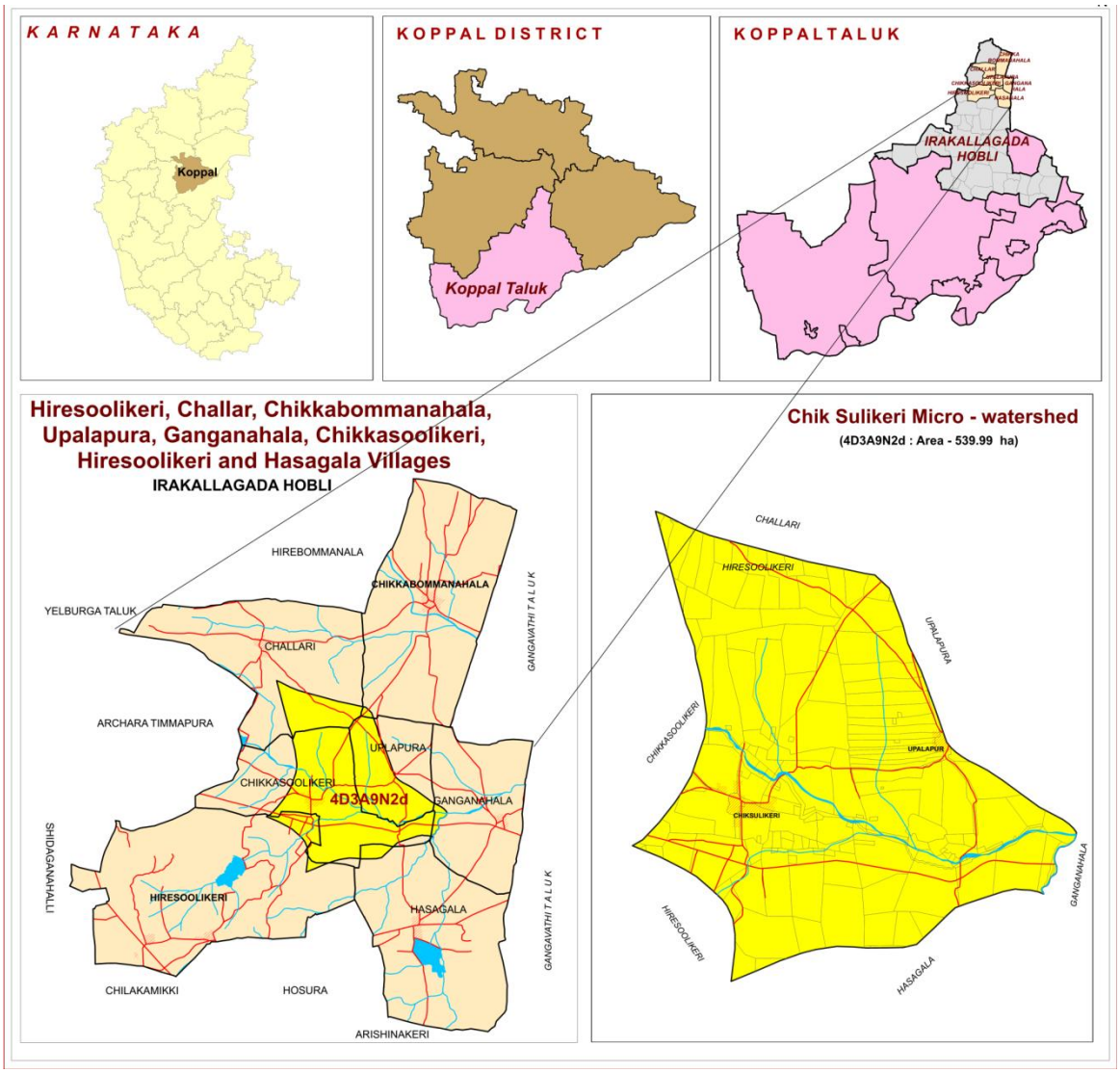


Fig.2.1 Location map of Chik Sulikeri Microwatershed

2.2 Geology

Major rock formation observed in the microwatershed are granite gneiss and alluvium (Figs.2.2 a & b). 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 upto a depth of about 10 m. Dolerite dykes and quartz veins are common with variable width and found to occur in Bettageri village. The soil thickness of the alluvium generally is limited to less than a meter, except in river valleys where it is very deep extending to tens of meters. Such soils are transported and represent palaeo black soils originally formed at higher elevation, but now occupying river valleys.

Fig.2.2 a Granite and granite gneiss rocks

Fig.2.2 b Alluvium

2.3 Physiography

Physiographically, the area has been identified as Granite gneiss and Alluvial landscapes based on geology. The microwatershed area has been further divided into mounds/ridges, summits, side slopes and very gently sloping uplands and nearly level

plains based on slope and its relief features. The elevation ranges from 558-601 m in the gently sloping uplands. The mounds and ridges are mostly covered by rock outcrops.

2.4 Drainage

The area is drained by several small seasonal streams that join Hire *halla* and Chenna *halla* along its course. Though, the streams are not perennial, during rainy season they carry large quantities of rain water. The microwatershed has only few small tanks which are not able to store the water flowing during the rainy season. Due to this, the ground water recharge is very much affected in the villages. This is reflected in the failure of many bore wells in the villages. If the available rain water is properly harnessed by constructing 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 dendritic to sub parallel.

2.5 Climate

The district falls under semiarid tract of the state and is categorized as drought - prone with total annual rainfall of 662 mm (Table 2.1) Of this, a maximum of 424 mm precipitation takes place during south–west monsoon period from June to September, north-east monsoon contributes about 161 mm and prevails from October to early December and the remaining 77 mm received during the rest of the year. The winter season is from December to February. During April and May, the temperatures reach up to 45°C and in December and January, the temperatures will go down to 16°C. Rainfall distribution is shown in Figure 2.3. The average Potential Evapo Transpiration (PET) is 145 mm and varies from a low of 101 mm in December and 193 mm in the months of May. The PET is always higher than precipitation in all the months except in the month of September. Generally, the Length of crop Growing Period (LGP) is <90 days and starts from 2nd week of August to 2nd week of November.

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

Sl. No.	Months	Rainfall	PET	1/2 PET
1	January	1.60	116.70	58.35
2	February	1.50	129.20	64.60
3	March	14.10	169.80	84.90
4	April	18.10	180.60	90.30
5	May	41.60	193.50	96.75
6	June	85.80	167.90	83.95
7	July	72.10	156.20	78.10
8	August	110.50	152.50	76.25
9	September	155.60	138.50	69.25
10	October	116.30	122.30	61.15
11	November	36.00	106.40	53.20
12	December	9.10	101.00	50.50
TOTAL		**662.30**	**144.55**	

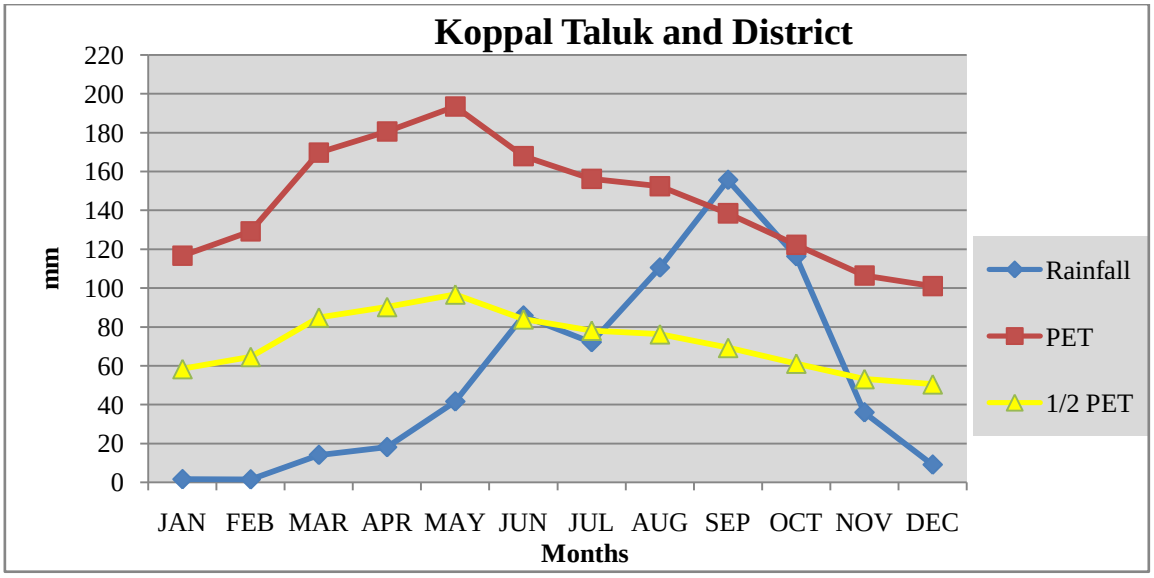


Fig. 2.3 Rainfall distribution in Koppal Taluk and District

2.6 Natural Vegetation

The natural vegetation is sparse comprising few tree species, shrubs and herbs. The mounds, ridges and boulders occupy sizeable areas which are 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 and eventually resulting in the heavy siltation of few tanks and reservoirs in the microwatershed.

Fig 2.4 Natural vegetation of Chik Sulikeri microwatershed

2.7 Land Utilization

About 91 per cent area (Table 2.2) in Koppal district is cultivated at present and about 17 per cent of the area is sown more than once. An area of about 3 per cent is currently barren. Forests occupy a small area of about 5 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 sorghum, maize, bajra, cotton, safflower, sunflower, red gram, horse gram, onion, mulberry, pomegranate, sugarcane, Bengalgram, marigold and groundnut (Fig 2.5). 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 Chik Sulikeri Microwatershed is presented in Fig.2.6. Simultaneously, enumeration of existing wells (bore wells and open wells) and other soil and water conservation structures in the microwatershed is made and their location in different survey numbers is marked on the cadastral map. Map showing the location of wells in Chik Sulikeri Microwatershed is given Fig.2.7.

Table 2.2 Land Utilization in Koppal District

Sl. No.	Agricultural land use	Area (ha)	Per cent
1	Total geographical area	552495	
2	Total cultivated area	500542	90.6
3	Area sown more than once	92696	16.8
4	Trees and groves	210	0.04
5	Cropping intensity	-	118
6	Forest	29451	5.33
7	Cultivable wasteland	2568	0.46
8	Permanent Pasture land	14675	2.66
9	Barren land	16627	3.01
10	Non agricultural land	40591	7.35
11	Current fallow	19660	3.56

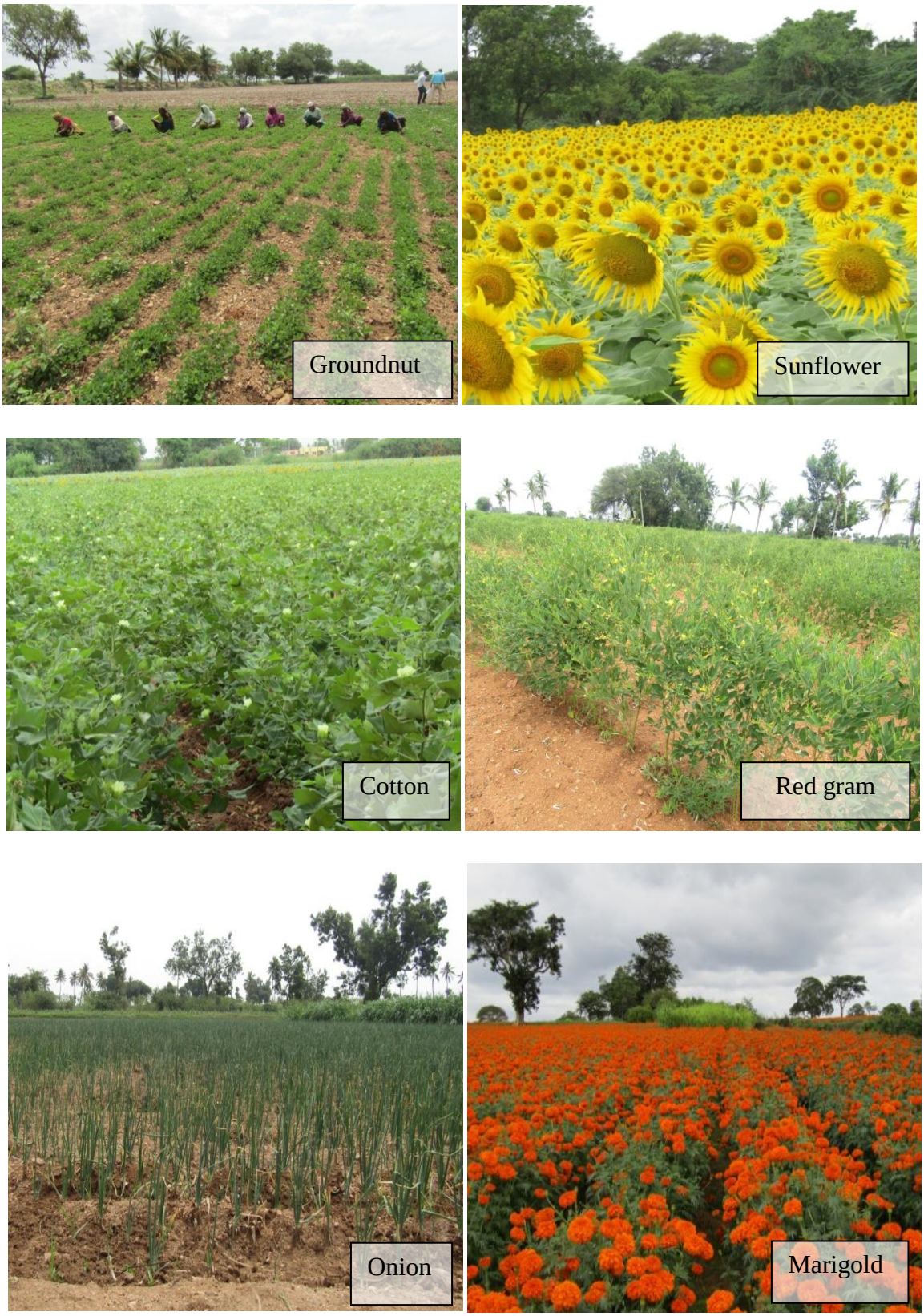


Fig.2.5 Different crops and cropping systems in Chik Sulikeri Microwatershed

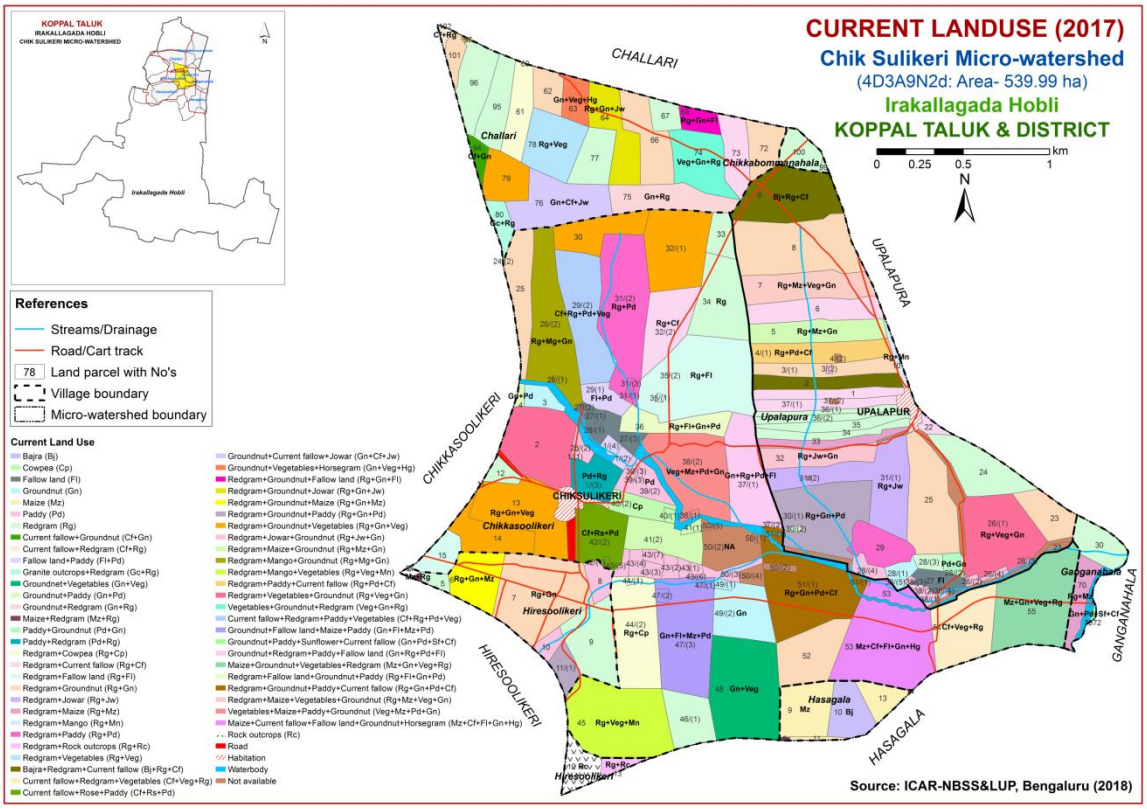


Fig.2.6 Current Land Use – Chik Sulikeri Microwatershed

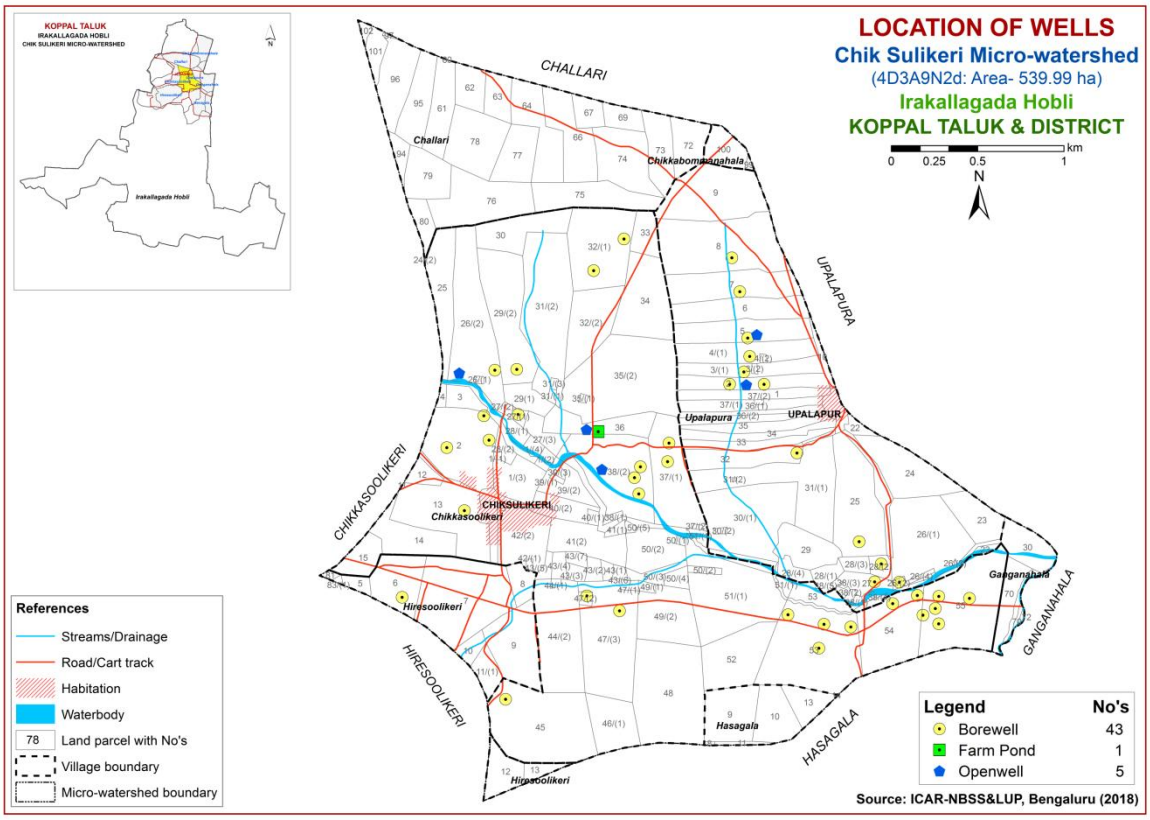


Fig.2.7 Location of wells - Chik Sulikeri Microwatershed

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 for a given level of management. This was achieved in Chik Sulikeri 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, 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 their extent and geographic distribution on the microwatershed cadastral map. The detailed soil survey at 1:7920 scale was carried out in 540 ha area. 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 satellite imagery as base supplied by the 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 geology, 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 used for initial traversing, identification of geology, landscapes 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 (FCC) of Cartosat-I and LISS-IV merged satellite data covering the 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 and alluvial landscapes and is divided into landforms such as uplands, summits and very gently sloping based on slope. 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)

DSe Alluvial landscape

DSe 1 Summit

- DSe 11 Nearly level Summit with dark grey tone
- DSe 12 Nearly level Summit with medium grey tone
- DSe 13 Nearly level Summit with whitish grey tone
- DSe 14 Nearly level Summit with whitish tone (Calcareousness)
- DSe 15 Nearly level Summit with pinkish grey tone
- DSe 16 Nearly level Summit with medium pink tone
- DSe 17 Nearly level Summit with bluish white tone
- DSe 18 Nearly level Summit with greenish grey tone

DSe 2 Very gently sloping

- DSe 21 Very gently sloping, whitish tone
- DSe 22 Very gently sloping, greyish pink tone
- DSe 23 Very gently sloping, whitish grey tone
- DSe 24 Very gently sloping, medium grey tone
- DSe 25 Very gently sloping, medium pink tone
- DSe 26 Very gently sloping, dark grey tone
- DSe 27 Very gently sloping, bluish grey tone
- DSe 28 Very gently sloping, greenish grey tone
- DSe 29 Very gently sloping, Pinkish grey

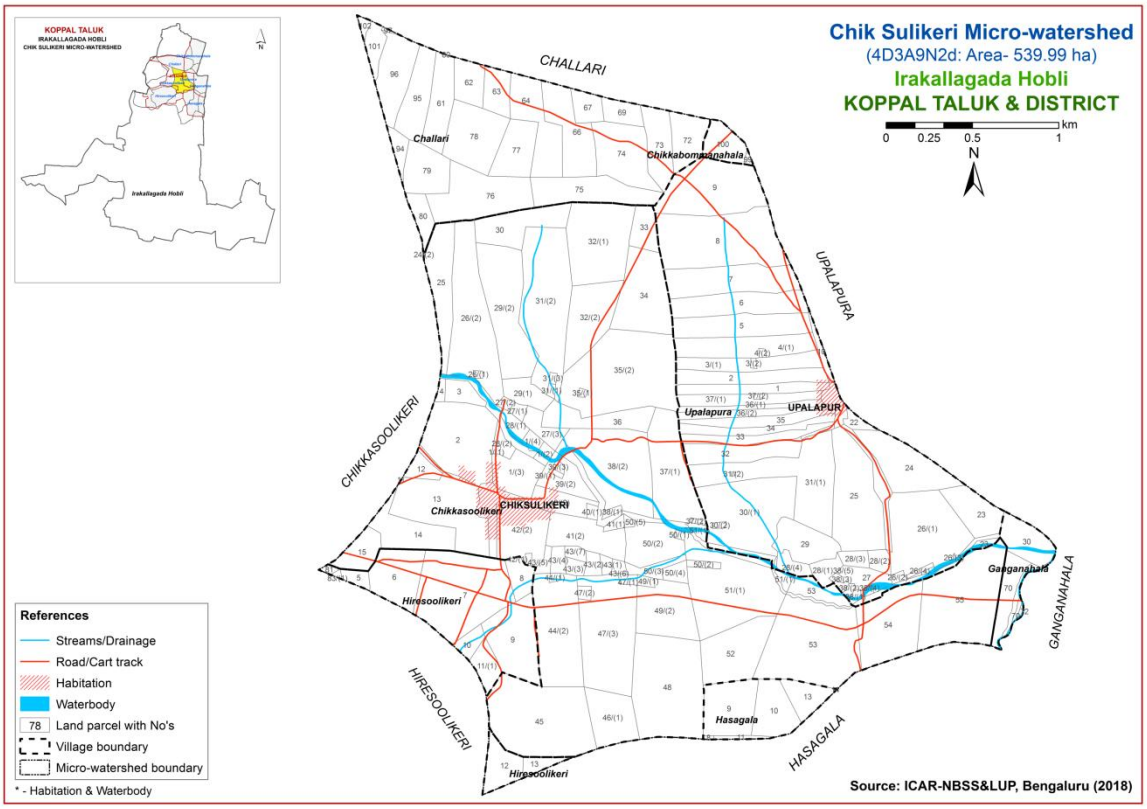


Fig 3.1 Scanned and Digitized Cadastral map of Chik Sulikeri Microwatershed

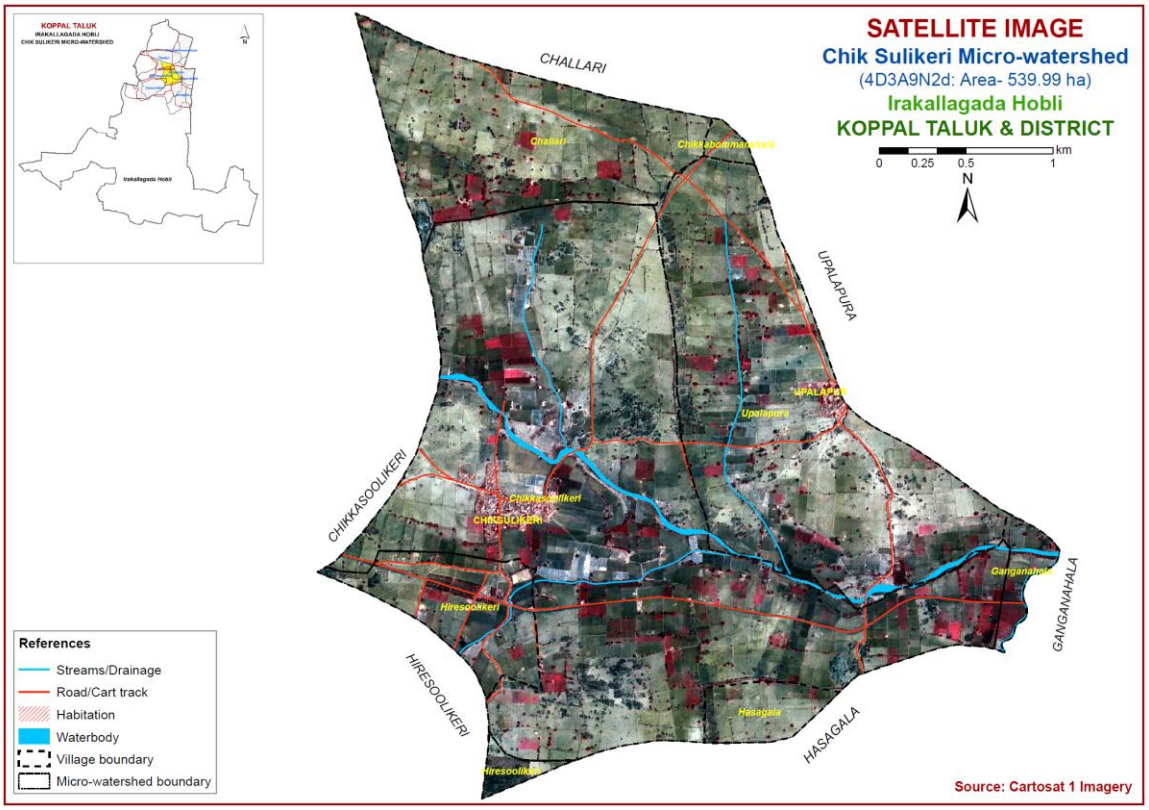


Fig.3.2 Satellite Image of Chik Sulikeri Microwatershed

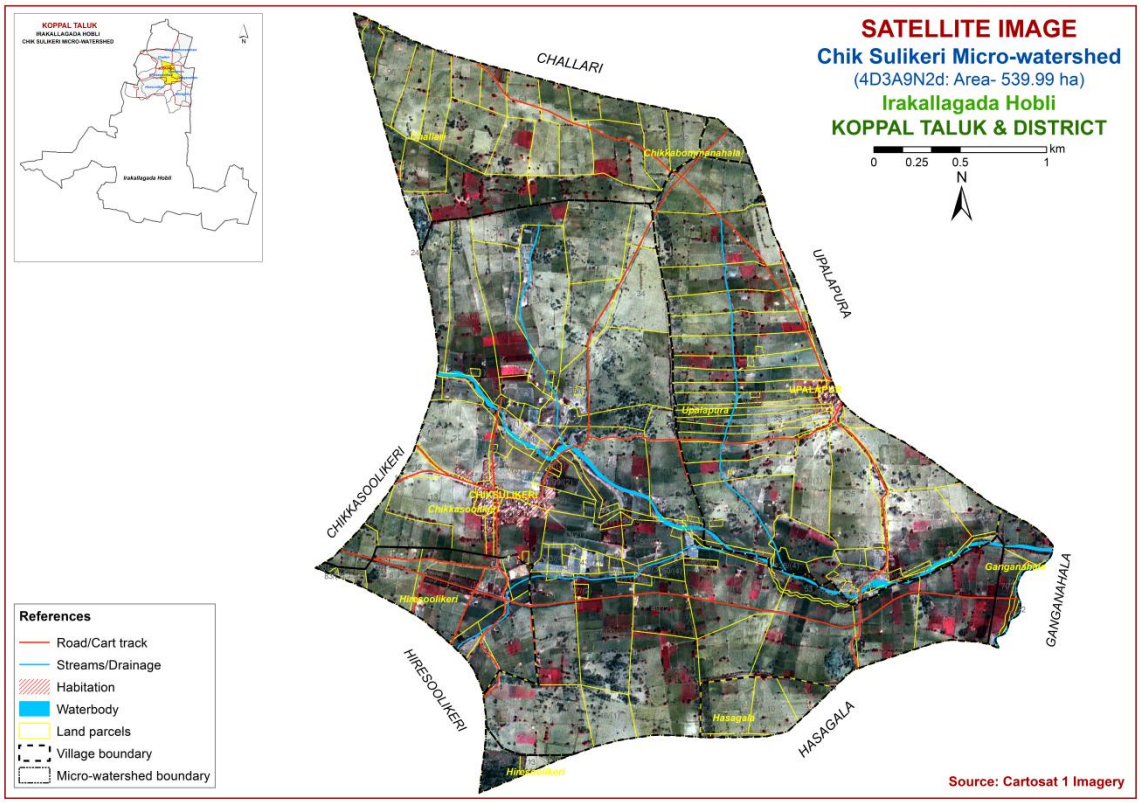


Fig.3.3 Cadastral map overlaid on IRS PAN+LISS IV merged imagery of Chik Sulikeri Microwatershed

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 uplands and plains 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).

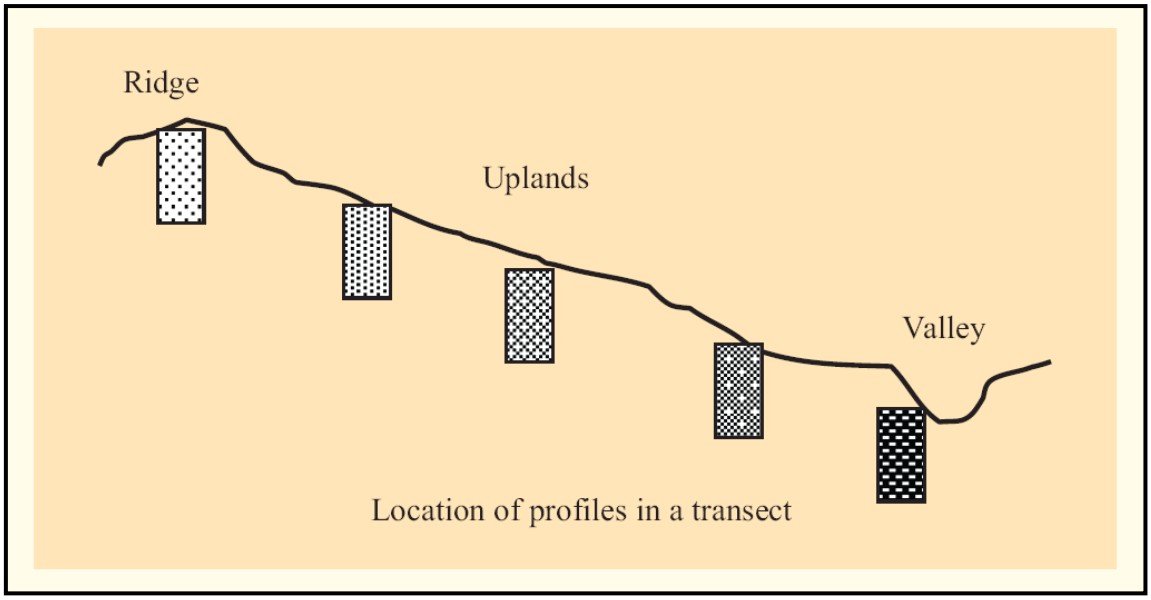


Fig: 3.4. Location of profiles in a transect

In the selected transect, soil profiles (Fig.3.4) were located 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 to validate the soil map unit boundaries.

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, amount and nature of gravel present, calcareousness, 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, 18 soil series were identified in Chik Sulikeri 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	Calcareou-sness
Soils of granite gneiss Landscape							
1	Harve (HRV)	25-50	2.5YR3/4,3/6 5YR3/3,4/4,3/4	gscl	>35	Ap-Bt-Cr-	-
2	Chikkasavanur (CSR)	25-50	7.5YR3/2,3/3,3/4	scl	<15	Ap-Bw-Cr	-
3	Abbigeri (ABR)	25-50	2.5YR 3/3, 3/4	sc	>35	Ap-Bt-Cr	-
4	Lakkur (LKR)	50-75	2.5YR 2.5/3, 2.5/4, 3/4, 3/6	gsc	40-60	Ap-Bt-Bc-Cr	-
5	Kutegoudanahundi (KGH)	50-75	7.5YR3/2,3/3,3/4	gscl	15-35	Ap-Bt-Cr	-
6	Kethanapura (KTP)	50-75	2.5YR3/4, 3/6	gsc	15-35	Ap-Bt-Cr	-
7	Mukhadahalli (MKH)	50-75	5YR3/3,3/4,4/3,5/4,6/6 2.5YR3/4	gscl	>35	Ap-Bt-Cr	-
8	Hooradhahalli (HDH)	75-100	2.5YR2.5/4,3/4, 3/6	gsc-gc	>35	Ap-Bt-Cr	-
9	Gollarahatti (GHT)	75-100	2.5YR3/4,3/6, 4/4,4/6	gscl	15-35	Ap-Bt-Cr	-
10	Kumchahalli (KMH)	100-150	2.5YR3/4, 3/6	sc	<15	Bt-Cr	-
11	Mornal (MNL)	100-150	5YR 3/4, 2.5 YR 3/4, 4/6	gsc	15-35	Ap-Bt-Cr	-
12	Balapur (BPR)	100-150	2.5YR2.5/4,3/4	gsc-gc	>35	Ap-Bt-Cr	-
13	Nagalapur (NGP)	100-150	5YR2.5/2,3/2, 2.5YR3/6,4/6	gsc	>35	Ap-Bt-Cr	-
14	Niduvalalu (NDL)	>150	2.5YR2.5/3,2.5/4, 3/3,4/6	gsc	>35	Ap-Bt	-
15	Kavalakkeri (KLR)	>150	10YR2/1,3/1,3/2 7.5YR2.5/1,3/2	sc	<15	Ap-Bw	e-es
16	Thimmasandra (TSD)	>150	10YR2/12/2,3/1,3/2,4/1,4/2,4/3	c	<15	Ap-Bw	-
Soils of Alluvial Landscape							
17	Ravanaki (RNK)	50-75	7.5YR3/2,3/3,5/2,5/3 10YR3/1,3/2,4/1,4/2,5/1,6/1	c	<15	Ap-Bw-Cr	e-ev
18	Budagumpa (BGP)	>150	7.5YR3/2,5/1 10YR4/1,4/4	c	<15	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 soil 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 and area extent of mapping units representing 18 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 35 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 Laboratory Characterization

Soil samples for each series 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 in the year 2017 from Chik Sulikeri farmer's fields (53 samples) for fertility status (major and micronutrients) at 320 m grid interval 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 using Kriging method for the microwatershed.

3.6 Land Management Units (LMUs)

The 35 soil phases identified and mapped in the microwatershed were regrouped 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 choosen for identification and delineation of LMUs. For Chik Sulikeri 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.

Table 3.2 Soil map unit description of Chik Sulikeri Microwatershed

Soil map unit No*	Soil Series	Soil Phase Symbol	Mapping Unit Description	Area in ha (%)
SOILS OF GRANITE AND GRANITE GNEISS				
	HRV	Harve soils are shallow (25-50 cm), well drained, have dark red to dark reddish brown, red gravelly loamy soils occurring on nearly level to gently sloping uplands under cultivation		**65 (12.32)**
21		HRVcC2g1	Sandy loam surface, slope 3-5%, moderate erosion, gravelly (15-35%)	17 (3.15)
22		HRVcC2g2R2	Sandy loam surface, slope 3-5%, moderate erosion, very gravelly (35-60%), fairly rocky (2-10%)	14 (2.64)
26		HRVhB2g1	Sandy clay loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	11 (2.11)
27		HRVhB2g2	Sandy clay loam surface, slope 1-3%, moderate erosion, very gravelly (35-60%)	7 (1.37)
30		HRViB1g2	Sandy clay surface, slope 1-3%, slight erosion, very gravelly (35-60%)	16 (3.05)
	CSR	Chikkasavanur soils are shallow (25-50 cm), well drained, have dark brown to light yellowish brown, red sandy clay loam soils occurring on nearly level to very gently sloping uplands under cultivation		**6 (1.19)**
39		CSRiB2	Sandy clay surface, slope 1-3%, moderate erosion	6 (1.19)
	ABR	Abbigere soils are shallow (25-50 cm), well drained, have dark reddish brown gravelly red sandy clay to clay soils occurring on very gently sloping uplands under cultivation.		**76 (14.02)**
472		ABRiB2g2	Sandy clay surface, slope 1-3%, moderate erosion, very gravelly (35-60%)	76 (14.02)
	LKR	Lakkur soils are moderately shallow (50-75 cm), well drained, have dark reddish brown to dark red, red gravelly sandy clay to sandy clay loam soils occurring on very gently to moderately sloping uplands under cultivation		**22 (3.99)**
47		LKRhB2g2	Sandy clay loam surface, slope 1-3%, moderate erosion, very gravelly (35-60%)	22 (3.99)
	KGH	Kutegoudanahundi soils are moderately shallow (50-75 cm), well drained, have brown to dark brown gravelly red sandy clay loam soils occurring on very gently to gently sloping uplands under cultivation		**8.01 (1.51)**
65		KGHcB2g1	Sandy loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	8 (1.5)
66		KGHcB2g2	Sandy loam surface, slope 1-3%, moderate erosion, very gravelly (35-60%)	0.01 (0.01)
	KTP	Kethanapura soils are moderately shallow (50-75 cm), well drained, have dark reddish brown gravelly red sandy clay loam soils occurring on very gently sloping uplands under		**56 (10.45)**

		cultivation		
73		KTPiB1	Sandy clay surface, slope 1-3%, slight erosion	15 (2.76)
74		KTPiB1g1	Sandy clay surface, slope 1-3%, slight erosion, gravelly (15-35%)	41 (7.69)
	MKH	Mukhadahalli soils are moderately shallow (50-75 cm), well drained, have dark brown to reddish brown gravelly red sandy clay loam soils occurring on gently very gently to gently sloping uplands under cultivation		**52 (9.65)**
78		MKHcB2g2	Sandy loam surface, slope 1-3%, moderate erosion, very gravelly (35-60%)	12 (2.13)
81		MKHhB1	Sandy clay loam surface, slope 1-3%, slight erosion	4 (0.82)
85		MKHhB2g1	Sandy clay loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	9 (1.68)
88		MKHiB1g1	Sandy clay surface, slope 1-3%, slight erosion, gravelly (15-35%)	13 (2.46)
91		MKHiB2g2	Sandy clay surface, slope 1-3%, moderate erosion, very gravelly (35-60%)	14 (2.56)
	HDH	Hooradhahalli soils are moderately deep (75-100 cm), well drained, have dark red to dark reddish brown, red gravelly sandy clay to sandy clay loam soils occurring on nearly level to moderately sloping uplands under cultivation		**28 (5.11)**
105		HDHbB2g1	Loamy sand surface, slope 1-3%, moderate erosion, gravelly (15-35%)	16 (2.99)
124		HDHhB2g2	Sandy clay loam surface, slope 1-3%, moderate erosion, very gravelly (35-60%)	6 (1.02)
127		HDHiB2	Sandy clay surface, slope 1-3%, moderate erosion	6 (1.1)
	GHT	Gollarahatti soils are moderately deep (75-100 cm), well drained, have dark reddish brown to dark red gravelly sandy clay loam soils occurring on nearly level very gently sloping uplands under cultivation		**23 (4.2)**
134		GHTbB2g1	Loamy sand surface, slope 1-3%, moderate erosion, gravelly (15-35%)	4 (0.74)
138		GHTcB2g1	Sandy loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	19 (3.46)
	KMH	Kumchahalli soils are deep (100-150cm), well drained, have dark reddish brown to dark red sandy clay loam to sandy clay red soils occurring on nearly level to very gently sloping uplands under cultivation		**13 (2.4)**
198		KMHhB1g1	Sandy clay loam surface, slope 1-3%, slight erosion, gravelly (15-35%)	13 (2.4)
	MNL	Mornal soils are deep (100-150 cm), well drained, have dark reddish brown to red gravelly sandy clay loam to sandy clay soils occurring on very gently sloping uplands under cultivation		**15 (2.7)**

205		MNLhB1	Sandy clay loam surface, slope 1-3%, slight erosion	15 (2.7)
	BPR	Balapur soils are deep (100-150 cm), well drained, have dark reddish brown to dark red gravelly sandy clay to clay soils occurring on nearly level to gently sloping uplands under cultivation		**16 (2.95)**
232		BPRhB2g2	Sandy clay loam surface, slope 1-3%, moderate erosion, very gravelly (35-60%)	16 (2.95)
	NGP	Nagalapur soils are deep (100-150 cm), well drained, have dark reddish brown to dark red gravelly sandy clay to clay soils occurring on nearly level to gently sloping uplands under cultivation		**64 (11.89)**
259		NGPhB1g2	Sandy clay loam surface, slope 1-3%, slight erosion, very gravelly (35-60%)	11 (2.06)
261		NGPiA1g1	Sandy clay surface, slope 0-1%, slight erosion, gravelly (15-35%)	22 (4.14)
262		NGPiB1	Sandy clay surface, slope 1-3%, slight erosion	23 (4.29)
460		NGPhC2g1	Sandy clay loam surface, slope 3-5%, moderate erosion, gravelly (15-35%)	8 (1.4)
	NDL	Niduvalalu soils are very deep (>150 cm), well drained, have red to dark reddish brown red gravelly sandy clay soils occurring on nearly level to very gently sloping uplands under cultivation		**1 (0.15)**
296		NDLhB2g1	Sandy clay loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	1 (0.15)
	KLR	Kavalakkeri soils are very deep soils (>150 cm), moderately well drained, have black to dark reddish brown, calcareous sandy clay to clay soil occurring on nearly level to very gently sloping low lands under cultivation		**9 (1.7)**
473		KLRmA1	Clay surface, slope 0-1%, slight erosion	9 (1.7)
	TSD	Thimmasandra soils are very deep (>150 cm), moderately well drained, have very dark brown to very dark grayish brown, black sandy clay to clay soils occurring on nearly level to very gently sloping lowlands under cultivation		**4 (0.68)**
446		TSDmA1	Clay surface, slope 0-1%, slight erosion	4 (0.68)
SOILS OF ALLUVIAL LANDSCAPE				
	RNK	Ravanaki soils are moderately shallow (50-75 cm), moderately well drained, have dark brown to very dark grayish brown and dark gray, calcareous gravelly sandy clay to clay black soils occurring on nearly level to very gently sloping plains under cultivation		**24 (4.46)**
329		RNKiA1	Sandy clay surface, slope 0-1%, slight erosion	16 (2.9)
336		RNKmB2	Clay surface, slope1-3%, moderate erosion	8 (1.56)
	BGP	Budagumpa soils are very deep (>150 cm), moderately well drained, have dark yellowish brown to dark brown and dark gray , calcareous black clay soils occurring on nearly level		**19 (3.52)**

		to very gently sloping plains under cultivation		
395		BGPmA1	Clay surface, slope 0-1%, slight erosion	19 (3.52)
999		Rock outcrops	Rock lands, both massive and bouldery with little or no soil	**26 (4.8)**
1000		Others	Water body	**12 (2.31)**

*Soil map unit numbers are continuous for the taluk, not for the microwatershed

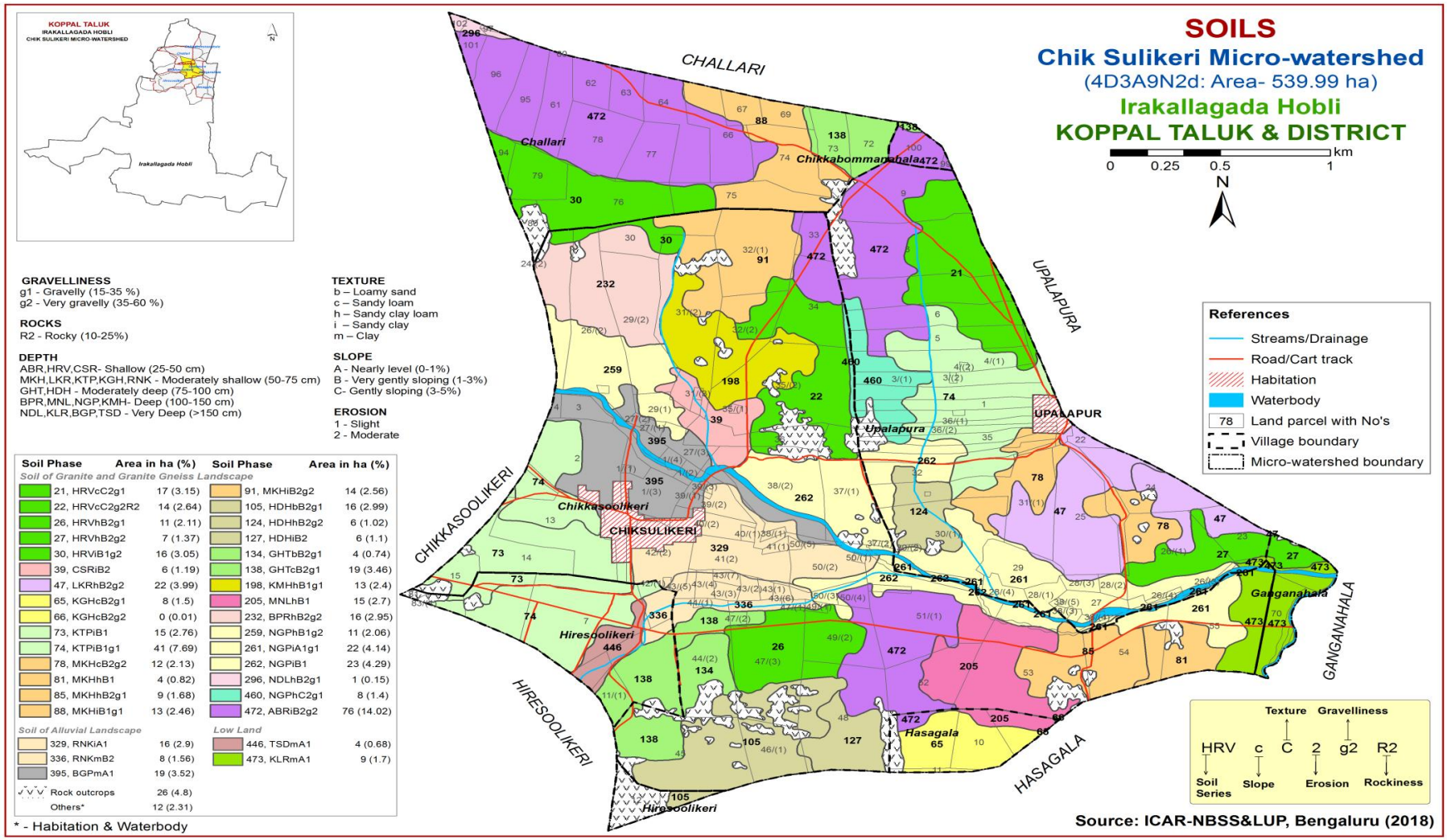


Fig 3.5 Soil Phase or Management Units- Chik Sulikeri Microwatershed

Chapter 4

THE SOILS

Detailed information pertaining to the nature, extent and distribution of different kinds of soils occurring in Chik Sulikeri Microwatershed is provided in this chapter. The microwatershed area has been identified as granite gneiss and alluvial landscapes based on geology. In all, 18 soil series are identified. Soil formation is the result of the combined effect of environmental and terrain factors that are reflected in soil morphology. The soil formation is dominantly influenced by the parent material, climate, time and relief.

A brief description of each of the 18 soil series identified followed by 35 soil phases (management units) mapped (Fig. 3.5) are furnished below. The physical and chemical characteristics of soil series identified in Chik Sulikeri microwatershed is 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, 16 soil series are identified and mapped. Of these, Abbigeri (ABR) series occupies major area 76 ha (14%) followed by Harve (HRV) 65 ha (12%), Nagalapura (NGP) 64 ha (12%), Kethanapura (KTP) 56 ha (10%), Mukhadahalli (MKH) 52 ha (10%), Hooradhahalli (HDH) 28 ha (5%), Gollarahatti (GHT) 23 ha (4%), Lakkur (LKR) 22 ha (4%), Balapur (BPR) 16 ha (3%), Mornal (MNL) 15 ha (3%), Kumchahalli (KMH) 13 ha (2%), Kavalakkeri (KLR) 9 ha (2%), Kutegoudanahundi (KGH) 8 ha (2%), Chikkasavanur (CSR) 6 ha (1%), Thimmasandra (TSD) 4 ha (<1%) and Niduvalalu (NDL) 1 ha (<1%). The brief description of each soil series along with the soil phases identified and mapped is given below.

4.1.1 Harve (HRV) Series: Harve soils are shallow (25-50 cm), well drained, have reddish brown to dark red gravelly sandy clay loam soils. They have developed from weathered granite gneiss and occur on very gently to moderately sloping uplands. The Harve series has been classified as a member of the loamy-skeletal, mixed, isohyperthermic family of (Paralithic) Rhodustalfs.

The thickness of the solum ranges from 28 to 50 cm. The thickness of A-horizon ranges from 12 to 17 cm. Its colour is in 5YR and 2.5 YR hue with value 3 to 4 and chroma 4 to 6. The texture varies from loamy sand to sandy loam with 20 to 60 per cent gravel. The thickness of B-horizon ranges from 16 to 32 cm. Its colour is in 2.5 YR and 5

YR hue with value 3 to 4 and chroma 4 to 6. Its texture is sandy clay loam with gravel content of more than 35 per cent. The available water capacity is very low (<50mm/m). Five soil phases were identified and mapped.

Landscape and soil profile characteristics of Harve (HRV) Series

4.1.2 Chikkasavanur (CSR) Series: Chikkasavanur soils are shallow (25-50 cm), well drained, have dark brown to light yellowish brown sandy clay loam soils. They have developed from weathered granite gneiss and occur on very gently sloping uplands. The Chikkasavanur series has been tentatively classified as a member of the fine-loamy, mixed, isohyperthermic family of Typic Haplustepts.

The thickness of the solum ranges from 32 to 49 cm. The thickness of A-horizon ranges from 12 to 23 cm. Its colour is in 7.5 YR and 10 YR hue with value 2.5 to 4 and chroma 3 to 6. The texture varies from sandy loam to clay with 10 to 20 per cent gravel. The thickness of B horizon ranges from 16 to 32 cm. Its colour is in 7.5 YR and 5 YR hue with value 3 and chroma 2 to 4. Its texture is sandy clay loam with gravel content of < 15 per cent. The available water capacity is low (50-100 mm/m). Only one soil phase was identified and mapped.

Landscape and soil profile characteristics of Chikkasavanur (CSR) Series

4.1.3 Abbigere (ABR) Series: Abbigere soils are shallow (25-50 cm), well drained, have dark reddish brown red gravelly sandy clay soils. They have developed from weathered granite gneiss and occur on very gently sloping uplands under cultivation. The Abbigere soil series has been classified as a member of the Clayey- skeletal, mixed, isohyperthermic family of (Paralithic) Rhodustalfs.

The thickness of the solum ranges from 28 to 48 cm. The thickness of A-horizon ranges from 12 to 17 cm. Its colour is in 5YR and 2.5 YR hue with value 3 to 4 and chroma 3 to 4. The texture is sandy clay with 20 to 35 per cent gravel. The thickness of B-horizon ranges from 16 to 32 cm. Its colour is in 2.5 YR and 5 YR hue with value 2.5 to 4 and chroma 2 to 3. Its texture is sandy clay with gravel content of more than 35 per cent. The available water capacity is very low (<50 mm/m). Only one soil phase was identified and mapped.

4.1.4 Lakkur (LKR) Series: Lakkur soils are moderately shallow (50-75cm), well drained, have reddish brown to dark red gravelly sandy clay red soils. They have developed from weathered granite gneiss and occur on nearly level to very gently and gently sloping uplands. The Lakkur series has been classified as a member of the Clayey-skeletal, mixed, isohyperthermic family of Typic Rhodustalfs.

The thickness of the solum ranges from 51 to 74 cm. The thickness of A-horizon ranges from 12 to 18 cm. Its colour is in 5YR and 2.5 YR hue with value 3 to 4 and chroma 4 to 6. The texture varies from loamy sand to sandy clay loam with 15 to 50 per cent gravel. The thickness of B horizon ranges from 39 to 58 cm. Its colour is in 2.5 YR hue with value 3 to 4 and chroma 4 to 6. Texture is sandy clay with 40 to 60 per cent gravel. The available water capacity is low (50-100 mm/m). Only one soil phase was identified and mapped.

Landscape and soil profile characteristics of Lakkur (LKR) Series

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

The thickness of the solum ranges from 50 to 74 cm. The thickness of A-horizon ranges from 12 to 22 cm. Its colour is in 7.5 YR and 10 YR hue with value and chroma 3 to 4. The texture varies from loamy sand to sandy loam with 15 to 30 per cent gravel. The thickness of B horizon ranges from 40 to 62 cm. Its colour is in 7.5 YR hue with value and chroma 3 to 4. Its texture is sandy clay loam with gravel content of 15 to 35 per cent. The available water capacity is medium (100-150 mm/m). Two soil phases were identified and mapped.

Landscape and soil profile characteristics of Kutegoudanahundi (KGH) Series

4.1.6 Kethanapura (KTP) Series: Kethanapura soils are moderately shallow (50-75cm), well drained, have dark reddish brown gravelly sandy clay soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands. The Kethanapura series has been classified as a member of the Fine, mixed, isohyperthermic family of Rhodic Paleustalfs.

The thickness of the solum ranges from 53 to 72 cm. The thickness of A-horizon ranges from 11 to 16 cm. Its colour is in 5YR and 2.5 YR hue with value 3 to 4 and chroma 3 to 6. The texture varies from loamy sand to sandy clay loam with 15 to 40 per cent gravel. The thickness of B-horizon varies from 41 to 56 cm. Its colour is in 2.5 YR hue with value 3 to 4 and chroma 4 to 6. Texture is dominantly sandy clay loam with 15 to 35 per cent gravel. The available water capacity is medium (101-150 mm/m). Two soil phases were identified and mapped.

Landscape and soil profile characteristics of Kethanapura (KTP) Series

4.1.7 Mukhadahalli (MKH) Series: Mukhadahalli soils are moderately shallow (50-75 cm), well drained, have dark brown to reddish brown gravelly sandy clay loam soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands. The Mukhadahalli series has been classified as a member of the clayey-skeletal, mixed, isohyperthermic family of Typic Haplustalfs.

The thickness of the solum ranges from 51 to 72 cm. The thickness of A-horizon ranges from 12 to 17 cm. Its colour is in 5 YR and 7.5 YR hue with value 3 to 4 and chroma 2 to 4. The texture varies from loamy sand to sandy loam with 20 to 45 per cent gravel. The thickness of B horizon ranges from 40 to 68 cm. Its colour is in 2.5 YR and 5 YR hue with value and chroma 3 to 6. Texture is sandy clay loam to sandy clay with 35 to 50 per cent gravel. The available water capacity is low (50-100 mm/m). Five soil phases were identified and mapped.

Landscape and soil profile characteristics of Mukhadahalli (MKH) Series

4.1.8 Hooradhahalli (HDH) Series: Hooradhahalli soils are moderately deep (75-100 cm), well drained, have red to dark red and reddish brown gravelly sandy clay to clay soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands. The Hooradhahalli series has been classified as a member of the clayey-skeletal, mixed isohyperthermic family of Rhodic Paleustalfs.

The thickness of the solum ranges from 76 to 100 cm. The thickness of A-horizon ranges from 11 to 19 cm. Its colour is in 5 YR and 2.5 YR hue with value 3 to 4 and chroma 3 to 6. The texture varies from loamy sand to sandy clay with 15 to 50 per cent gravel. The thickness of B horizon varies from 65 to 83 cm. Its colour is in 2.5 YR hue with value 2.5 to 3 and chroma 4 to 6. Texture is sandy clay to clay with 35 to 50 per cent gravel. The available water capacity is low (50-100mm/m). Three soil phases were identified and mapped.

Landscape and soil profile characteristics of Hooradhahalli (HDH) Series

4.1.9 Gollarahatti (GHT) Series: Gollarahatti soils are moderately deep (75-100 cm), well drained, have dark reddish brown to dark red gravelly sandy clay loam soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands. The Gollarahatti series has been classified as a member of the fine-loamy, mixed, isohyperthermic family of Typic Rhodustalfs.

The thickness of the solum ranges from 78 to 98 cm. The thickness of A-horizon ranges from 12 to 18cm. Its colour is in 5 YR and 2.5 YR hue with value 3 to 4 and chroma 4 to 6. Texture varies from loamy sand to sandy clay with 15 to 35 per cent gravel. The thickness of B horizon ranges from 66 to 81cm. Its colour is in 2.5 YR hue with value 3 to 4 and chroma 4 to 6. Texture is sandy clay loam with 15 to 35 per cent gravel. The available water capacity is medium (100-150 mm/m). Two soil phases were identified and mapped.

Landscape and soil profile characteristics of Gollarahatti (GHT) Series

4.1.10 Kumchahalli (KMH) Series: Kumchahalli soils are deep (100-150cm), well drained, have dark reddish brown to dark red sandy clay loam to sandy clay soils. They have developed from weathered granite gneiss and occur on nearly level to very gently sloping uplands. The Kumchahalli series has been classified as a fine, mixed, isohyperthermic family of Typic Rhodustalfs.

The thickness of the solum ranges from 102 to 150 cm. The thickness of A-horizon ranges from 11 to 23 cm. Its colour is in 5 YR and 2.5 YR hue with value 2.5 to 3 and chroma 3 to 6. The texture is dominantly sandy clay. The thickness of B horizon ranges from 95 to 132 cm. Its colour is in 2.5 YR hue with value 3 and chroma 4 to 6. Its texture is dominantly sandy clay loam to sandy clay. The available water capacity is high (150-200 mm/m). Only one soil phase was identified and mapped.

Landscape and soil profile characteristics of Kumchahalli (KMH) Series

4.1.11 Mornal (MNL) Series: Mornal soils are deep (100-150 cm), well drained, have dark reddish brown to dark red gravelly sandy clay soils. They are developed from weathered granite gneiss and occur on very gently sloping uplands under cultivation. The Mornal soil series has been classified as a member of the fine, mixed, isohyperthermic family of Rhodic Paleustalfs.

The thickness of the solum ranges from 112 to 149 cm. The thickness of A-horizon ranges from 15 to 25 cm. Its colour is in 5 YR, 10 YR hue with value 3 to 4 and chroma 2 to 4. The texture is sandy clay loam, sandy clay and clay with 15 to 30 per cent gravel. The thickness of B-horizon ranges from 103 to 131 cm. Its colour is in 2.5 YR and 5 YR hue with value 2.5 to 4 and chroma 3 to 6. Texture is sandy clay loam to sandy clay with 15 to 35 per cent gravel. The available water capacity is medium (101-150 mm/m). Only one soil phase was identified and mapped.

Landscape and soil profile characteristics of Mornal (MNL) Series.

4.1.12 Balapur (BPR) Series: Balapur soils are deep (100-150 cm), well drained, have dark reddish brown to dark red gravelly sandy clay to clay soils. These soils are developed from weathered granite gneiss and occur on very gently to gently sloping uplands. The Balapur series has been classified as a member of the clayey-skeletal, mixed, isohyperthermic family of Typic Rhodustalfs.

The thickness of the solum ranges from 102 to 147 cm. The thickness of A-horizon ranges from 12 to 17cm. Its colour is in 5 YR and 2.5 YR hue with value and chroma 3 to 4. The texture ranges from loamy sand to sandy clay with 15 to 50 per cent gravel. The thickness of B horizon ranges from 90 to 132 cm. Its colour is in 2.5 YR hue with value 2.5 to 3 and chroma 4 to 6. Texture is sandy clay to clay with 35 to 50 per cent gravel. The available water capacity is medium (100-150 mm/m). Only one soil phase was identified and mapped..

Landscape and soil profile characteristics of Balapur (BPR) Series.

4.1.13 Nagalapur (NGP) Series: Nagalapur soils are deep (100-150 cm), well drained, have dark reddish brown to dark red gravelly sandy clay soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands. The Nagalapur series has been classified as a member of the clayey-skeletal, mixed, isohyperthermic Typic Paleustalfs.

The thickness of the solum ranges from 105 to 145 cm. The thickness of A-horizon ranges from 14 to 20 cm. Its colour is in 7.5 YR hue with value and chroma 3 to 4. The texture ranges from sandy loam to sandy clay with 10 to 50 per cent gravel. The thickness of B horizon ranges from 90 to 128 cm. Its colour is in 2.5 YR, 5 YR and 7.5 YR hue with value 3 to 5 and chroma 3 to 6. Texture is sandy clay to clay with 35 to 80 per cent gravel. The available water capacity is low (51-100 mm/m). Four soil phases were identified and mapped.

Landscape Soil Profile Characteristics of Nagalapur (NGP) Series

4.1.14 Niduvalalu (NDL) Series: Niduvalalu soils are very deep (>150 cm), well drained, have dark red and dark reddish brown gravelly sandy clay soils. They have developed from weathered granite gneiss and occur on nearly level to very gently sloping uplands under cultivation. Niduvalalu series has been classified as a member of the Clayey –skeletal, mixed isohyperthermic family of Rhodic Paleustalfs.

The thickness of the solum is more than 150 cm. The thickness of A-horizon ranges from 11 to 15 cm. Its colour is in 5 YR hue with value 3 to 4 and chroma 4 to 6. The texture varies from sandy loam to sandy clay loam with 10 to 30 per cent gravel. The thickness of B-horizon ranges from 150 to 160 cm. Its colour is in 2.5 YR and 5 YR hue with value 2.5 to 4 and chroma 4 to 6. Its texture is sandy clay and ranges from gravelly sandy clay with 20 to 75 per cent gravel. The available water capacity is low (50-100 mm/m). Only one soil phase was identified and mapped.

Landscape Soil Profile Characteristics of Niduvalalu (NDL) Series

4.1.15 Kavalakkeri (KLR) Series: Kavalakkeri soils are very deep (>150 cm), moderately well drained, have black to very dark brown calcareous cracking sandy clay to clay soils. They have developed from weathered granite gneiss and occur on nearly level to very gently sloping lowlands under cultivation. The Kavalakkeri soil series has been classified as a member of the fine, mixed, isohyperthermic (calcareous) Typic Haplustepts.

The thickness of the solum is more than 150 cm. The thickness of A horizon ranges from 18 to 29 cm. Its colour is in 7.5 and 10YR hue with value 3 to 4 and chroma 2 to 4. The texture is sandy clay. The thickness of B horizon ranges from 131-155 cm. Its colour is in 7.5YR and 10 YR hue with value 2 to 4 and chroma 1 to 4. Its texture is sandy clay to clay. The available water capacity is very high (>200mm/). Only one soil phase was identified and mapped.

Landscape and soil profile characteristics of Kavalakkeri (KLR) Series

4.1.16 Thimmasandra (TSD) Series: Thimmasandra soils are very deep (>150 cm), moderately well drained, have very dark brown to very dark grayish brown sandy clay to clay soils. They have developed from weathered granite gneiss and occur on nearly level to very gently sloping lowlands under cultivation. The Thimmasandra soil series has been classified as a member of the fine, mixed, isohyperthermic family of Typic Haplustepts.

The thickness of the solum is more than 150 cm. The thickness of A-horizon ranges from 11 to 17 cm. Its colour is in 10 YR hue with value 3 and chroma 3. The texture is sandy clay. The thickness of B horizon is more than 150 cm. Its colour is in 10 YR hue with value 2 to 4 and chroma 1 to 3. Its texture is sandy clay to clay. The available water capacity is very high (>200 mm/m). Two soil phases were identified and mapped. Only one soil phase was identified and mapped.

Landscape and soil profile characteristics of Thimmasandra (TSD) Series

4.2 Soils of Alluvial landscape

In this landscape, 2 soil series were identified and mapped. Of these, Ravanaki (RNK) series occupies major area 24 ha (4%) and Budagumpa (BGP) 19 ha (4%)**.** The brief description along with the soil phases identified and mapped is given below.

4.2.1 Ravanaki (RNK) Series: Ravanaki soils are moderately shallow (50-75 cm), well drained, have dark brown to very dark grayish brown, calcareous clay soils. They have developed from alluvium and occur on nearly level to very gently sloping uplands. The Ravanaki soil series has been classified as a member of the very fine, smectitic, isohyperthermic (calc) family of Fluventic Haplustepts.

The thickness of the solum ranges from 50 to 75 cm. The thickness of A-horizon ranges from 15 to 20 cm. Its colour is in 7.5 YR and 10 YR hue with value 2 to 3 and chroma 2.5 to 4. The texture varies from sandy clay to clay with 10 to 15 per cent gravel. The thickness of B horizon ranges from 35 to 60 cm. Its colour is in 10 YR and 7.5 YR hue with value 2 to 6 and chroma 2 to 4. Its texture is sandy clay to clay with gravel content of 10 to 20 per cent. The available water capacity is low (51-100 mm/m). Two soil phases were identified and mapped.

Landscape and Soil Profile Characteristics of Ravanaki (RNK) Series

4.2.2 Budagumpa (BGP) Series: Budagumpa soils are very deep (>150 cm), well drained, have black calcareous sandy clay to clay soils. They have developed from Alluvium and occur on very gently sloping uplands under cultivation. Budagumpa series has been classified as a member of the Fine, mixed, isohyperthermic family of Typic Haplustepts.

The thickness of the solum is more than 150 cm. The thickness of A-horizon ranges from 16 to 26 cm. Its colour is in 7.5 YR and 10 YR hue with value 2 to 3 and chroma 2 to 4. The texture varies from sandy clay to clay with 5 to 10 per cent gravel. The thickness of B horizon ranges from 130 to 160 cm. Its colour is in 10 YR and 7.5 YR hue with value 3 to 5 and chroma 1 to 4. Its texture is clay with gravel content of <15 per cent. These soils are calcareous that increase with depth. The available water capacity is very high (>200 mm/m). Only one soil phase was identified and mapped.

Landscape and Soil Profile Characteristics of Budagumpa (BGP) Series

Table: 4.1 Physical and Chemical Characteristics of Soil Series identified in Chik Sulikeri Microwatershed

Series Name: Harve (HRV), **Pedon:** R-10
Location: $15^0$25'11.63"N, $76^0$22'03.65"E Jabbaragudda village, Koppal Taluk and District
Analysis at: NBSS&LUP, Regional Centre, Bangalore. **Classification:** Loamy-skeletal, mixed, isohyperthermic, (Paralithic) Rhodustalfs

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	65.64	9.07	25.28	29.04	12.99	9.00	3.48	11.15	50	scl	12.87	4.81
15-29	Bt1	56.13	7.75	36.12	27.81	11.43	7.21	1.44	8.24	60	sc	15.69	6.24
29-47	Bt2	63.42	6.53	30.05	32.38	13.93	7.48	5.74	3.89	60	scl	15.41	9.29

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	6.05	-	-	0.21	0.93	-	8.89	1.96	0.50	0.08	11.43	11.24	0.44	100.00	0.73
15-29	5.99	-	-	0.15	0.29	-	9.72	2.75	0.51	0.09	13.07	12.71	0.35	100.00	0.74
29-47	6.07	-	-	0.11	0.38	-	9.35	2.47	0.49	0.06	12.36	12.71	0.42	97.29	0.44

Contd....

Series Name: Abbigeri (ABR) **Pedon:** R-11

Location: $15^0$26'14.0"N, $76^0$16'39.0"E Abbigeri village, Koppal Taluk and District

Analysis at: NBSS&LUP, Regional Centre, Bangalore. **Classification:** Clayey- skeletal, mixed, isohyperthermic (Paralithic) Rhodustalfs

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	81.18	8.29	10.53	24.31	11.90	19.33	16.07	9.56	20	ls	7.13	3.91
10-25	Bt1	54.32	7.39	38.29	26.64	11.34	5.83	6.24	4.27	40	sc	14.71	11.30
25-40	Bt2	53.84	7.99	38.17	22.10	14.32	6.43	6.85	4.15	50	sc	16.45	12.00

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	6.13	-	-	0.02	0.81	-	1.56	0.50	0.04	0.01	2.12	3.60	0.34	58.76	0.36
10.-25	6.32	-	-	0.03	0.79	-	5.63	2.41	0.12	0.01	8.17	10.60	0.28	77.07	0.10
25-40	6.27	-	-	0.03	0.64	-	5.41	2.24	0.08	0.01	7.74	12.40	0.32	62.44	0.09

Contd....

Soil Series: Lakkur (LKR), **Pedon:** RM-8.
Location: $15^0$04'26.3"N, $75^0$37'84.1"E, (4D4A3I1f), Belhatti village, Shirahatti taluk, Gadag distrtict
Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Clayey-skeletal, mixed, isohyperthermic Typic Rhodustalf

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
0-21	Ap	74.00	8.34	17.66	9.62	11.57	15.76	23.13	13.92	20	sl	-	-
21-35	Bt	54.37	10.48	35.14	16.33	8.64	9.69	11.59	8.11	40	sc	-	-
35-56	Bc	48.37	13.46	38.17	10.96	7.69	9.17	11.28	9.27	60	sc	-	-

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}							%	%
0-21	8.18	-	-	0.30	0.56	0.94	-	-	0.31	0.55	0.86	12.19	0.69	100.00	4.51
21-35	8.17	-	-	0.30	0.52	1.29	-	-	0.19	0.84	1.03	22.18	0.63	100.00	3.79
35-56	7.95	-	-	0.46	0.48	1.99	-	-	0.24	0.58	0.82	22.94	0.60	100.00	2.53

Contd....

Series Name: Kethanapura (KTP), **Pedon:** R-9
Location: $15^0$25'28.81"N, $76^0$22'00.76" E Jabbaragudda village, Koppal Taluk and District
Analysis at: NBSS&LUP, Regional Centre, Bangalore. **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
0-18	Ap	83.64	10.52	5.84	25.61	22.36	15.24	13.52	6.91	10	ls	7.92	2.58
18-38	Bt1	46.06	5.63	48.31	21.58	9.54	3.53	4.15	7.26	30	sc	19.62	14.48
38-73	Bt2	52.31	6.91	40.78	24.56	12.74	5.96	5.55	3.49	30	sc	17.73	11.95

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}							%	%
0-18	6.42	-		0.07	1.24	-	2.95	0.93	0.57	0.02	4.48	4.41	0.75	100.00	0.05
18-38	6.63	-	-	0.09	0.70	-	11.71	3.53	0.98	0.08	16.31	16.59	0.34	98.30	0.50
38-73	6.88	-	-	0.15	0.48	-	11.36	3.30	0.72	0.13	15.50	15.75	0.39	98.42	0.80

Contd....

Series Name: Mukahadahalli (MKH), **Pedon:** R-11
Location: $15^0$22'05.4"N, $76^0$04'10.3"E, Halageri village, Koppal Taluk and District
Analysis at: NBSS&LUP, Regional Centre, Bangalore. **Classification:** Clayey-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
0-19	Ap	65.71	8.83	25.46	9.27	9.06	14.42	21.52	11.43	70	scl	16.54	8.60
19-32	Bt	55.89	11.13	32.98	6.47	9.18	11.89	19.19	9.18	50	scl	19.24	12.78
32-58	Bt	47.95	10.41	41.63	17.52	3.78	9.13	9.55	7.97	50	sc	24.03	16.02

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}							%	%
0-19	7.38	-	-	0.09	0.2	0.00	8.97	4.32	0.26	0.22	13.77	14.84	0.58	93	1.49
19-32	7.5	-	-	0.106	0.41	0.00	15.98	3.27	0.16	0.50	19.91	20.88	0.63	95	2.38
32-58	7.46	-	-	0.173	0.49	0.00	19.71	4.53	0.23	1.32	25.79	25.76	0.62	100	5.11

Contd....

Soil Series: Hooradhahalli (HDH), **Pedon:** RM-69

Location: $13^0$24'31"N, $76^0$33'41"E, (4D3D8G2d), Hesarahalli village, Chikkanayakanahalli taluk, Tumukura district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Clayey-skeletal, 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
0-18	Ap	72.56	15.17	12.27	4.57	8.33	17.38	23.88	18.39	35	sl	-	-
18-33	Bt1	56.29	10.75	32.96	7.88	10.24	13.41	14.43	10.34	55	scl	-	-
33-58	Bt2	46.66	10.79	42.55	10.79	9.87	8.43	9.04	8.53	55	sc	-	-
58-90	Bt3	43.09	13.63	43.27	9.90	8.25	7.32	8.76	8.87	45	c	-	-

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	6.54	-	-	0.07	0.60	0.00	2.68	1.38	0.44	0.42	4.91	5.84	0.48	84.07	7.11
18-33	5.90	-	-	0.07	0.52	0.00	3.99	1.27	0.09	0.37	5.71	8.61	0.26	66.32	4.29
33-58	6.16	-	-	0.07	0.44	0.00	4.92	1.67	0.08	0.55	7.22	10.00	0.24	72.23	5.50
58-90	6.39	-	-	0.06	0.40	0.00	4.30	2.02	0.08	0.46	6.87	9.21	0.21	74.61	5.05

Contd....

Soil Series: Gollarahatti (GHT), **Pedon:** RM-2
Location: $50^0$04'88.8"N, $75^0$37'65.2"E, (4D4A3I1f), Belhatti village, Shirahatti taluk, Gadag district.
Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** fine-loamy, mixed, isohyperthermic Typic Rhodustalfs

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
0-26	Ap	83.22	5.74	11.05	9.71	11.73	16.68	27.10	16.58	30	ls	-	-
26-63	Bt1	55.91	13.36	30.73	13.05	9.66	11.10	14.29	7.81	20	scl	-	-
63-84	Bt2	57.17	11.38	31.45	10.53	10.11	12.28	13.83	10.42	20	scl	-	-

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}							%	%
0-26	5.70	-	-	0.06	0.20	0.00	1.50	0.60	0.09	0.13	2.32	3.17	0.29	73.00	4.10
26-63	6.26	-	-	0.04	0.24	0.00	7.35	1.55	0.09	0.17	9.15	9.89	0.32	93.00	1.72
63-84	6.50	-	-	0.05	0.20	0.47	-	-	0.09	0.21	0.30	10.18	0.32	100.00	2.06

Contd....

S**eries Name:** Kumchahalli (KMH), **Pedon:** RM-9
Location: $15^0$20’05”N, $76^0$13’21”E, Basapura village, Koppal Taluk and District
Analysis at: NBSS&LUP, Regional Centre, Bangalore. **Classification:** Fine mixed, isohyperthermic Typic Rhodustalfs

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
0-13	Ap	51.76	9.05	39.19	7.99	8.84	13.42	14.38	7.14	-	sc	20.08	13.69
13-27	A2	53.50	8.12	38.38	7.00	11.05	15.21	14.33	5.91	-	sc	17.05	12.32
27-43	A3	63.60	5.01	31.40	3.85	11.56	24.52	18.52	5.14	-	scl	11.76	9.09
43-64	Bt1	48.74	5.91	45.35	8.87	9.31	12.49	12.27	5.81	10	sc	16.68	13.35
64-84	Bt2	45.13	8.90	45.97	9.86	7.12	10.95	10.62	6.57	20	sc	17.45	13.42
84-114	BC	65.04	6.94	28.02	10.49	16.21	17.80	13.88	6.67	40	scl	13.20	9.75

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-13	7.2	-	-	0.193	0.81	3.00	9.69	3.93	1.41	0.08	15.10	15.07	0.38	100	0.54
13-27	7.13	-	-	0.161	0.7	3.00	8.69	3.57	1.29	0.16	13.70	13.75	0.36	100	1.14
27-43	7.31	-	-	0.096	0.89	2.64	5.19	2.36	1.07	0.24	8.86	9.46	0.30	94	2.51
43-64	7.65	-	-	0.089	1.16	2.52	8.25	2.88	0.72	0.35	12.20	12.65	0.28	96	2.79
64-84	7.98	-	-	0.1	0.38	3.12	10.49	2.88	0.26	0.41	14.04	14.63	0.32	96	2.78
84-114	8.23	-	-	0.121	0.58	2.88	8.02	1.87	0.09	0.43	10.41	10.67	0.38	98	4.02

Contd....

Series Name: Mornal (MNL), **Pedon:** R-12
Location: $15^0$22'75"N, $76^0$05'16.1" Halageri village, Koppal Taluk and District
Analysis at: NBSS&LUP, Regional Centre, Bangalore. **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
0-17	Ap	81.48	5.14	13.39	14.07	12.15	17.00	27.53	10.73	70	sl	9.64	4.93
17-31	Bt1	51.43	10.24	38.33	6.67	7.72	9.52	19.26	8.25	30	sc	23.97	11.70
31-56	Bt2	45.62	8.77	45.62	17.85	7.31	8.14	8.87	3.44	30	sc	25.94	12.45
56-104	Bt3	53.10	10.62	36.28	21.87	10.30	8.10	7.99	4.84	<30	sc	20.95	10.16
104-126	Bc	54.21	12.88	32.91	12.28	8.84	15.92	10.20	6.97	<30	scl	19.96	10.21

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}							%	%
0-17	7.89	-	-	0.137	0.33	0.00	4.92	3.35	0.35	0.45	9.07	9.01	0.67	100	5.04
17-31	8.19	-	-	0.31	0.45	0.00	7.24	5.16	0.16	0.15	12.70	13.57	0.35	94	1.12
31-56	8.2	-	-	0.414	0.53	0.00	6.49	5.32	0.11	0.13	12.05	18.55	0.41	65	0.71
56-104	8.64	-	-	0.422	0.37	0.00	6.21	4.64	0.16	0.14	11.15	15.16	0.42	74	0.95
104-126	8.71	-	-	0.436	0.2	0.00	7.06	6.31	0.09	0.33	13.79	14.52	0.44	95	2.31

Contd....

Soil Series: Balapur (BPR), **Pedon**: RM-78
Location: $13^0$26'39"N, $76^0$35'03"E, (4D3D8G2c), Kasaba, Chikkanayakanahalli taluk, Tumakuru district
Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Clayey-skeletal, mixed, isohyperthermic, Typic Rhodustalfs

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-12	Ap	65.66	18.66	15.68	4.14	6.16	13.33	21.82	20.20	-	sl	-	-
12-34	Bt1	61.91	11.52	26.57	2.36	6.78	12.53	21.36	18.89	-	scl	-	-
34-60	Bt2	51.81	11.24	36.94	4.66	5.70	12.23	15.96	13.26	30	sc	-	-
60-84	Bt3	46.61	9.02	44.37	14.70	6.88	7.51	8.97	8.55	55	sc	-	-
84-112	Bt4	48.75	12.92	38.33	15.73	8.13	6.87	8.23	9.79	60	sc	-	-
112-127	Bc	50.98	24.74	24.28	5.25	4.63	5.15	10.92	25.03	50	scl	-	-

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-12	6.64	-	-	0.03	0.56	0.00	1.90	1.32	0.21	0.03	3.46	5.45	0.35	63.48	0.51
12-34	6.99	-	-	0.02	0.48	0.00	3.66	1.90	0.07	0.08	5.70	7.82	0.29	72.93	0.96
34-60	7.29	-	-	0.02	0.40	0.00	5.13	2.08	0.11	0.20	7.52	11.19	0.30	67.18	1.75
60-84	7.50	-	-	0.02	0.32	0.00	5.83	6.36	0.13	0.23	12.55	12.38	0.28	101.43	1.83
84-112	7.54	-	-	0.02	0.24	0.00	6.02	6.59	0.11	0.25	12.96	12.77	0.33	101.49	1.97
112-127	7.90	-	-	0.02	0.20	0.00	8.04	3.62	0.07	0.32	12.04	12.47	0.51	96.56	2.55

Contd....

Series Name: Nagalapur (NGP) **Pedon:** R-10
Location: $15^0$26'38.0"N, $76^0$10'27.0" E Budashettynala village, Koppal Taluk and District
Analysis at: NBSS&LUP, Regional Centre, Bangalore. **Classification:** clayey-skeletal, 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
0-16	Ap	78.43	6.36	15.21	25.23	18.82	14.04	13.22	7.12	30	sl	9.32	5.56
16-38	Bt1	46.97	8.53	44.51	14.33	12.34	7.43	6.80	6.07	30	sc	18.70	13.79
38-58	Bt2	51.92	7.48	40.60	20.98	10.07	7.37	7.48	6.02	40	sc	17.93	13.75
58-81	Bt3	54.05	7.18	38.77	27.07	10.58	5.91	5.81	4.67	50	sc	17.92	11.87
81-104	Bt4	59.03	8.93	32.04	21.88	13.11	8.88	8.05	7.12	50	scl	16.63	10.55
104-126	BC	62.35	9.26	28.40	21.19	14.51	9.88	8.13	8.64	60	scl	15.03	10.06

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}							%	%
0-16	6.77	-	-	0.09	0.82	-	3.52	2.14	0.18	0.03	5.87	7.10	0.47	82.70	0.46
16-38	6.89	-	-	0.06	0.57	-	9.35	3.85	0.10	0.21	13.50	14.70	0.33	91.87	1.40
38-58	6.80	-	-	0.06	0.52	-	8.76	3.42	0.10	0.26	12.55	14.20	0.35	88.35	1.85
58-81	6.84	-	-	0.06	0.32	-	7.67	2.77	0.10	0.58	11.12	12.90	0.33	86.18	4.48
81-104	6.86	-	-	0.05	0.20	-	6.97	2.07	0.09	0.95	10.07	11.90	0.37	84.59	7.95
104-126	6.70	-	-	0.07	0.10	-	5.53	1.77	0.07	0.73	8.09	9.40	0.33	86.09	7.77

Contd....

Series Name: Niduvalalu (NDL) **Pedon:** R-20
Location: $15^0$12'78.8"N, $75^0$57'44.0" E Raghunathanahalli village, Koppal Taluk and District
Analysis at: NBSS&LUP, Regional Centre, Bangalore. **Classification:** clayey–skeletal, 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
0-16	Ap	79.83	7.02	13.15	9.36	11.02	19.54	28.59	11.33	35-40	sl	14.30	5.17
16-31	Bt1	54.75	10.89	34.36	12.81	7.47	12.17	11.95	10.35	55-60	scl	24.67	14.17
31-44	Bt2	44.64	2.31	53.06	17.06	8.48	7.19	8.05	3.86	65-70	c	30.02	17.19
44-79	Bt3	47.28	2.50	50.21	24.17	8.20	6.07	5.96	2.88	65-70	sc	27.19	14.87
79-107	Bt4	47.79	8.17	44.04	13.38	5.72	11.11	11.87	5.72	60-65	sc	25.96	14.23
107-140	Bt5	46.16	3.57	50.27	21.75	7.57	6.40	6.72	3.73	60-65	sc	27.28	15.13
140-180	Bt6	49.47	3.94	46.59	22.49	8.21	6.29	7.78	4.69	65-70	sc	27.56	14.76

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}							%	%
0-16	7.46	-	-	0.08	0.76		6.26	4.05	0.12	0.09	10.52	11.45	0.87	91.88	0.32
16-31	7.84	-	-	0.28	1.05	2.86	-	-	0.18	1.41	-	27.36	0.80	100.00	2.06
31-44	7.69	-	-	0.46	0.81	2.99	-	-	0.24	2.63	-	32.59	0.61	100.00	3.23
44-79	7.92	-	-	0.11	0.35	1.69	16.29	3.51	0.14	2.63	22.57	22.56	0.45	100.03	4.66
79-107	7.86	-	-	0.09	0.23	1.43	12.98	2.83	0.10	1.82	17.73	17.88	0.41	99.19	4.07
107-140	8.20	-	-	0.07	0.23	1.17	16.26	3.41	0.13	1.85	21.65	20.82	0.41	104.01	3.56
140-180	8.11	-	-	0.20	0.15	1.82	-	-	0.11	1.29	-	20.71	0.44	100.00	2.49

Contd....

Series Name: Ravanaki (RNK), **Pedon:** RM-20
Location: $15^0$14'22.7"N, $75^0$57'45.8"E, Gatareddihalla village, Koppal Taluk and District
Analysis at: NBSS&LUP, Regional Centre, Bangalore. **Classification:** very fine, smectitic, isohyperthermic (calc) 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
0-28	Ap	24.43	17.76	57.81	5.30	3.89	3.78	7.14	4.32	20	c	41.40	29.60
28-55	Bw	18.77	15.59	65.64	2.74	3.73	2.85	4.83	4.61	10	c	46.71	35.18
55-80	Bc	12.53	15.43	72.04	2.60	1.92	1.47	3.16	3.39	10	c	56.82	43.73

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}							%	%
0-28	8.86	-	-	0.483	0.63	15.48	-	-	0.86	6.27	-	37.00	0.64	-	6.78
28-55	8.61	-	-	1.4	0.23	13.68	-	-	0.68	12.27	-	53.20	0.81	-	9.22
55-80	8.35	-	-	4.53	0.91	11.40	-	-	0.75	28.97	-	54.80	0.76	-	21.14

Contd....

Series Name: Budagumpa (BGP) **Pedon:** R-21
Location: $15^0$23'45"N, $76^0$08'52"E Neregalla village, Koppal Taluk and District
Analysis at: NBSS&LUP, Regional Centre, Bangalore. **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
0-16	Ap	58.30	18.10	23.60	6.34	11.75	11.66	17.44	11.10	-	scl	18.24	10.29
16-38	Bw1	44.26	18.39	37.36	4.71	9.79	9.32	12.24	8.19	-	cl	32.99	18.12
38-68	Bw2	37.84	24.91	37.25	3.66	7.51	8.45	10.89	7.32	-	cl	39.50	22.32
68-83	Bw3	19.17	19.89	60.93	0.87	3.47	3.85	6.07	4.91	-	c	47.27	28.52
83-107	Bw4	14.76	23.22	62.02	0.63	2.41	3.25	4.61	3.87	-	c	46.10	29.36
107-131	Bw5	11.86	17.75	70.39	0.85	2.73	2.45	3.20	2.64	-	c	50.52	28.09
131-160	Bw6	14.48	18.21	67.31	2.23	2.50	2.59	3.84	3.31	-	c	59.14	28.35

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}							%	%
0-16	9.20	-	-	0.27	0.51	6.24	-	-	0.42	3.11	-	19.60	0.83	100.00	3.84
16-38	9.29	-	-	0.88	0.35	5.98	-	-	0.17	9.36	-	28.40	0.76	100.00	15.38
38-68	8.95	-	-	2.37	0.31	4.81	-	-	0.31	24.10	-	34.90	0.94	100.00	42.65
68-83	8.65	-	-	4.28	0.33	4.42	-	-	0.39	27.95	-	45.10	0.74	100.00	25.94
83-107	8.10	-	-	9.50	0.30	3.38	-	-	0.44	31.29	-	44.10	0.71	100.00	12.82
107-131	8.16	-	-	9.32	0.22	2.73	-	-	0.63	37.86	-	47.20	0.67	100.00	20.37
131-160	8.49	-	-	5.29	0.19	3.51	-	-	0.60	34.82	-	43.70	0.65	100.00	48.66

Contd....

Series Name: Kavalakkeri (KLR) **Pedon:** R-5
Location: $15^0$27'55.2"N, $76^0$15'48.0" E Kenchanadoni village, Koppal Taluk and District
Analysis at: NBSS&LUP, Regional Centre, Bangalore. **Classification:** fine, mixed, isohyperthermic (calc) 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
0-21	Ap	41.67	28.70	29.62	6.62	10.58	5.70	8.00	10.76	-	cl	22.02	15.06
21-40	Bw1	32.23	29.16	38.61	3.76	4.03	3.04	8.24	13.16	-	cl	26.28	19.49
40-70	Bw2	37.41	26.13	36.46	7.52	6.25	4.62	8.61	10.42	-	cl	26.65	18.87
70-106	Bw3	46.43	18.15	35.42	13.93	14.29	5.98	5.98	6.25	-	sc	22.83	17.66
106-137	Bw4	55.64	12.91	31.45	10.59	8.16	12.67	11.46	12.76	-	scl	24.04	12.85
137-162	Bw5	47.16	16.68	36.16	2.88	4.80	5.68	17.12	16.68	-	sc	30.46	16.24

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}							%	%
0-21	7.11	-	-	0.33	0.82	8.84	-	-	0.10	0.67	-	19.50	0.66	100.00	3.42
21-40	7.50	-	-	0.32	0.40	6.63	-	-	0.15	0.99	-	23.20	0.60	100.00	4.26
40-70	7.68	-	-	0.33	0.34	8.19	-	-	0.09	1.18	-	21.90	0.60	100.00	5.38
70-106	7.82	-	-	0.23	0.42	6.50	-	-	0.07	1.36	-	21.80	0.62	100.00	6.23
106-137	7.86	-	-	0.23	0.32	3.57	-	-	0.08	0.95	-	17.30	0.55	100.00	5.47
137-162	7.75	-	-	0.31	0.38	3.90	-	-	0.09	1.01	-	22.10	0.61	100.00	4.55

Contd....

Soil Series: Thimmasandra (TSD), **Pedon:** R-14
Location: 11°55'64.2"N, 76°51'82.9" E, (4B3A5K3b), Somanapura village, Chamarajanagara 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
0-19	Ap	12.27	25.92	61.81	0.98	0.98	1.52	3.91	4.89	-	c	-	-
19-33	Bw1	32.98	26.29	40.72	2.75	4.44	4.97	8.35	12.47	-	c	-	-
33-58	Bw2	10.21	27.99	61.81	0.98	1.30	1.19	2.17	4.56	-	c	-	-
58-83	Bw3	9.83	27.40	62.77	1.09	0.98	0.98	1.86	4.91	-	c	-	-
83-95	Bw4	6.17	26.07	67.76	0.99	0.77	0.55	0.99	2.86	-	c	-	-
95-116	Bw5	7.52	28.87	63.61	0.77	1.00	1.11	1.88	2.77	-	c	-	-

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}							%	%
0-19	8.46	-	-	0.175	1.01	4.45	-	-	1.91	0.18		36.61	0.59	100	0.19
19-33	8.65	-	-	0.16	0.81	6.41	-	-	0.77	0.39		23.98	0.59	100	0.64
33-58	8.94	-	-	0.26	0.56	6.90	-	-	0.82	2.24		33.59	0.54	100	2.67
58-83	9.13	-	-	0.335	0.4	8.01	-	-	0.30	1.01		36.72	0.58	100	1.10
83-95	9.05	-	-	0.412	0.36	4.58	-	-	0.76	4.17		38.88	0.57	100	4.30
95-116	8.96	-	-	0.4	0.28	4.21	-	-	0.96	4.02		43.63	0.69	100	3.68

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, land irrigability, 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 and, soil and water conservation measures and structures needed thus helping to maintain good soil health for sustained crop production. The various 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: Soil depth, soil texture, coarse fragments, soil reaction, available water capacity, calcareousness, salinity/alkali *etc*.

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 severe 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/alkali 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 identified 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 upto land capability subclass level.

The 35 soil map units identified in the Chik Sulikeri microwatershed are grouped under 2 Land capability classes and 5 land capability subclasses (Fig. 5.1). Entire cultivated area of about 503 ha (93%) is suitable for agriculture. An area of about 26 ha (5%) is under rock lands and 12 ha (2%) is under habitation and settlements.

An area of about 200 ha (37%) has good lands (Class II) with minor problems of soil, drainage and erosion and are distributed in the central, northern, southern, eastern and southeastern parts of the microwatershed. Major area about 303 ha (56%) has moderately good lands (Class III) with moderate limitations of soil and erosion and are distributed in the central, northwestern, northern, northeastern, eastern, southeastern, western and southern parts of the microwatershed. An area of about 26 ha (5%) and 12 ha (2%) is under rock outcrops and water bodies respectively and are distributed in the minor parts of the microwatershed.

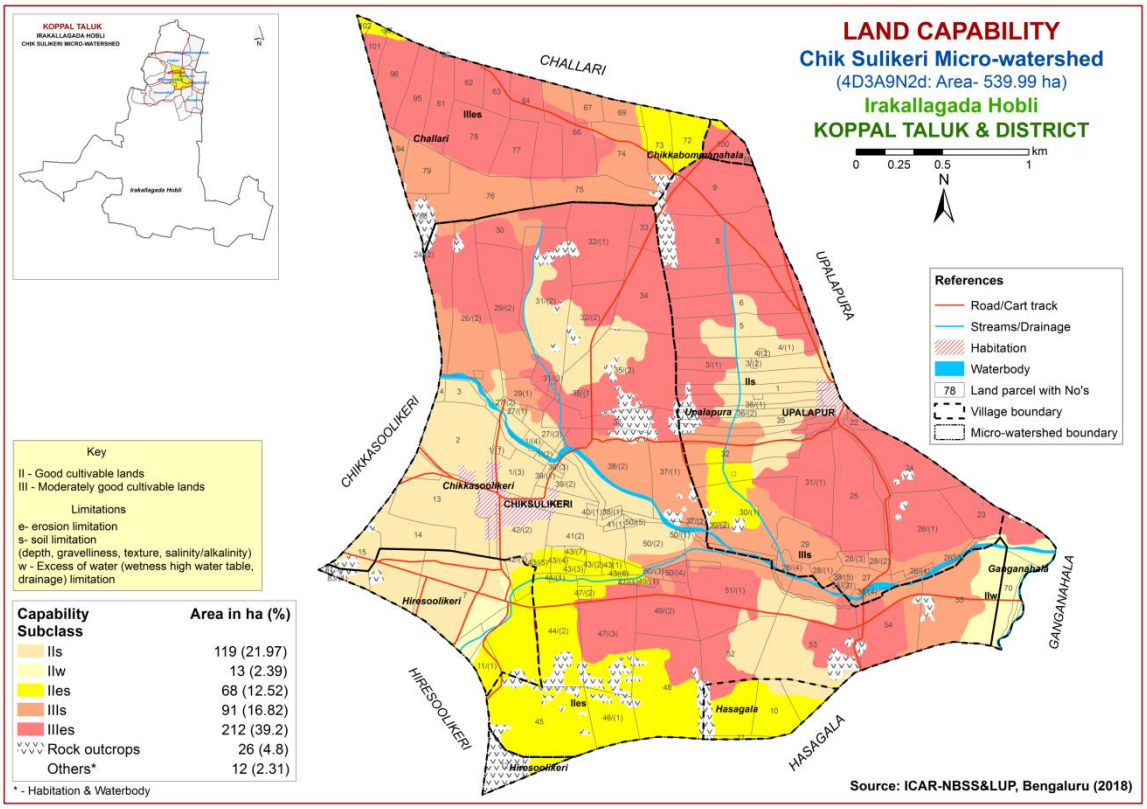


Fig. 5.1 Land Capability map of Chik Sulikeri Microwatershed

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 (Fig. 5.2).

Major area of about 311 ha (58%) is under shallow to moderately shallow (25-75 cm) soils and are distributed in the central, northwestern, northern, northeastern, eastern, southeastern and southern part of the microwatershed. Moderately deep (75-100 cm) and deep (100-150 cm) soils occupy an area of about 158 ha (29%) and occur in the central, western, northwestern, northern, southeastern and southern part of the microwatershed. Very deep (>150 cm) soils occupy an area of 33 ha (6%) and occur in the southwestern, western, southern, northern and southeastern part of the microwatershed.

The most productive lands cover about 141 ha (26%) where all climatically adopted long duration crops be grown. The problem soils cover about 149 ha (28%) area where only short duration crops can be grown and the probability of crop failure is high.

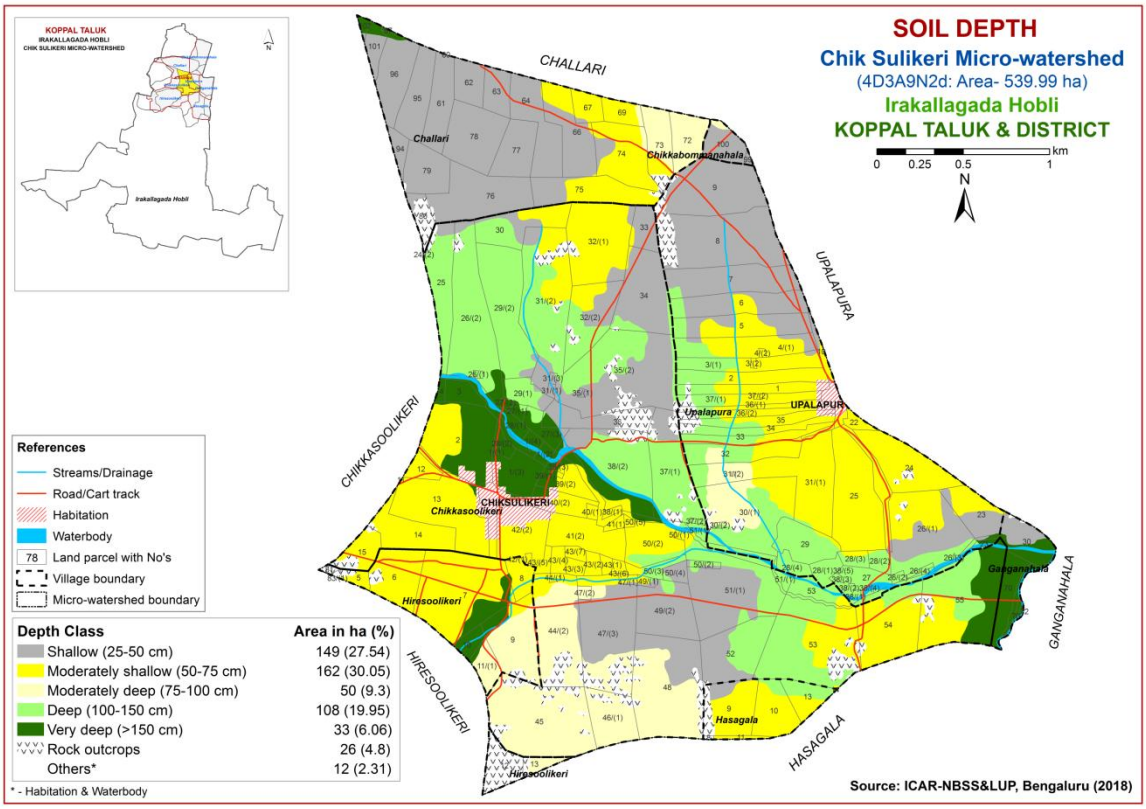


Fig. 5.2 Soil Depth map of Chik Sulikeri Microwatershed

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 showing sandy, loamy and clayey at the surface was generated. The area extent and their geographical distribution in the microwatershed is shown in Fig.5.3.

An area of about 20 ha (4%) has soils that are sandy at the surface and are distributed in the southern part of the microwatershed. An area of about 192 ha (36%) is loamy and is distributed in the central, western, northern, northeastern, eastern, southeastern and southern part of the microwatershed. Maximum area of 289 ha (54%) has soils that are clayey at the surface and occur in all parts of the microwatershed.

Entire area has most productive lands with respect to surface soil texture except 4 per cent area where they are sandy soils. The clayey soils (54%) have high potential for soil-water retention and availability, and nutrient retention and availability, but have more problems of drainage, infiltration, workability and other physical problems. The other productive lands are loamy soils (36%) which also have high potential for soil-

water retention and nutrient availability but have no drainage or other physical problems. The sandy soils (4%) are also productive for root and tuber crops, but these soils have the major limitation of moisture and nutrient retention capacity, hence frequent and shallow irrigation with balanced fertilizer application is to be followed in order to get better crop yields.

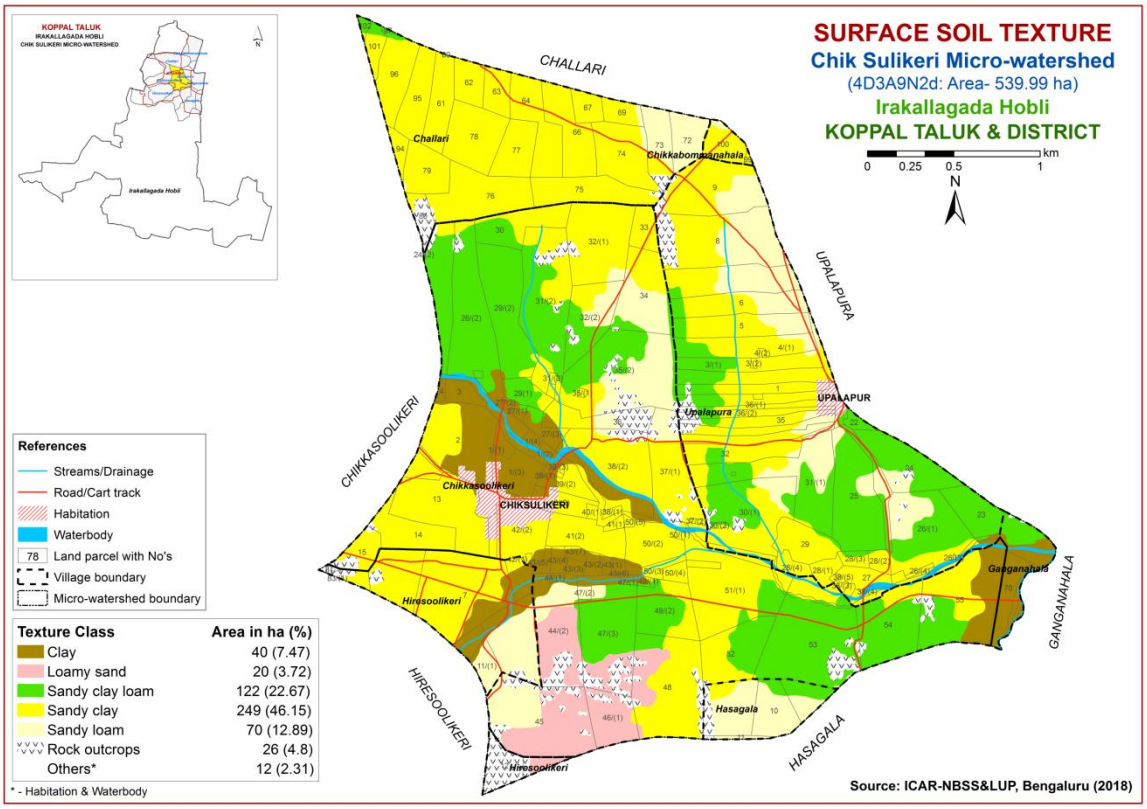


Fig. 5.3 Surface Soil Texture map of Chik Sulikeri Microwatershed

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 spatial distribution in the microwatershed is shown in Fig.5.4.

An area of about 125 ha (23%) has non gravelly (<15%) soils and occur in the western, southwestern, southern and southeastern part of the microwatershed. An area of about 183 ha (34%) has gravelly (15-35%) soils and distributed in the southwestern, southern, southeastern, eastern, northeastern and northern part of the microwatershed. Major area of about 193 ha (36%) has very gravelly (35-60%) soils and occur in the

western, northwestern, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

An area of about 125 ha (23%) are most productive lands with respect to gravelliness. They are non-gravelly with less than 15 per cent gravel and have potential for growing both annual and perennial crops. The problem lands cover about 376 ha (70%) that are gravelly to very gravelly where only medium or short duration crops can be grown.

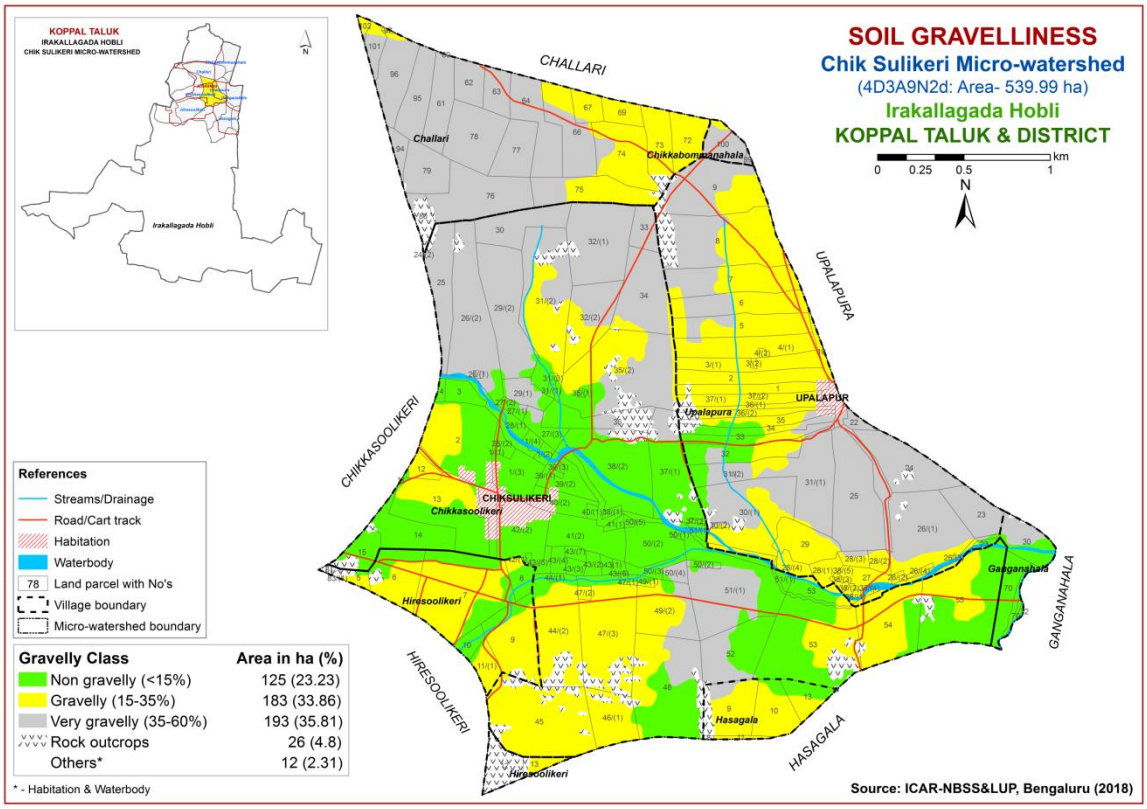


Fig. 5.4 Soil Gravelliness map of Chik Sulikeri Microwatershed

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 (Fig. 5.5).

Major area of about 442 ha (82%) has soils that are very low to low (<50-100 mm/m) in available water capacity and are distributed in the major part of the microwatershed. An area of about 47 ha (9%) is medium to high (101-200 mm/m) in available water capacity and are occur in the central, western and southern part of the

microwatershed. An area of about 13 ha (2%) is very high (>200 mm/m) in available water capacity and occur in the southwestern and southeastern part of the microwatershed.

An area of about 250 ha (20%) 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 about 13 ha (2%) has soils that have very high potential (>200 mm/m) with regard to available water capacity where all climatically adapted long duration crops can be grown successfully.

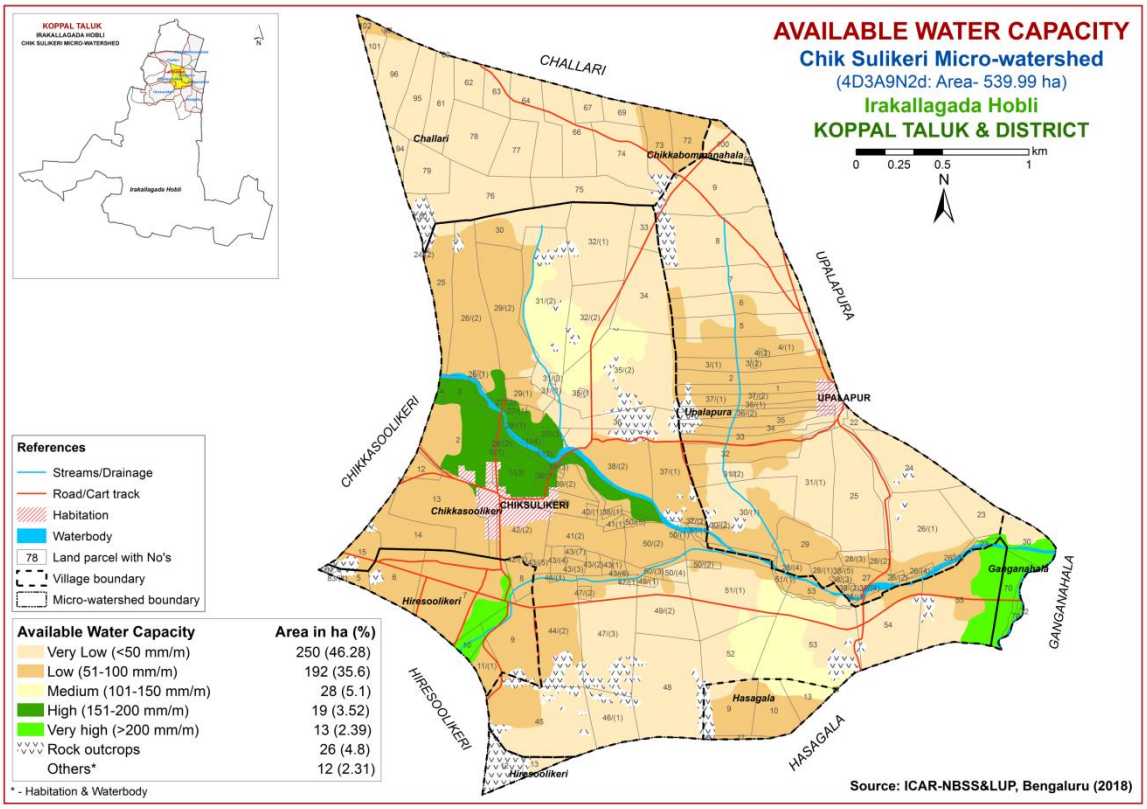


Fig. 5.5 Soil Available Water Capacity map of Chik Sulikeri Microwatershed

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 different slope classes and a slope map was generated showing the area extent and their geographic distribution of different slope classes in the microwatershed (Fig. 5.6).

An area of about 70 ha (13%) falls under nearly level (0-1% slope) lands and is distributed in the western, southwestern, southern and southeastern part of the microwatershed. Maximum area of about 393 ha (73%) falls under very gently sloping (1-

3% slope) lands and is distributed in the major part of the microwatershed. An area of about 39 ha (7%) falls under gently sloping (3-5%) lands and occur in the central, eastern and northeastern part of the microwatershed.

An area of about 463 ha (86%) in the microwatershed has soils that have high potential in respect of soil slopes. In these areas, all climatically adapted annual and perennial crops can be grown without much soil and water conservation and other land development measures. An area of about 39 ha (7%) in the microwatershed are problematic and require soil and water conservation measures in order to increase the productivity of soils.

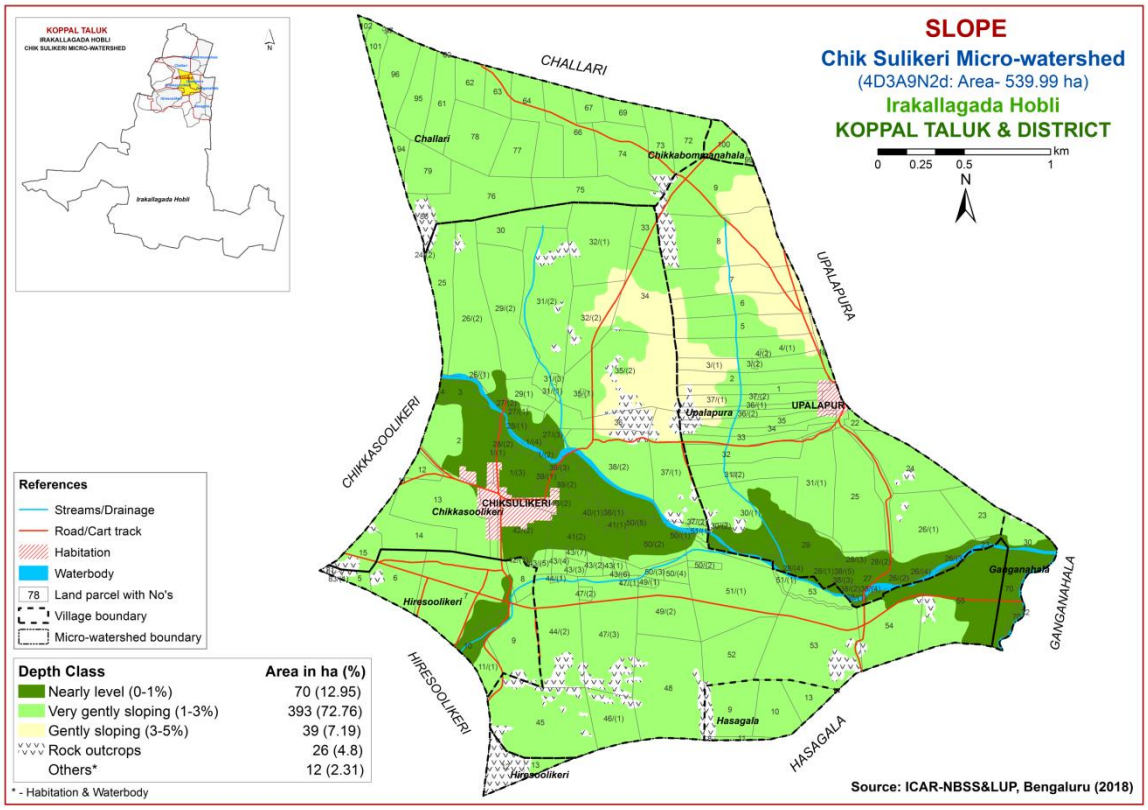


Fig. 5.6 Soil Slope map of Chik Sulikeri Microwatershed

5.7 Soil Erosion

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

Soils that are slightly eroded (e1 class) cover an area of 222 ha (41%) and are distributed in central, western, northwestern, northern, eastern, southeastern, southern and southwestern part of the microwatershed. Soils that are moderately eroded (e2 class) cover a major area of 279 ha (52%) and are distributed in the northern, northeastern, eastern, southeastern and southern part of the microwatershed.

An area of about 279 ha (52%) in the microwatershed is problematic because of moderate erosion. For these areas, taking up soil and water conservation and other land development measures are needed.

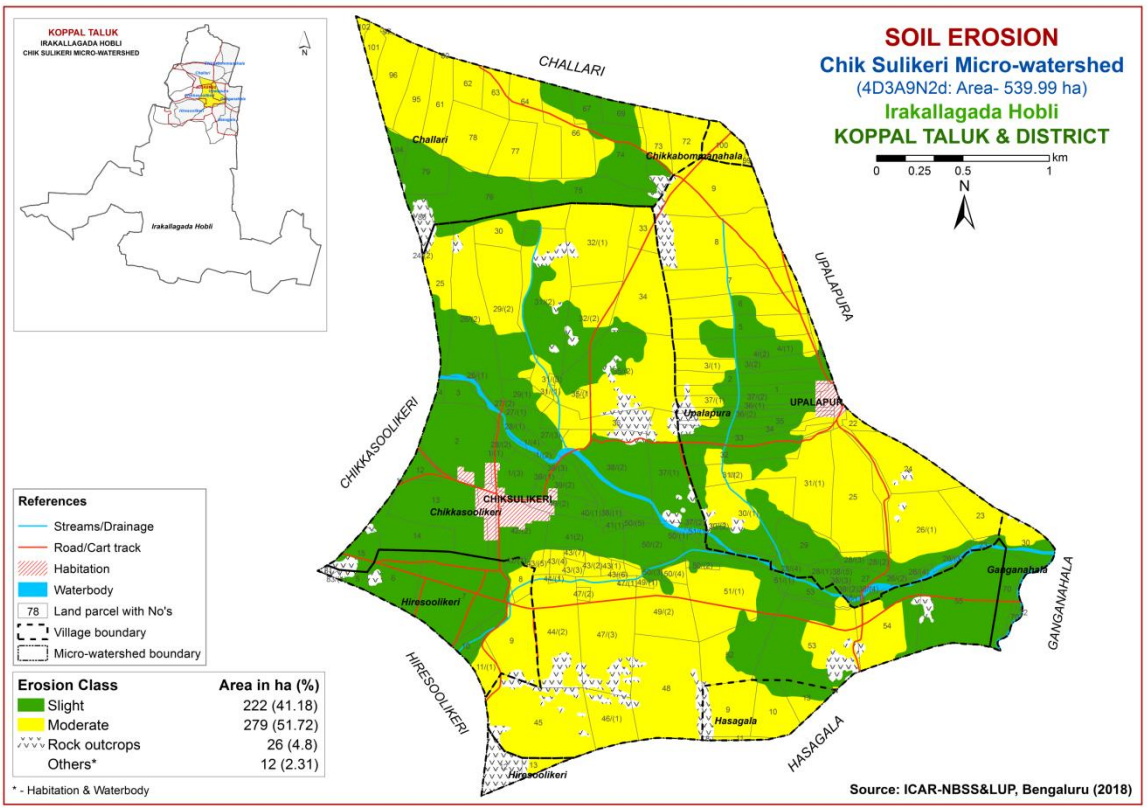


Fig. 5.7 Soil Erosion map of Chik Sulikeri Microwatershed

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 grid interval) all over the microwatershed through land resource inventory in the year 2017 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 the 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 Chik Sulikeri microwatershed for soil reaction (pH) showed that an area of about 2 ha (<1%) is under slightly acid (pH 6.0-6.5) in soil reaction and are distributed in the southern part of the microwatershed. Major area of about 334 ha (62%) is under neutral (pH 6.5-7.3) in soil reaction and are distributed in the major part of the microwatershed. An area of about 166 ha (31%) is under slightly alkaline to moderately alkaline (pH 7.3-8.4) in soil reaction and occur in the northern, northwestern, southern and southeastern part of the microwatershed (Fig.6.1). Thus major soils covering 334 ha (62%) area under neutral, 166 ha (31%) is under alkaline and 2 ha (<1%) is under acidic condition.

6.2 Electrical Conductivity (EC)

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

6.3 Organic Carbon (OC)

The soil organic carbon content (an index of available Nitrogen) of the microwatershed is medium (0.5-0.75%) in major area of about 423 ha (78%) and occur in the major part of the microwatershed. An area of about 79 ha (15%) is high (>0.75%) in organic carbon and is distributed in the northern, northeastern and southeastern part of the microwatershed (Fig.6.3).

6.4 Available Phosphorus

Major area of about 500 ha (93%) is medium (23-57 kg/ha) in available phosphorus and are distributed in the major part of the microwatershed. high (>57 kg/ha) available phosphorus covers an area of about 2 ha (<1%) and distributed in the southwestern part of the microwatershed (Fig 6.4).

6.5 Available Potassium

An area of about 177 ha (33%) is low (<145 kg/ha) in available potassium and are distributed in the central, western, northwestern, northern, eastern, southeastern and southern part of the microwatershed. Maximum area of about 290 ha (54%) is medium (145-337 kg/ha) and are distributed in the major part of the microwatershed. An area of about 35 ha (6%) is high (>337 kg/ha) and are distributed in the northern and northeastern part of the microwatershed (Fig.6.5).

6.6 Available Sulphur

An area of about 109 ha (20%) is low (<10 ppm) in available sulpur and are distributed in the northeastern, northern and northwestern part of the microwatershed. Maximum area of about 368 ha (68%) is medium (10-20 ppm) and occur in the major part of the microwatershed. An area of about 25 ha (5%) is high (>20 ppm) and are distributed in the southern and southwestern part of the microwatershed (Fig.6.6).

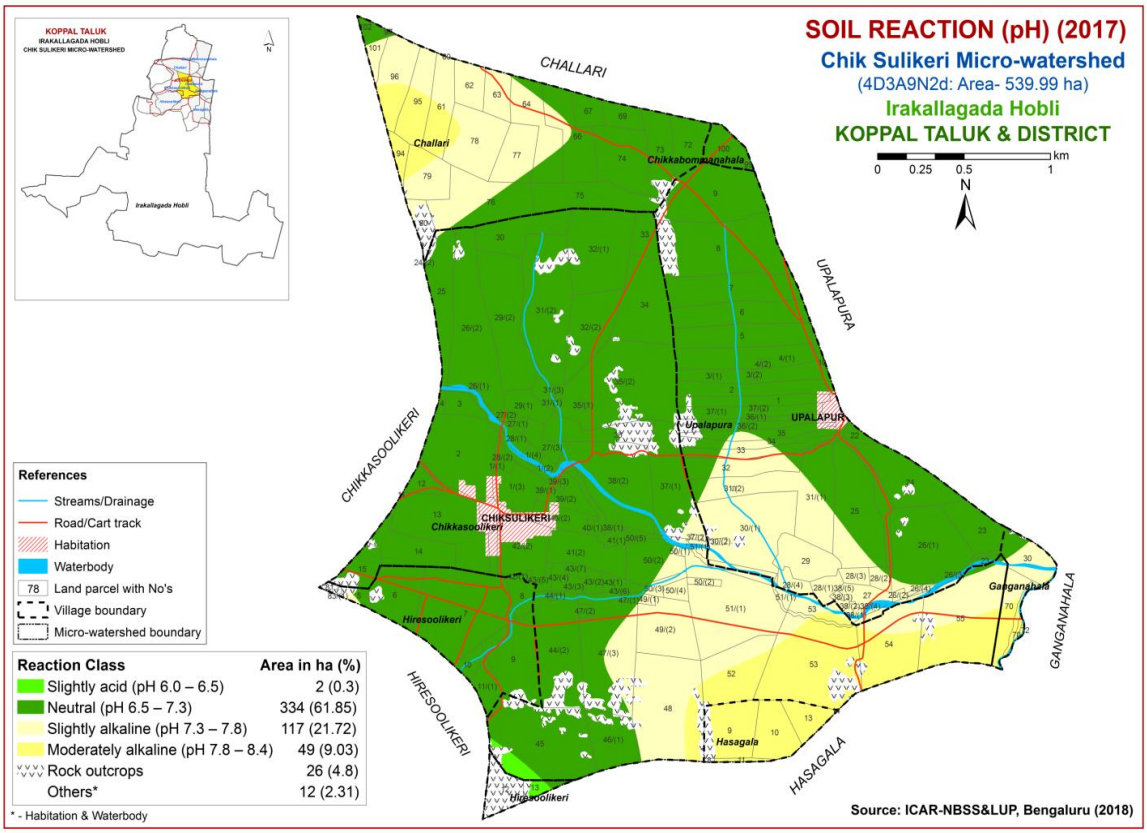


Fig.6.1 Soil Reaction (pH) map of Chik Sulikeri Microwatershed

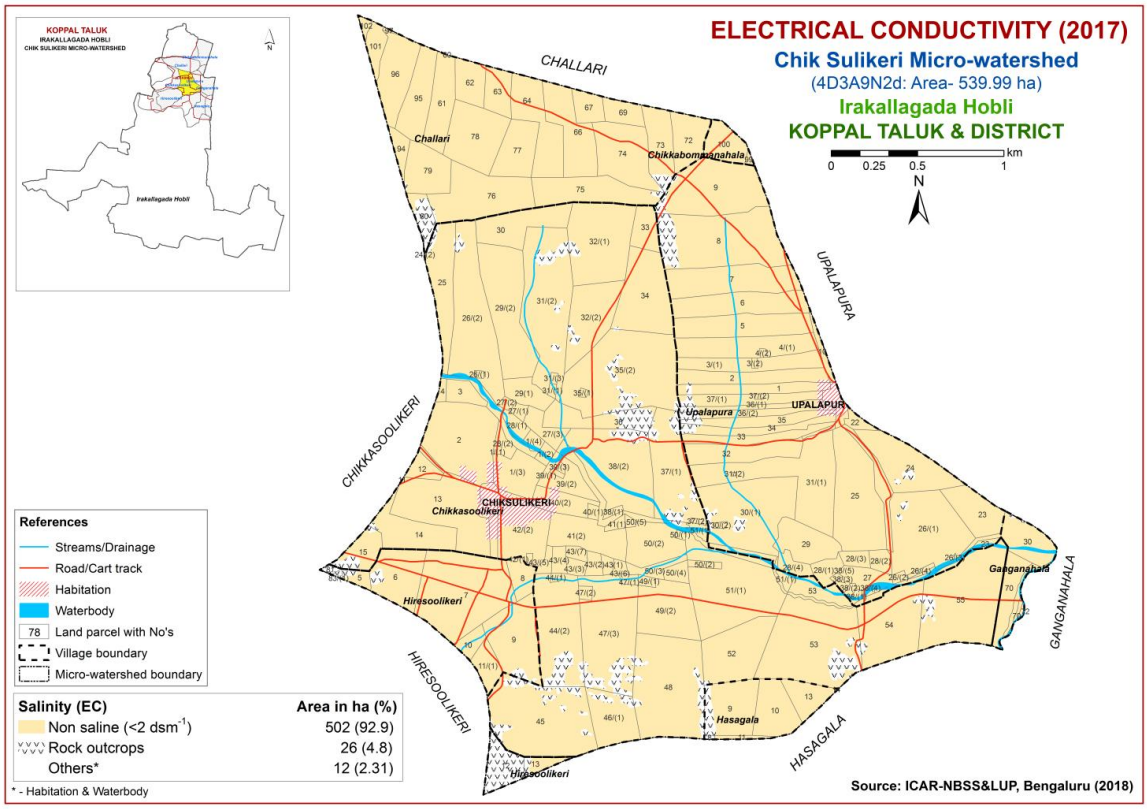


Fig.6.2 Electrical Conductivity (EC) map of Chik Sulikeri Microwatershed

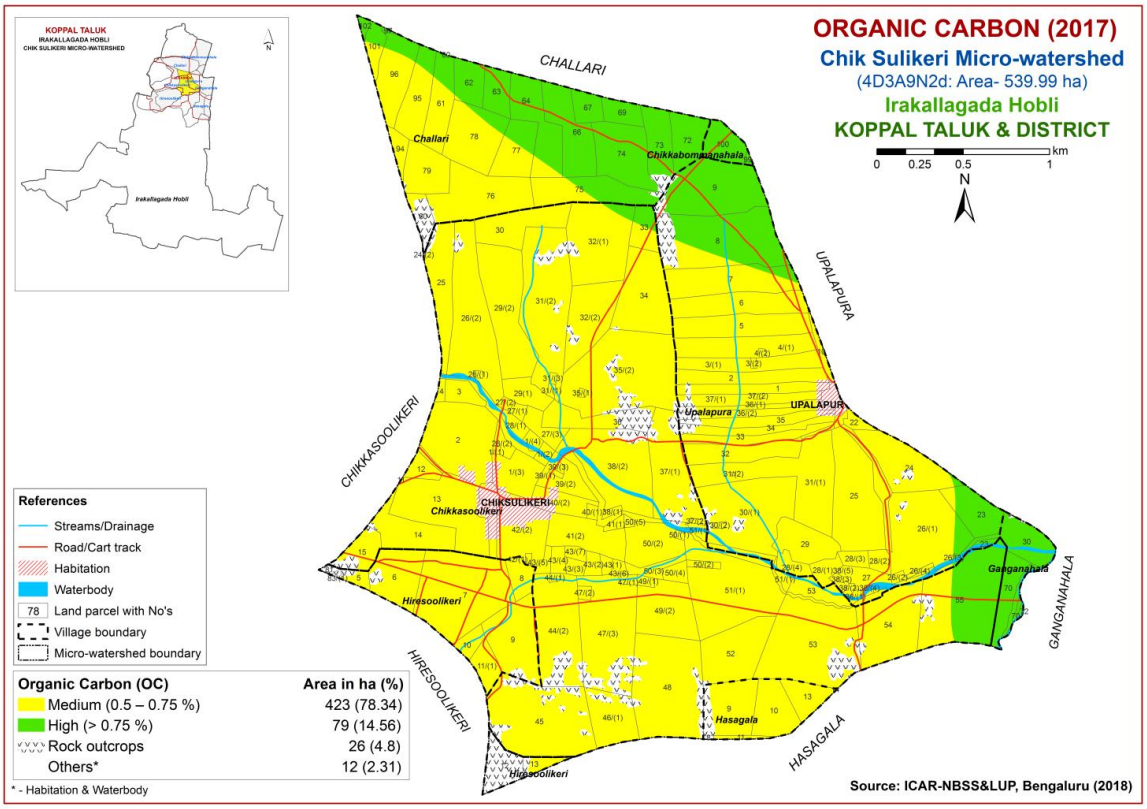


Fig.6.3 Soil Organic Carbon (OC) map of Chik Sulikeri Microwatershed

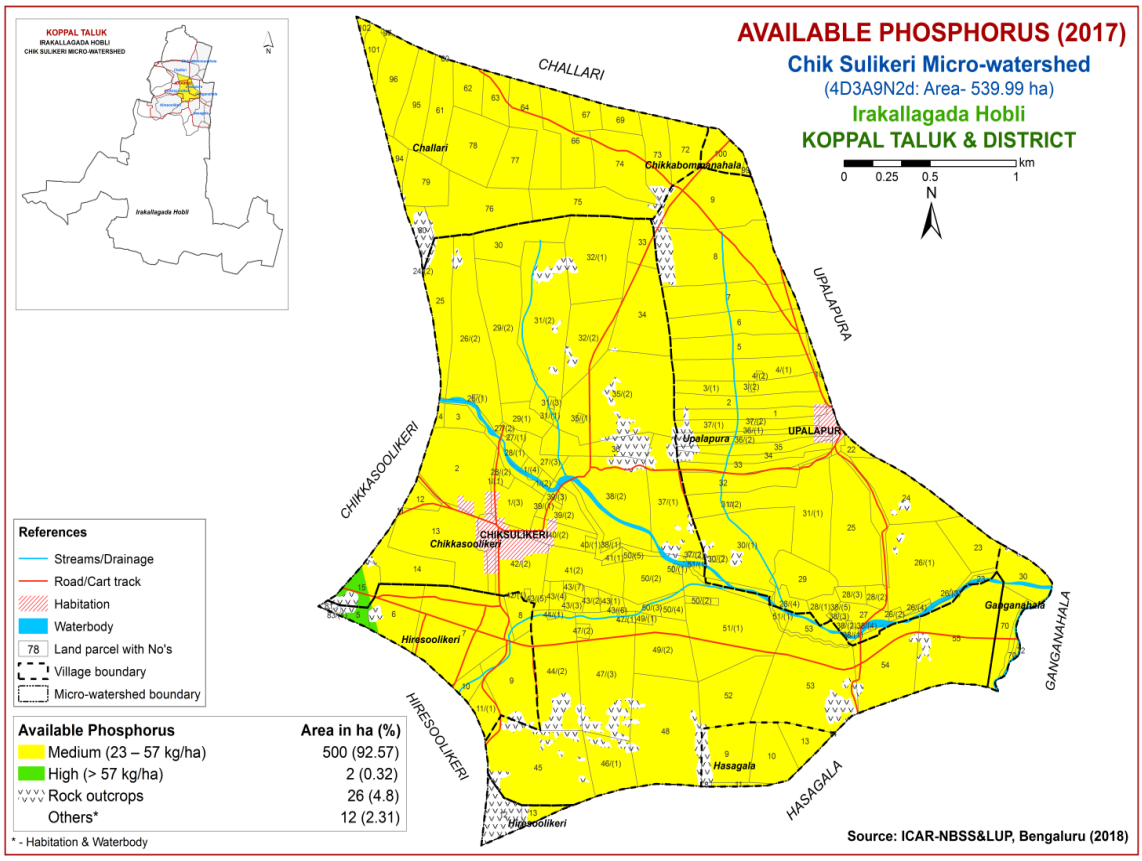


Fig.6.4 Soil Available Phosphors map of Chik Sulikeri Microwatershed

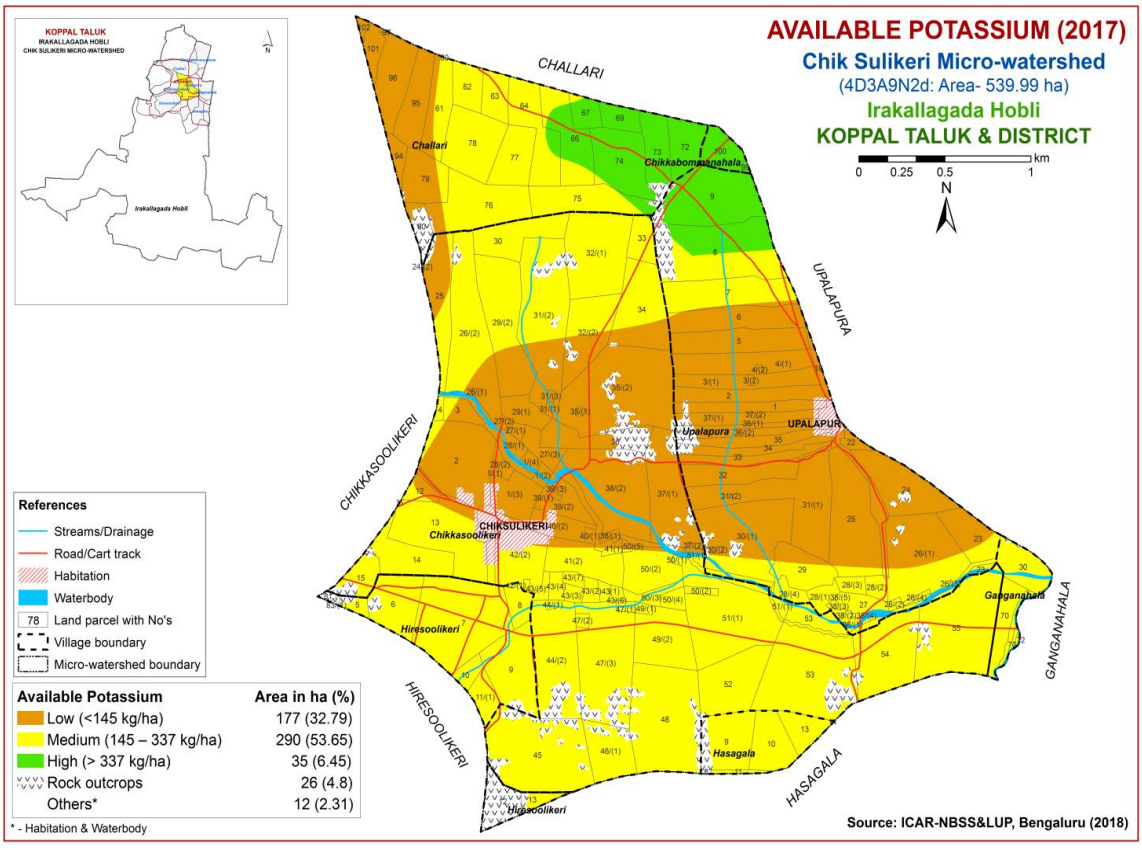


Fig.6.5 Soil Available Potassium map of Chik Sulikeri Microwatershed

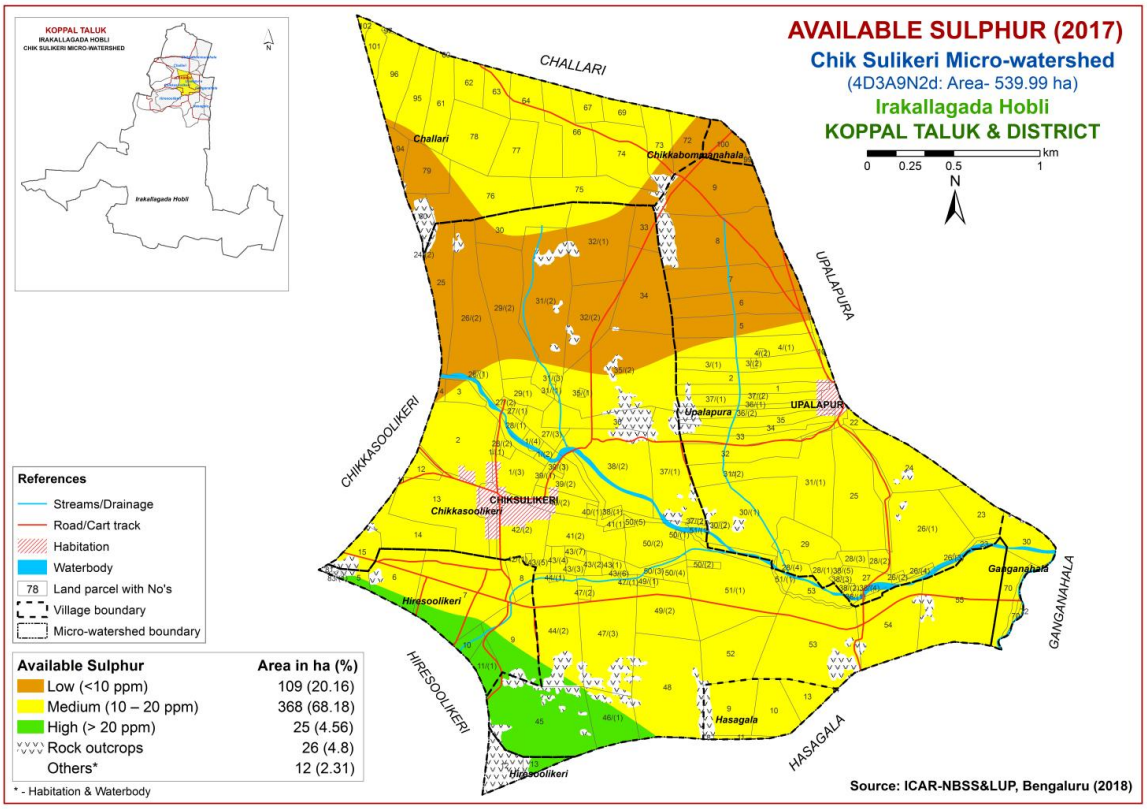


Fig.6.6 Soil Available Sulphur map of Chik Sulikeri Microwatershed

6.7 Available Boron

Available boron content is low (<0.5 ppm) in major area of 352 ha (65%) in the microwatershed and is distributed in the major part of the microwatershed. An area of about 150 ha (28%) is medium (0.5-1.0 ppm) in available boron and is distributed in the southwestern, southeastern and southern part of the microwatershed (Fig.6.7).

6.8 Available Iron

Available iron content is sufficient (>4.5 ppm) in major area of about 414 ha (77%) and are distributed in the major part of the microwatershed. An area of about 88 ha (16%) is deficient (<4.5 ppm) and are distributed in the central, northeastern, southwestern, southern and southeastern part 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).

6.10 Available Copper

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

6.11 Available Zinc

Available zinc content is deficient (<0.6 ppm) in an area of about 136 ha (25%) and distributed in the northeastern, southwestern and southern part of the microwatershed. Major area of about 365 ha (68%) is sufficient (>0.6 ppm) and are distributed in the major area of the microwatershed (Fig 6.11).

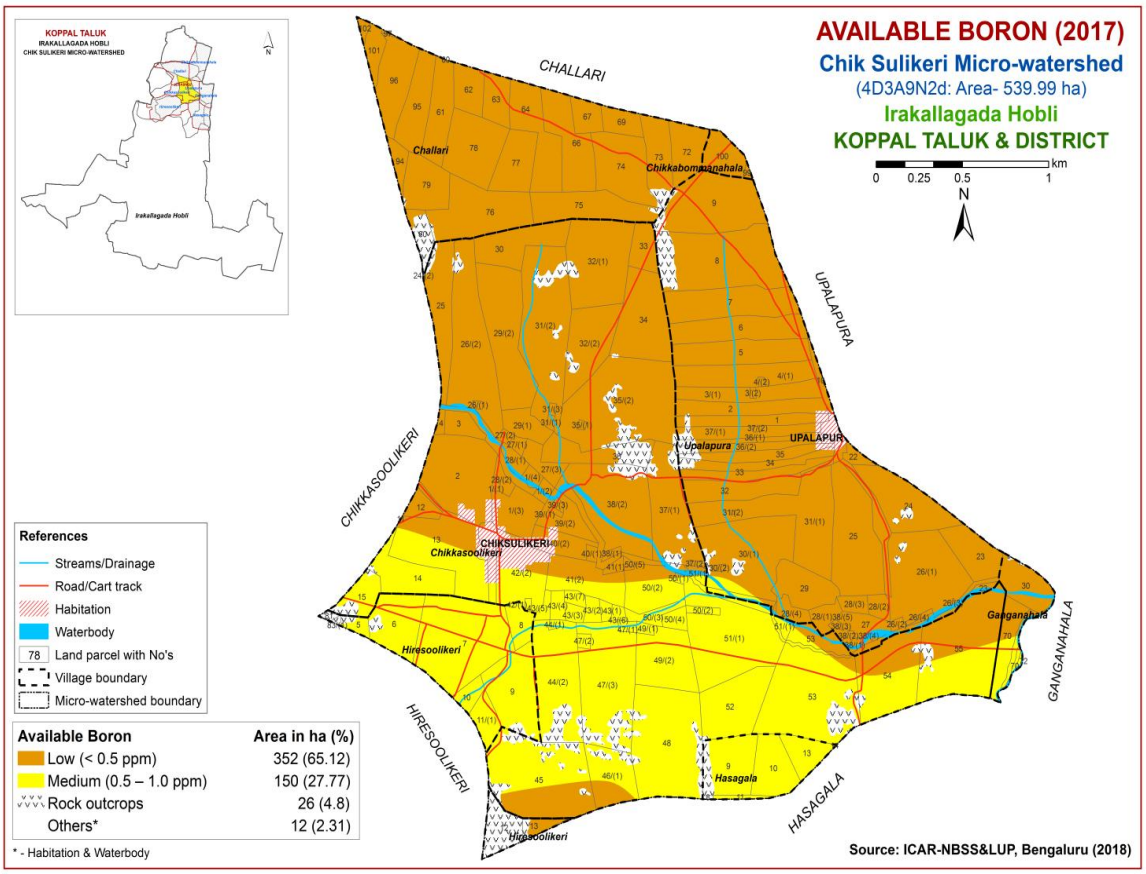


Fig.6.7 Soil Available Boron map of Chik Sulikeri Microwatershed

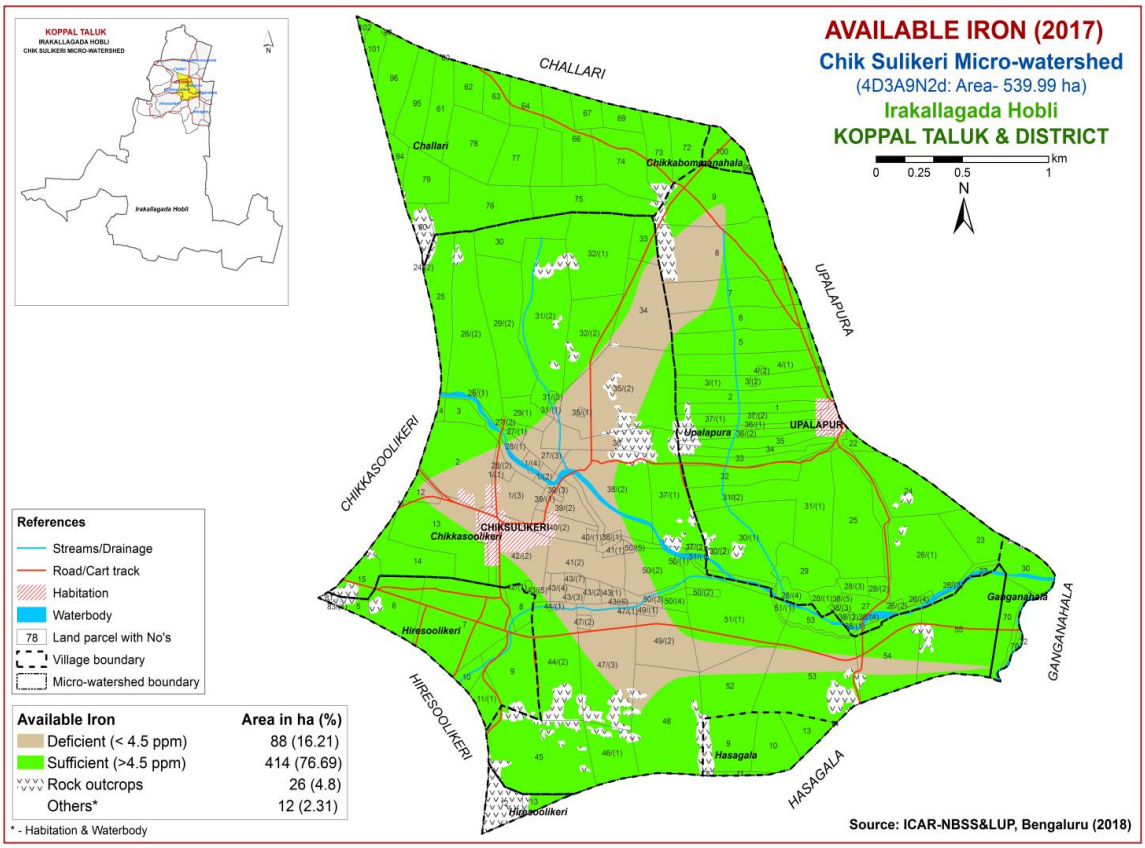


Fig.6.8 Soil Available Iron map of Chik Sulikeri Microwatershed

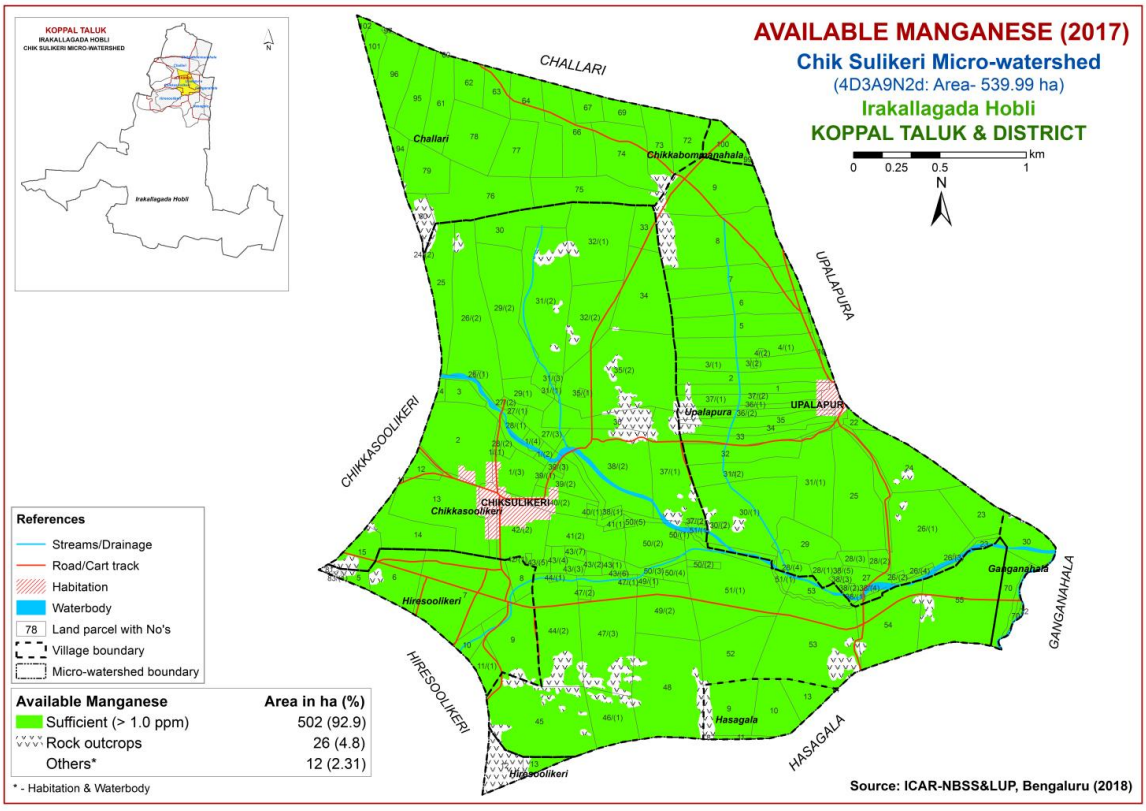


Fig.6.9 Soil Available Manganese map of Chik Sulikeri Microwatershed

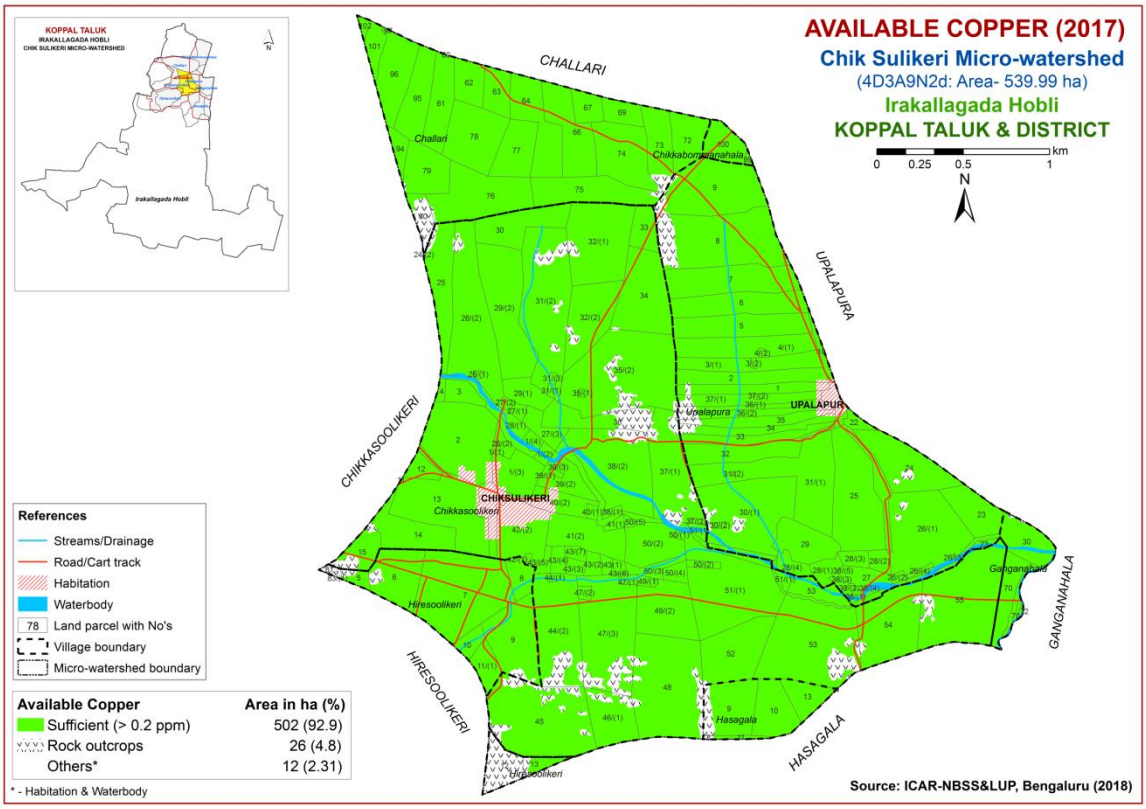


Fig.6.10 Soil Available Copper map of Chik Sulikeri Microwatershed

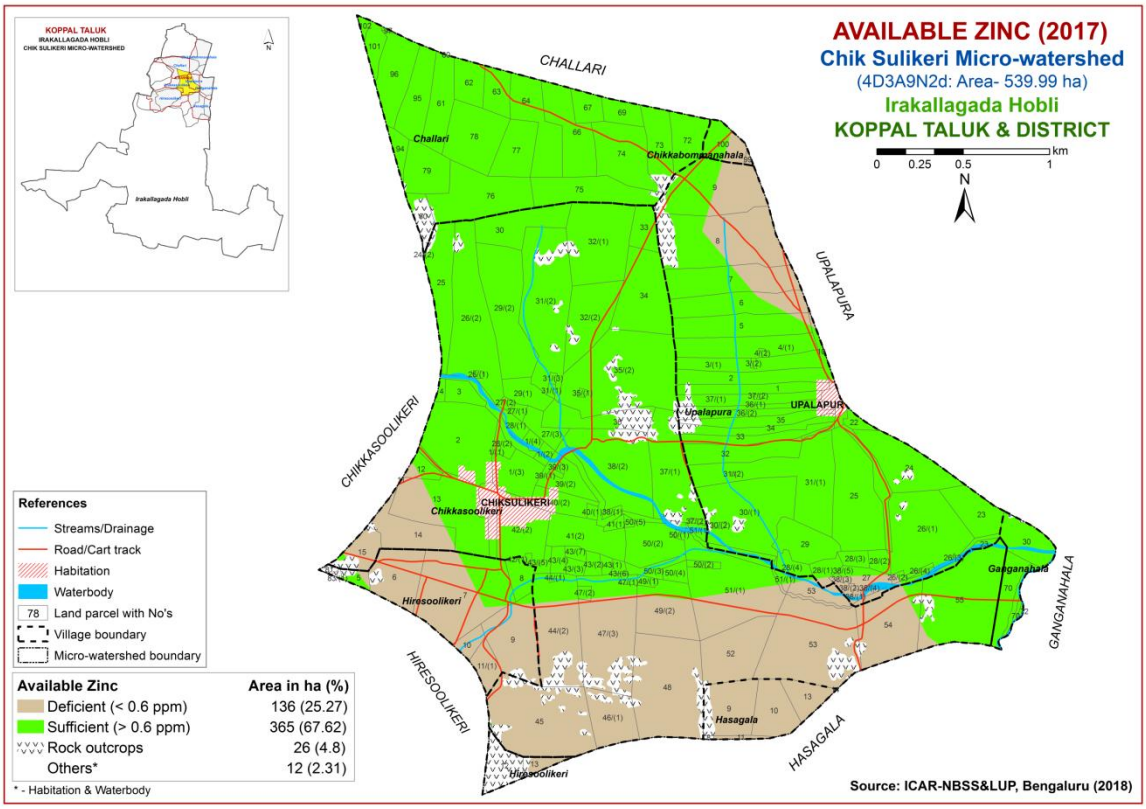


Fig.6.11 Soil Available Zinc map of Chik Sulikeri Microwatershed

Chapter 7

LAND SUITABILITY FOR MAJOR CROPS

The soil and land resource units (soil phases) of Chik Sulikeri 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 (Table 7.1) were matched with the crop requirements (Tables 7.2 to 7.32) to arrive at the crop suitability. The soil and land characteristics table and crop requirements tables 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, N1 and N2 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, 'z' for calcareousness and 'w' for drainage. 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 31 major agricultural and horticultural 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 Chamarajnagar 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 land a 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.

About 24 ha (4%) area is highly suitable (Class S1) for growing sorghum and occurs in the southern and southeastern part of the microwatershed. An area of about 188 ha (35%) is moderately suitable (Class S2) for growing sorghum and are distributed in the

central, northern, eastern, southwestern, southern and southeastern part of the microwatershed. They have minor limitations of rooting depth, gravelliness, calcareousness and drainage. Major area of about 289 ha (54%) is marginally suitable (Class S3) for growing sorghum with moderate limitations of rooting depth and gravelliness and occur in the central, western, northwestern, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

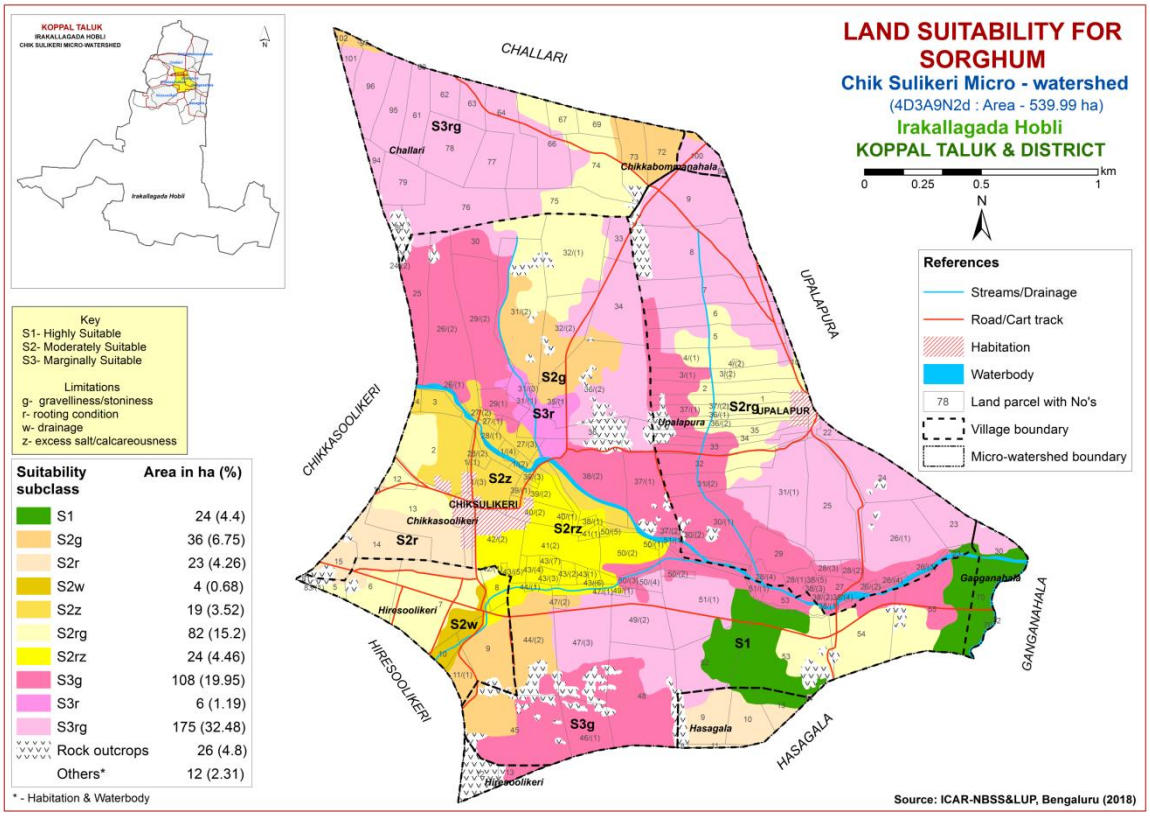


Fig. 7.1 Land Suitability map of Sorghum

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.

About 15 ha (3%) area is highly suitable (Class S1) for growing maize and occurs in the southern part of the microwatershed. An area of about 198 ha (37%) is moderately suitable (Class S2) for growing maize with minor limitations of texture, rooting depth, calcareousness and gravelliness and are distributed in the central, western, southern, eastern, southeastern, southern and southwestern part of the microwatershed. Maximum area of about 289 ha (54%) is marginally suitable (Class S3) for growing maize with moderate limitations of rooting depth and gravelliness and occur in the central, western,

northwestern, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

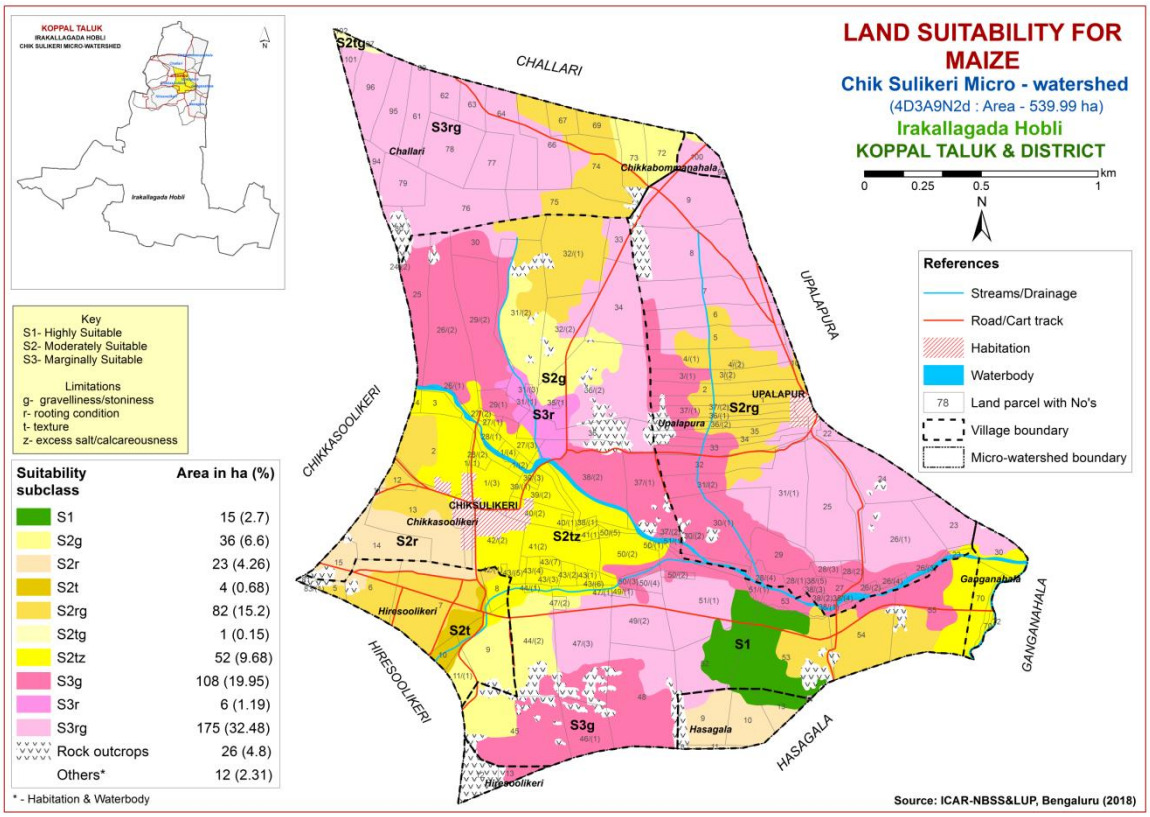


Fig. 7.2 Land Suitability map of Maize

7.3 Land Suitability for Bajra (*Pennisetum glaucum)*

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

An area of about 37 ha (7%) is highly suitable (Class S1) for growing bajra and are distributed in the southern and northern part of the microwatershed. Maximum area of about 235 ha (44%) is moderately suitable (Class S2) for growing bajra with minor limitations of texture, rooting depth, calcareousness and gravelliness and are distributed in the central, western, northern, eastern, southeastern, southern and southwestern part of the microwatershed. An area of about 228 ha (42%) is marginally suitable (Class S3) for growing maize with moderate limitations of rooting depth and gravelliness and are distributed in the central, western, northwestern, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

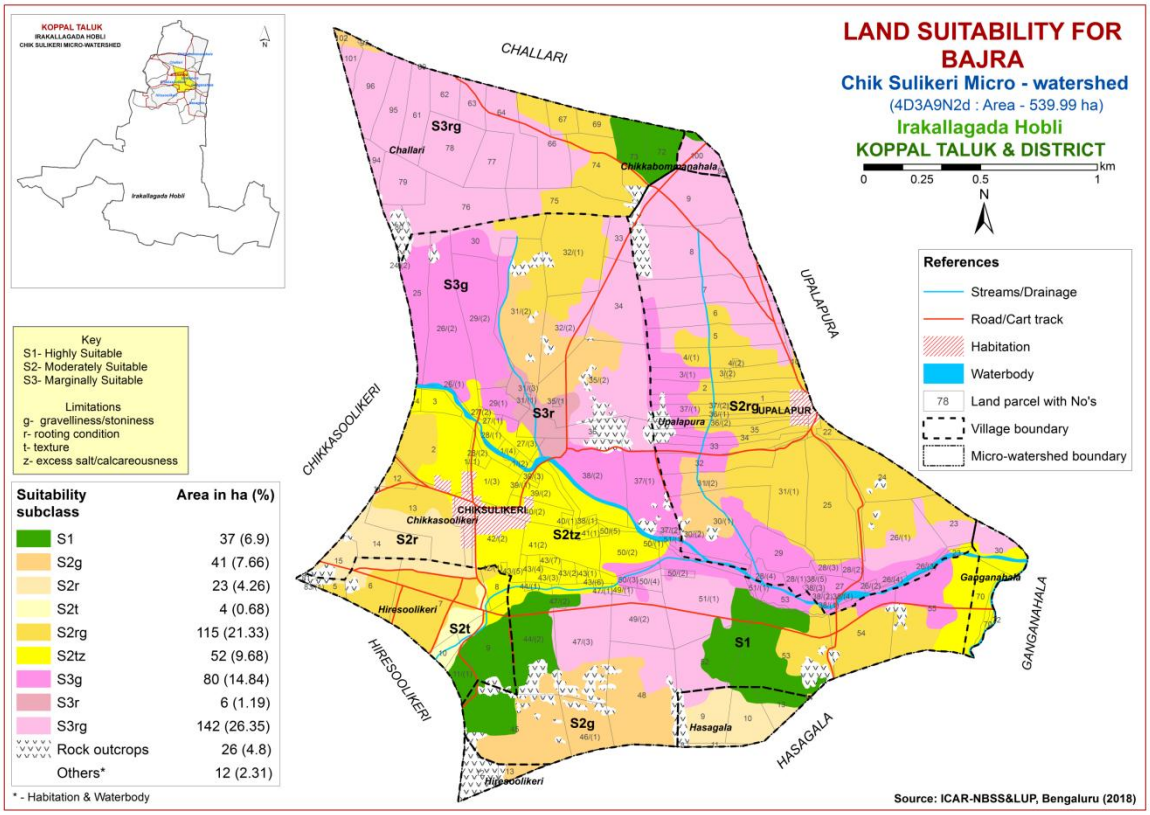


Fig. 7.3 Land Suitability map of Bajra

7.4 Land Suitability for Groundnut (*Arachis hypogaea*)

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

An area of about 37 ha (7%) is highly suitable (Class S1) for growing groundnut and are distributed in the northern and southern part of the microwatershed. An area of about 227 ha (42%) is moderately suitable (Class S2) for growing groundnut and are distributed in the central, western, northern, eastern, southeastern, southern and southwestern part of the microwatershed. They have minor limitations of texture, rooting depth and gravelliness. Maximum area of about 238 ha (44%) is marginally suitable (Class S3) for growing groundnut with moderate limitations of texture, rooting depth, gravelliness, calcareousness and drainage and are distributed in the major part of the microwatershed.

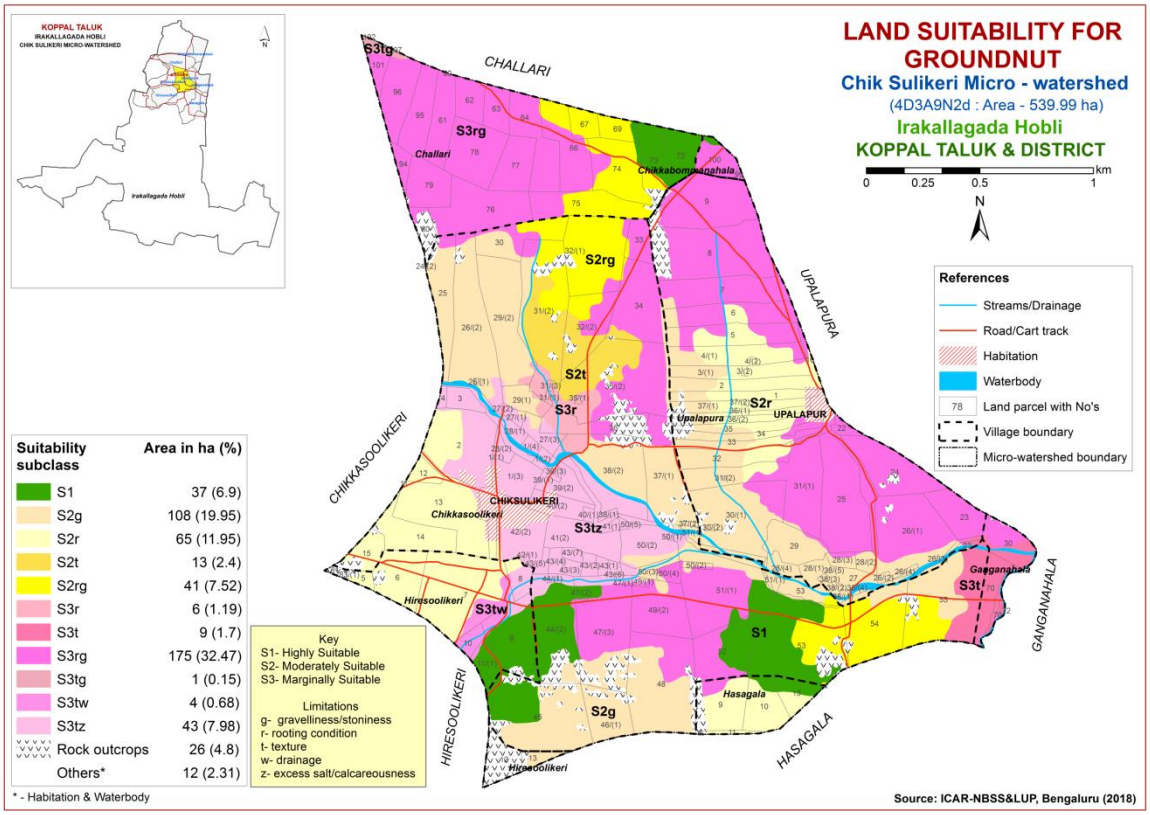


Fig. 7.4 Land Suitability map of Groundnut

7.5 Land Suitability for Sunflower (*Helianthus annus*)

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

A small area of 24 ha (4%) is highly suitable (Class S1) for growing sunflower and are distributed in the southern and southeastern part of the microwatershed. An area of about 60 ha (11%) is moderately suitable (Class S2) are distributed in the central, northern, western and southwestern part of the microwatershed with minor limitations of gravelliness, rooting depth, calcareousness and drainage. Maximum area of about 270 ha (50%) is marginally suitable (Class S3) for growing sunflower and occur in the central, western, northwestern, northern, eastern, southeastern, southern and southwestern part of the microwatershed with moderate limitations of gravelliness, calcareousness and rooting depth. An area of about 149 ha (28%) is currently not suitable (Class N1) for growing sunflower with severe limitations of rooting depth and gravelliness and occur in the central, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

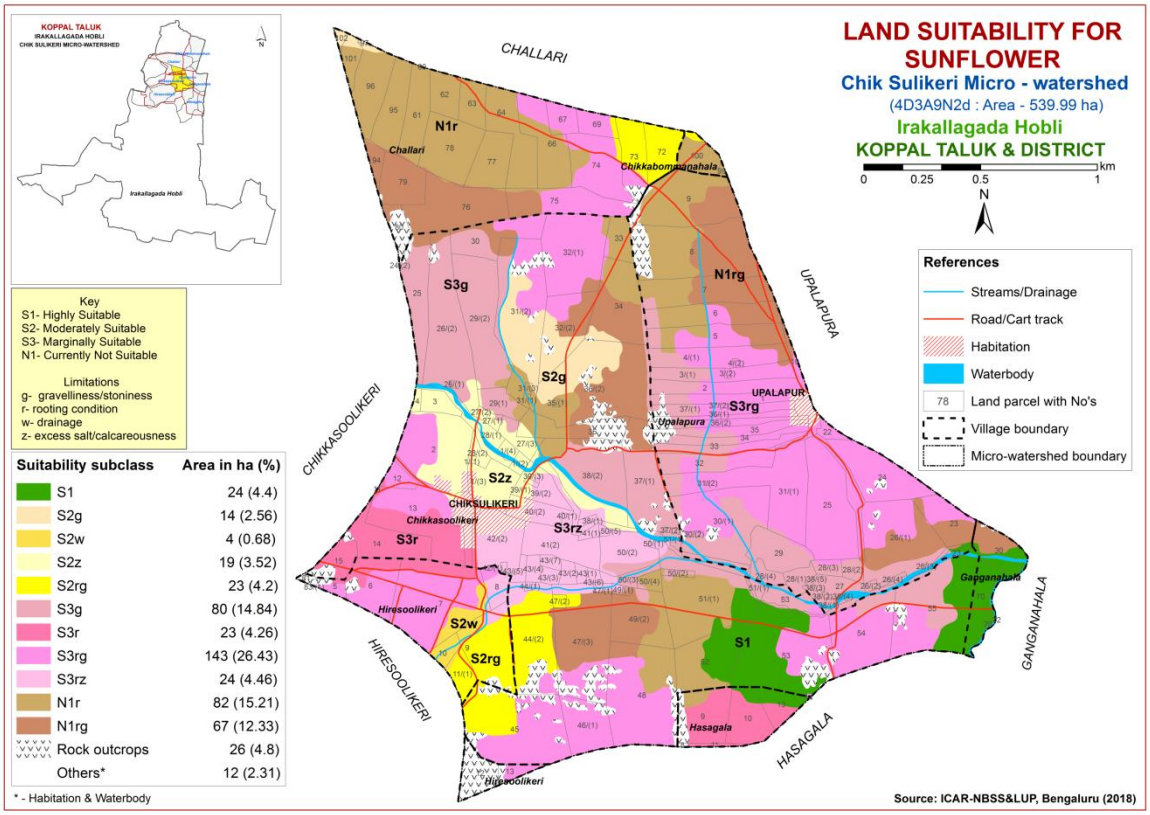


Fig. 7.5 Land Suitability map of Sunflower

7.6 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, Kalaburagi, Bijapur, Bidar, Bellary, Chitradurga and Chamarajnagar districts. The crop requirements for growing cotton (Table 7.7) 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 7.6.

An area of about 9 ha (2%) is highly (Class S1) suitable for growing cotton and occur in the southeastern part of the microwatershed. An area of about 204 ha (38%) is moderately suitable (Class S2) for growing cotton and are distributed in the central, northern, eastern, southeastern, southern, southwestern and western part of the microwatershed with minor limitations of gravelliness, drainage, texture, calcareousness and rooting depth. Major area of about 289 ha (54%) is marginally suitable (Class S3) for growing cotton with moderate limitations of texture, rooting depth and gravelliness and occur in the central, western, northwestern, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

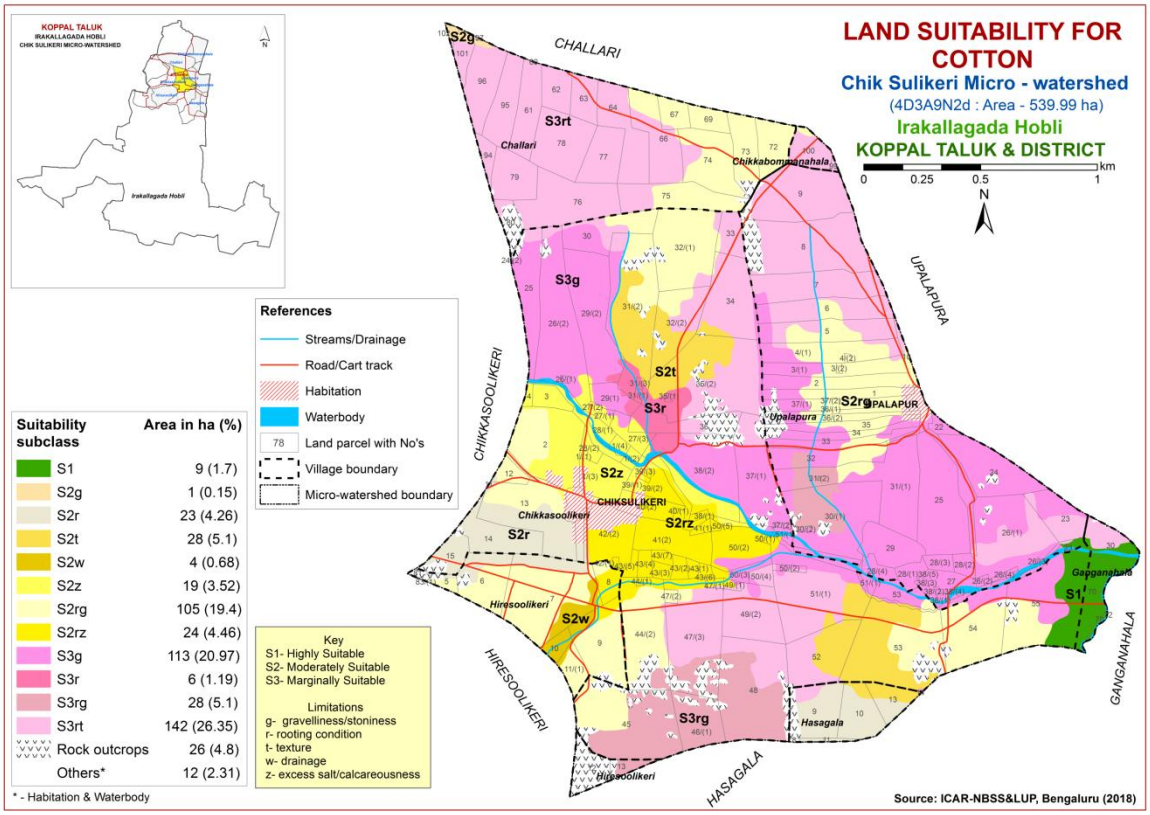


Fig. 7.6 Land Suitability map of Cotton

7.7 Land Suitability for Red gram (*Cajanus cajana*)

Red gram is one of the major pulse crop grown in an area of 7.28 lakh ha mainly in northern Karnataka in Bijapur, Kalaburagi, Raichur, Bidar, Belgaum, Dharwad and Bellary districts. The crop requirements for growing red gram (Table 7.8) were matched with the soil-site characteristics (Table 7.1) of the soils of the microwatershed and a land suitability map for growing red gram was generated. The area extent and their geographic distribution of different suitability subclasses in the microwatershed is given in Figure 7.7.

An area of about 15 ha (3%) is highly suitable (Class S1) for growing red gram and occur in the southern part of the microwatershed. An area of about 69 ha (13%) is moderately suitable (Class S2) for growing red gram. They have minor limitations of texture, rooting depth, drainage, calcareousness and gravelliness and occur in the central, western, southwestern, southern, southeastern and northern part of the microwatershed. Major area of about 270 ha (50%) is marginally suitable (Class S3) for growing red gram with moderate limitations of rooting depth, calcareousness and gravelliness and are distributed in the major part of the microwatershed. An area of about 149 ha (28%) is currently not suitable (Class N1) for growing red gram with severe limitations of rooting depth and gravelliness and occur in the central, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

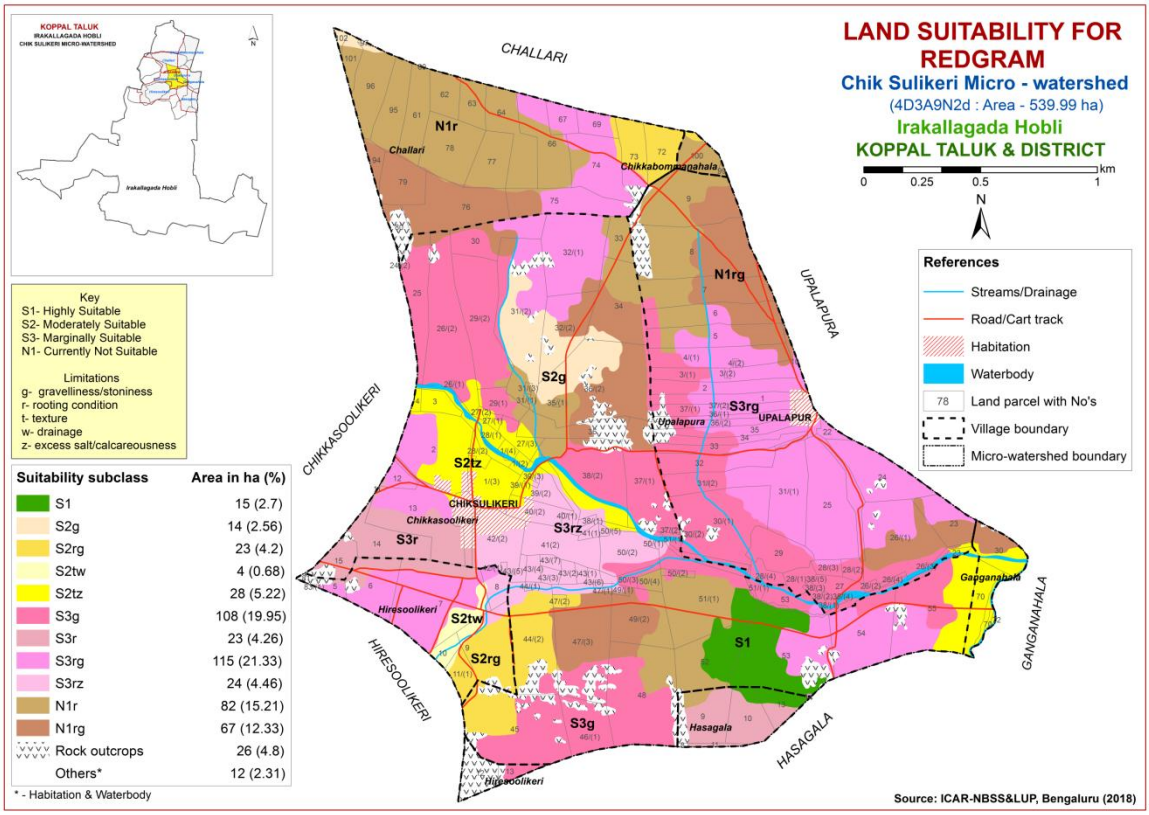


Fig. 7.7 Land Suitability map of Red gram

7.8 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, Kalaburagi, Dharwad, Belgaum and Bellary districts. The crop requirements for growing Bengal gram (Table 7.9) 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 7.8.

An area of about 13 ha (2%) is highly suitable (Class S1) for growing Bengal gram and are distributed in the southwestern and southeastern part of the microwatershed. An area of about 218 ha (40%) is moderately suitable (Class S2) for growing Bengal gram and are distributed in the central, western, southwestern, southern, southeastern, eastern and northern part of the microwatershed. They have minor limitations of rooting depth, gravelliness, calcareousness and texture. Maximum area of about 271 ha (50%) is moderately suitable (Class S3) for growing Bengal gram with moderate limitations of rooting depth, texture and gravelliness and occur in the major part of the microwatershed.

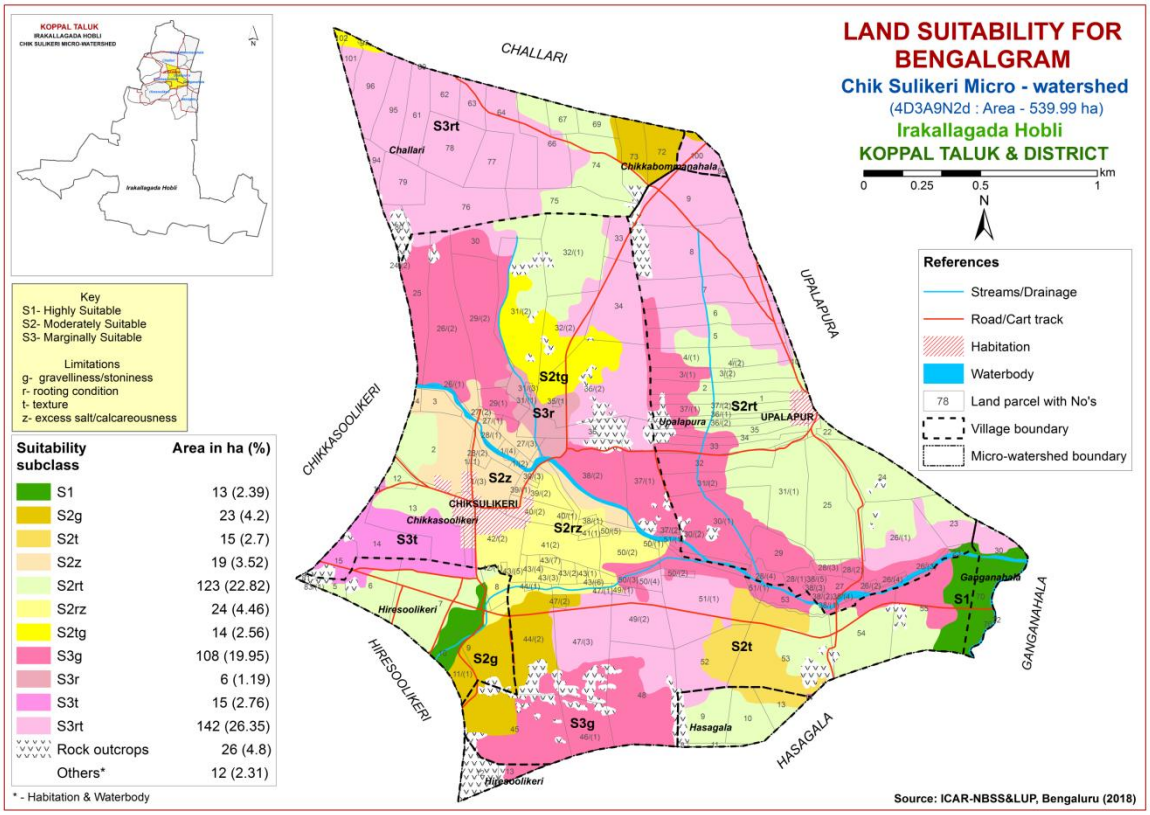


Fig. 7.8 Land Suitability map of Bengal gram

7.9 Land Suitability for Chilli (*Capsicum annuum L*)

Chilli is one of the major spice crop grown in an area of 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) of the soils of the microwatershed and a land suitability map for growing chilli was generated. The area extent and their geographic distribution of different suitability subclasses in the microwatershed are given in Figure 7.9.

An area of about 15 ha (3%) is highly suitable (Class S1) for growing chilli and are distributed in the southern part of the microwatershed. An area of about 151 ha (28%) is moderately suitable (Class S2) for growing chilli and are distributed in the central, southwestern, southern, southeastern, eastern and northern part of the microwatershed with minor limitations of gravelliness, texture, calcareousness and rooting depth. Major area of about 336 ha (62%) is marginally suitable (Class S3) for growing chilli with moderate limitations of texture, rooting depth, drainage, calcareousness and gravelliness and occur in the major part of the microwatershed.

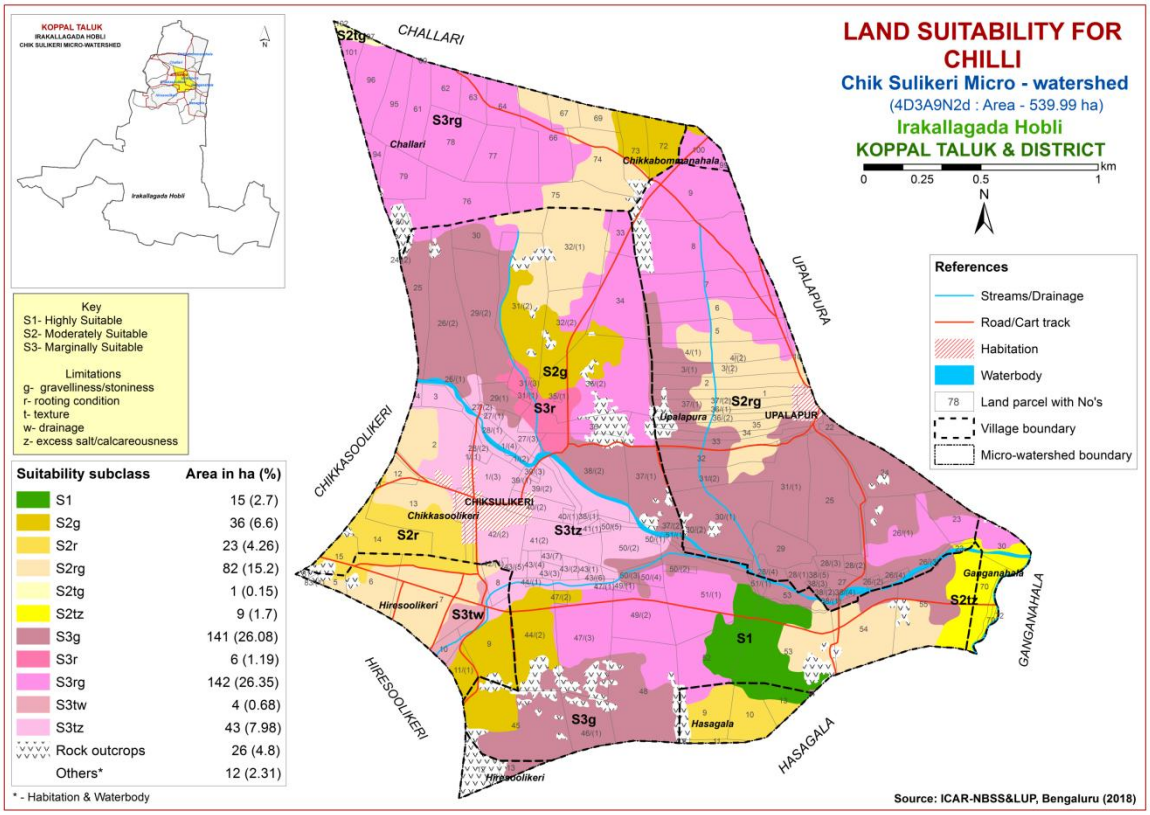


Fig. 7.9 Land Suitability map of Chilli

7.10 Land Suitability for Tomato (*Solanum lycopersicum*)

Tomato is one of the most important vegetable crop grown in an area of 0.65 lakh ha in almost all the districts of the State. The crop requirements (Table 7.11) for growing tomato 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 geographic distribution of different suitability subclasses in the microwatershed are given in Figure 7.10.

An area of about 15 ha (3%) is highly suitable (Class S1) for growing tomato and are distributed in the southern part of the microwatershed. An area of about 151 ha (28%) is moderately suitable (Class S2) for growing tomato and are distributed in the central, southwestern, southern, southeastern, eastern and northern part of the microwatershed with minor limitations of gravelliness, texture, calcareousness and rooting depth. Major area of about 336 ha (62%) is marginally suitable (Class S3) for growing tomato with moderate limitations of texture, rooting depth, drainage, calcareousness and gravelliness and occur in the major part of the microwatershed.

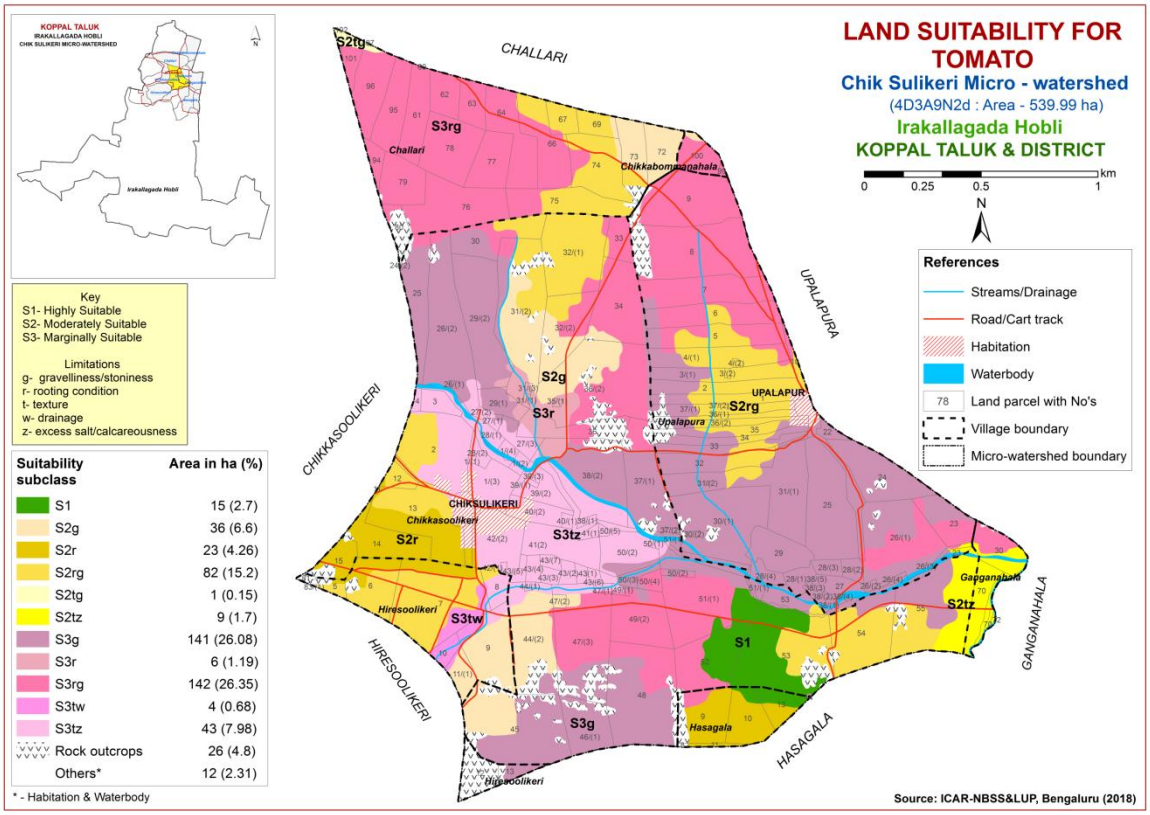


Fig. 7.10 Land Suitability map of Tomato

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) for growing brinjal occur in an area of 36 ha (7%) and are distributed in the southern, central and northern part of the microwatershed. An area of about 216 ha (40%) is moderately suitable (Class S2) for brinjal and is distributed in the central, northwestern, western, southwestern, southern, southeastern and eastern part of the microwatershed. They have minor limitations of gravelliness, rooting depth, drainage, calcareousness and texture. Major area about of 249 ha (46%) is marginally suitable (Class S3) and are distributed in the central, northwestern, northern, northeastern, eastern, southeastern and southern part of the microwatershed with moderate limitations of rooting depth and gravelliness.

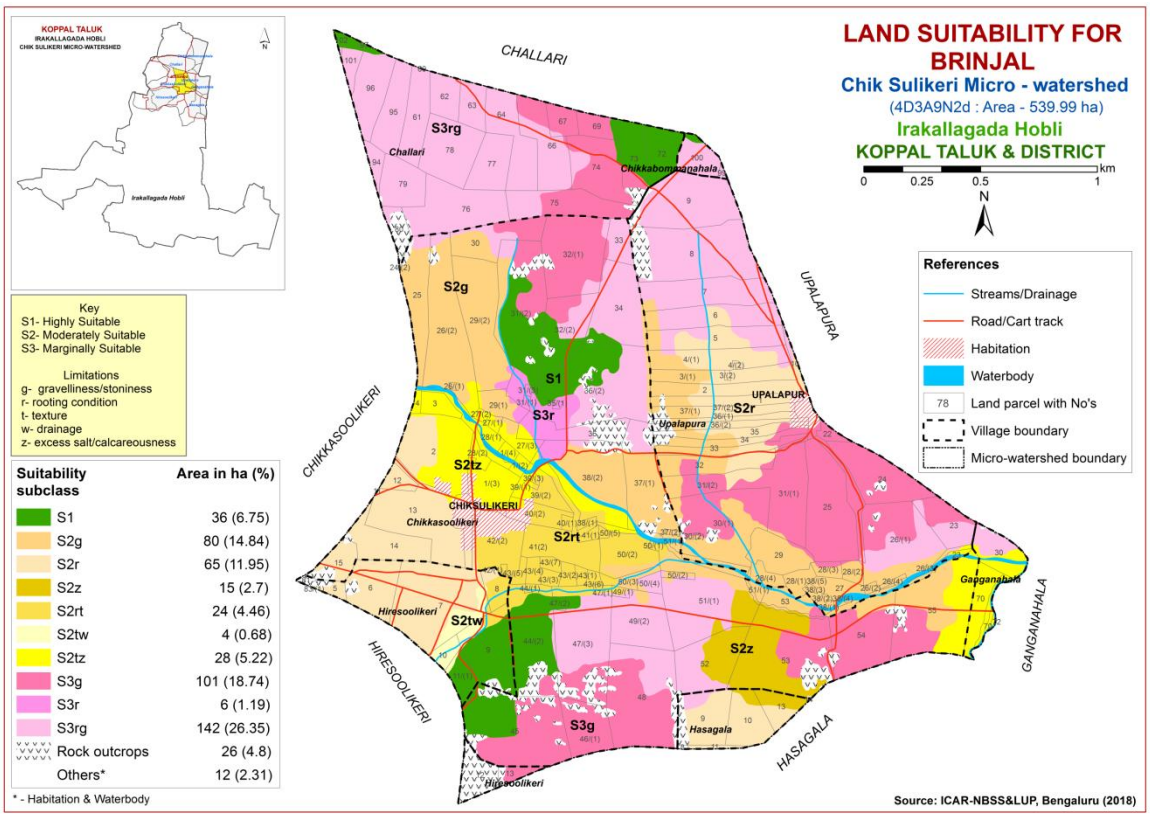


Fig 7.11 Land Suitability map of Brinjal

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 S1for growing onion occurs in an area of 36 ha (7%) and distributed in the southern, central and northern part of the microwatershed. An area of about 164 ha (30%) is moderately suitable (Class S2) for onion and are distributed in the central, northwestern, southwestern, southern, southeastern and eastern part of the microwatershed. They have minor limitations of rooting depth, texture, drainage, calcareousness and gravelliness. Major area of about 301 ha (56%) is marginally suitable (Class S3) and is distributed in the major part of the microwatershed with moderate limitations of rooting depth, gravelliness, calcareousness and texture.

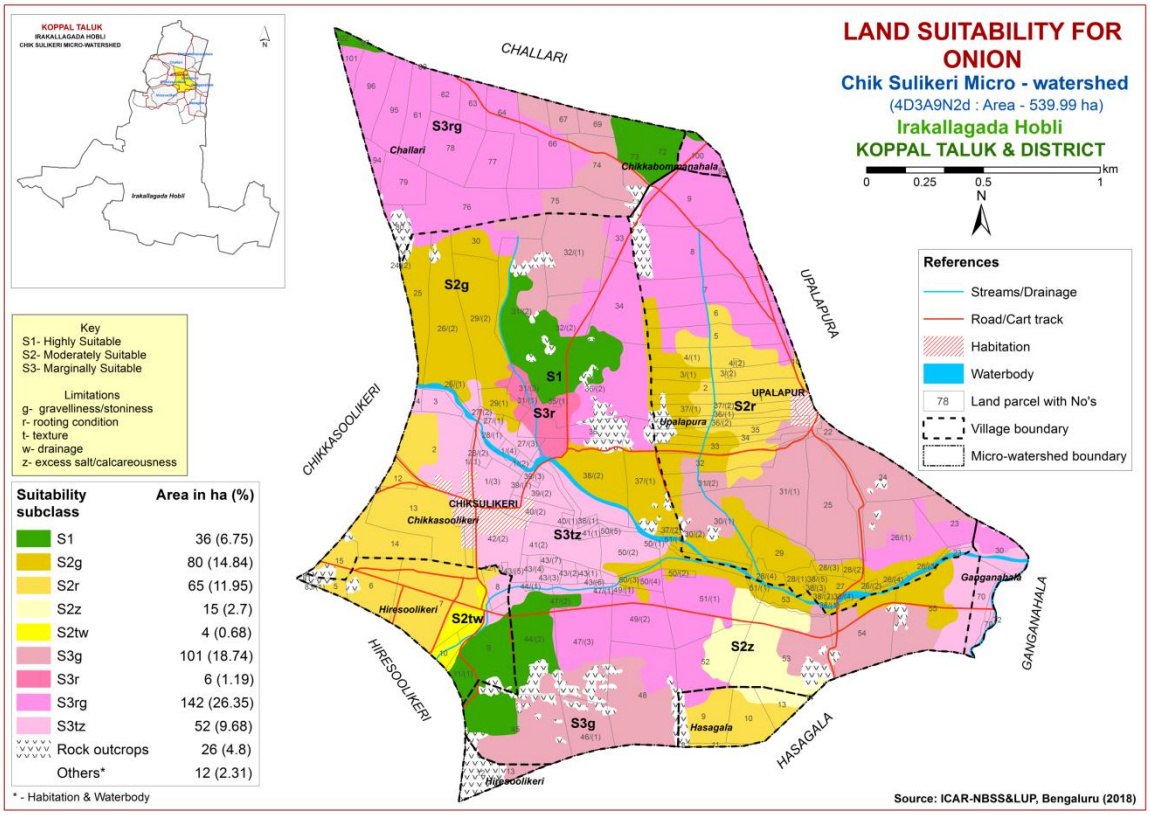


Fig 7.12 Land Suitability map of Onion

7.13 Land Suitability for Bhendi (*Abelmoschus esculentus*)

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

Highly suitable (Class S1) for growing bhendi occur in area of 36 ha (7%) and are distributed in the central, northern and southern part of the microwatershed. An area of about 216 ha (40%) is moderately suitable (Class S2) for bhendi and is distributed in the central, northwestern, western, southwestern, southern, southeastern and eastern part of the microwatershed. They have minor limitations of gravelliness, rooting depth, drainage, calcareousness and texture. Major area about of 249 ha (46%) is marginally suitable (Class S3) and are distributed in the central, northwestern, northern, northeastern, eastern, southeastern and southern part of the microwatershed with moderate limitations of rooting depth and gravelliness.

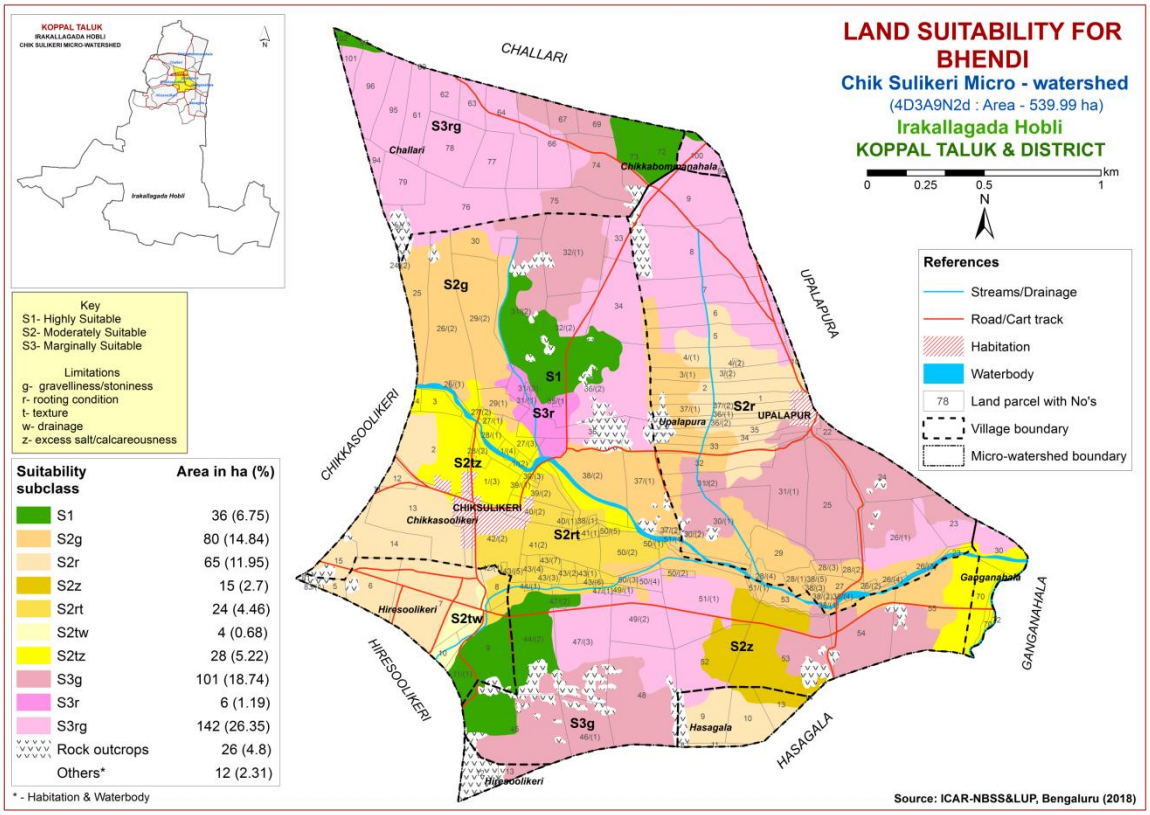


Fig 7.13 Land Suitability map of Bhendi

7.14 Land Suitability for Drumstick (*Moringa oleifera)*

Drumstick is one of the most important vegetable crop grown in 2403 ha area 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 28 ha (5%) is highly suitable (Class S1) for growing drumstick and are distributed in the central and southern part of the microwatershed. An area of 136 ha (25%) is moderately suitable (Class S2) for growing drumstick with minor limitations of texture, rooting depth, drainage, calcareousness and gravelliness and distributed in the central, southwestern, western, northwestern, northern, southeastern and southern part of the microwatershed. Major area of about 190 ha (35%) is marginally suitable (Class S3) for growing drumstick with moderate limitations of rooting depth, calcareousness and gravelliness and occur in the western, southwestern, southern, southeastern, eastern and northern part of the microwatershed. An area of about 149 ha (28%) is currently not suitable (Class N1) for growing drumstick with severe limitations of rooting depth and gravelliness and occur in the central, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

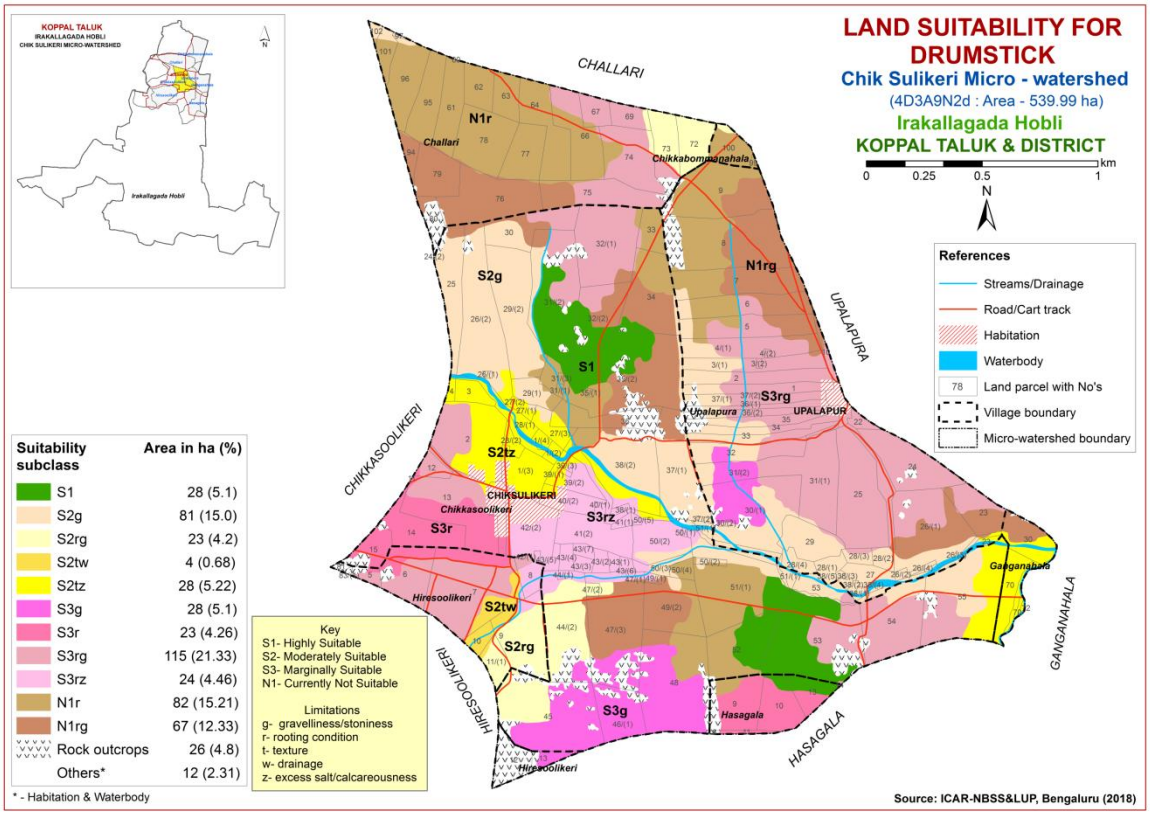


Fig. 7.14 Land Suitability map of Drumstick

7.15 Land Suitability for Mulberry (*Morus nigra*)

Mulberry is the most important leaf crop grown for rearing silkworms in about 1.66 lakh ha in all the districts of the state. The crop requirements for growing mulberry (Table 7.16) 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 7.15.

Highly suitable (Class S1) for growing mulberry occur in an area of 28 ha (5%) and are distributed in the central and southern part of the microwatershed. Moderately suitable (Class S2) lands occupy an area of about 155 ha (29%) and occur in the central, southeastern, southern, southwestern, western and northern part of the microwatershed. They have minor limitations of texture, rooting depth, drainage, calcareousness and gravelliness. Marginally suitable (Class S3) lands cover major area of about 171 ha (32%) and occur in the western, southwestern, southern, southeastern, eastern and northern part of the microwatershed. They have moderate limitations of rooting depth, calcareousness and gravelliness. An area of about 149 ha (28%) is currently not suitable (Class N1) for growing mulberry with severe limitations of rooting depth and gravelliness and occur in the central, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

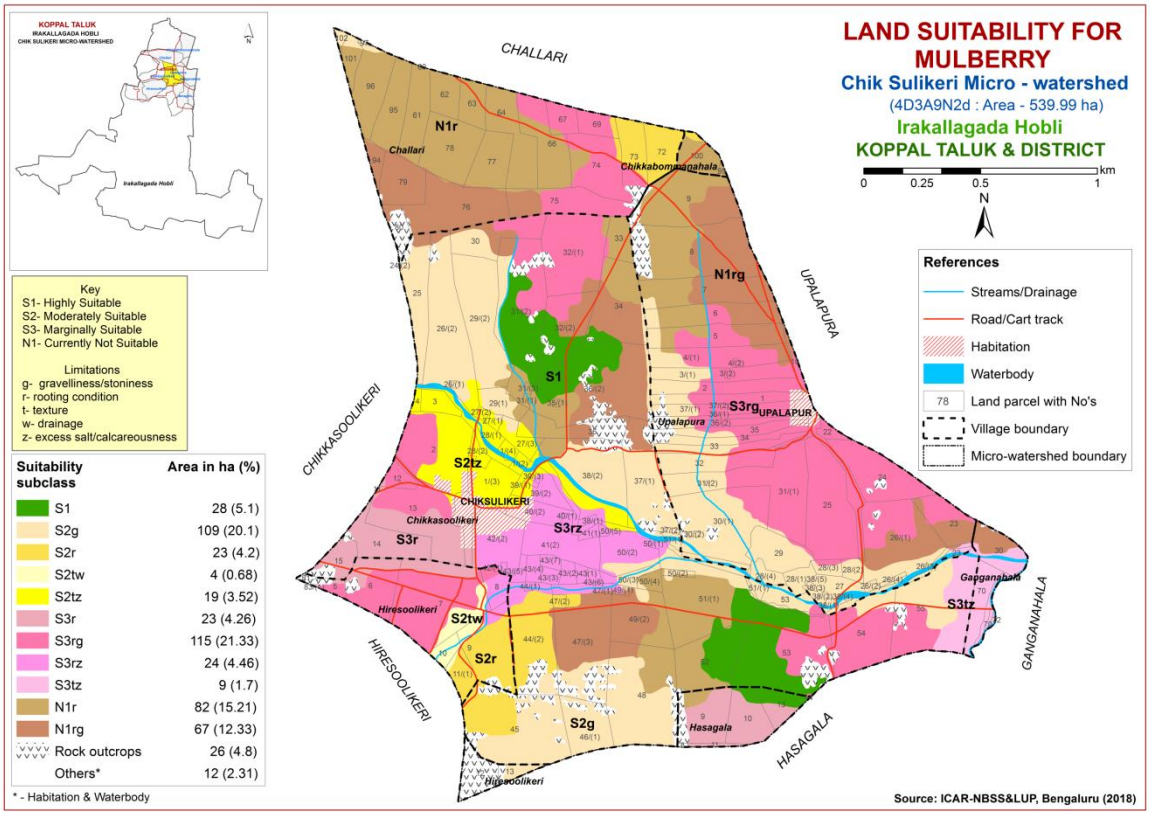


Fig. 7.15 Land Suitability map of Mulberry

7.16 Land Suitability for Mango (*Mangifera indica*)

Mango is one of the most important fruit crop grown in about 1.73 lakh ha in almost all the districts of the State. The crop requirements (Table 7.17) 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 are given in Figure 7.16.

Moderately suitable (Class S2) lands occupy an area of about 29 ha (5%) and occur in the central, northern and southern part of the microwatershed. They have minor limitations of rooting depth and gravelliness. Marginally suitable (Class S3) lands cover an area of about 163 ha (30%) and occur in the central, northwestern, western, southwestern, southern and southeastern part of the microwatershed. They have moderate limitations of texture, rooting depth, drainage, calcareousness and gravelliness. Major area of about 311 ha (58%) is currently not suitable (Class N1) for growing mango and occur in the central, western, southwestern, southern, southeastern, eastern, northeastern and northern part of the microwatershed with severe limitations of gravelliness, calcareousness and rooting depth.

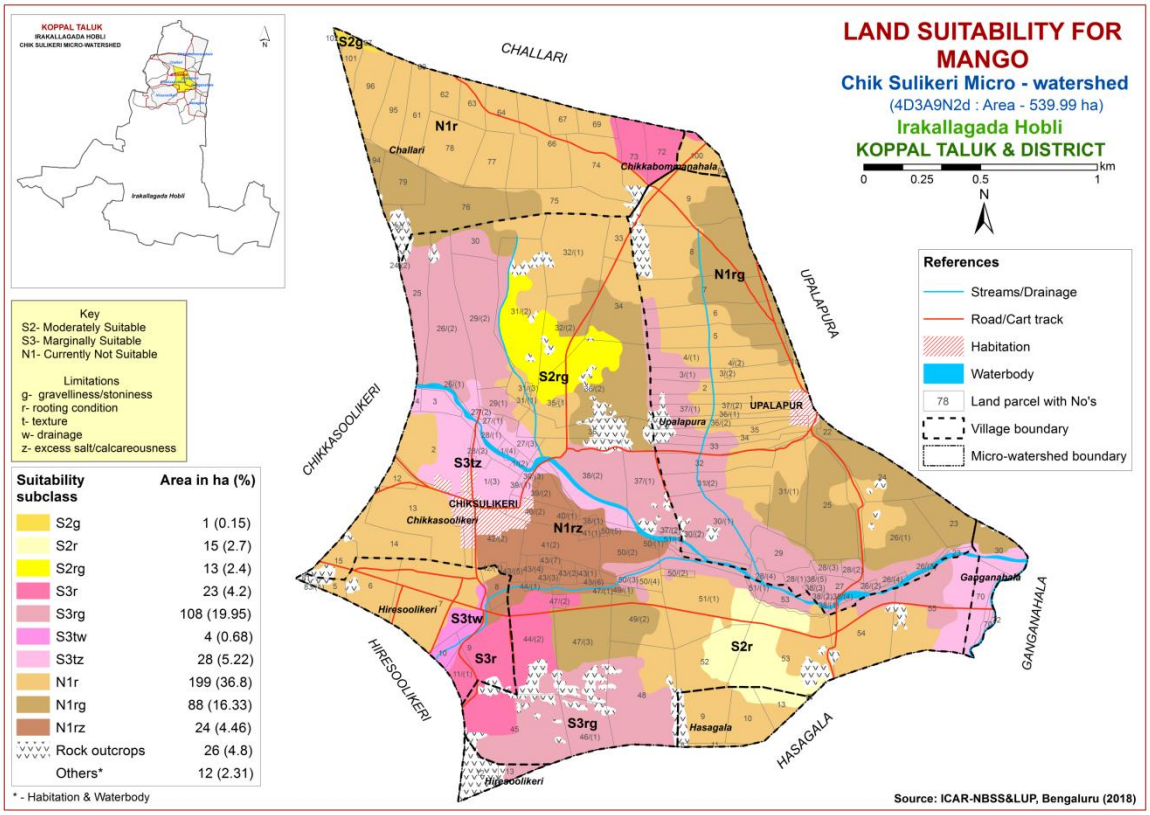


Fig. 7.16 Land Suitability map of Mango

7.17 Land Suitability for Sapota (*Manilkara zapota*)

Sapota is one of the most important fruit crop grown in an area of about 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 geographic distribution of different suitability subclasses in the microwatershed are given in Figure 7.17.

An area of about 15 ha (3%) is highly suitable (Class S1) for growing sapota and are distributed in the southern part of the microwatershed. An area of about 65 ha (12%) has moderately suitable (Class S2) for growing sapota with minor limitations of gravelliness and rooting depth, and are distributed in the central, northern and southern part of the microwatershed. Major area of about 275 ha (51%) is marginally (Class S3) suitable for growing sapota with moderate limitations of texture, rooting depth, drainage, calcareousness and gravelliness and occur in the northern, northwestern, western, southwestern, southern, eastern and southeastern part of the microwatershed. An area of about 149 ha (28%) is currently not suitable (Class N1) for growing sapota with severe limitations of rooting depth and gravelliness and occur in the central, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

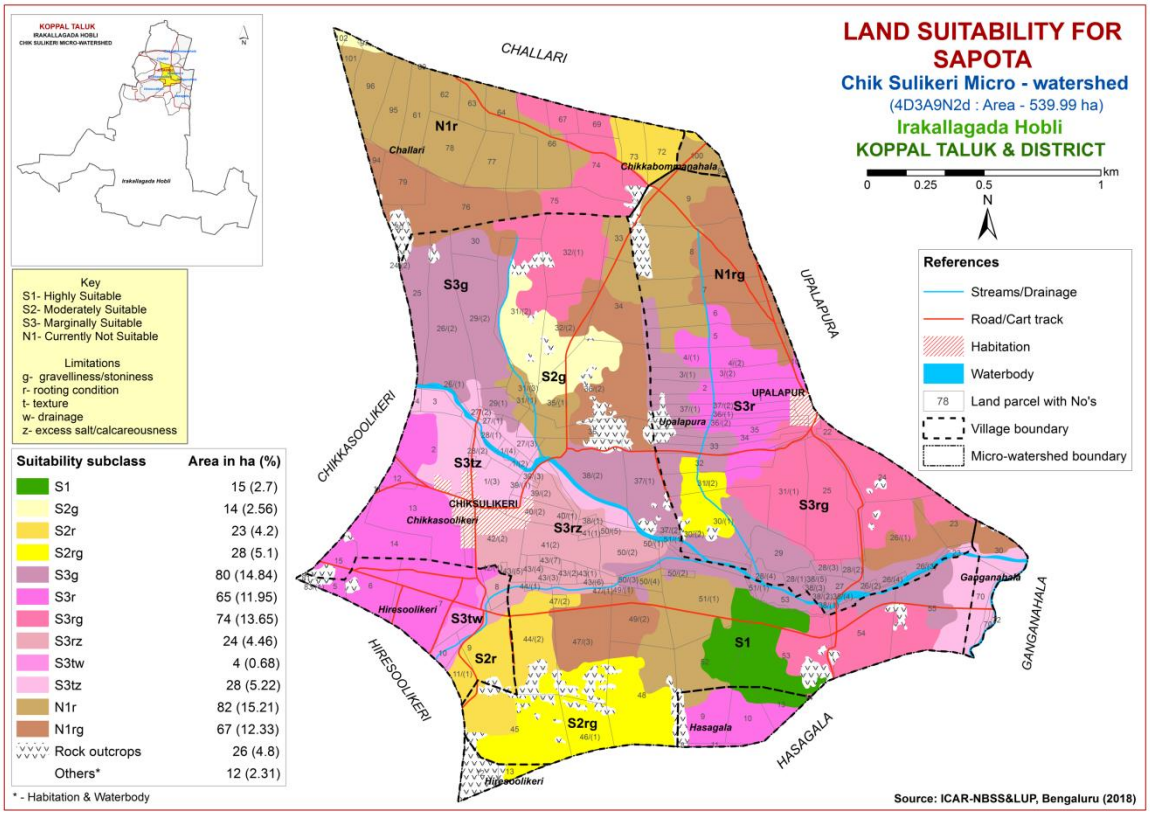


Fig. 7.17 Land Suitability map of Sapota

7.18 Land Suitability for Pomegranate (*Punica granatum*)

Pomegranate is one of the commercially grown fruit crop 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) of the soils of the microwatershed and a land suitability map for growing pomegranate was generated. The area extent and their geographic distribution of different suitability subclasses in the microwatershed are given in Figure 7.18.

Highly suitable (Class S1) for growing pomegranate occur in an area of about 15 ha (3%) and are distributed in the southern part of the microwatershed. An area of about 97 ha (18%) is moderately suitable (Class S2) for growing pomegranate with minor limitations of texture, rooting depth, drainage, calcareousness and gravelliness and occur in the central, northern, western, southwestern, southern and Southeastern part of the microwatershed. Marginally suitable (Class S3) lands cover a major area of about 243 ha (45%) and occur in the central, western, northwestern, southwestern, southern, southeastern, eastern and northern part of the microwatershed. They have moderate limitations of rooting depth and gravelliness. An area of about 149 ha (28%) is currently not suitable (Class N1) for growing pomegranate with severe limitations of rooting depth and gravelliness and occur in the central, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

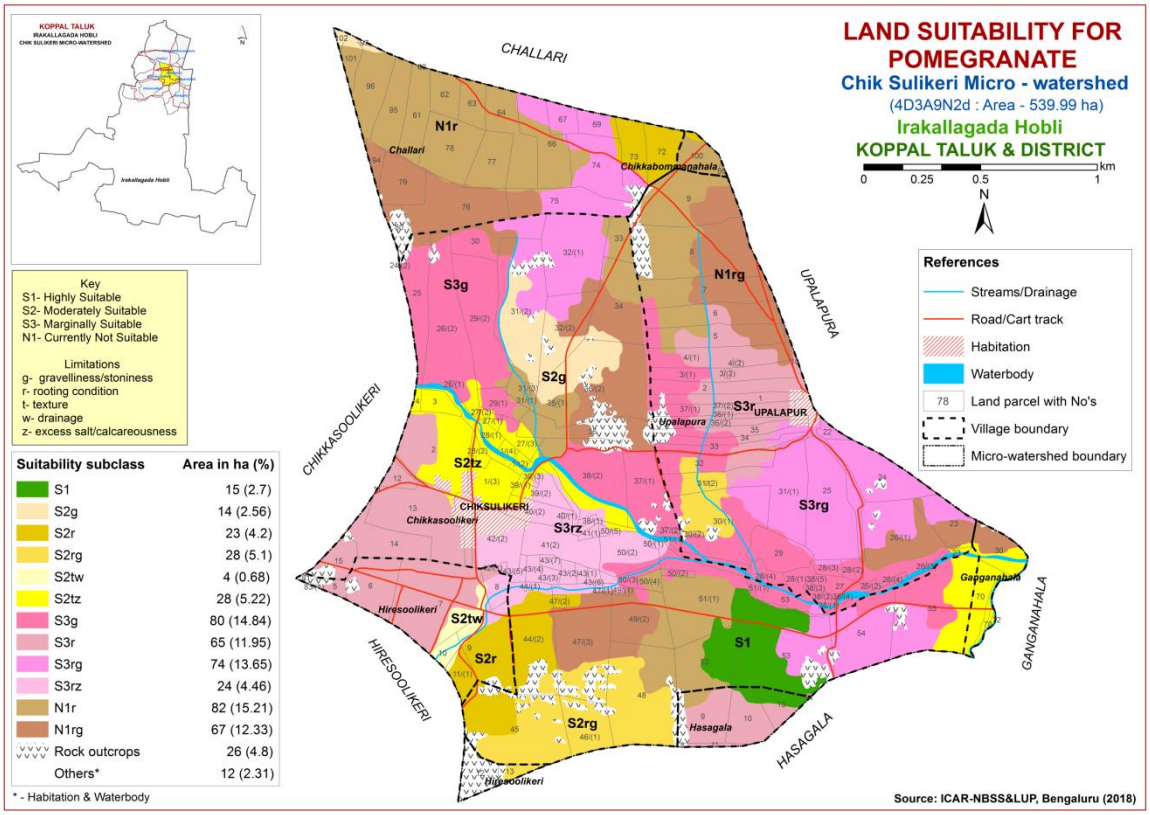


Fig. 7.18 Land Suitability map of Pomegranate

7.19 Land Suitability for Guava (*Psidium guajava*)

Guava is one of the most important fruit crop grown in an area of about 6558 ha in almost all the districts of the state. The crop requirements (Table 7.20) for growing guava were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing guava was generated. The area extent and their geographic distribution of different suitability subclasses in the microwatershed are given in Figure 7.19.

An area of about 15 ha (3%) is highly suitable (Class S1) for growing guava and are distributed in the southern part of the microwatershed. An area of about 65 ha (12%) is moderately suitable (Class S2) for growing guava with minor limitations of rooting depth, texture and gravelliness and are distributed in the central, southern and northern part of the microwatershed. Major area of 275 ha (51%) is marginally (Class S3) suitable for growing guava with moderate limitations of texture, rooting depth, drainage, calcareousness and gravelliness and occur in the northwestern, western, southwestern, southern, southeastern, eastern and northern part of the microwatershed. An area of about 149 ha (28%) is currently not suitable (Class N1) for growing guava with severe limitations of rooting depth and gravelliness and occur in the central, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

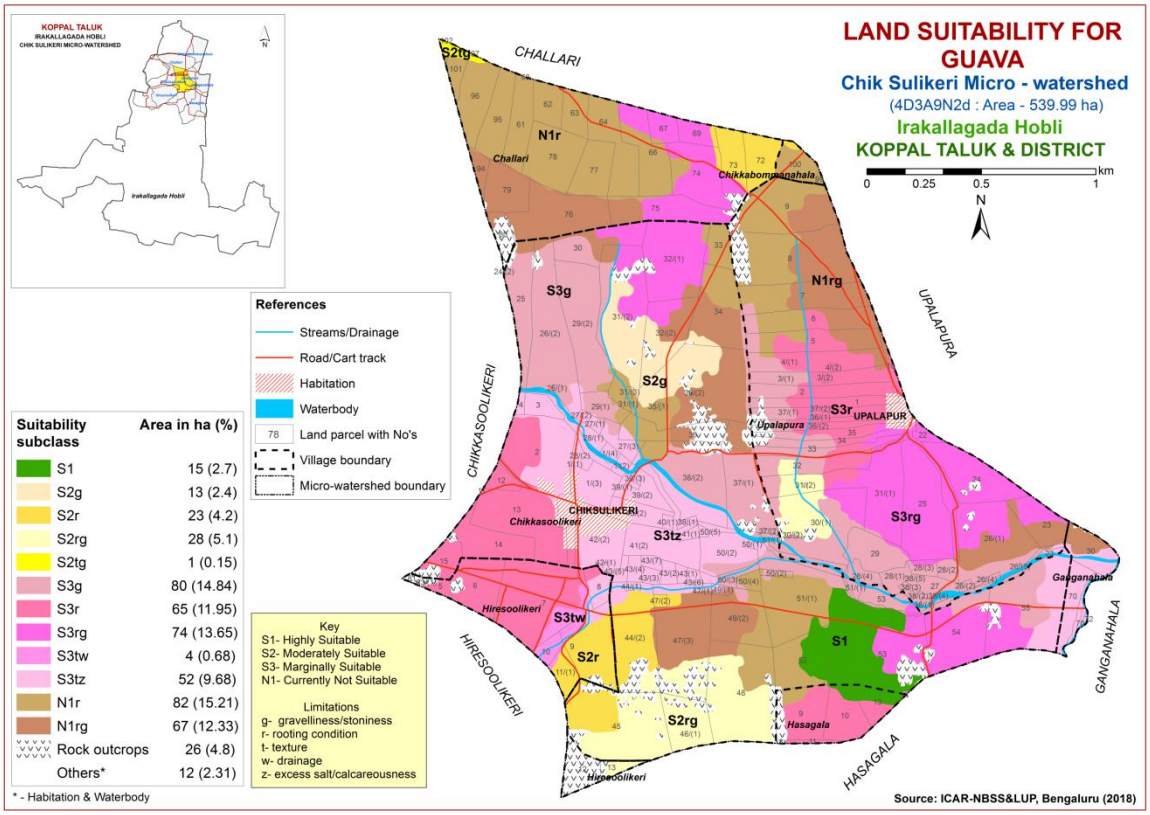


Fig. 7.19 Land Suitability map of Guava

7.20 Land Suitability for Jackfruit (*Artocarpus heterophyllus*)

Jackfruit is one of the most important fruit crop grown in 5368 ha in all the districts of the state. The crop requirements (Table 7.21) for growing jackfruit 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 geographic distribution of different suitability subclasses in the microwatershed are given in figure 7.20.

Highly suitable (Class S1) for growing jackfruit occur in an area of about 15 ha (3%) and are distributed in the southern part of the microwatershed. An area of about 65 ha (12%) is moderately suitable (Class S2) for growing jackfruit with minor limitations of gravelliness and rooting depth, and are distributed in the central, northern and southern part of the microwatershed. Major area of about 275 ha (51%) is marginally (Class S3) suitable for growing jackfruit with moderate limitations of texture, rooting depth, drainage, calcareousness and gravelliness and occur in the northern, northwestern, western, southwestern, southern, eastern and southeastern part of the microwatershed. An area of about 149 ha (28%) is currently not suitable (Class N1) for growing jackfruit with severe limitations of rooting depth and gravelliness and occur in the central, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

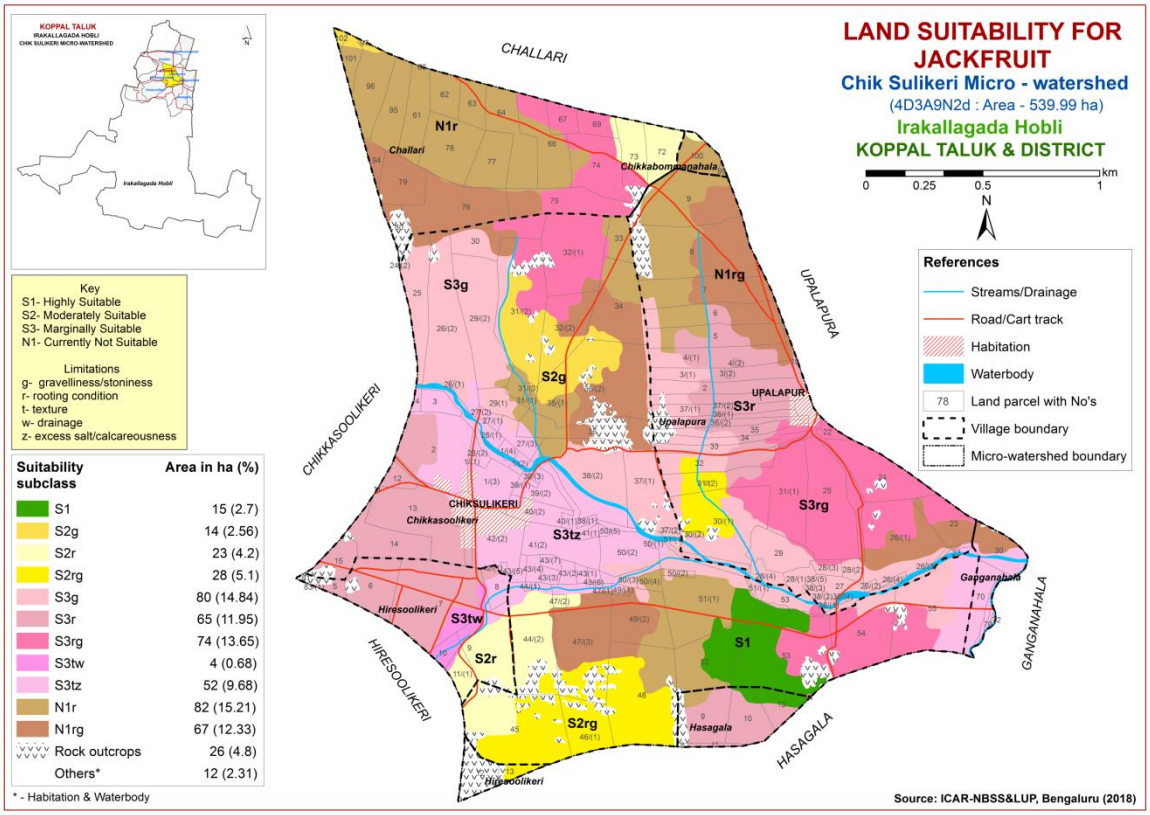


Fig. 7.20 Land Suitability map of Jackfruit

7.21 Land Suitability for Jamun (*Syzygium cumini*)

Jamun is one of the important fruit crop grown in almost all the districts of the state. The crop requirements (Table 7.22) for growing jamun 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 geographic distribution of different suitability subclasses in the microwatershed are given in Figure 7.21.

An area of 111 ha (20%) is moderately suitable (Class S2) for growing jamun with minor limitations of texture, rooting depth, drainage, calcareousness and gravelliness and occur in the central, northern, western, southwestern, southern and southeastern part of the microwatershed. Marginally suitable (Class S3) lands cover a major area of about 243 ha (45%) and occur in the northern, northwestern, western, southwestern, southern, southeastern and eastern part of the microwatershed. They have moderate limitations of rooting depth, texture, calcareousness and gravelliness. An area of about 149 ha (28%) is currently not suitable (Class N1) for growing jamun with severe limitations of rooting depth and gravelliness and occur in the central, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

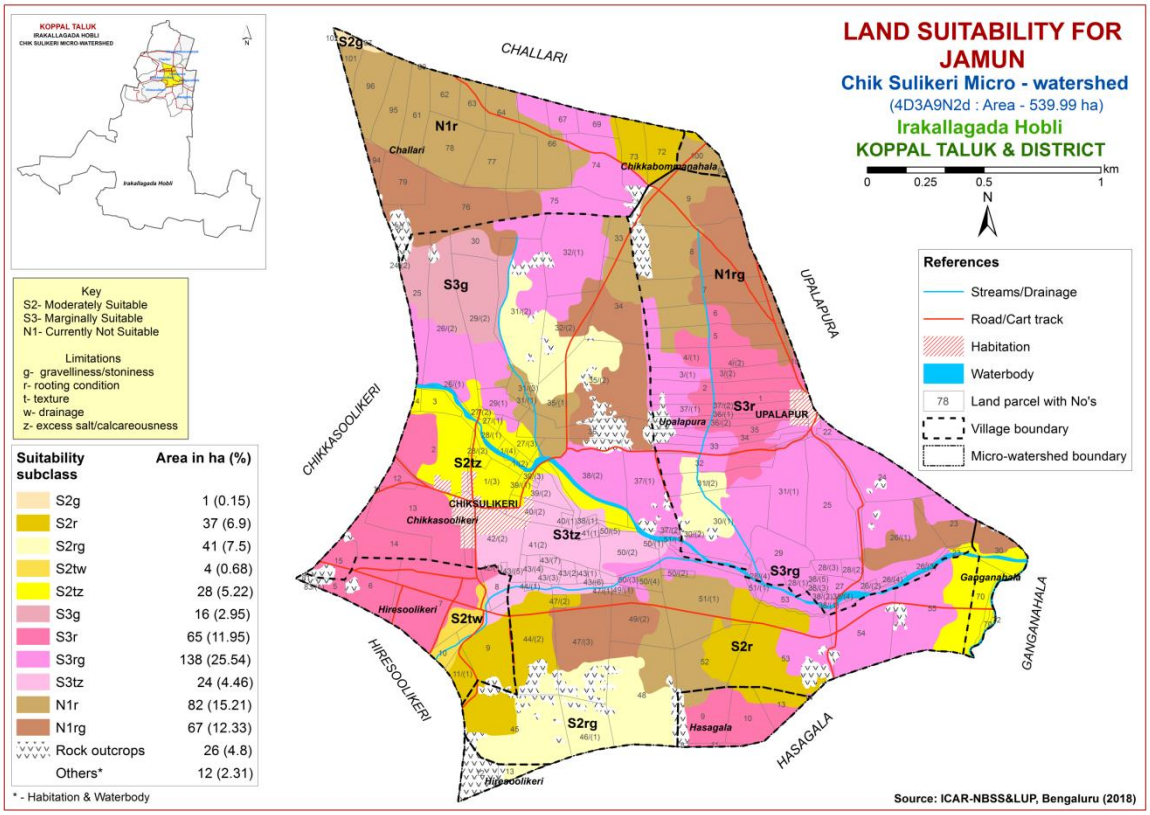


Fig. 7.21 Land Suitability map of Jamun

7.22 Land Suitability for Musambi (*Citrus limetta*)

Musambi is one of the most important fruit crop grown in an area of 5446 ha in almost all the districts of the state. The crop requirements (Table 7.23) for growing musambi 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 geographic distribution of different suitability subclasses in the microwatershed are given in Figure 7.22.

Highly suitable (Class S1) for growing musambi cover an area of about 24 ha (4%) and occur in the southern and southeastern part of the microwatershed. An area of about 88 ha (16%) is moderately suitable (Class S2) for growing musambi with minor limitations of rooting depth, drainage, calcareousness and gravelliness and occur in the central, northern, western, southwestern and southern part of the microwatershed. Marginally suitable (Class S3) lands cover a major area of about 243 ha (45%) and occur in the northern, northwestern, western, southwestern, southern, southeastern and eastern part of the microwatershed. They have moderate limitations of rooting depth, calcareousness and gravelliness. An area of about 149 ha (28%) is currently not suitable (Class N1) for growing musambi with severe limitations of rooting depth and gravelliness and occur in the central, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

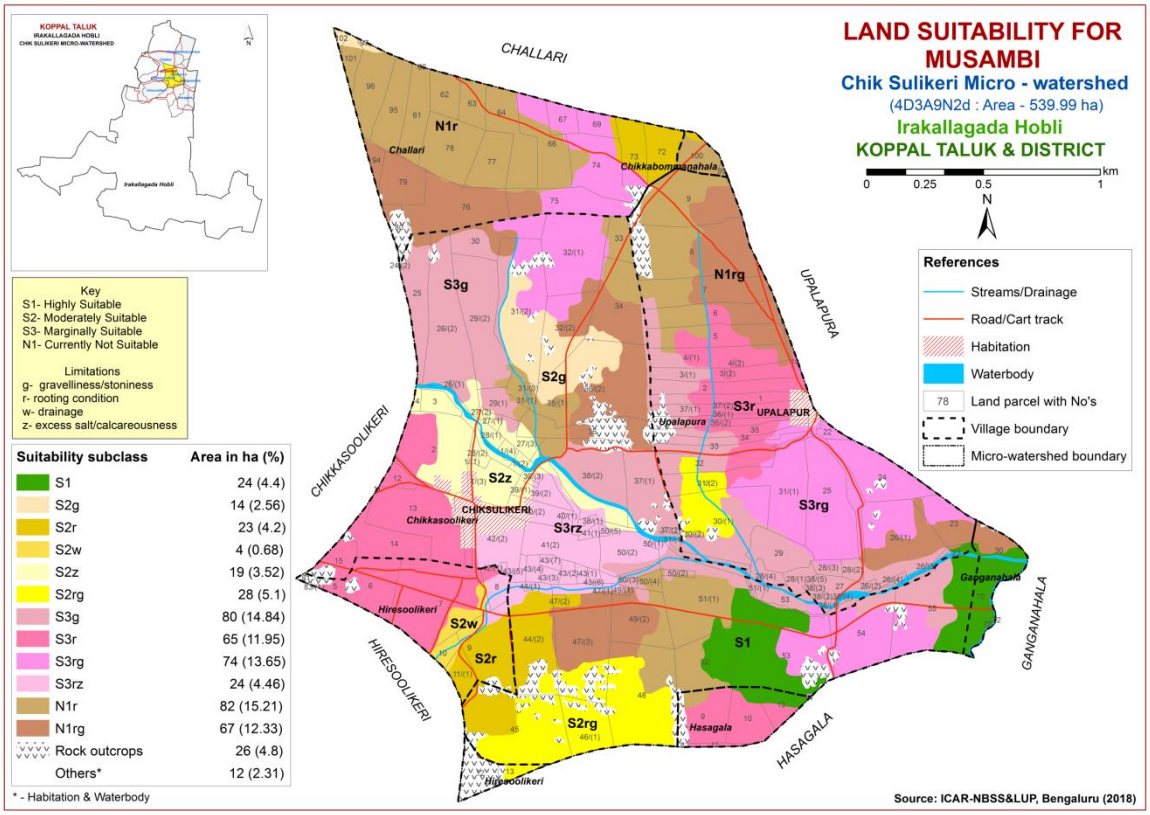


Fig. 7.22 Land Suitability map of Musambi

7.23 Land Suitability for Lime (*Citrus sp*)

Lime is one of the most important fruit crop grown in an area of 11752 ha in almost all the districts of the State. The crop requirements (Table 7.24) for growing lime (Table 7.15) 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 geographic distribution of different suitability subclasses in the microwatershed are given in Figure 7.23.

An area of about 24 ha (4%) is highly suitable (Class S1) for growing lime and occurs in the southern and southeastern part of the microwatershed. An area of about 88 ha (16%) is moderately suitable (Class S2) for growing lime with minor limitations of rooting depth, drainage, calcareousness and gravelliness and occur in the central, northern, western, southwestern and southern part of the microwatershed. Marginally suitable (Class S3) lands cover a major area of about 243 ha (45%) and occur in the northern, northwestern, western, southwestern, southern, southeastern and eastern part of the microwatershed. They have moderate limitations of rooting depth, calcareousness and gravelliness. An area of about 149 ha (28%) is currently not suitable (Class N1) for growing lime with severe limitations of rooting depth and gravelliness and occur in the central, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

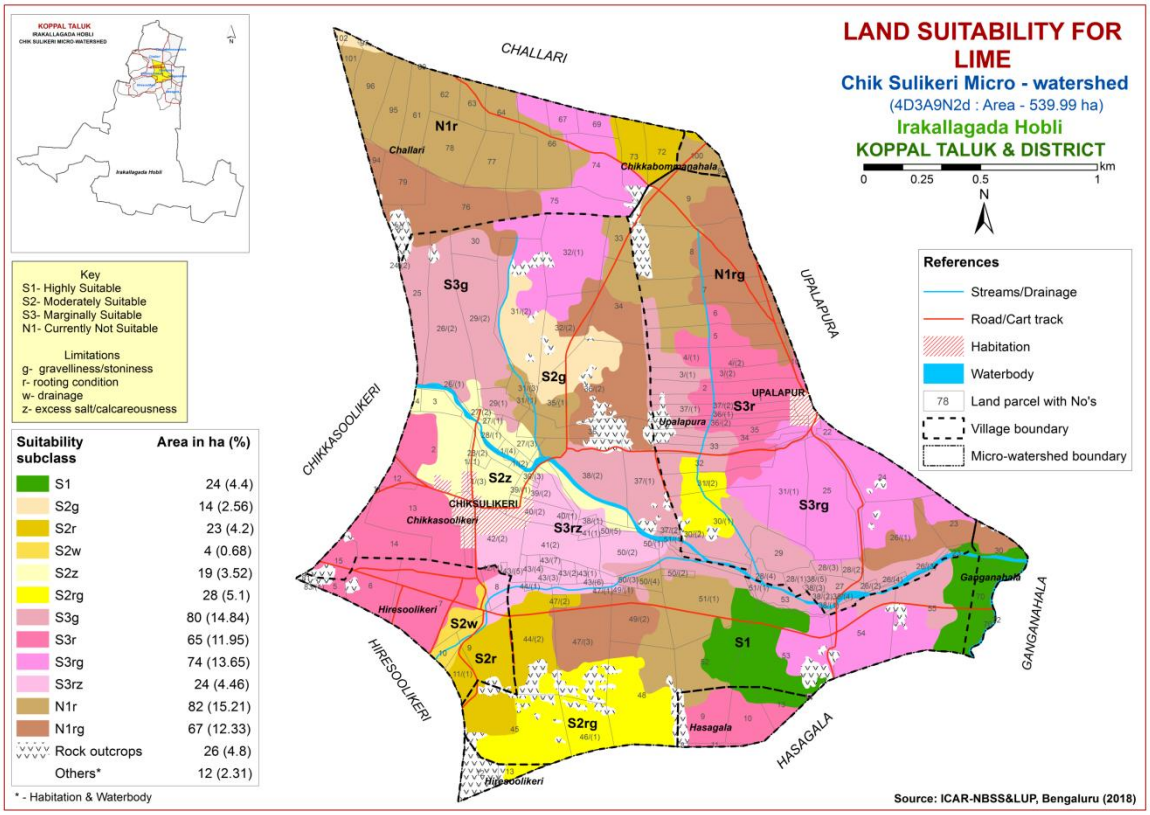


Fig. 7.23 Land Suitability map of Lime

7.24 Land Suitability for Cashew (*Anacardium occidentale)*

Cashew is one of the most important nut crop grown in an area of 7052 ha in almost all the districts of the State. The crop requirements (Table 7.25) for growing cashew 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 geographic distribution of different suitability subclasses in the microwatershed are given in Figure 7.24.

Highly suitable (Class S1) for growing cashew cover an area of about 13 ha (2%) and occur in the central part of the microwatershed. An area of about 52 ha (9%) is moderately suitable (Class S2) for growing cashew with minor limitations of rooting depth, texture and gravelliness and are distributed in the southern and northern part of the microwatershed. An area of about 219 ha (40%) is marginally suitable (Class S3) for growing cashew with moderate limitations of rooting depth and gravelliness and are distributed in the northern, northwestern, western, southwestern, southern, southeastern and eastern part of the microwatershed. Currently not suitable (Class N1) lands cover a major area of about 220 ha (41%) and are distributed in the central, northern, northeastern, eastern, southeastern, southern, southwestern and western part of the microwatershed with severe limitations of texture, rooting depth, drainage, calcareousness and gravelliness.

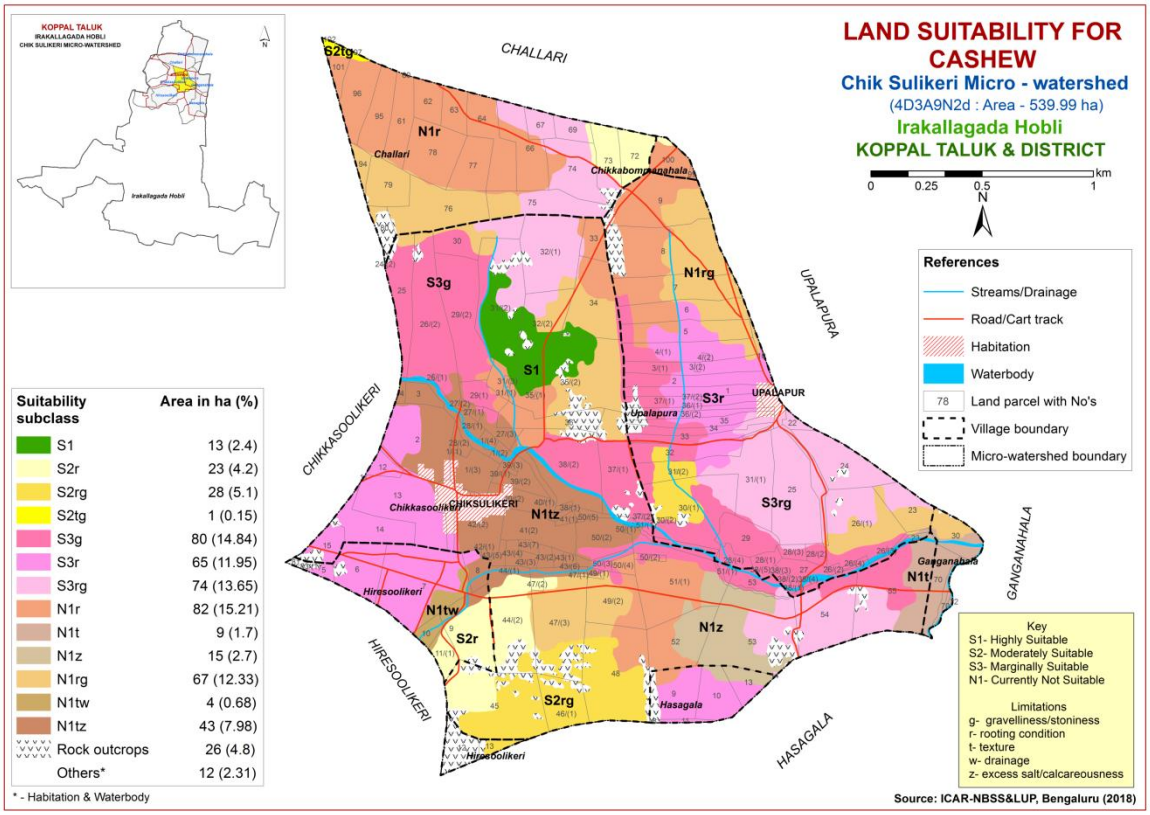


Fig. 7.24 Land Suitability map of Cashew

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

Custard apple is one of the most important fruit crop grown in 1426 ha in almost all the districts of the State. The crop requirements (Table 7.26) for growing custard apple 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 geographic distribution of different suitability subclasses in the microwatershed are given in Figure 7.25.

An area of about 59 ha (11%) is highly suitable (Class S1) for growing custard apple and occurs in the northern, southeastern, southern and central part of the microwatershed. Major area of about 294 ha (54%) is moderately suitable (Class S2) for growing custard apple with minor limitations of rooting depth, drainage, calcareousness and gravelliness and occur in the northern, northwestern, western, southwestern, southern, southeastern and eastern part of the microwatershed. Marginally suitable (Class S3) lands cover an area of about 148 ha (28%) and occur in the central, northern, northeastern, eastern, southeastern and southern part of the microwatershed. They have moderate limitations of rooting depth and gravelliness.

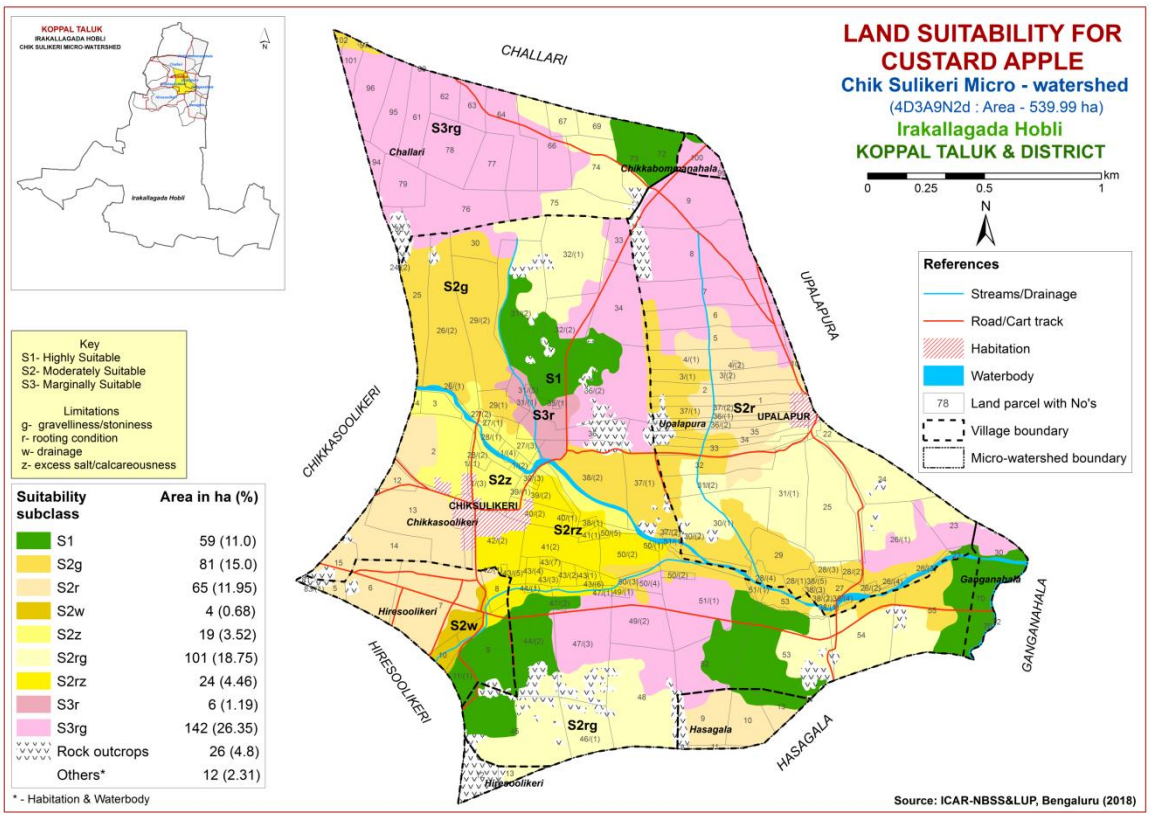


Fig. 7.25 Land Suitability map of Custard Apple

7.26 Land Suitability for Amla (*Phyllanthus emblica*)

Amla is one of the most important fruit and medicinal crop grown in an area of 151 ha and distributed in almost all the districts of the state. The crop requirements for (Table 7.27) growing amla 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 geographic distribution of different suitability subclasses in the microwatershed are given in Figure 7.26.

Highly suitable (Class S1) for growing amla cover an area of about 59 ha (11%) and occur in the northern, southeastern, southern and central part of the microwatershed. Major area of about 294 ha (54%) is moderately suitable (Class S2) for growing amla with minor limitations of rooting depth, drainage, calcareousness, texture and gravelliness and occur in the northern, northwestern, western, southwestern, southern, southeastern and eastern part of the microwatershed. An area of about 148 ha (28%) is marginally suitable (Class S3) for growing amla with moderate limitations of rooting depth and gravelliness and occur in the central, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

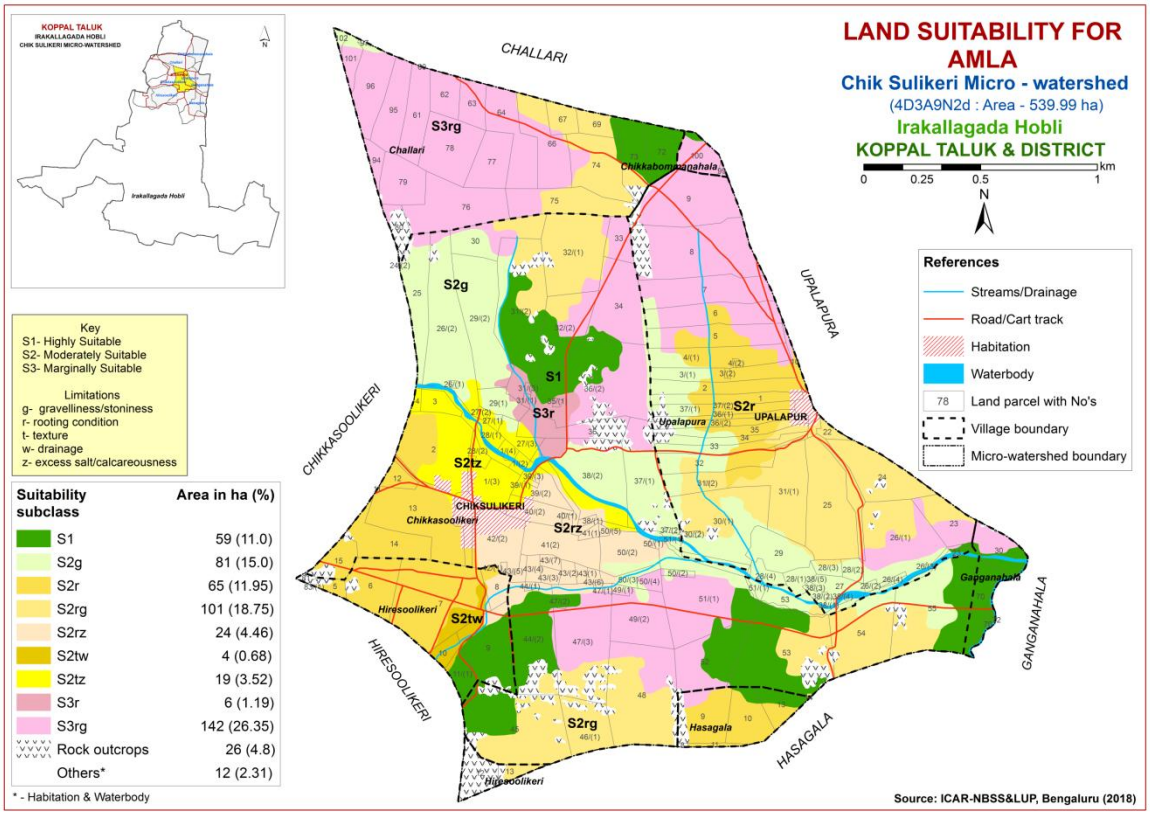


Fig. 7.26 Land Suitability map of Amla

7.27 Land Suitability for Tamarind (*Tamarindus indica*)

Tamarind is one of the most important spice crop grown in 14897 ha in all the districts of the state. The crop requirements (Table 7.28) for growing tamarind 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 Figure 7.27.

An area of about 61 ha (11%) is moderately suitable (Class S2) with minor limitations of rooting depth, gravelliness, drainage, calcareousness and texture and occur in the northern, central, southeastern, southwestern, southern and western part of the microwatershed. Marginally suitable (Class S3) lands cover an area of 130 ha (24%) and occur in the northern, northwestern, western, southern, southeastern and eastern part of the microwatershed. They have moderate limitations of rooting depth and gravelliness. Major area of about 311 ha (58%) is currently not suitable (Class N1) for growing tamarind and are distributed in central, northern, northeastern, eastern, southeastern, southern and southwestern part of the microwatershed. They have severe limitations of rooting depth, calcareousness and gravelliness.

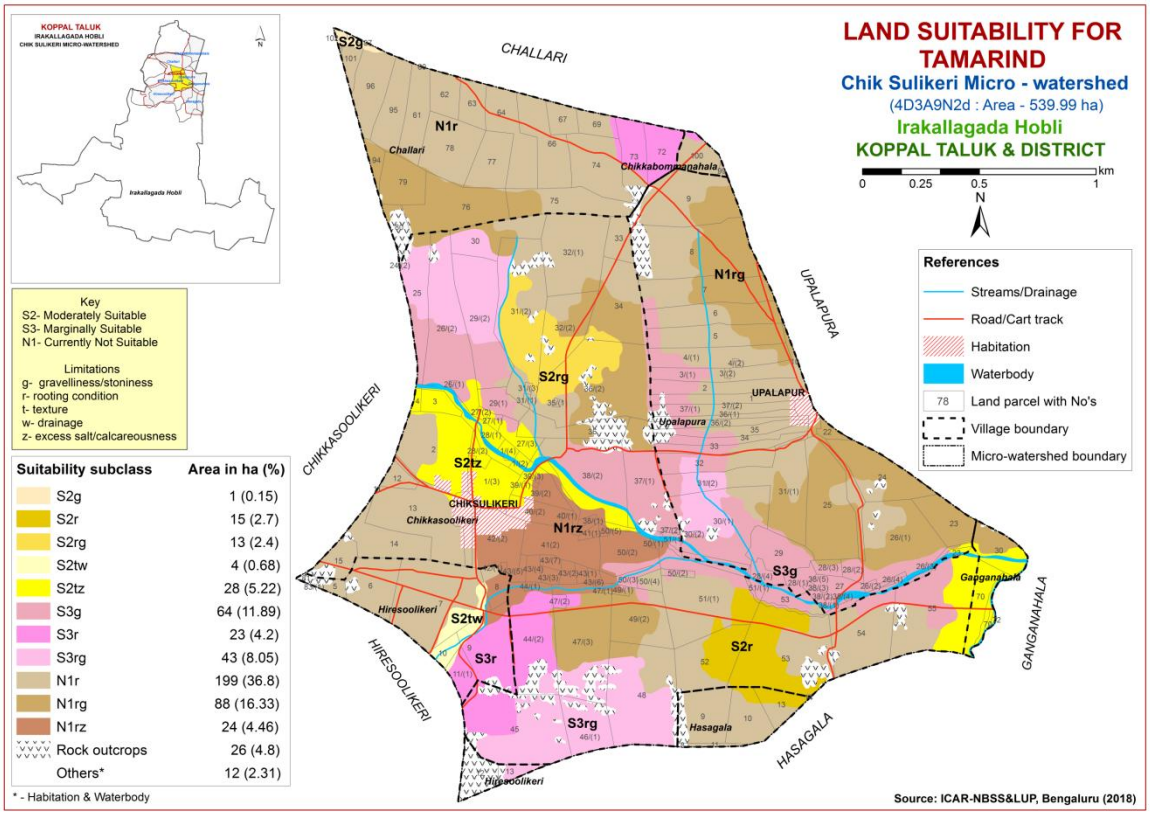


Fig. 7.27 Land Suitability map of Tamarind

7.28 Land Suitability for Marigold (*Tagetes erecta*)

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 is given in Figure 7.28.

Highly suitable (Class S1) for growing marigold cover an area of about 15 ha (3%) and occur in the southern part of the microwatershed. An area of about 198 ha (37%) is moderately suitable (Class S2) for growing marigold with minor limitations of texture, rooting depth, calcareousness, drainage and gravelliness and are distributed in the central, western, southern, eastern, southeastern, northern and southwestern part of the microwatershed. Maximum area of about 289 ha (54%) is marginally suitable (Class S3) for growing marigold with moderate limitations of rooting depth and gravelliness and occur in the central, western, northwestern, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

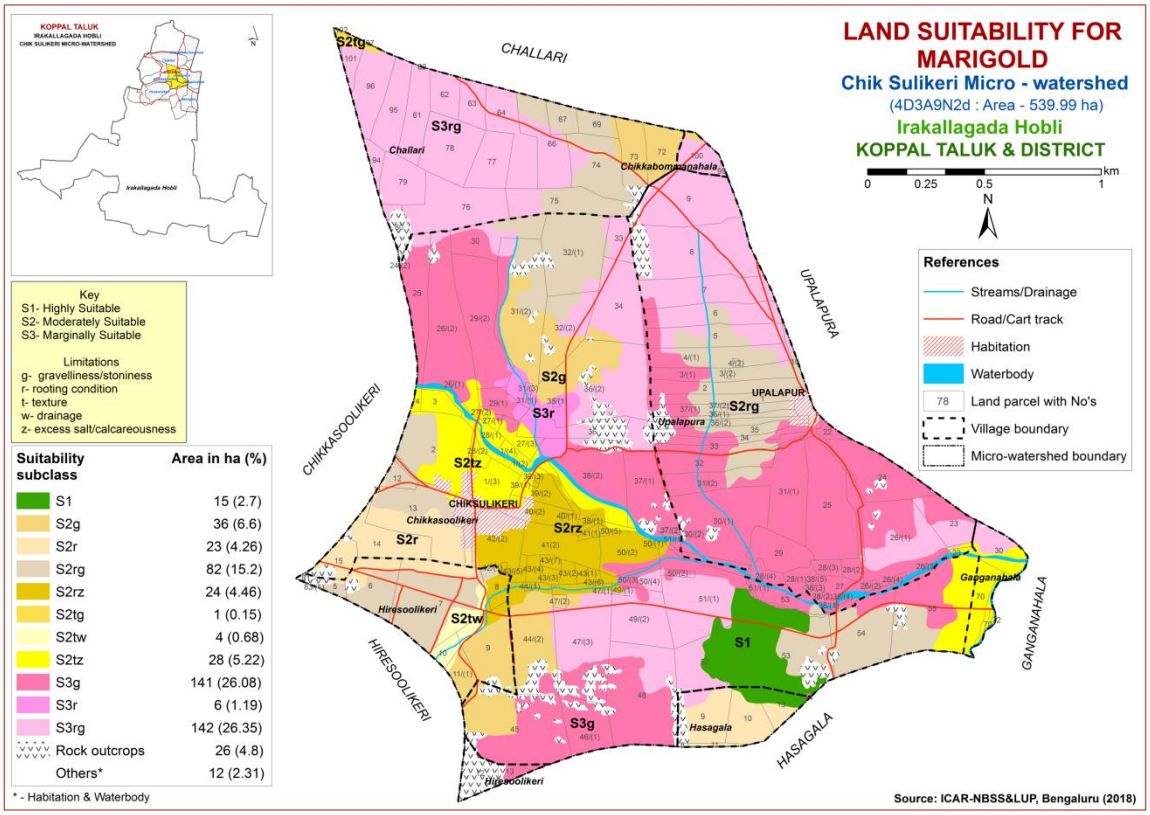


Fig. 7.28 Land Suitability map of Marigold

7.29 Land Suitability for Chrysanthemum (*Chrysanthemum indicum*)

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 geographic distribution of different suitability subclasses in the microwatershed is given in Figure 7.29.

An area of about 15 ha (3%) is highly suitable (Class S1) for growing chrysanthemum and occur in the southern part of the microwatershed. An area of about 198 ha (37%) is moderately suitable (Class S2) for growing chrysanthemum with minor limitations of texture, rooting depth, calcareousness, drainage and gravelliness and are distributed in the central, western, southern, eastern, southeastern, northern and southwestern part of the microwatershed. Maximum area of about 289 ha (54%) is marginally suitable (Class S3) for growing chrysanthemum with moderate limitations of rooting depth and gravelliness and occur in the central, western, northwestern, northern, northeastern, eastern, southeastern and southern part of the microwatershed.

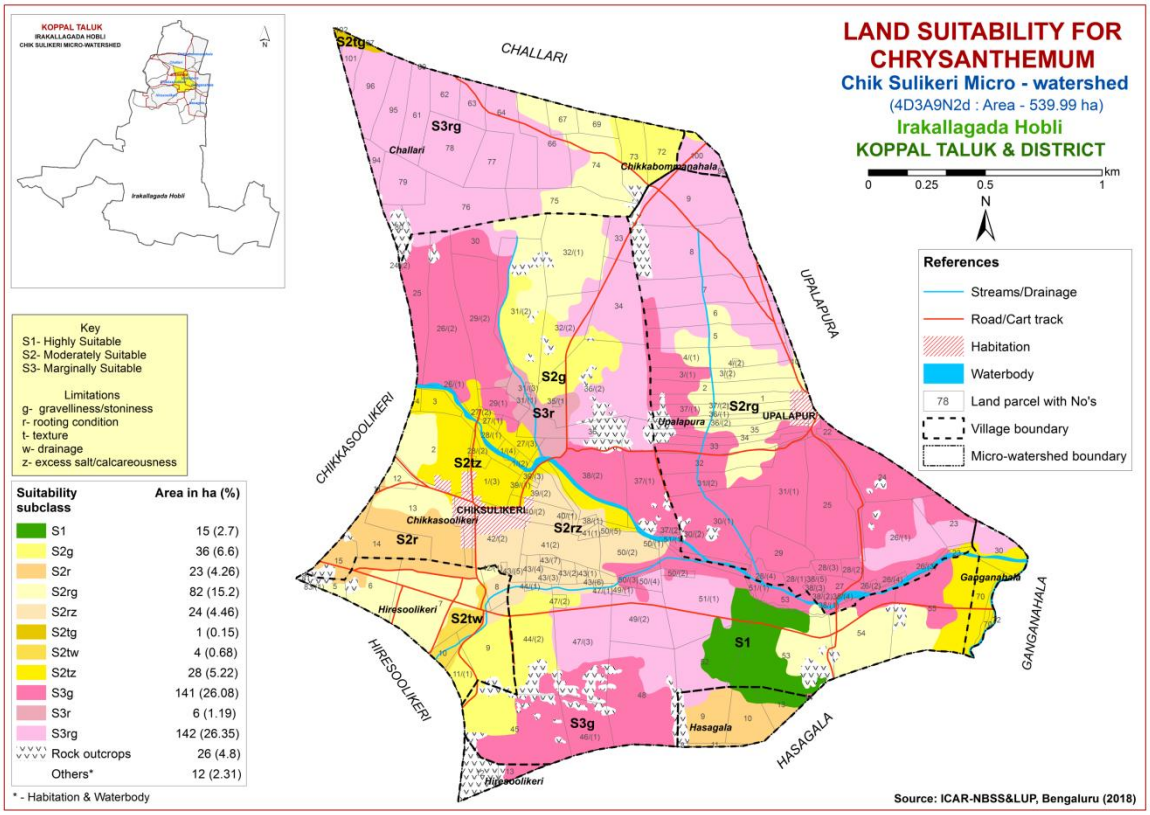


Fig. 7.29 Land Suitability map of Chrysanthemum

7.30 Land Suitability for Jasmine *(Jasminum sp.)*

Jasmine is one of the most important flower crop grown in an area of 803 ha in almost all the districts of the State. The crop requirements (Table 7.31) for growing jasmine were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing jasmine was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed are given in Figure 7.30.

Highly suitable (Class S1) for growing jasmine cover an area of about 15 ha (3%) and occur in the southern part of the microwatershed. An area of about 166 ha (31%) is moderately suitable (Class S2) for growing jasmine and occur in the central, northern, southwestern, southern, southeastern and eastern part of the microwatershed. They have minor limitations of gravelliness, calcareousness, texture and rooting depth. Major area of about 321 ha (60%) is marginally suitable (Class S3) for growing jasmine and occur in the major part of the microwatershed. They have moderate limitations of rooting depth, texture, drainage, calcareousness and gravelliness.

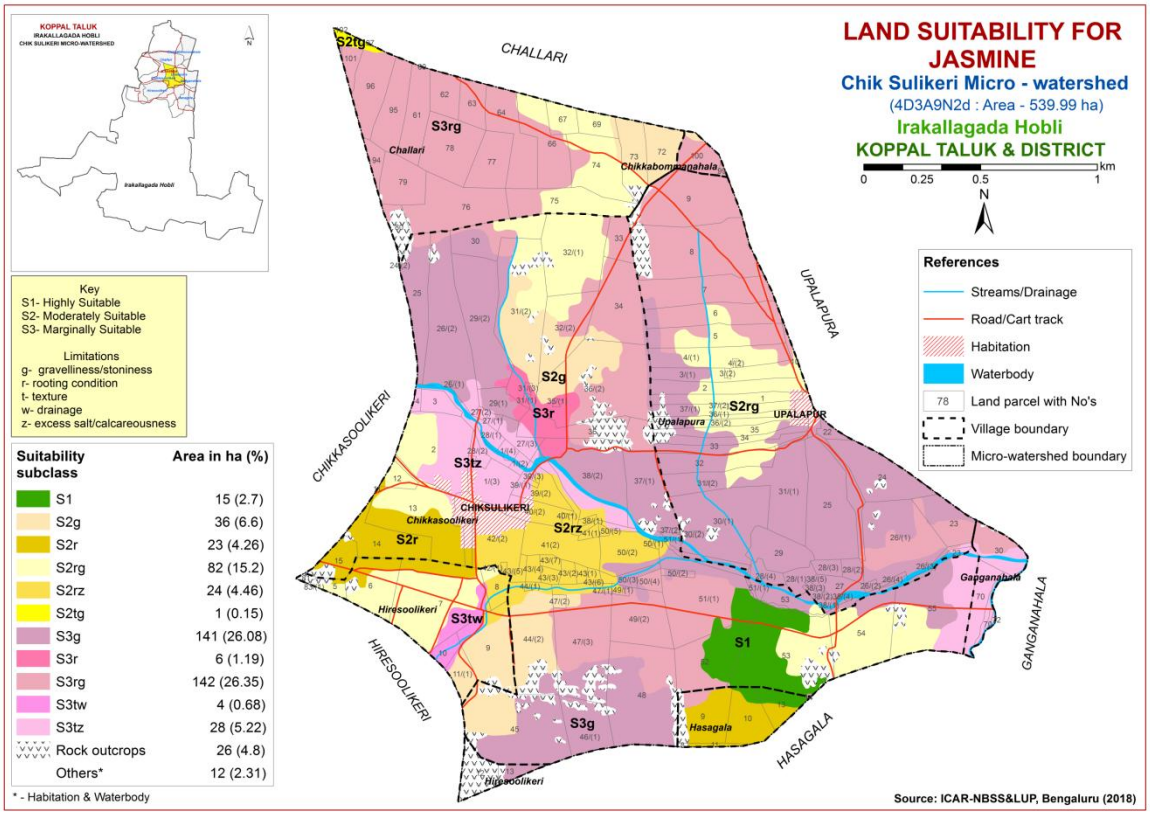


Fig. 7.30 Land Suitability map of Jasmine

7. 31 Land Suitability for Crossandra *(Crossandra infundibuliformis.)*

Crossandra is one of the most important flower crop grown in all the districts of the state. The crop requirements (Table 7.32) for growing crossandra were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing crossandra was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed are given in Figure 7.31.

An area of about 15 ha (3%) is highly suitable (Class S1) for growing crossandra and occur in the southern part of the microwatershed. An area of about 141 ha (26%) is moderately suitable (Class S2) for growing crossandra and occur in the central, northern, southwestern, southern, southeastern and eastern part of the microwatershed. They have minor limitations of gravelliness and rooting depth. Major area of about 345 ha (64%) is marginally suitable (Class S3) for growing crossandra and occur in all parts of the microwatershed. They have moderate limitations of rooting depth, texture, drainage, calcareousness and gravelliness.

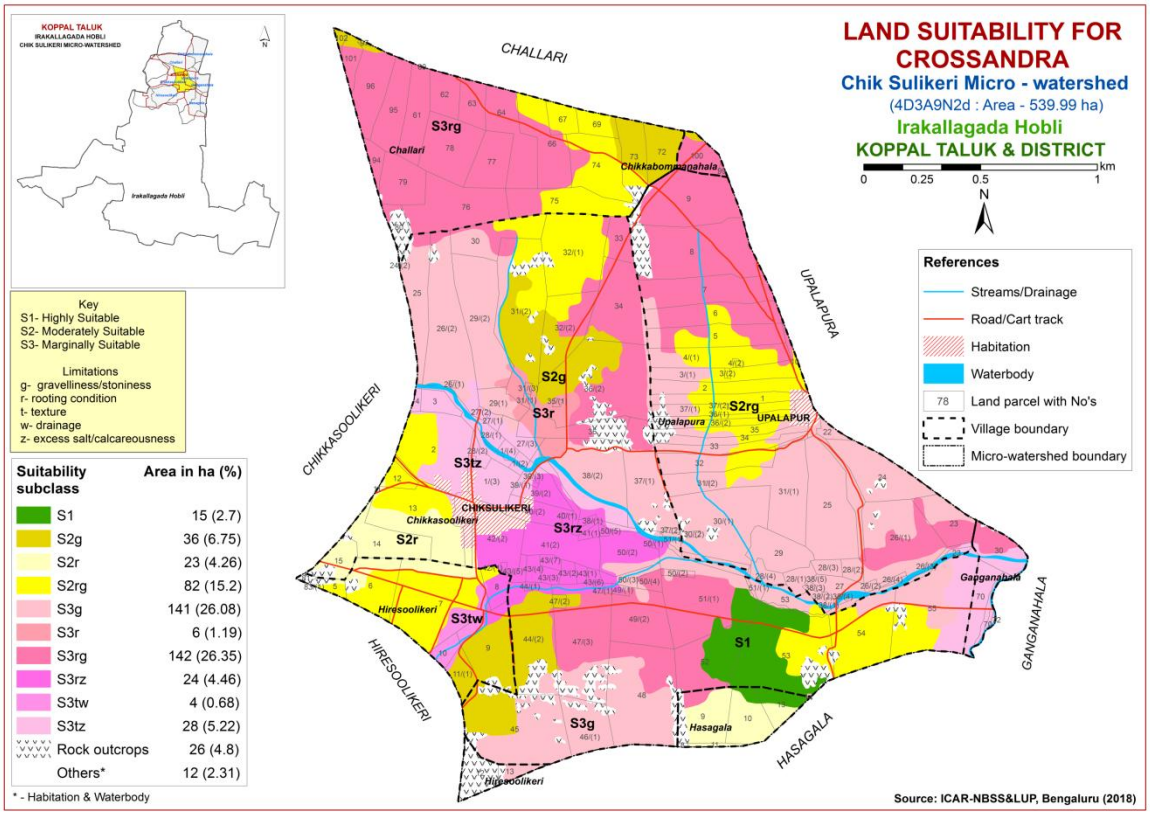


Fig. 7.31 Land Suitability map of Crossandra

Table 7.1 Soil-Site Characteristics of Chik Sulikeri Microwatershed

Soil Map Units	Climate (P) (mm)	Growing period (Days)	Drainage Class	Soil depth (cm)	Soil texture		Gravelliness		Rocks	AWC (mm/m	Slope (%)	Erosion	pH	EC	ESP	CEC [Cmol (p+)kg-1]	BS (%)
					Surf-ace	Sub-surface	Sur-face	Sub-surface									
HRVcC2g1	662	<90	WD	25-50	sl	gscl	15-35	>35	<2	<50	3-5	Moderate	6.05	0.21	0.73	11.24	100
HRVcC2g2R2	662	<90	WD	25-50	sl	gscl	35-60	>35	10-25	<50	3-5	Moderate	6.05	0.21	0.73	11.24	100
HRVhB2g1	662	<90	WD	25-50	scl	gscl	15-35	>35	<2	<50	1-3	Moderate	6.05	0.21	0.73	11.24	100
HRVhB2g2	662	<90	WD	25-50	scl	gscl	35-60	>35	<2	<50	1-3	Moderate	6.05	0.21	0.73	11.24	100
HRViB1g2	662	<90	WD	25-50	sc	gscl	35-60	>35	<2	<50	1-3	Slight	6.05	0.21	0.73	11.24	100
CSRiB2	662	<90	WD	25-50	sc	scl	<15	<15	<2	<50	1-3	Moderate					
ABRiB2g2	662	<90	WD	25-50	sc	sc	35-60	>35	<2	<50	1-3	Moderate	6.13	0.02	0.36	3.60	58.76
LKRhB2g2	662	<90	WD	50-75	scl	gsc	35-60	40-60	<2	<50	1-3	Moderate	8.18	0.30	4.51	12.19	100
KGHcB2g1	662	<90	WD	50-75	sl	gscl	15-35	15-35	<2	51-100	1-3	Moderate					
KGHcB2g2	662	<90	WD	50-75	sl	gscl	35-60	15-35	<2	51-100	1-3	Moderate					
KTPiB1	662	<90	WD	50-75	sc	gsc	<15	15-35	<2	51-100	1-3	Slight	6.42	0.07	0.05	4.41	100
KTPiB1g1	662	<90	WD	50-75	sc	gsc	15-35	15-35	<2	51-100	1-3	Slight	6.42	0.07	0.05	4.41	100
MKHcB2g2	662	<90	WD	50-75	sl	gscl	35-60	>35	<2	<50	1-3	Moderate	7.38	0.09	1.49	14.84	93
MKHhB1	662	<90	WD	50-75	scl	gscl	15-35	>35	<2	<50	1-3	Slight	7.38	0.09	1.49	14.84	93
MKHhB2g1	662	<90	WD	50-75	scl	gscl	15-35	>35	<2	<50	1-3	Moderate	7.38	0.09	1.49	14.84	93
MKHiB1g1	662	<90	WD	50-75	sc	gscl	15-35	>35	<2	<50	1-3	Slight	7.38	0.09	1.49	14.84	93
MKHiB2g2	662	<90	WD	50-75	sc	gscl	35-60	>35	<2	<50	1-3	Moderate	7.38	0.09	1.49	14.84	93
HDHbB2g1	662	<90	WD	75-100	ls	gsc-gc	15-35	>35	<2	51-100	1-3	Moderate	6.54	0.07	7.11	5.84	84.07
HDHhB2g2	662	<90	WD	75-100	scl	gsc-gc	35-60	>35	<2	51-100	1-3	Moderate	6.54	0.07	7.11	5.84	84.07
HDHiB2	662	<90	WD	75-100	sc	gsc-gc	<15	>35	<2	51-100	1-3	Moderate	6.54	0.07	7.11	5.84	84.07
GHTbB2g1	662	<90	WD	75-100	ls	gscl	15-30	15-35	<2	51-100	1-3	Moderate	5.70	0.06	4.10	3.17	73
GHTcB2g1	662	<90	WD	75-100	sl	gscl	15-35	15-35	<2	51-100	1-3	Moderate	5.70	0.06	4.10	3.17	73

KMHhB1g1	662	<90	WD	100-150	scl	sc	15-35	<15	<2	101-150	1-3	Slight	7.2	0.193	0.54	15.07	100
MNLhB1	662	<90	WD	100-150	scl	gsc	<15	15-35	<2	101-150	1-3	Slight	7.89	0.137	5.04	9.01	100
BPRhB2g2	662	<90	WD	100-150	scl	gsc-gc	35-60	>35	<2	51-100	1-3	Moderate	6.64	0.03	0.51	5.45	63.48
NGPhB1g2	662	<90	WD	100-150	scl	gsc	35-60	>35	<2	51-100	1-3	Slight	6.77	0.09	0.46	7.10	82.70
NGPiA1g1	662	<90	WD	100-150	sc	gsc	15-35	>35	<2	51-100	0-1	Slight	6.77	0.09	0.46	7.10	82.70
NGPiB1	662	<90	WD	100-150	sc	gsc	<15	>35	<2	51-100	1-3	Slight	6.77	0.09	0.46	7.10	82.70
NGPhC2g1	662	<90	WD	100-150	scl	gsc	15-35	>35	<2	51-100	3-5	Moderate	6.77	0.09	0.46	7.10	82.70
NDLhB2g1	662	<90	WD	>150	scl	gsc	15-35	>35	<2	51-100	1-3	Moderate	7.46	0.08	0.32	11.45	91.88
RNKiA1	662	<90	MWD	50-75	sc	c	<15	<15	<2	101-150	0-1	Slight	8.86	0.483	6.78	37.00	-
RNKmB2	662	<90	MWD	50-75	c	c	<15	<15	<2	101-150	1-3	Moderate	8.86	0.483	6.78	37.00	-
BGPmA1	662	<90	MWD	>150	c	c	<15	<15	<2	>200	0-1	Slight	9.2	0.27	3.84	19.60	100
KLRmA1	662	<90	MWD	>150	c	sc	<15	<15	<2	-	0-1	Slight	7.11	0.33	3.42	19.50	100
TSDmA1	662	<90	MWD	>150	c	c	<15	<15	<2	>200	0-1	Slight	8.46	0.175	0.19	36.61	100

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

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 characteristics					
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 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 7.8 Land suitability criteria for Red 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	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 7.9 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 7.10 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 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

Note: Suitability evaluation only for Mulberry leaf not for Silk worm rearing

Table 7.17 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 7.18 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 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 7.21 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 7.22 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 7.23 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 7.24 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 7.25 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 7.26 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 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 7.28 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 7.29 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

Table 7.31 Land suitability criteria for Jasmine (irrigated)

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	-
	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	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)	%				
Erosion hazard	Slope	%	<3	3-5	5-10	>10

Table 7.32 Land suitability criteria for Crossandra

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 to very 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 7.3-8.4	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

7.32 Land Management Units (LMUs)

The 35 soil map units identified in Chik Sulikeri microwatershed have been grouped into 8 Land Management Units (LMUs) 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.7.32) 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.

LMUs	Mapping unit	Soil and site characteristics
1	473.KLRmA1 446.TSDmA1	Very deep, calcareous to non calcareous clay lowland soils, 0-1% slope, slight erosion, non-gravelly (<15%).
2	105.HDHbB2g1 124.HDHhB2g2 127.HDHiB2 232.BPRhB2g2 259.NGPhB1g2 261.NGPiA1g1 262.NGPiB1 296.NDLhB2g1 460.NGPhC2g1	Moderately deep to very deep, red gravelly sandy clay loam to sandy clay soils, 0-5% slope, slight to moderate erosion, non-gravelly to very gravelly (<15-60%).
3	395.BGPmA1	Very deep, black calcareous clayey soils, 0-1% slope, slight erosion, non gravelly (<15%).
4	134.GHTbB2g1 138.GHTcB2g1 198.KMHhB1g1 205.MNLhB1	Moderately deep to deep, red sandy loam to sandy clay loam soils, 1-3% slope, slight to moderate erosion, non gravelly to gravelly (<15-35%).
5	47.LKRhB2g2 78.MKHcB2g2 81.MKHhB1 85.MKHhB2g1 88.MKHiB1g1 91.MKHiB2g2	Moderately shallow, red gravelly sandy clay to sandy clay loam soils, 1-3% slope, slight to moderate erosion, non gravelly to very gravelly (<15-60%).
6	65.KGHcB2g1 66.KGHcB2g2 73.KTPiB1 74.KTPiB1g1	Moderately shallow, red sandy loam to sandy clay soils, 1-3% slope, slight to moderate erosion, gravelly to very gravelly (15-60%).
7	329.RNKiA1 336.RNKmB2	Moderately shallow, black calcareous sandy clay to clay soils, 0-3% slope, slight to moderate erosion, non gravelly (<15%).
8	21.HRVcC2g1 22.HRVcC2g2R2 26.HRVhB2g1 27.HRVhB2g2 30.HRViB1g2 39.CSRiB2	Shallow, red gravelly sandy clay to sandy clay loam soils, 1-5% slope, slight to moderate erosion, non gravelly to very gravelly (<15-60%), Rocky (10-25%).

	472.ABRiB2g2	

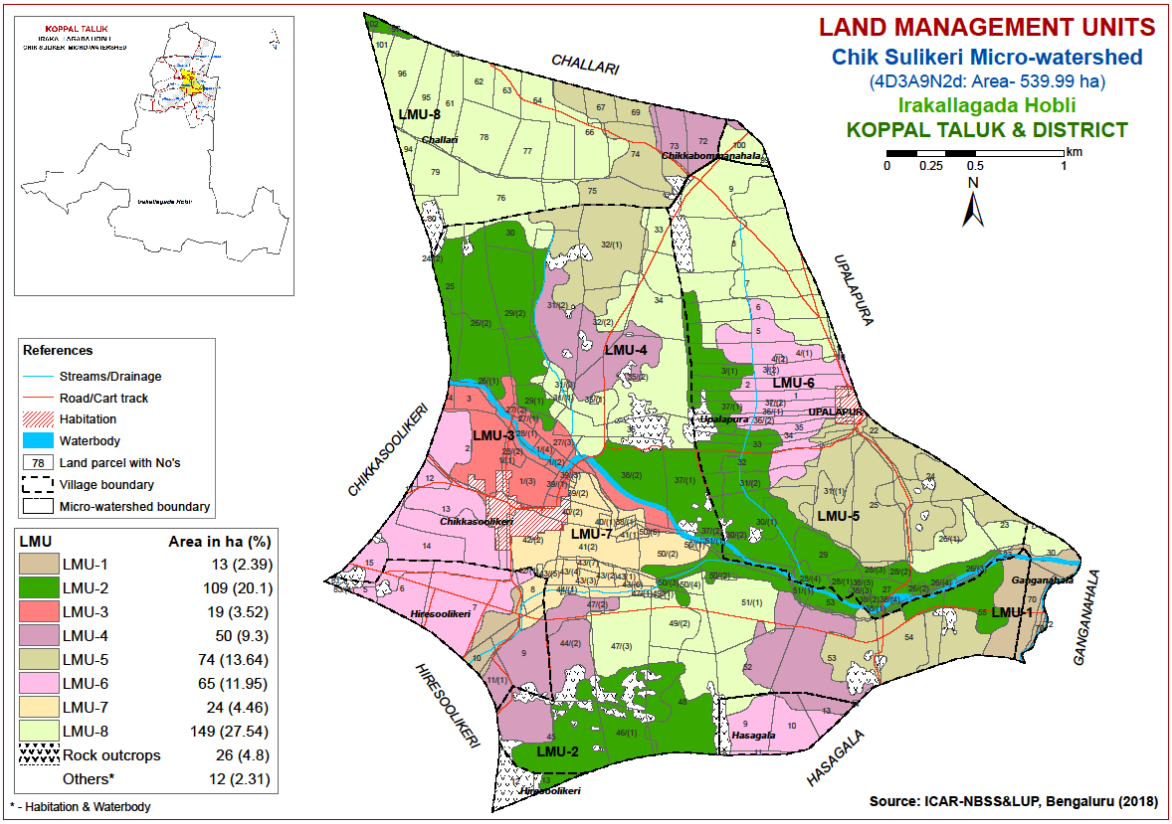


Fig 7.32 Land Management Units map of Chik Sulikeri microwatershed

7.33 Proposed Crop Plan for Chik Sulikeri Microwatershed

After assessing the land suitability for the 31 crops, the proposed crop plan has been prepared for the 8 identified LMU by considering only the highly (Class S1) and moderately (Class S2) suitable lands for each of the 31 crops. The resultant proposed crop plan is presented in Table 7.33.

Table 7.33 Proposed Crop Plan for Chik Sulikeri Microwatershed

LMU	Soil Map Units	Survey Number	Soil and site characteristics	Field Crops	Horticulture Crops	Suitable Interventions
1	473.KLRmA1 446.TSDmA1	**Chikkasoolikeri**: 55 **Ganganahala**: 70 **Hiresoolikeri**: 10	Very deep, calcareous to non calcareous clay lowland soils, 0-1% slope, slight erosion, non-gravelly (<15%).	Paddy, Maize, Sugarcane, Cotton	**Fruit crops**: Custard Apple, Amla **Vegetable crops**: Brinjal, Tomato, Chillies, Drumstick, Bhendi, Coriander, leafy vegetables **Flower crops**: Marigold, Chrysanthemum, Jasmine	Providing proper drainage, addition of organic manures, green leaf manuring, suitable conservation practices
2	105.HDHbB2g1 124.HDHhB2g2 127.HDHiB2 232.BPRhB2g2 259.NGPhB1g2 261.NGPiA1g1 262.NGPiB1 296.NDLhB2g1 460.NGPhC2g1	**Challari**: 97,102 **Chikkasoolikeri**:25,26/1,26/2,29/1,29/2,30,37/1,37/2,38/2,45,46/1,48,50/3 **Hiresoolikeri**: 13 **Upalapura**:26/2,26/3,26/4,27,28/1,28/2,28/3,28/4,29,30/1,30/2,31/2,32,33,34,38/1,38/2,38/3,38/5	Moderately deep to very deep, red gravelly sandy clay loam to sandy clay soils, 0-5% slope, slight to moderate erosion, non-gravelly to very gravelly (<15-60%).	Groundnut, Red gram, Bajra, Horse gram, Castor	**Fruit crops**: Musambi, Lime, Jamun, Jackfruit Amla, Custard apple, Tamarind **Vegetable crops**: Drumstick, Curry leaves	Drip irrigation, mulching, suitable soil and water conservation practices (Crescent Bunding with Catch Pit etc)
3	395.BGPmA1	**Chikkasoolikeri**:1/1,1/2,1/3,1/4,2,3,4,27/1,27/2,27/3,28/1,28/2,39/1,39/3	Very deep, black calcareous clayey soils, 0-1% slope, slight erosion, non gravelly (<15%).	Sorghum, Sunflower, Cotton, Bengal gram, Safflower, Linseed, Bajra	**Fruit crops**: Pomegranate, Jamun, Lime, Musambi, Tamarind, Amla, Custard apple **Vegetable crops**: Drumstick, Chilli, Coriander **Flowers**: Marigold, Chrysanthemum	Application of FYM, Biofertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices
4	134.GHTbB2g1 138.GHTcB2g1 198.KMHhB1g1 205.MNLhB1	**Challari**: 72,73 **Chikkasoolikeri**:31/2,32/2,44/2,47/2,52,53 **Hasagala**: 13 **Hiresoolikeri**: 11/1,9	Moderately deep to deep, red sandy loam to sandy clay loam soils, 1-3% slope, slight to moderate erosion, non gravelly to gravelly (<15-35%).	Maize, Sorghum, Sunflower, Bajra, Finger millet, Groundnut, Red gram, Cowpea,	**Fruit crops**: Pomegranate, Guava, Sapota, Jackfruit, Tamarind, Lime, Musambi, Amla, Custard apple Vegetable crops: Drumstick, Tomato, Chilli, Brinjal, Onion, Curry leaves	Drip irrigation, mulching, suitable soil and water conservation practices (Crescent Bunding with Catch Pit etc)

				Field bean, Castor	**Flower crops**: Marigold, Chrysanthemum, Jasmine	
5	47.LKRhB2g2 78.MKHcB2g2 81.MKHhB1 85.MKHhB2g1 88.MKHiB1g1 91.MKHiB2g2	**Challari**: 67,69,74,75 **Chikkasoolikeri**: 32/1,54 **Upalapura**: 22,24,25,31/1	Moderately shallow, red gravelly sandy clay to sandy clay loam soils, 1-3% slope, slight to moderate erosion, non gravelly to very gravelly (<15-60%).	Sorghum, Groundnut, Bajra, Castor	**Fruit crops**: Lime, Musambi, Amla, Cashew, Custard apple,	Drip irrigation, mulching, suitable soil and water conservation practices (Crescent Bunding with Catch Pit etc)
6	65.KGHcB2g1 66.KGHcB2g2 73.KTPiB1 74.KTPiB1g1	**Chikkasoolikeri**:11,12,13,14,15 **Hasagala**: 10,11,14,9 **Hiresoolikeri**: 5,6,7 **Upalapura**:1,2,3/1,3/2,4/1,4/2,5,10,35,36/1,36/2,37/1,37/2	Moderately shallow, red sandy loam to sandy clay soils, 1-3% slope, slight to moderate erosion, gravelly to very gravelly (15-60%).	Sorghum, Groundnut, Bajra, Green gram, Black gram, Cowpea, Horse gram, Castor,	**Fruit crops**: Lime, Musambi, Amla, Custard apple, Cashew **Flower crops**: Marigold, Chrysanthemum	Drip irrigation, Mulching, suitable soil and water conservation practices (Crescent Bunding with Catch Pit etc)
7	329.RNKiA1 336.RNKmB2	**Chikkasoolikeri**:38/1,39/2,40/1,40/2,41/1,412,42/1,42/2,43/1,43/2,43/3,43/4,43/5,43/6,43/7,44/1,47/1,49/1,50/1,50/2,50/5 **Hiresoolikeri**: 8	Moderately shallow, black calcareous sandy clay to clay soils, 0-3% slope, slight to moderate erosion, non gravelly (<15%).	Sorghum, Bajra, Bengal gram, Linseed, Safflower, Coriander	**Fruit crops**: Amla, Custard apple **Flower crops**: Marigold, Jasmine, Chrysanthemum	Application of FYM, Biofertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices
8	21.HRVcC2g1 22.HRVcC2g2R2 26.HRVhB2g1 27.HRVhB2g2 30.HRViB1g2 39.CSRiB2 472.ABRiB2g2	**Challari**:60,61,62,63,64,66,76,77,78,79,94,95,96,101 **Chikkabommanahala**:100,99 **Chikkasoolikeri**:31/1,31/3,33,34,35/1,35/2,36,47/3,49/2,50/4)51/1 **Ganganahala**: 30 **Upalapura**: 6,7,8,9,23,26/1	Shallow, red gravelly sandy clay to sandy clay loam soils, 1-5% slope, slight to moderate erosion, non gravelly to very gravelly (<15-60%), Rocky (10-25%).	Green gram, Black gram, Horse gram	**Agri-Silvi-Pasture:** Custard apple, Amla, Hybrid Napier, *Styloxanthes hamata*, Glyricidia, *Styloxanthes scabra*	Use of short duration varieties, sowing across the slope and split application of nitrogen fertilizers

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 Chik Sulikeri Microwatershed

- The soil phases with sizeable area identified in the microwatershed belonged to the soil series of Abbigeri (ABR) series occupies major area of 76 ha (14%) followed by Harve (HRV) 65 ha (12%), Nagalapura (NGP) 64 ha (12%), Kethanapura (KTP) 56 ha (10%), Mukhadahalli (MKH) 52 ha (10%), Hooradhahalli (HDH) 28 ha (5%), Ravanaki (RNK) 24 ha (4%), Gollarahatti (GHT) 23 ha (4%), Lakkur (LKR) 22 ha (4%), Budagumpa (BGP) 19 ha (4%), Balapur (BPR) 16 ha (3%), Mornal (MNL) 15 ha (3%), Kumchahalli (KMH) 13 ha (2%), Kavalakkeri (KLR) 9 ha (2%),

Kutegoudanahundi (KGH) 8 ha (2%), Chikkasavanur (CSR) 6 ha (1%), Thimmasandra (TSD) 4 ha (<1%) and Niduvalalu (NDL) 1 ha (<1%).

- ❖ As per land capability classification, an area of about 200 ha (37%) in the microwatershed falls under good lands (Class II) with minor limitations of soil, drainage and erosion. An area of about 303 ha (56%) is under moderately good lands (Class III) with severe limitations of soil and erosion.
- ❖ On the basis of soil reaction, an area of about 2 ha (<1%) soils are slightly acid (pH 6.0-6.5), 334 ha (62%) soils are neutral (pH 6.5-7.3) and 166 ha (31%) soil are slightly alkaline to moderately alkaline (pH 7.3-8.4) in soil reaction.

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

Slightly acid soils occurs in about 2 ha (<1%) 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.

Neutral soils

Neutral soils occur in about 334 ha (62%) area in the microwatershed.

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

Alkaline soils

Slightly alkaline to moderately alkaline soils cover an area of about 166 ha (31%) in the microwatershed.

1. Regular addition of organic manure, green manuring, green leaf manuring, crop residue incorporation and mulching needs to be taken up to improve the soil organic matter status.

2. Application of Biofertilizers (Azospirullum, Azotobacter, Rhizobium).
3. Application of 25% extra N and P (125 % RDN&P).
4. Application of ZnSO4 – 12.5 kg/ha (once in three years).
5. Application of Boron – 5 kg/ha (once in three years).

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

Soil Degradation

Soil erosion is one of the major factors affecting the soil health in the microwatershed. An area of about 234 ha (42%) is suffering from moderate erosion. These areas need immediate soil and water conservation and, other land development and land husbandry practices for restoring soil health.

Dissemination of Information and Communication of Benefits

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

Inputs for Net Planning (Saturation Plan) and Interventions needed

Net planning in IWMP is focusing on preparation of

1. Soil and Water Conservation Treatment Plans 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 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, radish, 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 and soil are the major constraints in Chik Sulikeri Microwatershed.
- **Organic Carbon:** The OC content is medium (0.5-0.75%) in an area of about 423 ha (78%). These areas needs to be further improved by applying farmyard manure and rotating crops with cereals and legumes or mixed cropping and high (>0.75%) in 79 ha (15%) area.
- **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 423 ha (78%) area where OC is 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**: An area of about 500 ha (93) is medium (23-57 kg/ha) and 2 ha (<1%) is high (>57 kg/ha) in available phosphorus content. Hence all the plots, where available phosphorus is medium, for all the crops, 25% additional P-needs to be applied
- **Available Potassium:** Available potassium content is low (<145 kg/ha) in 177 ha (33%), medium (145-337 kg/ha) in an area of about 290 ha (54%) and high in an area of about 35 ha (6%) of the microwatershed. All the plots, where available potassium is low to medium, for all the crops, additional 25% of potassium may be applied.
- **Available Sulphur:** Available sulphur is a very critical nutrient for oilseed crops, Available sulphur content is high (>20 ppm) in 25 ha (5%), medium (10-20ppm) in 368 ha (68%) and low (<10 ppm) in 109 ha (20%) area of the microwatershed. Low and medium areas need to be applied with magnesium sulphate or gypsum or

Factamphos (p) fertilizer (13% of sulphur) for 2-3 years for the deficiency to be corrected.

- **Available Boron:** An area of about 352 ha (65%) is low (<0.5 ppm) and an area of 150 ha (28%) is medium (05 -1.0 ppm) in available boron content. These areas need to be applied with sodium borate @ 10kg/ha as soil application or 0.2% borax as foliar spray to correct the deficiency.
- **Available Iron:** Available iron content is deficient (<4.5 ppm) 88 ha (25%) area and sufficient (>4.5 ppm) in 414 ha (77%) area of the microwatershed. For deficient areas, iron sulphate @ 25 kg/ha needs to be applied for 2-3 years to correct the deficiency.
- **Available Manganese:** Entire cultivated area of the microwatershed is sufficient (>1.0 ppm) in the available manganese content.
- **Available Copper:** Entire cultivated area of the microwatershed is sufficient (>0.2 ppm) in the available copper content.
- **Available Zinc:** Available zinc content is deficient (<0.6 ppm) in an area about 136 ha (25%) and sufficient (>0.6 ppm) in an area of about 365 ha (68%) of the microwatershed. For deficient areas, application of zinc sulphate @ 25kg/ha is recommended.

Soil Alkalinity: An area of about 166 ha (31%) in the microwatershed has soils that are slightly alkaline to moderately alkaline. These areas need application of gypsum and wherever calcium is in excess, iron pyrites and element sulphur can be recommended. Management practices like treating repeatedly with good quality water to drain out the excess salts and provision of subsurface drainage and growing of salt tolerant crops like Casuarina, Acasia, Neem, Ber etc, are recommended.

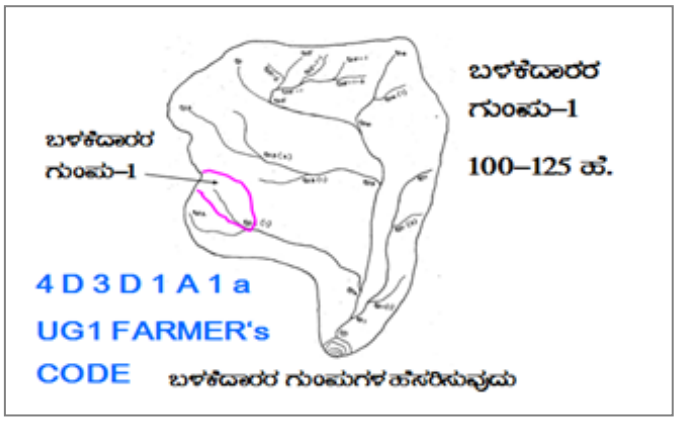
Land Suitability for various crops: Areas that are highly, moderately and marginally suitable and not suitable for growing various crops are indicated. Along with the suitability, various constraints that are limiting the productivity are also indicated. For example, in case of cotton, gravel content, 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 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 Chik Sulikeri 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 maps
- Rainfall map
- 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 needs 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.

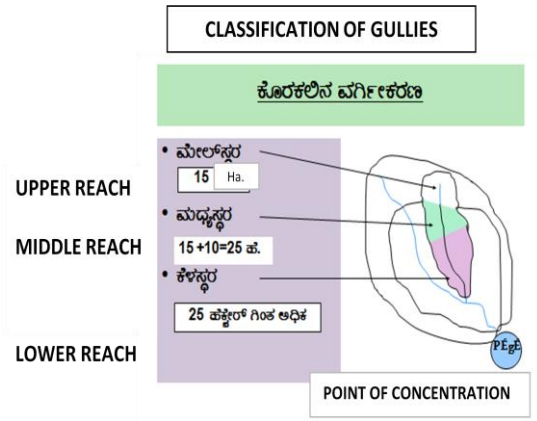
- Naming of user groups and farmers
- Identification of arable and non arable lands
- Identification of drainage lines and gullies
- Identification of non treatable areas
- Identification of priority areas in the arable lands
- Treatment plan for arable lands
- Location of water harvesting and recharge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

9.1 Treatment Plan

The treatment plan recommended for arable lands is briefly described below.

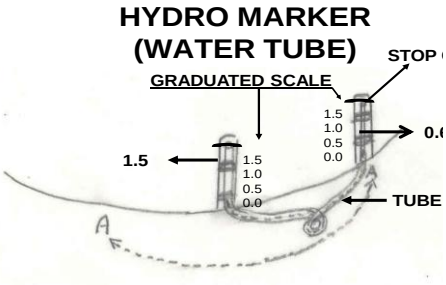
9.1.1 Arable Land Treatment

A. BUNDING

Steps for Survey and Preparation of Treatment Plan		USER GROUP-1
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)	

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.



FALL: 1.5 - 0.6 = 0.9 m.

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 (bg0 .....b= loamy sand, g0 = <15% gravel). The recommended sections for different soils are given below.

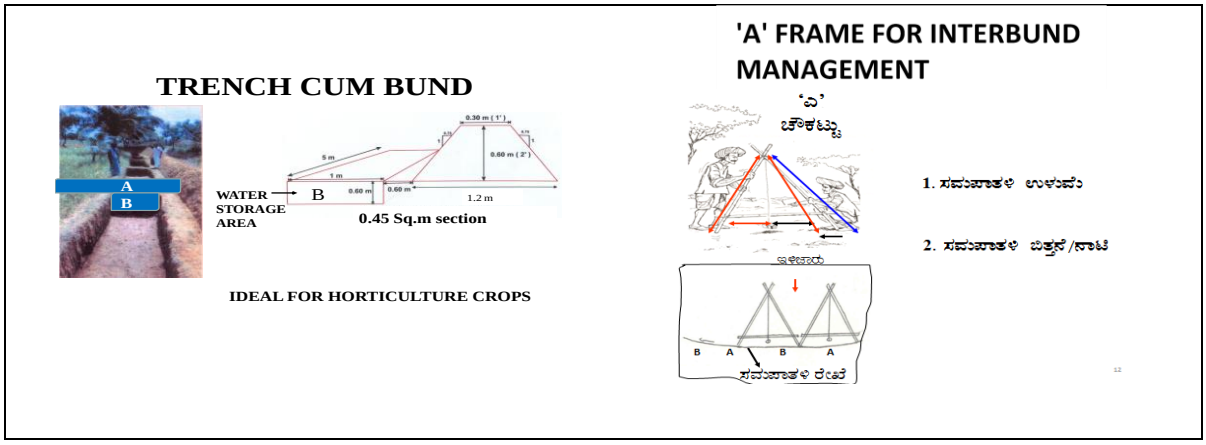
Recommended Bund Section

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 clayey soils	
0.45	2	0.75	01:01	0.92		
0.45	2.4	0.75	1.3:1	1.07	Shallow black clayey soils	
0.6	3.1	0.7	1.78:1	1.29	Medium black clayey 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
m2	m	m3	L(m)	W(m)	D(m)	Quantity (m3)	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. Waterways

a) Existing waterways are marked on the cadastral map (1:7920 scale) and their dimensions are recorded.

b) Considering the contour plan of the MWS, additional waterways/ modernization of the existing ones can be thought of.

c) 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 in water budgeting and quality of water in the wells and site suitability.
e) Detailed Leveling 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 423 ha (78%) needs Trench cum Bunding, 8 ha (2%) needs Graded Bunding and 70 ha (13%) needs strengthening of existing bunds.

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

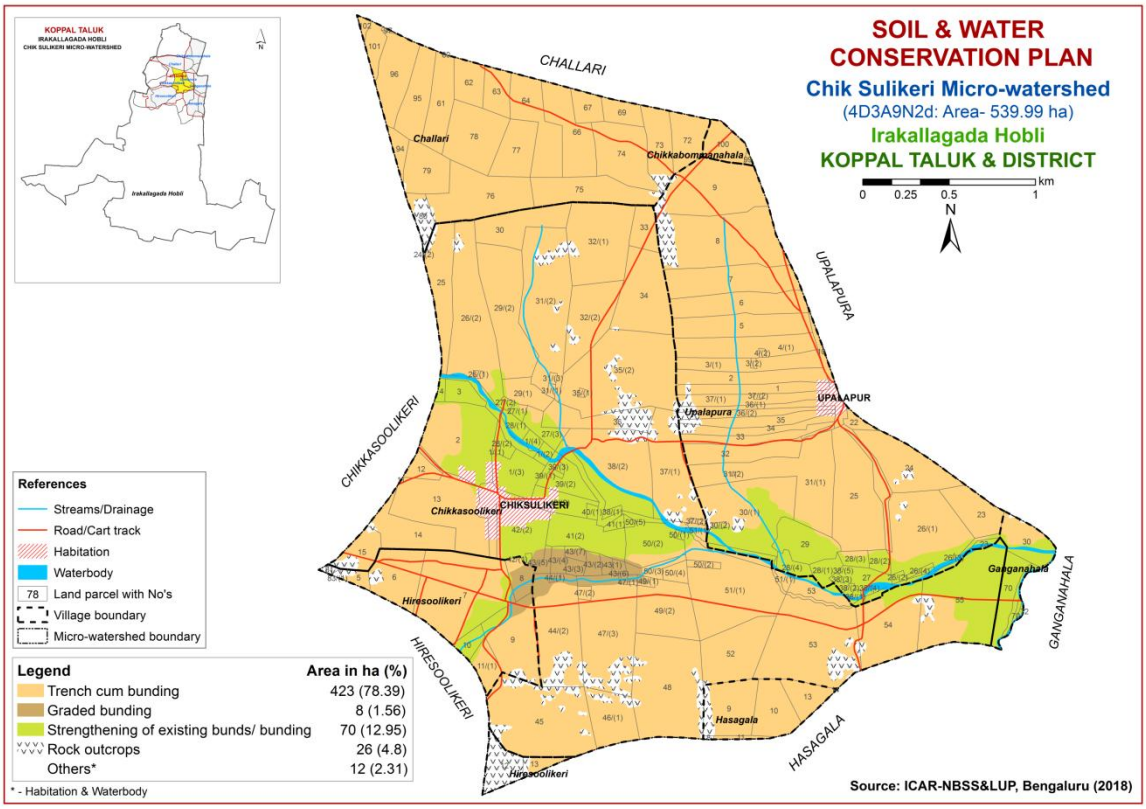


Fig. 9.1 Soil and Water Conservation Plan map of Chik Sulikeri Microwatershed

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 for growing annual and perennial crops. The method of planting these trees is given below.

It is recommended to open the 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 Neral (*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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Appendix-I

Chik Sulikeri (9N2d) Microwatershed

Soil Phase Information

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Chikkabommanahalla	99	0.15	ABRiB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	TCB
Chikkabommanahalla	100	2.46	ABRiB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	TCB
Chikkasoolikeri	1/(1)	0.11	BGPmA1	LMU-3	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIs	Graded bunding
Chikkasoolikeri	1/(2)	0.5	BGPmA1	LMU-3	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Fallow land+Paddy (Fl+Pd)	Not Available	IIs	Graded bunding
Chikkasoolikeri	1/(3)	3.23	BGPmA1	LMU-3	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Paddy+Redgram (Pd+Rg)	Not Available	IIs	Graded bunding
Chikkasoolikeri	1/(4)	0.5	BGPmA1	LMU-3	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Fallow land+Paddy (Fl+Pd)	Not Available	IIs	Graded bunding
Chikkasoolikeri	2	8.68	BGPmA1	LMU-3	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Redgram+Vegetables+Groundnut (Rg+Veg+Gn)	3 Borewell	IIs	Graded bunding
Chikkasoolikeri	3	1.35	BGPmA1	LMU-3	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Groundnut (Gn)	Not Available	IIs	Graded bunding
Chikkasoolikeri	4	0.32	BGPmA1	LMU-3	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Groundnut+Paddy (Gn+Pd)	Not Available	IIs	Graded bunding
Chikkasoolikeri	11	0	KTPiB1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Paddy (Rg+Pd)	Not Available	IIs	TCB
Chikkasoolikeri	12	1.12	KTPiB1g1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram (Rg)	Not Available	IIs	TCB
Chikkasoolikeri	13	8.76	KTPiB1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Groundnut+Vegetables (Rg+Gn+Veg)	1 Borewell	IIs	TCB
Chikkasoolikeri	14	4.41	KTPiB1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Groundnut+Vegetables (Rg+Gn+Veg)	Not Available	IIs	TCB
Chikkasoolikeri	15	2.34	KTPiB1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Fallow land (Rg+Fl)	Not Available	IIs	TCB
Chikkasoolikeri	24/(2)	0.01	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Redgram (Rg)	Not Available	Ro	Ro
Chikkasoolikeri	25	5	BPRhB2g2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Very gravelly (35-60%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut (Rg+Gn)	Not Available	IIIes	TCB
Chikkasoolikeri	26/(1)	0.11	NGPhB1g2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Very gravelly (35-60%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Mango+Groundnut (Rg+Mg+Gn)	Not Available	IIIs	TCB
Chikkasoolikeri	26/(2)	10.46	NGPhB1g2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Very gravelly (35-60%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Mango+Groundnut (Rg+Mg+Gn)	1Openwell, 1 Borewell	IIIs	TCB
Chikkasoolikeri	27/(1)	0.38	BGPmA1	LMU-3	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Fallow land (Fl)	1 Borewell	IIs	Graded bunding
Chikkasoolikeri	27/(2)	0.27	BGPmA1	LMU-3	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Fallow land (Fl)	Not Available	IIs	Graded bunding
Chikkasoolikeri	27/(3)	1.51	BGPmA1	LMU-3	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Fallow land (Fl)	Not Available	IIs	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Chikkasoolikeri	28/(1)	0.82	BGPmA1	LMU-3	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Fallow land (Fl)	Not Available	IIs	Graded bunding
Chikkasoolikeri	28/(2)	0.67	BGPmA1	LMU-3	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIs	Graded bunding
Chikkasoolikeri	29(1)	1.91	NGPhB1g2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Very gravelly (35-60%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Fallow land+Paddy (Fl+Pd)	Not Available	IIIs	TCB
Chikkasoolikeri	29/(2)	8.83	BPRhB2g2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Very gravelly (35-60%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Current fallow+ Redgram+Paddy+Vegetables (Cf+Rg+Pd+Veg)	1 Borewell	IIIes	TCB
Chikkasoolikeri	30	4.55	BPRhB2g2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Very gravelly (35-60%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut+Vegetables (Rg+Gn+Veg)	Not Available	IIIes	TCB
Chikkasoolikeri	31/(1)	0.18	CSRiB2	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	TCB
Chikkasoolikeri	31/(2)	12.01	KMHhB1g1	LMU-4	Deep (100-150 cm)	Sandy clay loam	Gravelly (15-35%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Paddy (Rg+Pd)	Not Available	IIs	TCB
Chikkasoolikeri	31/(3)	0.14	CSRiB2	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	TCB
Chikkasoolikeri	32/(1)	8.76	MKHiB2g2	LMU-5	Moderately shallow (50-75 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut+Vegetables (Rg+Gn+Veg)	4 Borewell	IIIes	TCB
Chikkasoolikeri	32/(2)	5.68	KMHhB1g1	LMU-4	Deep (100-150 cm)	Sandy clay loam	Gravelly (15-35%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Current fallow (Rg+Cf)	Not Available	IIs	TCB
Chikkasoolikeri	33	1.95	ABRiB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	TCB
Chikkasoolikeri	34	7.05	HRVcC2g2R2	LMU-8	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very Low (<50 mm/m)	Gently sloping (3-5%)	Moderate	Redgram (Rg)	Not Available	IIIes	TCB
Chikkasoolikeri	35/(1)	0.12	CSRiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Fallow land (Rg+Fl)	Not Available	IIIes	TCB
Chikkasoolikeri	35/(2)	14.37	HRVcC2g2R2	LMU-8	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very Low (<50 mm/m)	Gently sloping (3-5%)	Moderate	Redgram+Fallow land (Rg+Fl)	Not Available	IIIes	TCB
Chikkasoolikeri	36	3.78	CSRiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Fallow land+Groundnut+Paddy (Rg+Fl+Gn+Pd)	1 Farm Pond,1 Openwell	IIIes	TCB
Chikkasoolikeri	37/(1)	7.61	NGPiB1	LMU-2	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Groundnut+Redgram+Paddy+Fallow land (Gn+Rg+Pd+Fl)	2 Borewell	IIIs	TCB
Chikkasoolikeri	37/(2)	0.1	NGPiB1	LMU-2	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Groundnut+Redgram+Paddy+Fallow land (Gn+Rg+Pd+Fl)	Not Available	IIIs	TCB
Chikkasoolikeri	38/(1)	0.24	RNKiA1	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Vegetables+Maize+Paddy+Groundnut (Veg+Mz+Pd+Gn)	Not Available	IIs	Graded bunding
Chikkasoolikeri	38/(2)	9.9	NGPiB1	LMU-2	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Vegetables+Maize+Paddy+Groundnut (Veg+Mz+Pd+Gn)	3 Borewell,1 Openwell	IIIs	TCB
Chikkasoolikeri	39/(1)	0.13	BGPmA1	LMU-3	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIs	Graded bunding
Chikkasoolikeri	39/(2)	2.3	RNKiA1	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIs	Graded bunding
Chikkasoolikeri	39/(3)	0.19	BGPmA1	LMU-3	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIs	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Chikkasoolikeri	40/(1)	0.29	RNKiA1	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Cowpea (Cp)	Not Available	IIs	Graded bunding
Chikkasoolikeri	40/(2)	2.22	RNKiA1	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Cowpea (Cp)	Not Available	IIs	Graded bunding
Chikkasoolikeri	41(1)	0.35	RNKiA1	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Redgram+Maize+Groundnut (Rg+Mz+Gn)	Not Available	IIs	Graded bunding
Chikkasoolikeri	41(2)	4.32	RNKiA1	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Redgram+Maize+Groundnut (Rg+Mz+Gn)	Not Available	IIs	Graded bunding
Chikkasoolikeri	42/(1)	0.13	RNKiA1	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Current fallow+Rose+Paddy (Cf+Rs+Pd)	Not Available	IIs	Graded bunding
Chikkasoolikeri	42/(2)	5.08	RNKiA1	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Current fallow+Rose+Paddy (Cf+Rs+Pd)	Not Available	IIs	Graded bunding
Chikkasoolikeri	43(1)	0.37	RNKmB2	LMU-7	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Chikkasoolikeri	43/(2)	0.65	RNKmB2	LMU-7	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Chikkasoolikeri	43/(3)	0.56	RNKmB2	LMU-7	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Chikkasoolikeri	43/(4)	0.7	RNKmB2	LMU-7	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Chikkasoolikeri	43/(5)	0.5	RNKmB2	LMU-7	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Chikkasoolikeri	43/(6)	0.34	RNKmB2	LMU-7	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Chikkasoolikeri	43/(7)	0.49	RNKmB2	LMU-7	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Chikkasoolikeri	44/(1)	0.15	RNKmB2	LMU-7	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Cowpea (Rg+Cp)	Not Available	IIes	Graded bunding
Chikkasoolikeri	44/(2)	8.86	GHTbB2g1	LMU-4	Moderately deep (75-100 cm)	Loamy sand	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Cowpea (Rg+Cp)	Not Available	IIes	TCB
Chikkasoolikeri	45	12.83	HDHbB2g1	LMU-2	Moderately deep (75-100 cm)	Loamy sand	Gravelly (15-35%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Mango+Vegetables (Rg+Veg+Mn)	1 Borewell	IIes	TCB
Chikkasoolikeri	46/(1)	4.23	HDHbB2g1	LMU-2	Moderately deep (75-100 cm)	Loamy sand	Gravelly (15-35%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	TCB
Chikkasoolikeri	47/(1)	0.33	RNKmB2	LMU-7	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut+Fallow land+Maize+Paddy(Gn+Fl+Mz+Pd)	Not Available	IIes	Graded bunding
Chikkasoolikeri	47/(2)	0.32	GHTcB2g1	LMU-4	Moderately deep (75-100 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut+Fallow land+Maize+Paddy (Gn+Fl+Mz+Pd)	1 Borewell	IIes	TCB
Chikkasoolikeri	47/(3)	10.88	HRVhB2g1	LMU-8	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut+Fallow land+Maize+Paddy (Gn+Fl+Mz+Pd)	1 Borewell	IIIes	TCB
Chikkasoolikeri	48	12.53	HDHiB2	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnet+Vegetables (Gn+Veg)	Not Available	IIes	TCB
Chikkasoolikeri	49/(1)	0.31	RNKmB2	LMU-7	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIes	Graded bunding
Chikkasoolikeri	49/(2)	5.57	HRVhB2g1	LMU-8	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIIes	TCB
Chikkasoolikeri	50/(1)	0.16	RNKiA1	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Not Available	Not Available	IIs	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Chikkasoolikeri	50/(2)	4.26	RNKiA1	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Not Available	Not Available	IIs	Graded bunding
Chikkasoolikeri	50/(3)	1.05	NGPiB1	LMU-2	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Paddy (Pd)	Not Available	IIIs	TCB
Chikkasoolikeri	50/(4)	0.78	ABRiB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available	Not Available	IIIes	TCB
Chikkasoolikeri	50/(5)	0.19	RNKiA1	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Not Available	Not Available	IIs	Graded bunding
Chikkasoolikeri	51/(1)	11.77	ABRiB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut+Paddy+Current fallow (Rg+Gn+Pd+Cf)	Not Available	IIIes	TCB
Chikkasoolikeri	52	6.16	MNLhB1	LMU-4	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Groundnut (Rg+Gn)	Not Available	IIs	TCB
Chikkasoolikeri	53	14.92	MNLhB1	LMU-4	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize+Current fallow+Fallow land+Groundnut+Horsegram (Mz+Cf+Fl+Gn+Hg)	4 Borewell	IIs	TCB
Chikkasoolikeri	54	7.68	MKHhB2g1	LMU-5	Moderately shallow (50-75 cm)	Sandy clay loam	Gravelly (15-35%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Current fallow+Redgram +Vegetables (Cf+Veg+Rg)	2 Borewell	IIIes	TCB
Chikkasoolikeri	55	12.03	KLRmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Maize+Groundnut+Vegetables +Redgram (Mz+Gn+Veg+Rg)	5 Borewell	IIw	Graded bunding
Ganganahala	30	3.24	HRVhB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay loam	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	TCB
Ganganahala	70	2.79	KLRmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram+Maize (Rg+Mz)	Not Available	IIw	Graded bunding
Ganganahala	72	0.1	Waterbody	Others	Others	Others	Others	Others	Others	Others	Groundnut+Paddy+Sunflowe+Current fallow (Gn+Pd+Sf+Cf)	Not Available	Others	Others
Hasagala	8	0.07	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Maize+Redgram (Mz+Rg)	Not Available	Ro	Ro
Hasagala	9	5	KGHcB2g1	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	TCB
Hasagala	10	3.73	KGHcB2g1	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Bajra (Bj)	Not Available	IIes	TCB
Hasagala	11	0.36	KGHcB2g1	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	TCB
Hasagala	13	2.21	MNLhB1	LMU-4	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	TCB
Hasagala	14	0.01	KGHcB2g2	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Very gravelly (35-60%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	TCB
Hiresoolikeri	5	0.75	KTPiB1g1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram (Rg)	Not Available	IIs	TCB
Hiresoolikeri	6	4.7	KTPiB1g1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Groundnut+Maize (Rg+Gn+Mz)	1 Borewell	IIs	TCB
Hiresoolikeri	7	11.93	KTPiB1g1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Groundnut (Rg+Gn)	Not Available	IIs	TCB
Hiresoolikeri	8	1.55	RNKmB2	LMU-7	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Hiresoolikeri	9	6.22	GHTcB2g1	LMU-4	Moderately deep (75-100 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	TCB
Hiresoolikeri	10	1.02	TSDmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIw	Graded bunding

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Hiresoolikeri	11/(1)	1.7	GHTcB2g1	LMU-4	Moderately deep (75-100 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut+Paddy (Rg+Gn+Pd)	Not Available	IIes	TCB
Hiresoolikeri	12	2.69	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro (Rc)	Not Available	Ro	Ro
Hiresoolikeri	13	0.96	HDHbB2g1	LMU-2	Moderately deep (75-100 cm)	Loamy sand	Gravelly (15-35%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Ro (Rg+Rc)	Not Available	IIes	TCB
Hiresoolikeri	81	0.2	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro (Rc)	Not Available	Ro	Ro
Hiresoolikeri	83/(1)	0.1	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Maize+Redgram (Mz+Rg)	Not Available	Ro	Ro
Upalapura	1	2.75	KTPiB1g1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Current fallow (Rg+Cf)	Not Available	IIs	TCB
Upalapura	2	3.63	KTPiB1g1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Bajra+Redgram+Current fallow (Bj+Rg+Cf)	1 Openwell,2 Borewell	IIs	TCB
Upalapura	3/(1)	3.59	KTPiB1g1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Groundnut (Rg+Gn)	1 Borewell	IIs	TCB
Upalapura	3/(2)	0.11	KTPiB1g1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Paddy (Pd)	Not Available	IIs	TCB
Upalapura	4/(1)	5.02	KTPiB1g1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Paddy+Current fallow (Rg+Pd+Cf)	1 Borewell	IIs	TCB
Upalapura	4/(2)	0.11	KTPiB1g1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Not Available	Not Available	IIs	TCB
Upalapura	5	5.35	KTPiB1g1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Maize+Groundnut (Rg+Mz+Gn)	1 Borewell,1 Openwell	IIs	TCB
Upalapura	6	5.23	HRVcC2g1	LMU-8	Shallow (25-50 cm)	Sandy loam	Gravelly (15-35%)	Very Low (<50 mm/m)	Gently sloping (3-5%)	Moderate	Redgram+Current fallow (Rg+Cf)	Not Available	IIIes	TCB
Upalapura	7	6.48	HRVcC2g1	LMU-8	Shallow (25-50 cm)	Sandy loam	Gravelly (15-35%)	Very Low (<50 mm/m)	Gently sloping (3-5%)	Moderate	Redgram+Maize+Vegetables+Groundnut (Rg+Mz+Veg+Gn)	1 Borewell	IIIes	TCB
Upalapura	8	11.75	HRVcC2g1	LMU-8	Shallow (25-50 cm)	Sandy loam	Gravelly (15-35%)	Very Low (<50 mm/m)	Gently sloping (3-5%)	Moderate	Redgram+Groundnut (Rg+Gn)	1 Borewell	IIIes	TCB
Upalapura	9	8.74	ABRiB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Bajra+Redgram+Current fallow (Bj+Rg+Cf)	Not Available	IIIes	TCB
Upalapura	10	0.64	KTPiB1g1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Mango (Rg+Mn)	Not Available	IIs	TCB
Upalapura	22	0.62	LKRhB2g2	LMU-5	Moderately shallow (50-75 cm)	Sandy clay loam	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Current fallow (Rg+Cf)	Not Available	IIIes	TCB
Upalapura	23	3.75	HRVhB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay loam	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut (Rg+Gn)	Not Available	IIIes	TCB
Upalapura	24	5.96	LKRhB2g2	LMU-5	Moderately shallow (50-75 cm)	Sandy clay loam	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	TCB
Upalapura	25	8.94	LKRhB2g2	LMU-5	Moderately shallow (50-75 cm)	Sandy clay loam	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut (Rg+Gn)	1 Borewell	IIIes	TCB
Upalapura	26/(1)	9.61	HRVhB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay loam	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Vegetables+Groundnut (Rg+Veg+Gn)	Not Available	IIIes	TCB
Upalapura	26/(2)	0.37	NGPiA1g1	LMU-2	Deep (100-150 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	1 Borewell	IIIs	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Upalapura	26/(3)	0.04	NGPiA1g1	LMU-2	Deep (100-150 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIIs	Graded bunding
Upalapura	26/(4)	0.21	NGPiA1g1	LMU-2	Deep (100-150 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIIs	Graded bunding
Upalapura	27	1.7	NGPiA1g1	LMU-2	Deep (100-150 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Fallow land (Fl)	1 Borewell	IIIs	Graded bunding
Upalapura	28/(1)	1.11	NGPiA1g1	LMU-2	Deep (100-150 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Groundnut (Gn)	Not Available	IIIs	Graded bunding
Upalapura	28/(2)	0.83	NGPiA1g1	LMU-2	Deep (100-150 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy+Groundnut (Pd+Gn)	1 Borewell	IIIs	Graded bunding
Upalapura	28/(3)	0.81	NGPiA1g1	LMU-2	Deep (100-150 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIIs	Graded bunding
Upalapura	28/(4)	1	NGPiA1g1	LMU-2	Deep (100-150 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIIs	Graded bunding
Upalapura	29	3.58	NGPiA1g1	LMU-2	Deep (100-150 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Redgram+Paddy (Rg+Pd)	Not Available	IIIs	Graded bunding
Upalapura	30/(1)	10.36	NGPiA1g1	LMU-2	Deep (100-150 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Redgram+Groundnut+Paddy (Rg+Gn+Pd)	Not Available	IIIs	Graded bunding
Upalapura	30/(2)	0.14	NGPiA1g1	LMU-2	Deep (100-150 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIIs	Graded bunding
Upalapura	31/(1)	10.04	MKHcB2g2	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Jowar (Rg+Jw)	Not Available	IIIes	TCB
Upalapura	31/(2)	0.03	HDHhB2g2	LMU-2	Moderately deep (75-100 cm)	Sandy clay loam	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available	Not Available	IIes	TCB
Upalapura	32	3.87	NGPiB1	LMU-2	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Jowar+Groundnut (Rg+Jw+Gn)	1 Borewell	IIIs	TCB
Upalapura	33	2.25	NGPiB1	LMU-2	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Maize (Rg+Mz)	Not Available	IIIs	TCB
Upalapura	34	2.25	NGPiB1	LMU-2	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram (Rg)	Not Available	IIIs	TCB
Upalapura	35	2.39	KTPiB1g1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram (Rg)	Not Available	IIs	TCB
Upalapura	36/(1)	1.32	KTPiB1g1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram (Rg)	Not Available	IIs	TCB
Upalapura	36/(2)	1.82	KTPiB1g1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram (Rg)	Not Available	IIs	TCB
Upalapura	37/(1)	2.71	KTPiB1g1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Current fallow (Rg+Cf)	Not Available	IIs	TCB
Upalapura	37/(2)	0.09	KTPiB1g1	LMU-6	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Not Available	Not Available	IIs	TCB
Upalapura	38/(1)	0.22	NGPiA1g1	LMU-2	Deep (100-150 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIIs	Graded bunding
Upalapura	38/(2)	0.2	NGPiA1g1	LMU-2	Deep (100-150 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIIs	Graded bunding
Upalapura	38/(3)	0.19	NGPiA1g1	LMU-2	Deep (100-150 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIIs	Graded bunding
Upalapura	38/(4)	0.19	Waterbody	Others	Others	Others	Others	Others	Others	Others	Paddy (Pd)	Not Available	Others	Others

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Upalapura	38/(5)	0.11	NGPiA1g1	LMU-2	Deep (100-150 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IIIs	Graded bunding
Challari	60	0	ABRiB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut+Vegetables (Rg+Gn+Veg)	Not Available	IIIes	TCB
Challari	61	3.85	ABRiB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Cowpea (Rg+Cp)	Not Available	IIIes	TCB
Challari	62	2.3	ABRiB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut (Rg+Gn)	Not Available	IIIes	TCB
Challari	63	2.14	ABRiB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut+Vegetables+Horsegram (Gn+Veg+Hg)	Not Available	IIIes	TCB
Challari	64	5.38	ABRiB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut+Jowar (Rg+Gn+Jw)	Not Available	IIIes	TCB
Challari	66	5.27	ABRiB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut (Rg+Gn)	Not Available	IIIes	TCB
Challari	67	1.59	MKHiB1g1	LMU-5	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Slight	Redgram (Rg)	Not Available	IIIs	TCB
Challari	69	1.62	MKHiB1g1	LMU-5	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Groundnut+Fallow land (Rg+Gn+Fl)	Not Available	IIIs	TCB
Challari	72	3.07	GHTcB2g1	LMU-4	Moderately deep (75-100 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut (Rg+Gn)	Not Available	IIes	TCB
Challari	73	3.54	GHTcB2g1	LMU-4	Moderately deep (75-100 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Current fallow (Rg+Cf)	Not Available	IIes	TCB
Challari	74	5.76	MKHiB1g1	LMU-5	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Slight	Vegetables+Groundnut+Redgram (Veg+Gn+Rg)	Not Available	IIIs	TCB
Challari	75	5.48	MKHiB1g1	LMU-5	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Slight	Groundnut+Redgram (Gn+Rg)	Not Available	IIIs	TCB
Challari	76	7.48	HRViB1g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Slight	Groundnut+Current fallow+Jowar (Gn+Cf+Jw)	Not Available	IIIs	TCB
Challari	77	3.65	ABRiB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	TCB
Challari	78	5.93	ABRiB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Vegetables (Rg+Veg)	Not Available	IIIes	TCB
Challari	79	3.71	HRViB1g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Slight	Redgram+Groundnut+Vegetables (Rg+Gn+Veg)	Not Available	IIIs	TCB
Challari	80	1.56	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Granite outcrops+Redgram (Gc+Rg)	Not Available	Ro	Ro
Challari	94	0.99	HRViB1g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Slight	Current fallow+Groundnut (Cf+Gn)	Not Available	IIIs	TCB
Challari	95	4.03	ABRiB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	TCB
Challari	96	4.54	ABRiB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	TCB
Challari	97	0.07	NDLhB2g1	LMU-2	Very deep (>150 cm)	Sandy clay loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut+Vegetables (Rg+Gn+Veg)	Not Available	IIes	TCB
Challari	101	1.33	ABRiB2g2	LMU-8	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Very Low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut (Rg+Gn)	Not Available	IIIes	TCB
Challari	102	0.31	NDLhB2g1	LMU-2	Very deep (>150 cm)	Sandy clay loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Current fallow+Redgram (Cf+Rg)	Not Available	IIes	TCB

Appendix II

Chik Sulikeri (9N2d) 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
Chikkabommanahala	99	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)
Chikkabommanahala	100	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)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	1/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	1/(2)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	1/(3)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	1/(4)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	2	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	3	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	4	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)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	11	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkasoolikeri	12	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	13	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	14	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkasoolikeri	15	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	High (> 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkasoolikeri	24/(2)	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Chikkasoolikeri	25	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	26/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	26/(2)	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)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	27/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	27/(2)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	27/(3)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	28/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	28/(2)	Neutral (pH 6.5 –	Non saline	Medium (0.5	Medium (23 –	Low (<145	Medium (10	Low (< 0.5	Deficient (<	Sufficient (>	Sufficient (>	Sufficient (>

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
		7.3)	(<2 dsm)	– 0.75 %)	57 kg/ha)	kg/ha)	– 20 ppm)	ppm)	4.5 ppm)	1.0 ppm)	0.2 ppm)	0.6 ppm)
Chikkasoolikeri	29(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	29/(2)	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)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	30	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	31/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	31/(2)	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)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	31/(3)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	32/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	32/(2)	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)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	33	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	34	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	35/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	35/(2)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	36	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	37/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	37/(2)	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	38/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	38/(2)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	39/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	39/(2)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	39/(3)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	40/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	40/(2)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	41(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	41(2)	Neutral (pH 6.5 –	Non saline	Medium (0.5	Medium (23 –	Medium (145 –	Medium (10	Low (< 0.5	Deficient (<	Sufficient (>	Sufficient (>	Sufficient (>

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
		7.3)	(<2 dsm)	– 0.75 %)	57 kg/ha)	337 kg/ha)	– 20 ppm)	ppm)	4.5 ppm)	1.0 ppm)	0.2 ppm)	0.6 ppm)
Chikkasoolikeri	42/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	42/(2)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Habitation	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	43(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	43/(2)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	43/(3)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	43/(4)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	43/(5)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	43/(6)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	43/(7)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	44/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	44/(2)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkasoolikeri	45	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkasoolikeri	46/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkasoolikeri	47/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	47/(2)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	47/(3)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkasoolikeri	48	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkasoolikeri	49/(1)	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	49/(2)	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkasoolikeri	50/(1)	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	50/(2)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	50/(3)	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	50/(4)	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	50/(5)	Neutral (pH 6.5 –	Non saline	Medium (0.5	Medium (23 –	Low (<145	Medium (10	Low (< 0.5	Deficient (<	Sufficient (>	Sufficient (>	Sufficient (>

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
		7.3)	(<2 dsm)	– 0.75 %)	57 kg/ha)	kg/ha)	– 20 ppm)	ppm)	4.5 ppm)	1.0 ppm)	0.2 ppm)	0.6 ppm)
Chikkasoolikeri	51/(1)	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkasoolikeri	52	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkasoolikeri	53	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkasoolikeri	54	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkasoolikeri	55	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Ganganahala	30	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Ganganahala	70	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Ganganahala	72	Waterbody	Waterbody	Waterbody	Waterbody	Waterbody	Waterbody	Waterbody	Waterbody	Waterbody	Waterbody	Waterbody
Hasagala	8	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Hasagala	9	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hasagala	10	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hasagala	11	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hasagala	13	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hasagala	14	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hiresoolikeri	5	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	High (> 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hiresoolikeri	6	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hiresoolikeri	7	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hiresoolikeri	8	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hiresoolikeri	9	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hiresoolikeri	10	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)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hiresoolikeri	11/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hiresoolikeri	12	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Hiresoolikeri	13	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)	High (> 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hiresoolikeri	81	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Hiresoolikeri	83/(1)	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Upalapura	1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 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
Upalapura	2	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	3/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	3/(2)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	4/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	4/(2)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	5	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	6	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	7	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)	Sufficient (> 0.6 ppm)
Upalapura	8	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)
Upalapura	9	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)	Sufficient (> 0.6 ppm)
Upalapura	10	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	22	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	23	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	24	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	25	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	26/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	26/(2)	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	26/(3)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	26/(4)	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	27	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Upalapura	28/(1)	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	28/(2)	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	28/(3)	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	28/(4)	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 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
Upalapura	29	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	30/(1)	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	30/(2)	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	31/(1)	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	31/(2)	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	32	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	33	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	34	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	35	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	36/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	36/(2)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	37/(1)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	37/(2)	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Upalapura	38/(1)	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Upalapura	38/(2)	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Upalapura	38/(3)	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Upalapura	38/(4)	Waterbody	Waterbody	Waterbody	Waterbody	Waterbody	Waterbody	Waterbody	Waterbody	Waterbody	Waterbody	Waterbody
Upalapura	38/(5)	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Challari	60	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	61	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	62	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	63	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	64	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	66	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	67	Neutral (pH 6.5 –	Non saline	High (> 0.75	Medium (23 –	High (> 337	Medium (10	Low (< 0.5	Sufficient	Sufficient (>	Sufficient (>	Sufficient (>

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
		7.3)	(<2 dsm)	%)	57 kg/ha)	kg/ha)	– 20 ppm)	ppm)	(>4.5 ppm)	1.0 ppm)	0.2 ppm)	0.6 ppm)
Challari	69	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	72	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)	Sufficient (> 0.6 ppm)
Challari	73	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	74	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	75	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	76	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	77	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	78	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	79	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	80	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Challari	94	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	95	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	96	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	97	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	101	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Challari	102	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)

Appendix III

Chik Sulikeri (9N2d) 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	Jasmine	Bhendi	Crossandra	Drumstick	Mulberry
Chikkabommanahala	99	N1r	S3rg	N1r	S3rg	N1r	S3rt	N1r	N1r	S3rt	N1r	N1r	S3rg	N1r	S3rg	N1r	N1r	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	N1r
Chikkabommanahala	100	N1r	S3rg	N1r	S3rg	N1r	S3rt	N1r	N1r	S3rt	N1r	N1r	S3rg	N1r	S3rg	N1r	N1r	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	N1r
Chikkasoolikeri	1/(1)	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S3tz	S2tz	S2tz
Chikkasoolikeri	1/(2)	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S3tz	S2tz	S2tz
Chikkasoolikeri	1/(3)	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S3tz	S2tz	S2tz
Chikkasoolikeri	1/(4)	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S3tz	S2tz	S2tz
Chikkasoolikeri	2	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S3tz	S2tz	S2tz
Chikkasoolikeri	3	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S3tz	S2tz	S2tz
Chikkasoolikeri	4	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S3tz	S2tz	S2tz
Chikkasoolikeri	11	N1r	S2r	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S2r	S2r	S3r	S3r
Chikkasoolikeri	12	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rt	S3rg	S3rg	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2rg	S2r	S2rg	S2r	S2rg	S3rg	S3rg
Chikkasoolikeri	13	N1r	S2r	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S2r	S2r	S3r	S3r
Chikkasoolikeri	14	N1r	S2r	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S2r	S2r	S3r	S3r
Chikkasoolikeri	15	N1r	S2r	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S2r	S2r	S3r	S3r
Chikkasoolikeri	24/(2)	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Chikkasoolikeri	25	S3rg	S3g	S3g	S3g	S3g	S3g	S3rg	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3g	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Chikkasoolikeri	26/(1)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Chikkasoolikeri	26/(2)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Chikkasoolikeri	27/(1)	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S3tz	S2tz	S2tz
Chikkasoolikeri	27/(2)	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S3tz	S2tz	S2tz

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eri																																
Chikkasoolikeri	27/(3)	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S3tz	S2tz	S2tz
Chikkasoolikeri	28/(1)	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S3tz	S2tz	S2tz
Chikkasoolikeri	28/(2)	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S3tz	S2tz	S2tz
Chikkasoolikeri	29(1)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Chikkasoolikeri	29/(2)	S3rg	S3g	S3g	S3g	S3g	S3g	S3rg	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3g	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Chikkasoolikeri	30	S3rg	S3g	S3g	S3g	S3g	S3g	S3rg	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3g	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Chikkasoolikeri	31/(1)	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3r	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	S3r	S3r	N1r	N1r
Chikkasoolikeri	31/(2)	S2rg	S2g	S2g	S2g	S2g	S2t	S2rg	S2g	S2tg	S2g	S2g	S1	S2g	S1	S1	S2rg	S2g	S2t	S1	S2g	S2g	S2g	S2g	S2g	S2g	S1	S2g	S1	S2g	S1	S1
Chikkasoolikeri	31/(3)	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3r	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	S3r	S3r	N1r	N1r
Chikkasoolikeri	32/(1)	N1r	S2rg	S3rg	S2rg	S3rg	S2rg	N1r	S3rg	S2rt	S3rg	S3rg	S2rg	S3rg	S2rg	S3rg	S3rg	S3rg	S2rg	S3g	S2rg	S2rg	S2rg	S2rg	S3rg	S2rg	S3g	S2rg	S3g	S2rg	S3rg	S3rg
Chikkasoolikeri	32/(2)	S2rg	S2g	S2g	S2g	S2g	S2t	S2rg	S2g	S2tg	S2g	S2g	S1	S2g	S1	S1	S2rg	S2g	S2t	S1	S2g	S2g	S2g	S2g	S2g	S2g	S1	S2g	S1	S2g	S1	S1
Chikkasoolikeri	33	N1r	S3rg	N1r	S3rg	N1r	S3rt	N1r	N1r	S3rt	N1r	N1r	S3rg	N1r	S3rg	N1r	N1r	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	N1r
Chikkasoolikeri	34	N1rg	S3rg	N1rg	S3rg	N1rg	S3rt	N1rg	N1rg	S3rt	N1rg	N1rg	S3rg	N1rg	S3rg	N1rg	N1rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	N1rg
Chikkasoolikeri	35/(1)	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3r	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	S3r	S3r	N1r	N1r
Chikkasoolikeri	35/(2)	N1rg	S3rg	N1rg	S3rg	N1rg	S3rt	N1rg	N1rg	S3rt	N1rg	N1rg	S3rg	N1rg	S3rg	N1rg	N1rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	N1rg
Chikkasoolikeri	36	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3r	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	S3r	S3r	N1r	N1r
Chikkasoolikeri	37/(1)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Chikkasoolikeri	37/(2)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Chikkasoolikeri	38/(1)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	38/(2)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Chikkasoolikeri	39/(1)	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S3tz	S2tz	S2tz

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Chikkasoolikeri	39/(2)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	39/(3)	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S3tz	S2tz	S2tz
Chikkasoolikeri	40/(1)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	40/(2)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	41(1)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	41(2)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	42/(1)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	42/(2)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	43(1)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	43/(2)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	43/(3)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	43/(4)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	43/(5)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	43/(6)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	43/(7)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	44/(1)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	44/(2)	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S1	S2g	S2g	S2g	S2g	S2r	S1	S1	S2g	S1	S2g	S2rg	S2r
Chikkasoolikeri	45	S3rg	S3g	S2rg	S3g	S2rg	S3rg	S3rg	S2rg	S3g	S3rg	S3g	S2rg	S2rg	S2rg	S2rg	S2rg	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2g
Chikkasoolikeri	46/(1)	S3rg	S3g	S2rg	S3g	S2rg	S3rg	S3rg	S2rg	S3g	S3rg	S3g	S2rg	S2rg	S2rg	S2rg	S2rg	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2g
Chikkasoolikeri	47/(1)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	47/(2)	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S1	S2g	S2g	S2g	S2g	S2r	S1	S1	S2g	S1	S2g	S2rg	S2r
Chikkasoolikeri	47/(3)	N1rg	S3rg	N1rg	S3rg	N1rg	S3rt	N1rg	N1rg	S3rt	N1rg	N1rg	S3rg	N1rg	S3rg	N1rg	N1rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	N1rg

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	Jasmine	Bhendi	Crossandra	Drumstick	Mulberry
Chikkasoolikeri	48	S3rg	S3g	S2rg	S3g	S2rg	S3rg	S3rg	S2rg	S3g	S3rg	S3g	S2rg	S2rg	S2rg	S2rg	S2rg	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2g
Chikkasoolikeri	49/(1)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	49/(2)	N1rg	S3rg	N1rg	S3rg	N1rg	S3rt	N1rg	N1rg	S3rt	N1rg	N1rg	S3rg	N1rg	S3rg	N1rg	N1rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	N1rg
Chikkasoolikeri	50/(1)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	50/(2)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	50/(3)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Chikkasoolikeri	50/(4)	N1r	S3rg	N1r	S3rg	N1r	S3rt	N1r	N1r	S3rt	N1r	N1r	S3rg	N1r	S3rg	N1r	N1r	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	N1r
Chikkasoolikeri	50/(5)	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Chikkasoolikeri	51/(1)	N1r	S3rg	N1r	S3rg	N1r	S3rt	N1r	N1r	S3rt	N1r	N1r	S3rg	N1r	S3rg	N1r	N1r	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	N1r
Chikkasoolikeri	52	S2r	S1	S1	S1	S1	S2t	S2r	S1	S2t	S1	S1	S1	S1	S1	N1z	S2r	S1	S1	S2z	S1	S1	S1	S1	S1	S1	S2z	S1	S2z	S1	S1	S1
Chikkasoolikeri	53	S2r	S1	S1	S1	S1	S2t	S2r	S1	S2t	S1	S1	S1	S1	S1	N1z	S2r	S1	S1	S2z	S1	S1	S1	S1	S1	S1	S2z	S1	S2z	S1	S1	S1
Chikkasoolikeri	54	N1r	S2rg	S3rg	S2rg	S3rg	S2rg	N1r	S3rg	S2rt	S3rg	S3rg	S2rg	S3rg	S2rg	S3rg	S3rg	S3rg	S2rg	S3g	S2rg	S2rg	S2rg	S2rg	S3rg	S2rg	S3g	S2rg	S3g	S2rg	S3rg	S3rg
Chikkasoolikeri	55	S3tz	S2tz	S3tz	S1	S3tz	S1	S2tz	S1	S1	S1	S2tz	S1	S3tz	S1	N1t	S2tz	S1	S3t	S3tz	S2tz	S2tz	S2tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S3tz	S2tz	S3tz
Ganganahala	30	N1rg	S3rg	N1rg	S3rg	N1rg	S3rt	N1rg	N1rg	S3rt	N1rg	N1rg	S3rg	N1rg	S3rg	N1rg	N1rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	N1rg
Ganganahala	70	S3tz	S2tz	S3tz	S1	S3tz	S1	S2tz	S1	S1	S1	S2tz	S1	S3tz	S1	N1t	S2tz	S1	S3t	S3tz	S2tz	S2tz	S2tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S3tz	S2tz	S3tz
Ganganahala	72	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	Others
Hasagala	8	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Hasagala	9	N1r	S2r	S3r	S2r	S3r	S2r	N1r	S3r	S2rt	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S2r	S2r	S3r	S3r
Hasagala	10	N1r	S2r	S3r	S2r	S3r	S2r	N1r	S3r	S2rt	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S2r	S2r	S3r	S3r
Hasagala	11	N1r	S2r	S3r	S2r	S3r	S2r	N1r	S3r	S2rt	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S2r	S2r	S3r	S3r
Hasagala	13	S2r	S1	S1	S1	S1	S2t	S2r	S1	S2t	S1	S1	S1	S1	S1	N1z	S2r	S1	S1	S2z	S1	S1	S1	S1	S1	S1	S2z	S1	S2z	S1	S1	S1
Hasagala	14	N1rg	S3rg	S3rg	S3rg	S3rg	S3g	N1rg	S3rg	S3g	S3rg	S3rg	S2rg	S3rg	S2rg	S3rg	S3rg	S3rg	S2rg	S2r	S3g	S3g	S3g	S3g	S3rg	S2rg	S2r	S3g	S2r	S3g	S3rg	S3rg
Hiresooliker i	5	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rt	S3rg	S3rg	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2rg	S2r	S2rg	S2r	S2rg	S3rg	S3rg
Hiresooliker i	6	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rt	S3rg	S3rg	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2rg	S2r	S2rg	S2r	S2rg	S3rg	S3rg

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	Jasmine	Bhendi	Crossandra	Drumstick	Mulberry
Hiresooliker i	7	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rt	S3rg	S3rg	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2rg	S2r	S2rg	S2r	S2rg	S3rg	S3rg
Hiresooliker i	8	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rt	S2rz	S2rt	S3rz	S3rz	S3rz
Hiresooliker i	9	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S1	S2g	S2g	S2g	S2g	S2r	S1	S1	S2g	S1	S2g	S2rg	S2r
Hiresooliker i	10	S3tw	S2t	S3tw	S2w	S3tw	S2w	S2tw	S2w	S1	S2w	S2tw	S2tw	S3tw	S2w	N1tw	S2tw	S2w	S3tw	S2tw	S3tw	S3tw	S2tw	S2tw	S2tw	S2t	S2tw	S3tw	S2tw	S3tw	S2tw	S2tw
Hiresooliker i	11/(1)	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S1	S2g	S2g	S2g	S2g	S2r	S1	S1	S2g	S1	S2g	S2rg	S2r
Hiresooliker i	12	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Hiresooliker i	13	S3rg	S3g	S2rg	S3g	S2rg	S3rg	S3rg	S2rg	S3g	S3rg	S3g	S2rg	S2rg	S2rg	S2rg	S2rg	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2g
Hiresooliker i	81	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Hiresooliker i	83/(1)	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Upalapura	1	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rt	S3rg	S3rg	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2rg	S2r	S2rg	S2r	S2rg	S3rg	S3rg
Upalapura	2	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rt	S3rg	S3rg	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2rg	S2r	S2rg	S2r	S2rg	S3rg	S3rg
Upalapura	3/(1)	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rt	S3rg	S3rg	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2rg	S2r	S2rg	S2r	S2rg	S3rg	S3rg
Upalapura	3/(2)	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rt	S3rg	S3rg	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2rg	S2r	S2rg	S2r	S2rg	S3rg	S3rg
Upalapura	4/(1)	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rt	S3rg	S3rg	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2rg	S2r	S2rg	S2r	S2rg	S3rg	S3rg
Upalapura	4/(2)	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rt	S3rg	S3rg	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2rg	S2r	S2rg	S2r	S2rg	S3rg	S3rg
Upalapura	5	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rt	S3rg	S3rg	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2rg	S2r	S2rg	S2r	S2rg	S3rg	S3rg
Upalapura	6	N1rg	S3rg	N1rg	S3rg	N1rg	S3rt	N1rg	N1rg	S3rt	N1rg	N1rg	S3rg	N1rg	S3rg	N1rg	N1rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	N1rg
Upalapura	7	N1rg	S3rg	N1rg	S3rg	N1rg	S3rt	N1rg	N1rg	S3rt	N1rg	N1rg	S3rg	N1rg	S3rg	N1rg	N1rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	N1rg
Upalapura	8	N1rg	S3rg	N1rg	S3rg	N1rg	S3rt	N1rg	N1rg	S3rt	N1rg	N1rg	S3rg	N1rg	S3rg	N1rg	N1rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	N1rg
Upalapura	9	N1r	S3rg	N1r	S3rg	N1r	S3rt	N1r	N1r	S3rt	N1r	N1r	S3rg	N1r	S3rg	N1r	N1r	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	N1r
Upalapura	10	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rt	S3rg	S3rg	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2rg	S2r	S2rg	S2r	S2rg	S3rg	S3rg
Upalapura	22	N1rg	S3rg	S3rg	S3rg	S3rg	S3g	N1rg	S3rg	S2rt	S3rg	S3rg	S2rg	S3rg	S2rg	S3rg	S3rg	S3rg	S3rg	S3g	S3g	S3g	S3g	S3g	S3rg	S2rg	S3g	S3g	S3g	S3g	S3rg	S3rg
Upalapura	23	N1rg	S3rg	N1rg	S3rg	N1rg	S3rt	N1rg	N1rg	S3rt	N1rg	N1rg	S3rg	N1rg	S3rg	N1rg	N1rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	N1rg
Upalapura	24	N1rg	S3rg	S3rg	S3rg	S3rg	S3g	N1rg	S3rg	S2rt	S3rg	S3rg	S2rg	S3rg	S2rg	S3rg	S3rg	S3rg	S3rg	S3g	S3g	S3g	S3g	S3g	S3rg	S2rg	S3g	S3g	S3g	S3g	S3rg	S3rg
Upalapura	25	N1rg	S3rg	S3rg	S3rg	S3rg	S3g	N1rg	S3rg	S2rt	S3rg	S3rg	S2rg	S3rg	S2rg	S3rg	S3rg	S3rg	S3rg	S3g	S3g	S3g	S3g	S3g	S3rg	S2rg	S3g	S3g	S3g	S3g	S3rg	S3rg

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	Jasmine	Bhendi	Crossandra	Drumstick	Mulberry
Upalapura	26/(1)	N1rg	S3rg	N1rg	S3rg	N1rg	S3rt	N1rg	N1rg	S3rt	N1rg	N1rg	S3rg	N1rg	S3rg	N1rg	N1rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	N1rg
Upalapura	26/(2)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Upalapura	26/(3)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Upalapura	26/(4)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Upalapura	27	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Upalapura	28/(1)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Upalapura	28/(2)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Upalapura	28/(3)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Upalapura	28/(4)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Upalapura	29	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Upalapura	30/(1)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Upalapura	30/(2)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Upalapura	31/(1)	N1r	S3rg	S3rg	S3rg	S3rg	S3g	N1r	S3rg	S2rt	S3rg	S3rg	S2rg	S3rg	S2rg	S3rg	S3rg	S3rg	S3rg	S3g	S3g	S3g	S3g	S3g	S3rg	S2rg	S3g	S3g	S3g	S3g	S3rg	S3rg
Upalapura	31/(2)	S3rg	S3g	S2rg	S3g	S2rg	S3rg	S3rg	S2rg	S3g	S3rg	S3g	S2rg	S2rg	S2rg	S2rg	S2rg	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2rg	S2g	S3g	S3g	S3g	S3g	S3g	S2g
Upalapura	32	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Upalapura	33	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Upalapura	34	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Upalapura	35	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rt	S3rg	S3rg	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2rg	S2r	S2rg	S2r	S2rg	S3rg	S3rg
Upalapura	36/(1)	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rt	S3rg	S3rg	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2rg	S2r	S2rg	S2r	S2rg	S3rg	S3rg
Upalapura	36/(2)	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rt	S3rg	S3rg	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2rg	S2r	S2rg	S2r	S2rg	S3rg	S3rg
Upalapura	37/(1)	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rt	S3rg	S3rg	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2rg	S2r	S2rg	S2r	S2rg	S3rg	S3rg
Upalapura	37/(2)	N1r	S2rg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rt	S3rg	S3rg	S2r	S3r	S2r	S3r	S3r	S3r	S2r	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2rg	S2r	S2rg	S2r	S2rg	S3rg	S3rg
Upalapura	38/(1)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Upalapura	38/(2)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Upalapura	38/(3)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g
Upalapura	38/(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	Others	Others
Upalapura	38/(5)	S3rg	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S3rg	S3g	S2g	S2g	S3g	S3g	S3g	S3g	S3g	S3g	S2g	S3g	S2g	S3g	S2g	S2g

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	Jasmine	Bhendi	Crossandra	Drumstick	Mulberry
Challari	60	N1r	S3rg	N1r	S3rg	N1r	S3rt	N1r	N1r	S3rt	N1r	N1r	S3rg	N1r	S3rg	N1r	N1r	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	N1r
Challari	61	N1r	S3rg	N1r	S3rg	N1r	S3rt	N1r	N1r	S3rt	N1r	N1r	S3rg	N1r	S3rg	N1r	N1r	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	N1r
Challari	62	N1r	S3rg	N1r	S3rg	N1r	S3rt	N1r	N1r	S3rt	N1r	N1r	S3rg	N1r	S3rg	N1r	N1r	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	N1r
Challari	63	N1r	S3rg	N1r	S3rg	N1r	S3rt	N1r	N1r	S3rt	N1r	N1r	S3rg	N1r	S3rg	N1r	N1r	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	N1r
Challari	64	N1r	S3rg	N1r	S3rg	N1r	S3rt	N1r	N1r	S3rt	N1r	N1r	S3rg	N1r	S3rg	N1r	N1r	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	N1r
Challari	66	N1r	S3rg	N1r	S3rg	N1r	S3rt	N1r	N1r	S3rt	N1r	N1r	S3rg	N1r	S3rg	N1r	N1r	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	N1r
Challari	67	N1r	S2rg	S3rg	S2rg	S3rg	S2rg	N1r	S3rg	S2rt	S3rg	S3rg	S2rg	S3rg	S2rg	S3rg	S3rg	S3rg	S2rg	S3g	S2rg	S2rg	S2rg	S2rg	S3rg	S2rg	S3g	S2rg	S3g	S2rg	S3rg	S3rg
Challari	69	N1r	S2rg	S3rg	S2rg	S3rg	S2rg	N1r	S3rg	S2rt	S3rg	S3rg	S2rg	S3rg	S2rg	S3rg	S3rg	S3rg	S2rg	S3g	S2rg	S2rg	S2rg	S2rg	S3rg	S2rg	S3g	S2rg	S3g	S2rg	S3rg	S3rg
Challari	72	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S1	S2g	S2g	S2g	S2g	S2r	S1	S1	S2g	S1	S2g	S2rg	S2r
Challari	73	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S1	S2g	S2g	S2g	S2g	S2r	S1	S1	S2g	S1	S2g	S2rg	S2r
Challari	74	N1r	S2rg	S3rg	S2rg	S3rg	S2rg	N1r	S3rg	S2rt	S3rg	S3rg	S2rg	S3rg	S2rg	S3rg	S3rg	S3rg	S2rg	S3g	S2rg	S2rg	S2rg	S2rg	S3rg	S2rg	S3g	S2rg	S3g	S2rg	S3rg	S3rg
Challari	75	N1r	S2rg	S3rg	S2rg	S3rg	S2rg	N1r	S3rg	S2rt	S3rg	S3rg	S2rg	S3rg	S2rg	S3rg	S3rg	S3rg	S2rg	S3g	S2rg	S2rg	S2rg	S2rg	S3rg	S2rg	S3g	S2rg	S3g	S2rg	S3rg	S3rg
Challari	76	N1rg	S3rg	N1rg	S3rg	N1rg	S3rt	N1rg	N1rg	S3rt	N1rg	N1rg	S3rg	N1rg	S3rg	N1rg	N1rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	N1rg
Challari	77	N1r	S3rg	N1r	S3rg	N1r	S3rt	N1r	N1r	S3rt	N1r	N1r	S3rg	N1r	S3rg	N1r	N1r	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	N1r
Challari	78	N1r	S3rg	N1r	S3rg	N1r	S3rt	N1r	N1r	S3rt	N1r	N1r	S3rg	N1r	S3rg	N1r	N1r	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	N1r
Challari	79	N1rg	S3rg	N1rg	S3rg	N1rg	S3rt	N1rg	N1rg	S3rt	N1rg	N1rg	S3rg	N1rg	S3rg	N1rg	N1rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	N1rg
Challari	80	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Challari	94	N1rg	S3rg	N1rg	S3rg	N1rg	S3rt	N1rg	N1rg	S3rt	N1rg	N1rg	S3rg	N1rg	S3rg	N1rg	N1rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1rg	N1rg
Challari	95	N1r	S3rg	N1r	S3rg	N1r	S3rt	N1r	N1r	S3rt	N1r	N1r	S3rg	N1r	S3rg	N1r	N1r	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	N1r
Challari	96	N1r	S3rg	N1r	S3rg	N1r	S3rt	N1r	N1r	S3rt	N1r	N1r	S3rg	N1r	S3rg	N1r	N1r	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	N1r
Challari	97	S2g	S2tg	S2g	S2g	S2tg	S2g	S2g	S2g	S2tg	S2g	S2g	S2g	S2g	S2g	S2tg	S2g	S2g	S3tg	S1	S2tg	S2tg	S2tg	S2tg	S2g	S2g	S1	S2tg	S1	S2g	S2g	S2g
Challari	101	N1r	S3rg	N1r	S3rg	N1r	S3rt	N1r	N1r	S3rt	N1r	N1r	S3rg	N1r	S3rg	N1r	N1r	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	S3rg	S3rg	S3rg	S3rg	S3rg	N1r	N1r
Challari	102	S2g	S2tg	S2g	S2g	S2tg	S2g	S2g	S2g	S2tg	S2g	S2g	S2g	S2g	S2g	S2tg	S2g	S2g	S3tg	S1	S2tg	S2tg	S2tg	S2tg	S2g	S2g	S1	S2tg	S1	S2g	S2g	S2g

RO-Rock outcrops

PART-B

SOCIO-ECONOMIC STATUS OF FARM HOUSEHOLDS

CONTENTS

LIST OF TABLES

Chapter 1

SALIENT FINDINGS OF THE STUDY

- *Results indicated that 37 farmers were sampled in Chik Sulikeri micro watershed among them 5(13.51%) were landless, 4 (10.51%) were marginal farmers, 15 (40.54%) were small farmers, 7 (18.92%) were semi medium farmers, 5 (13.51%) were medium farmers and 1 (2.70%) were large farmers.*
- *The data indicated that there were 101(59.06%) men and 70 (40.94%) women among the sampled households. The average family size of landless farmers' was 3, marginal, small, medium and large farmers' was 5b and semi medium farmers' was 6.*
- *The data indicated that, 29 (16.97%) people were in 0-15 years of age, 80 (46.78%) were in 16-35 years of age, 51 (29.82%) were in 36-60 years of age and 11(6.43 %) were above 61 years of age.*
- *The results indicated that Chik Sulikeri had 37.43 per cent illiterates, 44.44 per cent of them had primary school education, 1.17 per cent of them had middle school education, 6.43 per cent of them had high school education, 5.26 per cent of them had PUC education, 1.17 per cent of them did diploma, 2.34 per cent of them had degree education and 1.75 persons were doing others.*
- *The results indicate that, 91.89 per cent of households practicing agriculture and 8.11 per cent of the households were agricultural laborers.*
- *The results indicate that agriculture was the major occupation for 25.73 per cent of the household members, 51.46 per cent were agricultural laborers, 20.47 per cent were students and 1.17 housewives and children. In case of landless farmers, 21.43 per cent were doing agriculture, 64.29 per cent were agricultural laborers, and 14.29 per cent were housewives. In case of marginal farmers 26.32 per cent were agriculturists, 31.58 per cent were agricultural laborers and 36.84 per cent were students. In case of small farmers, 28.99 per cent were agriculturists, 53.62 per cent were agricultural laborers and 17.39 per cent were students. In case of semi medium farmers, 25.64 per cent were agriculturists, 48.72 per cent were agricultural laborer and 23.08 per cent were students. In case of medium farmers, 20 per cent were agriculturists, another 60 per cent were agricultural laborers and 20 per cent were students. In large farmers 20 per cent were agriculturists, another 40 per cent were agricultural laborers and 40 per cent were students.*
- *The results show that 100 per cent of the populations in the micro watershed have not participated in any local institutions.*
- *The results indicate that 13.51 per cent of the households possess thatched house, 75.68 per cent of the households possess Katcha house and 10.81 per cent of them possess Pucca house.*
- *The results shows that 89.19 per cent of the households possess TV, 67.57 per cent of the households possess Mixer grinder, 32.43 per cent of the households possess*

bicycle, 37.84 per cent of the households possess motor cycle, and 97.30 per cent of the households possess mobile phones.

- *The results showed that the average value of television was Rs.4151, mixer grinder was Rs.1396, motor cycle was Rs.1500 and mobile phone was Rs.31285 and mobile was Rs.1472.*
- *The data showed that, about 10.81 per cent of the households possess bullock cart, 18.92 per cent of them possess plough and sprayer, 94.59 per cent of them possess weeder and 2.70 per cent of them possess harvester and chaff cutter respectively.*
- *The results show that the average value of bullock cart was Rs.18250, plough was Rs.1250, the average value of weeder was Rs. 23, the average value of sprayer was Rs.4571, the average value of harvester was Rs.45000 and the average value of chaff cutter Rs.3000.*
- *The results indicate that, 16.22 per cent of the households possess bullocks, 24.32 per cent of the households possess local cow and 2.70 per cent of the households possess buffalo and sheep respectively. In case of marginal households, 25per cent possess local cow. Among small farmers, 33.33 per cent of the households possess bullock and 26.67 per cent possess local cow. In case of semi medium farmers, 14.29 per cent of households possess bullock, 28.57 per cent of households possess local cow and 14.29 per cent of households possess buffalo. In medium farmers 20 per cent local cow and in large farmers 100 per cent of the household possess local cow.*
- *The results indicate that, average own labour men available in the micro watershed was 9.19, average own labour (women) available was 5.66, average hired labour (men) available was 8.05 and average hired labour (women) available was 9.13.*
- *In case of marginal farmers, average own labour men available was 31, average own labour (women) was 16, average hired labour (men) was 7 and average hired labour (women) available was 7.25. In case of small farmers, average own labour men available was 1.81, average own labour (women) was 1.69, average hired labour (men) was 9.27 and average hired labour (women) available was 11.63. In case of semi medium farmers, average own labour men available was 25, average own labour (women) was 15.71, average hired labour (men) was 11.29 and average hired labour (women) available was 10.57. In case of medium farmers, average own labour men available was 2.20, average own labour (women) was 2.60, average hired labour (men) was 9 and average hired labour (women) available was 10. In case of large farmers, average own labour men available was 1, average own labour (women) was 1, average hired labour (men) was 7 and average hired labour (women) available was 8.*

- *The results indicate that, 8.11 per cent of the households opined that the hired labour was adequate and 94.59 per cent of the households opined that the hired labour was inadequate.*
- *The results indicate that, households of the Chik Sulikeri micro watershed possess 22.83 ha (35.54%) of dry land and 41.42 ha (64.46%) of irrigated land. Marginal farmers possess 2.06 ha (80.95%) of dry land and 0.49 ha (19.05%) of irrigated land. Small farmers possess 13.89 ha (77.44%) of dry land and 4.05 ha (22.56%) of irrigated land. Semi medium possess 6.88 ha (52.80%) of dry land and 6.15 ha (47.20%) of irrigated land. Medium farmers possess 12.52 ha (100%) of irrigated land, large farmers possess 3.64 18.21 ha (100%) of irrigated land.*
- *The results indicate that, the average value of dry land was Rs. 262,672.81 and average value of irrigated was Rs. 183,427.89. In case of marginal famers, the average land value was Rs. 435,882.36 for dry land and was Rs. 1,029,166.63 for irrigated land. In case of small famers, the average land value was Rs. 251,893.94 for dry land and Rs. 592,800. In case of semi medium famers, the average land value was Rs. 232,470.59 for dry land and Rs. 325,000 for irrigated land. In case of medium and large famers, the average irrigated land value was Rs. 215,546.22 and Rs. 220,000 respectively.*
- *The results indicate that, there were 17 functioning and 16 de-functioning bore wells in the micro watershed.*
- *The results indicate that, bore well was the major irrigation source in the micro water shed for 45.95 per cent of the farmers.*
- *The results indicate that, the depth of bore well was found to be 77.04 meters.*
- *The results indicate that, marginal farmers were having 0.40 ha irrigated land, small farmers were having 3.24 ha of irrigated land, semi medium were having 9.39 ha of irrigated land and medium farmers had irrigated area of 12.52 ha and large farmers were having 1.62 ha of irrigated land respectively. On an average there was 27.17 ha of irrigated land.*
- *The results indicate that, farmers have grown groundnut (17.05 ha), maize (12.55 ha), bajra (4.05 ha), paddy (3.68 ha), navane (3.24 ha), mango (1.62 ha), sorghum (1.30 ha), horsegram (1.21 ha), groundnut (1.21 ha), cotton (0.81 ha) and tomato (0.40 ha) in kharif season and also grown groundnut (1.21 ha) in Rabi season. Marginal farmers have grown maize, navane and tomato. Small farmers have grown groundnut, bajra, paddy, navane, horsegram and cotton. Semi medium farmers have grown groundnut, maize, bajra, navane and groundnut. Medium farmers have grown groundnut, maize and paddy. Large farmers have grown mango.*
- *The results indicate that, the cropping intensity in Chik Sulikeri micro watershed was found to be 88.79 per cent. In case of marginal farmers it was 98.36 per cent, for small farmers it was 99.54 per cent, in case of semi medium farmers it was*

89.11 per cent, and medium farmers had cropping intensity of 72.90 per cent and in large farmers it was 100 per cent.

- *The results indicate that, 86.49 per cent of the households have bank account and 86.49 per cent of the households have savings.*
- *The results indicate that, 86.49 per cent of the households have availed credit from different sources.*
- *The results indicate that, the total cost of cultivation for maize was Rs. 31771.63. The gross income realized by the farmers was Rs. 34174.67. The net income from Maize cultivation was Rs. 2403.04, thus the benefit cost ratio was found to be 1:1.08.*
- *The results indicate that, the total cost of cultivation for bajra was Rs. 35771.59. The gross income realized by the farmers was Rs. 48158.68. The net income from bajra cultivation was Rs. 12387.09. Thus the benefit cost ratio was found to be 1:1.35.*
- *The results indicate that, the total cost of cultivation for sorghum was Rs. 27138.83. The gross income realized by the farmers was Rs. 33379.73. The net income from sorghum cultivation was Rs. 6240.91. Thus the benefit cost ratio was found to be 1:1.23.*
- *The results indicate that, the total cost of cultivation for horsegram was Rs. 14751.82. The gross income realized by the farmers was Rs. 32604. The net income from horsegram cultivation was Rs. 17852.18. Thus the benefit cost ratio was found to be 1:2.21.*
- *The results indicate that, the total cost of cultivation for groundnut was Rs. 43450.70. The gross income realized by the farmers was Rs. 73850.81. The net income from groundnut cultivation was Rs. 30400.12. Thus the benefit cost ratio was found to be 1:1.7.*
- *The results indicate that, the total cost of cultivation for cotton was Rs. 48854.75. The gross income realized by the farmers was Rs. 74100. The net income from cotton cultivation was Rs. 25245.25. Thus the benefit cost ratio was found to be 1:1.52.*
- *The results indicate that, the total cost of cultivation for tomato was Rs. 45006.53. The gross income realized by the farmers was Rs. 98800. The net income from tomato cultivation was Rs. 53793.47. Thus the benefit cost ratio was found to be 1:2.2.*
- *The results indicate that, the total cost of cultivation for navane was Rs. 19144.78. The gross income realized by the farmers was Rs. 25177.99. The net income from navane cultivation was Rs. 6033.21. Thus the benefit cost ratio was found to be 1:1.32.*
- *The results indicate that, the total cost of cultivation for mango was Rs. 30875.21. The gross income realized by the farmers was Rs. 203775. The net income from*

mango cultivation was Rs. 172899.79. Thus the benefit cost ratio was found to be 1:6.6.

- *The results indicate that, the total cost of cultivation for paddy was Rs. 141928.82. The gross income realized by the farmers was Rs. 137399.96. The net income from paddy cultivation was Rs. -4528.86. Thus the benefit cost ratio was found to be 1:0.97.*
- *The results indicate that, 21.62 per cent of the households opined that dry fodder was adequate and 13.51 per cent of the households opined that dry fodder was inadequate. Around 2.70 per cent of the households opined that green fodder was adequate.*
- *The results indicate that, in landless farmers, the average annual gross income from wage was Rs. 103,000, in marginal farmers, the average annual gross income from wage was Rs. 27,500 and agriculture was Rs.42837.50. In small farmers, the average annual gross income from service/salary was Rs. 2000, wage was Rs.22333.33, agriculture was Rs.71713.33 and dairy farm was Rs.5060.67.In semi medium farmers, the average annual gross income from wage was Rs. 32,142.86, agriculture was Rs. 71,542.86 and dairy farm was Rs. 1,285.71. In medium farmers, the average annual gross income from wage was Rs. 19400 and agriculture was Rs. 298400 and dairy farm was Rs. 600. In large farmers, the average annual gross income from wage was Rs. 10000 and agriculture was Rs. 30000.*
- *The results indicate that, in land less farmers, the average annual expenditure from wage was Rs. 42000. In marginal farmers, the average annual expenditure from wage was Rs.8333.33 and agriculture was Rs. 23,750. In small farmers the average annual expenditure from service/salary was Rs.20000, wage was Rs.9000, agriculture was Rs.32266.67 and dairy farm was Rs.6600. In semi medium farmers, the average annual expenditure from wage was Rs.9500, agriculture was Rs.31428.57 and dairy farm was Rs.2000. In medium farmers, the average annual expenditure from wage was Rs.9,250, agriculture was Rs. 59,000 and dairy farm was Rs.1000. In large farmers the average annual expenditure from wage was Rs.5000 and agriculture was Rs.10000.*
- *The results indicate that, sampled households have grown 2 areca nut, 11 coconut and 607 mango trees in their field and also planted 2 coconut trees in their back yard.*
- *The results indicate that, households have planted 3 teak trees and 43 neem trees in their field and 1 neem trees in their backyard.*
- *The results indicate that, households have an average investment capacity of Rs. 7243.24 for land development, Rs. 2513.51 in irrigation facility and 162.16 for improved crop production. Marginal households have an average investment capacity of Rs. 7000 for land development. Small farmers have an average*

investment capacity of Rs. 7866.67 for land development, Rs. 3066.67 in irrigation facility and Rs.400 for improved crop production. Semi medium farmers have an average investment capacity of Rs. 8571.43 for land development and Rs. 3285.71 in irrigation facility. Medium farmers have an average investment capacity of Rs. 10,400 for land development and Rs. 3,200 in irrigation facility. large farmers have an average investment capacity of Rs. 10,000 for land development and Rs. 8,000 in irrigation facility.

- *The results indicate that, for land development, 31.58 per cent of the farmers were dependent on government subsidy and 42.11 per cent of the farmers were dependent on loan from bank. For irrigation facility 15.79 per cent of the farmers were dependent on government subsidy and loan from bank respectively. For improved crop production 2.63 per cent of the farmers were dependent on loan from bank.*
- *The results indicated that, bajra, cotton, horsegram, maize, mango, navane, paddy, sorghum and tomato crops were sold to the extent of 100 per cent. Groundnut was sold to the extent of 95.50 per cent.*
- *The results indicated that, about 8.11 per cent of the famers have sold their produce in agent/traders. 91.89 per cent farmers also sold their produce in cooperative marketing society.*
- *The results indicated that, 2.70 per cent of the households have used cart as a mode of transportation for their agricultural produce, and 97.30 per cent have also used tractor.*
- *The results indicated that, 62.61 per cent of the households have experienced soil and water erosion problems in the farm i.e., 50 per cent of marginal farmers, 80 per cent of small farmers, 57.14 per cent of semi medium farmers, 80 per cent of the medium farmers and 100 per cent of large farmers have experienced soil and water erosion problems.*
- *The results indicated that, 75.68 per cent have shown interest in soil test.*
- *The results indicated that, piped supply was the major source of drinking water for 89.19 per cent of the households and bore well was the source of drinking water for 10.81 per cent of the households.*
- *The results indicated that, 100 per cent of the households used fire wood as a source of fuel.*
- *The results indicated that, Electricity was the major source of light for 100 per cent of the households in micro watershed.*
- *The results indicated that, 51.35 per cent of the households possess sanitary toilet i.e. 100 per cent of the landless, marginal, medium and large farmers, 13.13 per cent of small farmers and 28.57 per cent of the semi medium farmers.*
- *The results indicated that, 97.30 per cent of the sampled households possessed BPL card and 2.70 per cent did not possess PDS card.*

- *The results indicated that, 64.86 per cent of the households participated in NREGA programme.*
- *The results indicated that, cereals were adequate for 97.30 per cent of the households, pulses were adequate for 54.05 per cent, oilseeds were adequate for 35.14 per cent, vegetables were adequate for 48.65 per cent, fruits were adequate for 78.38 per cent, milk was adequate for 54.05 per cent, eggs were adequate for 54.05 per cent and meat was adequate for 5.41 per cent of the households.*
- *The results indicated that, cereals were inadequate for 2.70 per cent of the households, pulses were inadequate for 45.95 per cent, oilseeds were inadequate for 56.76 per cent, vegetables were inadequate for 45.95 per cent, fruits were inadequate for 24.32 per cent, milk was inadequate for 13.51 per cent and eggs were inadequate for 16.22 per cent of the households.*
- *The results indicated that, lower fertility status of the soil was the constraint experienced by 75.68 per cent of the households, wild animal menace on farm field (64.86%), frequent incidence of pest and diseases (29.73%), inadequacy of irrigation water (16.22%), high cost of fertilizers and plant protection chemicals (43.24%), high rate of interest on credit (8.11%), low price for the agricultural commodities (16.22%), lack of marketing facilities in the area (13.51%), lack of transport for safe transport of the agricultural produce to the market (24.32%), less rainfall (40.54%) inadequate extension services (24.32%) and source of agri technology information (13.51).*

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.

Description of the study area

Koppal district is an administrative district in the state of Karnataka in India. In the past Koppal was referred to as 'Kopana Nagara'. Koppal, now a district headquarters is ancient Kopana a major holy place of the Jainas. The district occupies an area of 7,190 km² and has a population of 1,196,089, which 16.58% were urban as of 2001. The Koppal district was formed after split of Raichur district. Geographers are very particular about the physiography or relief of a region. It plays a very important role in the spatial analysis of agricultural situation of the study area. The undulating topography with black cotton soil shrips, cut across by numerous nalas or streams is the major characteristic feature of the study region. Three physiographic divisions have made considering the local conditions of landforms and crops grown in the district. On the basis of physiography, Koppal district can be divided into three major divisions.3 they are (a) Koppal & Yelburga plateau, (b) Maidan division, (c) Tungabhadra valley. The district is part of Krishna basin the main streams draining the area are Maskinala, Ilkal-nadi and Hirenala. These are Ephemaral in nature, these come under Tungabhadra sub-basin. The drainage exhibit dentritic to subdentric with drainage density varies from 1.4 to7.0kms/sq.km.

According to the 2011 census Koppal district has a population of 1,391,292 roughly equal to the nation of Swaziland or the US state of Hawaii. This gives it a ranking of 350th in India (out of a total of 640). The district has a population density of 250 inhabitants per square kilometre (650/sq mi). Its population growth rate over the decade 2001-2011 was 16.32%.Koppal has a sex ratio of 983 females for every 1000 males, and a literacy rate of 67.28%.

Description of the micro watershed

Chik Sulikeri micro-watershed (Ginigera sub-watershed, Koppal Taluk and District) is located at North latitude $15^0$34’11.373’’ to 15^0 32’16.956’’and East longitude 76^0 17’51.183’’ to $76^0$16'11.494'' covering an area of 540.14 ha and spread across Chikkabommanala, Upalapura, Ganganahala, Hiresoolikeri, Challari and Chikksoolikeri villages.

Methodology followed in assessing socio-economic status of households

In order to assess the socio-economic condition of the farmers in the watershed a comprehensive questionnaire was prepared. Major components such as demographic conditions, migration details, food consumption and family expenditure pattern, material possession, land holding, land use management, cropping pattern, cost of cultivation of

crops, livestock management. The statistical components such as frequency and percentage were used to analyze the data. About 37 households located in the micro watershed were interviewed for the survey.

Chapter 4

SALIENT FEATURES OF THE SURVEY

Households sampled for socio-economic survey: The data on households sampled for socio economic survey in Chik Sulikeri micro watershed is presented in Table 1 and it indicated that 37 farmers were sampled in Chik Sulikeri micro watershed among them 5(13.51%) were landless, 4 (10.51%) were marginal farmers, 15 (40.54%) were small farmers, 7 (18.92%) were semi medium farmers, 5 (13.51%) were medium farmers and 1 (2.70%) were large farmers.

Table 1: Households sampled for socio economic survey in Chik Sulikeri micro watershed

Sl.No.	Particulars	LL (5)		MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Farmers	5	13.51	4	10.81	15	40.54	7	18.92	5	13.51	1	2.70	37	100

Population characteristics: The population characteristics of households sampled for socio-economic survey in Chik Sulikeri micro watershed is presented in Table 2. The data indicated that there were 101(59.06%) men and 70 (40.94%) women among the sampled households. The average family size of landless farmers' was 3, marginal, small, medium and large farmers' was 5b and semi medium farmers' was 6.

Table 2: Population characteristics of Chik Sulikeri micro-watershed

Sl. No.	Particulars	LL (14)		MF (19)		SF (69)		SMF (39)		MDF(25)		LF (5)		All (171)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Male	7	50.00	11	57.89	39	56.52	25	64.10	17	68.00	2	40.00	101	59.06
2	Female	7	50.00	8	42.11	30	43.48	14	35.90	8	32.00	3	60.00	70	40.94
Total		14	100.00	19	100.00	69	100.00	39	100.00	25	100.00	5	100.00	171	100.00
Average		3		5		5		6		5		5		4.62	

Age wise classification of population: The age wise classification of household members in Chik Sulikeri micro watershed is presented in Table 3. The data indicated that, 29 (16.97%) people were in 0-15 years of age, 80 (46.78%) were in 16-35 years of age, 51 (29.82%) were in 36-60 years of age and 11(6.43 %) were above 61 years of age.

Table 3: Age wise classification of household members in Chik Sulikeri micro watershed

Sl. No.	Particulars	LL (14)		MF (19)		SF (69)		SMF (39)		MDF (25)		LF (5)		All (171)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	0-15 years	0	0.00	3	15.79	13	18.84	7	17.95	4	16.00	2	40.00	29	16.96
2	16-35 years	9	64.29	9	47.37	32	46.38	20	51.28	9	36.00	1	20.00	80	46.78
3	36-60 years	4	28.57	6	31.58	20	28.99	11	28.21	8	32.00	2	40.00	51	29.82
4	> 61 years	1	7.14	1	5.26	4	5.80	1	2.56	4	16.00	0	0.00	11	6.43
Total		14	100	19	100	69	100	39	100	25	100	5	100	171	100

Education level of household members: Education level of household members in Chik Sulikeri micro watershed is presented in Table 4. The results indicated that Chik Sulikeri had 37.43 per cent illiterates, 44.44 per cent of them had primary school education, 1.17 per cent of them had middle school education, 6.43 per cent of them had high school

education, 5.26 per cent of them had PUC education, 1.17 per cent of them did diploma, 2.34 per cent of them had degree education and 1.75 persons were doing others.

Table 4: Education level of household members in Chik Sulikeri micro watershed

Sl.No.	Particulars	LL (14)		MF (19)		SF (69)		SMF (39)		MDF (25)		LF (5)		All (171)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Illiterate	6	42.86	4	21.05	33	47.83	11	28.21	9	36.00	1	20.00	64	37.43
2	Primary School	6	42.86	8	42.11	31	44.93	16	41.03	11	44.00	4	80.00	76	44.44
3	Middle School	0	0.00	1	5.26	1	1.45	0	0.00	0	0.00	0	0.00	2	1.17
4	High School	2	14.29	0	0.00	1	1.45	5	12.82	3	12.00	0	0.00	11	6.43
5	PUC	0	0.00	2	10.53	2	2.90	4	10.26	1	4.00	0	0.00	9	5.26
6	Diploma	0	0.00	0	0.00	1	1.45	0	0.00	1	4.00	0	0.00	2	1.17
7	Degree	0	0.00	3	15.79	0	0.00	1	2.56	0	0.00	0	0.00	4	2.34
8	Others	0	0.00	1	5.26	0	0.00	2	5.13	0	0.00	0	0.00	3	1.75
Total		14	100	19	100	69	100	39	100	25	100	5	100	171	100

Occupation of household heads: The data regarding the occupation of the household heads in Chik Sulikeri micro watershed is presented in Table 5. The results indicate that, 91.89 per cent of households practicing agriculture and 8.11 per cent of the households were agricultural laborers.

Table 5: Occupation of household heads in Chik Sulikeri micro watershed

Sl. No.	Particulars	LL (5)		MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Agriculture	3	60.00	4	100	14	93.33	7	100	5	100	1	100	34	91.89
2	Agricultural Labour	2	40.00	0	0.00	1	6.67	0	0.00	0	0.00	0	0.00	3	8.11
Total		5	100	4	100	15	100	7	100	5	100	1	100	37	v

Table 6: Occupation of family members in Chik Sulikeri micro watershed

Sl.No.	Particulars	LL (14)		MF (19)		SF (69)		SMF (39)		MDF (25)		LF (5)		All (171)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Agriculture	3	21.43	5	26.32	20	28.99	10	25.64	5	20.00	1	20.00	44	25.73
2	Agricultural Labour	9	64.29	6	31.58	37	53.62	19	48.72	15	60.00	2	40.00	88	51.46
3	Student	0	0.00	7	36.84	12	17.39	9	23.08	5	20.00	2	40.00	35	20.47
4	Housewife	2	14.29	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	1.17
5	Children	0	0.00	1	5.26	0	0.00	1	2.56	0	0.00	0	0.00	2	1.17
Total		14	100	19	100	69	100	39	100	25	100	5	100	171	100

Occupation of the household members: The data regarding the occupation of the household members in Chik Sulikeri micro watershed is presented in Table 6. The results indicate that agriculture was the major occupation for 25.73 per cent of the household members, 51.46 per cent were agricultural laborers, 20.47 per cent were students and 1.17 housewives and children. In case of landless farmers, 21.43 per cent were doing agriculture, 64.29 per cent were agricultural laborers, and 14.29 per cent were housewives. In case of marginal farmers 26.32 per cent were agriculturists, 31.58 per cent were agricultural laborers and 36.84 per cent were students. In case of small farmers,

28.99 per cent were agriculturists, 53.62 per cent were agricultural laborers and 17.39 per cent were students. In case of semi medium farmers, 25.64 per cent were agriculturists, 48.72 per cent were agricultural laborer and 23.08 per cent were students. In case of medium farmers, 20 per cent were agriculturists, another 60 per cent were agricultural laborers and 20 per cent were students. In large farmers 20 per cent were agriculturists, another 40 per cent were agricultural laborers and 40 per cent were students.

Institutional participation of the household members: The data regarding the institutional participation of the household members in Chik Sulikeri micro watershed is presented in Table 7. The results show that 100 per cent of the populations in the micro watershed have not participated in any local institutions.

Table 7: Institutional Participation of household members in Chik Sulikeri micro watershed

Sl. No.	Particulars	LL (14)		MF (19)		SF (69)		SMF (39)		MDF (25)		LF (5)		All (171)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	No Participation	14	100	19	100	69	100	39	100	25	100	5	100	171	100
Total		14	100	19	100	69	100	39	100	25	100	5	100	171	100

Type of house owned: The data regarding the type of house owned by the households in Chik Sulikeri micro watershed is presented in Table 8. The results indicate that 13.51 per cent of the households possess thatched house, 75.68 per cent of the households possess Katcha house and 10.81 per cent of them possess Pucca house.

Table 8: Type of house owned by households in Chik Sulikeri micro watershed

Sl.No.	Particulars	LL (5)		MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Thatched	1	20.00	1	25.00	0	0.00	1	14.29	1	20.00	1	100.00	5	13.51
2	Katcha	4	80.00	3	75.00	13	86.67	5	71.43	3	60.00	0	0.00	28	75.68
3	Pucca/RCC	0	0.00	0	0.00	2	13.33	1	14.29	1	20.00	0	0.00	4	10.81
Total		5	100.00	4	100.00	15	100.00	7	100.00	5	100.00	1	100.00	37	100.00

Durable Assets owned by the households: The data regarding the Durable Assets owned by the households in Chik Sulikeri micro watershed is presented in Table 9. The results shows that 89.19 per cent of the households possess TV, 67.57 per cent of the households possess Mixer grinder, 32.43 per cent of the households possess bicycle, 37.84 per cent of the households possess motor cycle, and 97.30 per cent of the households possess mobile phones.

Table 9: Durable Assets owned by households in Chik Sulikeri micro watershed

Sl.No.	Particulars	LL (5)		MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Television	4	80	3	75	14	93.33	6	85.71	5	100	1	100	33	89.19
2	Mixer/Grinder	2	40	1	25	10	66.67	6	85.71	5	100	1	100	25	67.57
3	Bicycle	0	0	1	25	8	53.33	3	42.86	0	0	0	0	12	32.43
4	Motor Cycle	1	20	0	0	7	46.67	4	57.14	2	40	0	0	14	37.84
5	Mobile Phone	4	80	4	100	15	100	7	100	5	100	1	100	36	97.30

Average value of durable assets: The data regarding the average value of durable assets owned by the households in Chik Sulikeri micro watershed is presented in Table 10. The results showed that the average value of television was Rs.4151, mixer grinder was Rs.1396, motor cycle was Rs.1500 and mobile phone was Rs.31285 and mobile was Rs.1472.

Table 10: Average value (Rs) of durable assets owned by households in Chik Sulikeri micro watershed

Sl.No.	Particulars	LL (5)	MF (4)	SF (15)	SMF (7)	MDF (5)	LF (1)	All (37)
1	Television	2,250.00	3,333.00	3,785.00	5,166.00	5,600.00	6,000.00	4,151.00
2	Mixer/Grinder	1,100.00	1,500.00	1,530.00	1,233.00	1,400.00	1,500.00	1,396.00
3	Bicycle	0.00	1,000.00	1,500.00	1,666.00	0.00	0.00	1,500.00
4	Motor Cycle	35,000.00	0.00	31,142.00	31,250.00	30,000.00	0.00	31,285.00
5	Mobile Phone	700.00	2,000.00	1,228.00	1,571.00	2,000.00	4,000.00	1,472.00

Farm Implements owned: The data regarding the farm implements owned by the households in Chik Sulikeri micro watershed is presented in Table 11. About 10.81 per cent of the households possess bullock cart, 18.92 per cent of them possess plough and sprayer, 94.59 per cent of them possess weeder and 2.70 per cent of them possess harvester and chaff cutter respectively.

Table 11: Farm Implements owned by households in Chik Sulikeri micro watershed

Sl. No.	Particulars	LL (5)		MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Bullock Cart	0	0.00	0	0.00	3	20.00	1	14.29	0	0.00	0	0.00	4	10.81
2	Plough	0	0.00	0	0.00	6	40.00	1	14.29	0	0.00	0	0.00	7	18.92
3	Sprayer	0	0.00	0	0.00	3	20.00	2	28.57	1	20.00	1	100.00	7	18.92
4	Weeder	3	60.00	4	100.00	15	100.00	7	100.00	5	100.00	1	100.00	35	94.59
5	Harvester	0	0.00	0	0.00	0	0.00	1	14.29	0	0.00	0	0.00	1	2.70
6	Chaff Cutter	0	0.00	0	0.00	1	6.67	0	0.00	0	0.00	0	0.00	1	2.70
7	Blank	2	40.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	5.41

Average value of farm implements: The data regarding the average value of farm Implements owned by the households in Chik Sulikeri micro watershed is presented in Table 12. The results show that the average value of bullock cart was Rs.18250, plough was Rs.1250, the average value of weeder was Rs. 23, the average value of sprayer was Rs.4571, the average value of harvester was Rs.45000 and the average value of chaff cutter Rs.3000.

Table 12: Average value (Rs) of farm implements owned by households in Chik Sulikeri micro watershed

Sl.No.	Particulars	LL (5)	MF (4)	SF (15)	SMF (7)	MDF (5)	LF (1)	All (37)
1	Bullock Cart	0.00	0.00	18,333.00	18,000.00	0.00	0.00	18,250.00
2	Plough	0.00	0.00	1,222.00	1,500.00	0.00	0.00	1,250.00
3	Sprayer	0.00	0.00	4,000.00	5,000.00	5,000.00	5,000.00	4,571.00
4	Weeder	15.00	32.00	22.00	34.00	16.00	11.00	23.00
5	Harvester	0.00	0.00	0.00	45,000.00	0.00	0.00	45,000.00
6	Chaff Cutter	0.00	0.00	3,000.00	0.00	0.00	0.00	3,000.00

Livestock possession by the households: The data regarding the Livestock possession by the households in Chik Sulikeri micro watershed is presented in Table 13. The results indicate that, 16.22 per cent of the households possess bullocks, 24.32 per cent of the households possess local cow and 2.70 per cent of the households possess buffalo and sheep respectively. In case of marginal households, 25per cent possess local cow. Among small farmers, 33.33 per cent of the households possess bullock and 26.67 per cent possess local cow. In case of semi medium farmers, 14.29 per cent of households possess bullock, 28.57 per cent of households possess local cow and 14.29 per cent of households possess buffalo. In medium farmers 20 per cent local cow and in large farmers 100 per cent of the household possess local cow.

Table 13: Livestock possession by households in Chik Sulikeri micro watershed

Sl. No.	Particulars	LL (5)		MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Bullock	0	0.00	0	0.00	5	33.33	1	14.29	0	0.00	0	0.00	6	16.22
2	Local cow	0	0.00	1	25.00	4	26.67	2	28.57	1	20.00	1	100.00	9	24.32
3	Buffalo	0	0.00	0	0.00	0	0.00	1	14.29	0	0.00	0	0.00	1	2.70
4	Sheep	1	20.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	2.70
9	blank	4	80.00	3	75.00	5	33.33	3	42.86	4	80.00	0	0.00	19	51.35

Average Labour availability: The data regarding the average labour availability in Chik Sulikeri micro watershed is presented in Table 14. The results indicate that, average own labour men available in the micro watershed was 9.19, average own labour (women) available was 5.66, average hired labour (men) available was 8.05 and average hired labour (women) available was 9.13.

Table 14: Average Labour availability in Chik Sulikeri micro watershed

Sl.No.	Particulars	LL (5)	MF (4)	SF (15)	SMF (7)	MDF (5)	LF (1)	All (37)
		N	N	N	N	N	N	N
1	Own labour Male	0.00	31.00	1.81	25.00	2.20	1.00	9.19
2	Own Labour Female	0.00	16.00	1.69	15.71	2.60	1.00	5.66
3	Hired labour Male	0.00	7.00	9.27	11.29	9.00	7.00	8.05
4	Hired labour Female	0.00	7.25	11.63	10.57	10.00	8.00	9.13

Adequacy of Hired Labour: The data regarding the adequacy of hired labour in Chik Sulikeri micro watershed is presented in Table 15. The results indicate that, 8.11 per cent of the households opined that the hired labour was adequate and 94.59 per cent of the households opined that the hired labour was inadequate.

Table 15: Adequacy of Hired Labour in Chik Sulikeri micro watershed

Sl.No.	Particulars	LL (5)		MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Adequate	0	0.00	1	25.00	1	6.67	1	14.29	0	0.00	0	0.00	3	8.11
2	Inadequate	5	100.00	3	75.00	15	100.00	6	85.71	5	100.00	1	100.00	35	94.59

Distribution of land (ha): The data regarding the distribution of land (ha) in Chik Sulikeri micro watershed is presented in Table 16. The results indicate that, households of

the Chik Sulikeri micro watershed possess 22.83 ha (35.54%) of dry land and 41.42 ha (64.46%) of irrigated land. Marginal farmers possess 2.06 ha (80.95%) of dry land and 0.49 ha (19.05%) of irrigated land. Small farmers possess 13.89 ha (77.44%) of dry land and 4.05 ha (22.56%) of irrigated land. Semi medium possess 6.88 ha (52.80%) of dry land and 6.15 ha (47.20%) of irrigated land. Medium farmers possess 12.52 ha (100%) of irrigated land, large farmers possess 18.21 ha (100%) of irrigated land.

Table 16: Distribution of land (Ha) in Chik Sulikeri micro watershed

Sl. No.	Particulars	MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		ha	%	ha	%	ha	%	ha	%	ha	%	ha	%
1	Dry	2.06	80.95	13.89	77.44	6.88	52.80	0.00	0.00	0.00	0.00	22.83	35.54
2	Irrigated	0.49	19.05	4.05	22.56	6.15	47.20	12.52	100.00	18.21	100.00	41.42	64.46
Total		2.55	100.00	17.94	100.00	13.03	100.00	12.52	100.00	18.21	100.00	64.25	100.00

Average land value (Rs./ha): The data regarding the average land value (Rs./ha) in Chik Sulikeri micro watershed is presented in Table 17. The results indicate that, the average value of dry land was Rs. 262,672.81 and average value of irrigated was Rs. 183,427.89. In case of marginal famers, the average land value was Rs. 435,882.36 for dry land and was Rs. 1,029,166.63 for irrigated land. In case of small famers, the average land value was Rs. 251,893.94 for dry land and Rs. 592,800. In case of semi medium famers, the average land value was Rs. 232,470.59 for dry land and Rs. 325,000 for irrigated land. In case of medium and large famers, the average irrigated land value was Rs. 215,546.22 and Rs. 220,000 respectively.

Table 17: Average land value (Rs./ha) in Chik Sulikeri micro watershed

Sl. No.	Particulars	MF (4)	SF (15)	SMF (7)	MDF (5)	LF (1)	All (37)
		N	N	N	N	N	N
1	Dry	435,882.36	251,893.94	232,470.59	0.00	0.00	262,672.81
2	Irrigated	1,029,166.63	592,800	325,000.00	215,546.22	220,000.00	183,427.89

Status of bore wells: The data regarding the status of bore wells in Chik Sulikeri micro watershed is presented in Table 18. The results indicate that, there were 17 functioning and 16 de-functioning bore wells in the micro watershed.

Table 18: Status of bore wells in Chik Sulikeri micro watershed

Sl. No.	Particulars	LL (5)	MF (4)	SF (15)	SMF (7)	MDF (5)	LF (1)	All (37)
		N	N	N	N	N	N	N
1	De-functioning	0	1	5	4	5	1	16
2	Functioning	0	1	6	4	5	1	17

Source of irrigation: The data regarding the source of irrigation in Chik Sulikeri micro watershed is presented in Table 19. The results indicate that, bore well was the major irrigation source in the micro water shed for 45.95 per cent of the farmers.

Table 19: Source of irrigation in Chik Sulikeri micro watershed

Sl.No.	Particulars	MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Bore Well	1	25.00	6	40.00	4	57.14	5	100.00	1	100.00	17	45.95

Depth of water (Avg in meters): The data regarding the depth of water in Chik Sulikeri micro watershed is presented in Table 20. The results indicate that, the depth of bore well was found to be 77.04 meters.

Table 20: Depth of water (Avg in meters) in Chik Sulikeri micro watershed

Sl.No.	Particulars	MF (4)	SF (15)	SMF (7)	MDF (5)	LF (1)	All (37)
		N	N	N	N	N	N
1	Bore Well	19.05	70.14	49.20	256.03	97.54	77.04

Irrigated Area (ha): The data regarding the irrigated area (ha) in Chik Sulikeri micro watershed is presented in Table 21. The results indicate that, marginal farmers were having 0.40 ha irrigated land, small farmers were having 3.24 ha of irrigated land, semi medium were having 9.39 ha of irrigated land and medium farmers had irrigated area of 12.52 ha and large farmers were having 1.62 ha of irrigated land respectively. On an average there were 27.17 ha of irrigated land.

Table 21: Irrigated Area (ha) in Chik Sulikeri micro watershed

Sl.No.	Particulars	MF (4)	SF (15)	SMF (7)	MDF (5)	LF (1)	All (37)
1	Kharif	0.40	3.24	6.15	12.52	1.62	23.94
2	Rabi	0.00	0.00	3.24	0.00	0.00	3.24
Total		0.40	3.24	9.39	12.52	1.62	27.17

Cropping pattern: The data regarding the cropping pattern in Chik Sulikeri micro watershed is presented in Table 22. The results indicate that, farmers have grown groundnut (17.05 ha), maize (12.55 ha), bajra (4.05 ha), paddy (3.68 ha), navane (3.24 ha), mango (1.62 ha), sorghum (1.30 ha), horsegram (1.21 ha), groundnut (1.21 ha), cotton (0.81 ha) and tomato (0.40 ha) in kharif season and also grown groundnut (1.21 ha) in Rabi season. Marginal farmers have grown maize, navane and tomato. Small farmers have grown groundnut, bajra, paddy, navane, horsegram and cotton. Semi medium farmers have grown groundnut, maize, bajra, navane and groundnut. Medium farmers have grown groundnut, maize and paddy. Large farmers have grown mango.

Table 22: Cropping pattern in Chik Sulikeri micro watershed

(Area in ha)

Sl.No.	Particulars	MF (4)	SF (15)	SMF (7)	MDF (5)	LF (1)	All (37)
1	Kharif - Groundnut	0	11.38	2.43	3.24	0	17.05
2	Kharif - Maize	0.81	0	6.48	5.26	0	12.55
3	Kharif - Bajra	0	0.81	3.24	0	0	4.05
4	Kharif - Paddy	0.4	0.89	0	2.39	0	3.68
5	Kharif - Navane (Fox Millet)	0.81	1.21	1.21	0	0	3.24
6	Kharif - Mango	0	0	0	0	1.62	1.62
7	Kharif - Sorghum	0	1.3	0	0	0	1.3
8	Kharif - Horsegram	0	1.21	0	0	0	1.21
9	Rabi - Groundnut	0	0	1.21	0	0	1.21
10	Kharif - Cotton	0	0.81	0	0	0	0.81
11	Kharif - Tomato	0.4	0	0	0	0	0.4
Total		2.43	17.62	14.57	10.89	1.62	47.13

Cropping intensity: The data regarding the cropping intensity in Chik Sulikeri micro watershed is presented in Table 23. The results indicate that, the cropping intensity in Chik Sulikeri micro watershed was found to be 88.79 per cent. In case of marginal farmers it was 98.36 per cent, for small farmers it was 99.54 per cent, in case of semi medium farmers it was 89.11 per cent, and medium farmers had cropping intensity of 72.90 per cent and in large farmers it was 100 per cent.

Table 23: Cropping intensity (%) in Chik Sulikeri micro watershed

Sl.No.	Particulars	MF (4)	SF (15)	SMF (7)	MDF (5)	LF (1)	All (37)
1	Cropping Intensity	98.36	99.54	89.11	72.90	100.00	88.79

Possession of Bank account and savings: The data regarding the cropping intensity in Chik Sulikeri micro watershed is presented in Table 24. The results indicate that, 86.49 per cent of the households have both bank account and 86 savings respectively.

Table 24: Possession of Bank account and savings in Chik Sulikeri micro watershed

Sl. No.	Particulars	LL(5)		MF(4)		SF (15)		SMF (7)		MDF(5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Account	3	60	3	75	14	93.33	6	85.71	5	100	1	100	32	86.49
2	Savings	3	60	3	75	14	93.33	6	85.71	5	100	1	100	32	86.49

Borrowing status: The data regarding the cropping intensity in Chik Sulikeri micro watershed is presented in Table 25. The results indicate that, 86.49 per cent of the households have availed credit from different sources.

Table 25: Borrowing status in Chik Sulikeri micro watershed

Sl. No.	Particulars	LL (5)		MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Credit Availed	3	60.00	3	75.00	14	93.33	6	85.71	5	100.00	1	100.00	32	86.49

Cost of Cultivation of Maize: The data regarding the cost of cultivation of maize in Chik Sulikeri micro watershed is presented in Table 26. The results indicate that, the total cost of cultivation for maize was Rs. 31771.63. The gross income realized by the farmers was Rs. 34174.67. The net income from Maize cultivation was Rs. 2403.04, thus the benefit cost ratio was found to be 1:1.08.

Table 26: Cost of Cultivation of maize in Chik Sulikeri micro watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	23.76	4990.63	15.71
2	Bullock		Pairs/day	0.24	133.93	0.42
3	Tractor		Hours	2.51	1880.07	5.92
4	Machinery		Hours	0.68	407.99	1.28
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	26.97	2946.91	9.28
6	FYM		Quintal	10.29	2058.33	6.48
7	Fertilizer + micronutrients		Quintal	5.13	8399.10	26.44
8	Pesticides (PPC)		Kgs / ltrs	1.46	2688.24	8.46
9	Irrigation		Number	3.09	0.00	0.00
10	Depreciation charges			0.00	22.05	0.07
11	Land revenue and Taxes			0.00	0.00	0.00
II	**Cost B1**					
12	Interest on working capital				1932.31	6.08
13	**Cost B1 = (Cost A1 + sum of 15 and 16)**				25459.56	80.13
III	**Cost B2**					
14	Rental Value of Land				240.74	0.76
15	**Cost B2 = (Cost B1 + Rental value)**				25700.31	80.89
IV	**Cost C1**					
16	Family Human Labour			13.50	3172.99	9.99
17	**Cost C1 = (Cost B2 + Family Labour)**				28873.30	90.88
V	**Cost C2**					
18	Risk Premium				10.00	0.03
19	**Cost C2 = (Cost C1 + Risk Premium)**				28883.30	90.91
VI	**Cost C3**					
20	Managerial Cost				2888.33	9.09
21	**Cost C3 = (Cost C2 + Managerial Cost)**				31771.63	100.00
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		21.85	33327.41	
		b) Main Crop Sales Price (Rs.)			1525.00	
	By Product	e) Main Product (q)		15.76	847.26	
		f) Main Crop Sales Price (Rs.)			53.75	
b.	Gross Income (Rs.)				34174.67	
c.	Net Income (Rs.)				2403.04	
d.	Cost per Quintal (Rs./q.)				1453.81	
e.	Benefit Cost Ratio (BC Ratio)				1:1.08	

Cost of cultivation of Bajra: The data regarding the cost of cultivation of bajra in Chik Sulikeri micro watershed is presented in Table 27. The results indicate that, the total cost of cultivation for bajra was Rs. 35771.59. The gross income realized by the farmers was Rs. 48158.68. The net income from bajra cultivation was Rs. 12387.09. Thus the benefit cost ratio was found to be 1:1.35.

Table 27: Cost of Cultivation of bajra in Chik Sulikeri micro watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	27.61	5263.10	14.71
2	Bullock		Pairs/day	2.49	1440.83	4.03
3	Tractor		Hours	0.14	82.33	0.23
4	Machinery		Hours	0.37	224.55	0.63
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	42.36	6107.64	17.07
6	FYM		Quintal	11.84	4097.95	11.46
7	Fertilizer + micronutrients		Quintal	5.18	4810.26	13.45
8	Pesticides (PPC)		Kgs / ltrs	1.12	842.05	2.35
9	Irrigation		Number	0.00	0.00	0.00
10	Depreciation charges			0.00	148.91	0.42
11	Land revenue and Taxes			0.00	2.20	0.01
II	**Cost B1**					
12	Interest on working capital				1903.43	5.32
13	**Cost B1 = (Cost A1 + sum of 15 and 16)**				24923.24	69.67
III	**Cost B2**					
14	Rental Value of Land				333.33	0.93
15	**Cost B2 = (Cost B1 + Rental value)**				25256.57	70.61
IV	**Cost C1**					
16	Family Human Labour			36.95	7259.06	20.29
17	**Cost C1 = (Cost B2 + Family Labour)**				32515.63	90.90
V	**Cost C2**					
18	Risk Premium				4.00	0.01
19	**Cost C2 = (Cost C1 + Risk Premium)**				32519.63	90.91
VI	**Cost C3**					
20	Managerial Cost				3251.96	9.09
21	**Cost C3 = (Cost C2 + Managerial Cost)**				35771.59	100.00
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		27.38	45636.78	
		b) Main Crop Sales Price (Rs.)			1666.67	
	By Product	e) Main Product (q)		9.95	2521.89	
		f) Main Crop Sales Price (Rs.)			253.33	
b.	Gross Income (Rs.)				48158.68	
c.	Net Income (Rs.)				12387.09	
d.	Cost per Quintal (Rs./q.)				1306.39	
e.	Benefit Cost Ratio (BC Ratio)				1:1.35	

Cost of cultivation of sorghum: The data regarding the cost of cultivation of sorghum in Chik Sulikeri micro watershed is presented in Table 28. The results indicate that, the total cost of cultivation for sorghum was Rs. 27138.83. The gross income realized by the farmers was Rs. 33379.73. The net income from sorghum cultivation was Rs. 6240.91. Thus the benefit cost ratio was found to be 1:1.23.

Table 28: Cost of Cultivation of sorghum in Chik Sulikeri micro watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	35.58	7618.41	28.07
2	Bullock		Pairs/day	1.00	551.89	2.03
3	Tractor		Hours	3.01	2257.73	8.32
4	Machinery		Hours	0.62	370.50	1.37
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	11.96	1319.91	4.86
6	FYM		Quintal	6.95	1389.37	5.12
7	Fertilizer + micronutrients		Quintal	1.39	2778.75	10.24
8	Pesticides (PPC)		Kgs / liters	1.62	2547.19	9.39
9	Irrigation		Number	6.18	0.00	0.00
10	Depreciation charges			0.00	189.64	0.70
11	Land revenue and Taxes			0.00	0.00	0.00
II	**Cost B1**					
12	Interest on working capital				965.43	3.56
13	**Cost B1 = (Cost A1 + sum of 15 and 16)**				19988.82	73.65
III	**Cost B2**					
14	Rental Value of Land				250.00	0.92
15	**Cost B2 = (Cost B1 + Rental value)**				20238.82	74.58
IV	**Cost C1**					
16	Family Human Labour			16.83	4422.84	16.30
17	**Cost C1 = (Cost B2 + Family Labour)**				24661.66	90.87
V	**Cost C2**					
18	Risk Premium				10.00	0.04
19	**Cost C2 = (Cost C1 + Risk Premium)**				24671.66	90.91
VI	**Cost C3**					
20	Managerial Cost				2467.17	9.09
21	**Cost C3 = (Cost C2 + Managerial Cost)**				27138.83	100.00
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		17.98	32372.44	
		b) Main Crop Sales Price (Rs.)			1800.00	
	By Product	e) Main Product (q)		22.38	1007.30	
		f) Main Crop Sales Price (Rs.)			45.00	
b.	Gross Income (Rs.)				33379.73	
c.	Net Income (Rs.)				6240.91	
d.	Cost per Quintal (Rs./q.)				1509.00	
e.	Benefit Cost Ratio (BC Ratio)				1:1.23	

Cost of Cultivation of horse gram: The data regarding the cost of cultivation of horsegram in Chik Sulikeri micro watershed is presented in Table 29. The results indicate that, the total cost of cultivation for horsegram was Rs. 14751.82. The gross income realized by the farmers was Rs. 32604. The net income from horsegram cultivation was Rs. 17852.18. Thus the benefit cost ratio was found to be 1:2.21.

Table 29: Cost of Cultivation of horse gram in Chik Sulikeri micro watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	18.94	4199.00	28.46
2	Bullock		Pairs/day	0.82	452.83	3.07
3	Tractor		Hours	3.29	2470.00	16.74
4	Machinery		Hours	0.00	0.00	0.00
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	4.94	29.64	0.20
6	FYM		Quintal	0.00	0.00	0.00
7	Fertilizer + micronutrients		Quintal	0.82	1646.67	11.16
8	Pesticides (PPC)		Kgs / liters	0.82	1646.67	11.16
9	Irrigation		Number	0.00	0.00	0.00
10	Depreciation charges			0.00	1.65	0.01
11	Land revenue and Taxes			0.00	0.00	0.00
II	**Cost B1**					
12	Interest on working capital				399.96	2.71
13	**Cost B1 = (Cost A1 + sum of 15 and 16)**				10846.41	73.53
III	**Cost B2**					
14	Rental Value of Land				166.67	1.13
15	**Cost B2 = (Cost B1 + Rental value)**				11013.08	74.66
IV	**Cost C1**					
16	Family Human Labour			9.06	2387.67	16.19
17	**Cost C1 = (Cost B2 + Family Labour)**				13400.74	90.84
V	**Cost C2**					
18	Risk Premium				10.00	0.07
19	**Cost C2 = (Cost C1 + Risk Premium)**				13410.74	90.91
VI	**Cost C3**					
20	Managerial Cost				1341.07	9.09
21	**Cost C3 = (Cost C2 + Managerial Cost)**				14751.82	100.00
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		14.82	31122.00	
		b) Main Crop Sales Price (Rs.)			2100.00	
	By Product	e) Main Product (q)		24.70	1482.00	
		f) Main Crop Sales Price (Rs.)			60.00	
b.	Gross Income (Rs.)				32604.00	
c.	Net Income (Rs.)				17852.18	
d.	Cost per Quintal (Rs./q.)				995.40	
e.	Benefit Cost Ratio (BC Ratio)				1:2.21	

Cost of Cultivation of groundnut: The data regarding the cost of cultivation of groundnut in Chik Sulikeri micro watershed is presented in Table 30. The results indicate that, the total cost of cultivation for groundnut was Rs. 43450.70. The gross income realized by the farmers was Rs. 73850.81. The net income from groundnut cultivation was Rs. 30400.12. Thus the benefit cost ratio was found to be 1:1.7.

Table 30. Cost of Cultivation of groundnut in Chik Sulikeri micro watershed

Sl. No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	35.11	7547.23	17.37
2	Bullock		Pairs/day	0.47	260.01	0.60
3	Tractor		Hours	4.93	3694.66	8.50
4	Machinery		Hours	0.54	323.07	0.74
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	143.58	13217.70	30.42
6	FYM		Quintal	10.19	2450.07	5.64
7	Fertilizer + micronutrients		Quintal	1.50	1997.54	4.60
8	Pesticides (PPC)		Kgs /liters	1.54	2876.73	6.62
9	Irrigation		Number	5.04	0.00	0.00
10	Depreciation charges			0.00	112.88	0.26
11	Land revenue and Taxes			0.00	0.00	0.00
II	**Cost B1**					
12	Interest on working capital				2466.25	5.68
13	**Cost B1 = (Cost A1 + sum of 15 and 16)**				34946.14	80.43
III	**Cost B2**					
14	Rental Value of Land				250.00	0.58
15	**Cost B2 = (Cost B1 + Rental value)**				35196.14	81.00
IV	**Cost C1**					
16	Family Human Labour			16.28	4294.50	9.88
17	**Cost C1 = (Cost B2 + Family Labour)**				39490.63	90.89
V	**Cost C2**					
18	Risk Premium				10.00	0.02
19	**Cost C2 = (Cost C1 + Risk Premium)**				39500.63	90.91
VI	**Cost C3**					
20	Managerial Cost				3950.06	9.09
21	**Cost C3 = (Cost C2 + Managerial Cost)**				43450.70	100.00
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		21.24	72763.26	
		b) Main Crop Sales Price (Rs.)			3425.00	
	By Product	e) Main Product (q)		20.58	1087.55	
		f) Main Crop Sales Price (Rs.)			52.83	
b.	Gross Income (Rs.)				73850.81	
c.	Net Income (Rs.)				30400.12	
d.	Cost per Quintal (Rs./q.)				2045.24	
e.	Benefit Cost Ratio (BC Ratio)				1:1.7	

Cost of Cultivation of Cotton: The data regarding the cost of cultivation of cotton in Chik Sulikeri micro watershed is presented in Table 31. The results indicate that, the total cost of cultivation for cotton was Rs. 48854.75. The gross income realized by the farmers was Rs. 74100. The net income from cotton cultivation was Rs. 25245.25. Thus the benefit cost ratio was found to be 1:1.52.

Table 31. Cost of Cultivation of Cotton in Chik Sulikeri micro watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	54.34	11609.00	23.76
2	Bullock		Pairs/day	2.47	1358.50	2.78
3	Tractor		Hours	2.47	1852.50	3.79
4	Machinery		Hours	1.24	741.00	1.52
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	4.94	4693.00	9.61
6	FYM		Quintal	24.70	4940.00	10.11
7	Fertilizer + micronutrients		Quintal	2.47	3458.00	7.08
8	Pesticides (PPC)		Kgs /liters	2.47	4940.00	10.11
9	Irrigation		Number	0.00	0.00	0.00
10	Repairs			0.00	0.00	0.00
11	Msc. Charges (Marketing costs etc)			0.00	0.00	0.00
12	Depreciation charges			0.00	409.16	0.84
13	Land revenue and Taxes			0.00	0.00	0.00
II	**Cost B1**					
14	Interest on working capital				2164.92	4.43
15	**Cost B1 = (Cost A1 + sum of 15 and 16)**				36166.08	74.03
III	**Cost B2**					
16	Rental Value of Land				333.33	0.68
17	**Cost B2 = (Cost B1 + Rental value)**				36499.41	74.71
IV	**Cost C1**					
18	Family Human Labour			29.64	7904.00	16.18
19	**Cost C1 = (Cost B2 + Family Labour)**				44403.41	90.89
V	**Cost C2**					
20	Risk Premium				10.00	0.02
21	**Cost C2 = (Cost C1 + Risk Premium)**				44413.41	90.91
VI	**Cost C3**					
24	Managerial Cost				4441.34	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				48854.75	100.00
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		24.70	74100.00	
		b) Main Crop Sales Price (Rs.)			3000.00	
b.	Gross Income (Rs.)				74100.00	
c.	Net Income (Rs.)				25245.25	
d.	Cost per Quintal (Rs./q.)				1977.93	
e.	Benefit Cost Ratio (BC Ratio)				1:1.52	

Cost of cultivation of Tomato: The data regarding the cost of cultivation of tomato in Chik Sulikeri micro watershed is presented in Table 32. The results indicate that, the total cost of cultivation for tomato was Rs. 45006.53. The gross income realized by the farmers was Rs. 98800. The net income from tomato cultivation was Rs. 53793.47. Thus the benefit cost ratio was found to be 1:2.2.

Table 32: Cost of Cultivation of tomato in Chik Sulikeri micro watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	64.22	13338.00	29.64
2	Bullock		Pairs/day	0.00	0.00	0.00
3	Tractor		Hours	4.94	3705.00	8.23
4	Machinery		Hours	0.00	0.00	0.00
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	2.47	494.00	1.10
6	FYM		Quintal	2.47	494.00	1.10
7	Fertilizer + micronutrients		Quintal	4.94	6916.00	15.37
8	Pesticides (PPC)		Kgs /liters	2.47	4940.00	10.98
9	Irrigation		Number	0.00	0.00	0.00
10	Repairs			0.00	0.00	0.00
11	Msc. Charges (Marketing costs etc)			0.00	0.00	0.00
12	Depreciation charges			0.00	3.21	0.01
13	Land revenue and Taxes			0.00	0.00	0.00
II	**Cost B1**					
14	Interest on working capital				1542.48	3.43
15	**Cost B1 = (Cost A1 + sum of 15 and 16)**				31432.69	69.84
III	**Cost B2**					
16	Rental Value of Land				333.33	0.74
17	**Cost B2 = (Cost B1 + Rental value)**				31766.02	70.58
IV	**Cost C1**					
18	Family Human Labour			34.58	9139.00	20.31
19	**Cost C1 = (Cost B2 + Family Labour)**				40905.02	90.89
V	**Cost C2**					
20	Risk Premium				10.00	0.02
21	**Cost C2 = (Cost C1 + Risk Premium)**				40915.02	90.91
VI	**Cost C3**					
24	Managerial Cost				4091.50	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				45006.53	100.00
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		98.80	98800.00	
		b) Main Crop Sales Price (Rs.)			1000.00	
b.	Gross Income (Rs.)				98800.00	
c.	Net Income (Rs.)				53793.47	
d.	Cost per Quintal (Rs./q.)				455.53	
e.	Benefit Cost Ratio (BC Ratio)				1:2.2	

Cost of cultivation of navane: The data regarding the cost of cultivation of Navane in Chik Sulikeri micro watershed is presented in Table 33. The results indicate that, the total cost of cultivation for navane was Rs. 19144.78. The gross income realized by the farmers was Rs. 25177.99. The net income from navane cultivation was Rs. 6033.21. Thus the benefit cost ratio was found to be 1:1.32.

Table 33. Cost of Cultivation of navane in Chik Sulikeri micro watershed

Sl. No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	17.84	3732.44	19.50
2	Bullock		Pairs/day	0.00	0.00	0.00
3	Tractor		Hours	2.74	2058.33	10.75
4	Machinery		Hours	0.27	164.67	0.86
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	7.41	741.00	3.87
6	FYM		Quintal	8.23	1646.67	8.60
7	Fertilizer + micronutrients		Quintal	1.65	2470.00	12.90
8	Pesticides (PPC)		Kgs / ltrs	0.96	720.42	3.76
9	Irrigation		Number	0.00	0.00	0.00
10	Msc. Charges (Marketing costs etc)			0.00	0.00	0.00
11	Depreciation charges			0.00	275.69	1.44
12	Land revenue and Taxes			0.00	0.00	0.00
II	**Cost B1**					
13	Interest on working capital				670.57	3.50
14	**Cost B1 = (Cost A1 + sum of 15 and 16)**				12479.79	65.19
III	**Cost B2**					
15	Rental Value of Land				166.67	0.87
16	**Cost B2 = (Cost B1 + Rental value)**				12646.46	66.06
IV	**Cost C1**					
17	Family Human Labour			17.98	4747.89	24.80
18	**Cost C1 = (Cost B2 + Family Labour)**				17394.35	90.86
V	**Cost C2**					
19	Risk Premium				10.00	0.05
20	**Cost C2 = (Cost C1 + Risk Premium)**				17404.35	90.91
VI	**Cost C3**					
21	Managerial Cost				1740.43	9.09
22	**Cost C3 = (Cost C2 + Managerial Cost)**				19144.78	100.00
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		13.86	25177.99	
		b) Main Crop Sales Price (Rs.)			1816.67	
b.	Gross Income (Rs.)				25177.99	
c.	Net Income (Rs.)				6033.21	
d.	Cost per Quintal (Rs./q.)				1381.35	
e.	Benefit Cost Ratio (BC Ratio)				1:1.32	

Cost of cultivation of mango: The data regarding the cost of cultivation of mango in Chik Sulikeri micro watershed is presented in Table 34. The results indicate that, the total cost of cultivation for mango was Rs. 30875.21. The gross income realized by the farmers was Rs. 203775. The net income from mango cultivation was Rs. 172899.79. Thus the benefit cost ratio was found to be 1:6.6.

Table 34. Cost of Cultivation of Mango in Chik Sulikeri micro watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	17.29	4816.50	15.60
2	Bullock		Pairs/day	0.00	0.00	0.00
3	Tractor		Hours	2.47	1852.50	6.00
4	Machinery		Hours	0.62	370.50	1.20
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	370.50	9262.50	30.00
6	Seed Inter Crop		Kgs.	0.00	0.00	0.00
7	FYM		Quintal	12.35	2470.00	8.00
8	Fertilizer + micronutrients		Quintal	1.24	1729.00	5.60
9	Pesticides (PPC)		Kgs / liters	1.24	2470.00	8.00
10	Irrigation		Number	3.09	0.00	0.00
13	Depreciation charges			0.00	62.31	0.20
14	Land revenue and Taxes			0.00	0.00	0.00
II	**Cost B1**					
16	Interest on working capital				1912.98	6.20
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				24946.29	80.80
III	**Cost B2**					
18	Rental Value of Land				333.33	1.08
19	**Cost B2 = (Cost B1 + Rental value)**				25279.62	81.88
IV	**Cost C1**					
20	Family Human Labour			9.88	2778.75	9.00
21	**Cost C1 = (Cost B2 + Family Labour)**				28058.37	90.88
V	**Cost C2**					
22	Risk Premium				10.00	0.03
23	**Cost C2 = (Cost C1 + Risk Premium)**				28068.37	90.91
VI	**Cost C3**					
24	Managerial Cost				2806.84	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				30875.21	100.00
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		67.93	203775.00	
		b) Main Crop Sales Price (Rs.)			3000.00	
b.	Gross Income (Rs.)				203775.00	
c.	Net Income (Rs.)				172899.79	
d.	Cost per Quintal (Rs./q.)				454.55	
e.	Benefit Cost Ratio (BC Ratio)				1:6.6	

Cost of cultivation of paddy: The data regarding the cost of cultivation of paddy in Chik Sulikeri micro watershed is presented in Table 35. The results indicate that, the total cost of cultivation for paddy was Rs. 141928.82. The gross income realized by the farmers was Rs. 137399.96. The net income from paddy cultivation was Rs. -4528.86. Thus the benefit cost ratio was found to be 1:0.97.

Table 35. Cost of Cultivation of Paddy in Chik Sulikeri micro watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	95.08	21086.58	14.86
2	Bullock		Pairs/day	0.00	0.00	0.00
3	Tractor		Hours	8.55	6351.35	4.48
4	Machinery		Hours	6.17	3705.00	2.61
6	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	142.34	21134.20	14.89
7	FYM		Quintal	89.24	17848.19	12.58
8	Fertilizer + micronutrients		Quintal	10.71	13050.60	9.20
9	Pesticides (PPC)		Kgs / liters	8.92	17436.53	12.29
10	Irrigation		Number	43.92	0.00	0.00
11	Depreciation charges			0.00	315.77	0.22
12	Land revenue and Taxes			0.00	0.82	0.00
II	**Cost B1**					
13	Interest on working capital				8337.27	5.87
14	**Cost B1 = (Cost A1 + sum of 15 and 16)**				109266.31	76.99
III	**Cost B2**					
15	Rental Value of Land				333.33	0.23
16	**Cost B2 = (Cost B1 + Rental value)**				109599.65	77.22
IV	**Cost C1**					
17	Family Human Labour			78.05	19418.80	13.68
18	**Cost C1 = (Cost B2 + Family Labour)**				129018.45	90.90
V	**Cost C2**					
19	Risk Premium				7.75	0.01
20	**Cost C2 = (Cost C1 + Risk Premium)**				129026.20	90.91
VI	**Cost C3**					
21	Managerial Cost				12902.62	9.09
22	**Cost C3 = (Cost C2 + Managerial Cost)**				141928.82	100.00
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		78.74	113183.69	
		b) Main Crop Sales Price (Rs.)			1437.50	
	By Product	e) Main Product (q)		73.11	24216.27	
		f) Main Crop Sales Price (Rs.)			331.25	
b.	Gross Income (Rs.)				137399.96	
c.	Net Income (Rs.)				-4528.86	
d.	Cost per Quintal (Rs./q.)				1802.58	
e.	Benefit Cost Ratio (BC Ratio)				1:0.97	

Adequacy of fodder: The data regarding the adequacy of fodder in Chik Sulikeri micro watershed is presented in Table 36. The results indicate that, 21.62 per cent of the households opined that dry fodder was adequate and 13.51 per cent of the households opined that dry fodder was inadequate. Around 2.70 per cent of the households opined that green fodder was adequate.

Table 36: Adequacy of fodder in Chik Sulikeri micro watershed

Sl.No.	Particulars	SF (15)		SMF (7)		MDF (5)		All (37)	
		N	%	N	%	N	%	N	%
1	Adequate-Dry Fodder	5	33.33	1	14.29	2	40.00	8	21.62
2	Inadequate-Dry Fodder	3	20.00	2	28.57	0	0.00	5	13.51
3	Adequate-Green Fodder	1	6.67	0	0.00	0	0.00	1	2.70

Average annual gross income: The data regarding the average annual gross income in Chik Sulikeri micro watershed is presented in Table 37. The results indicate that, in landless farmers, the average annual gross income from wage was Rs. 103,000, in marginal farmers, the average annual gross income from wage was Rs. 27,500 and agriculture was Rs.42837.50. In small farmers, the average annual gross income from service/salary was Rs. 2000, wage was Rs.22333.33, agriculture was Rs.71713.33 and dairy farm was Rs.5060.67.In semi medium farmers, the average annual gross income from wage was Rs. 32,142.86, agriculture was Rs. 71,542.86 and dairy farm was Rs. 1,285.71. In medium farmers, the average annual gross income from wage was Rs. 19400 and agriculture was Rs. 298400 and dairy farm was Rs. 600. In large farmers, the average annual gross income from wage was Rs. 10000 and agriculture was Rs. 30000.

Table 37: Average annual gross income in Chik Sulikeri micro watershed

Sl.No.	Particulars	LL (5)	MF (4)	SF (15)	SMF (7)	MDF (5)	LF (1)	All (37)
1	Service/salary	0	0.00	2000	0.00	0	0	810.81
2	Wage	103000	27500.00	22333.33	32142.86	19400	10000	34918.92
3	Agriculture	0	42837.50	71713.33	71542.86	298400	30000	88374.32
4	Dairy Farm	0	0.00	5060.67	1285.71	600	0	2375.95
Income(Rs.)		103000	70337.50	101107.33	104971.43	318400	40000	126480.00

Average annual expenditure: The data regarding the average annual expenditure in Chik Sulikeri micro watershed is presented in Table 38. The results indicate that, in land less farmers, the average annual expenditure from wage was Rs. 42000. In marginal farmers, the average annual expenditure from wage was Rs.8333.33 and agriculture was Rs. 23,750. In small farmers the average annual expenditure from service/salary was Rs.20000, wage was Rs.9000, agriculture was Rs.32266.67 and dairy farm was Rs.6600. In semi medium farmers, the average annual expenditure from wage was Rs.9500, agriculture was Rs.31428.57 and dairy farm was Rs.2000. In medium farmers, the average annual expenditure from wage was Rs.9,250, agriculture was Rs. 59,000 and dairy farm was Rs.1000. In large farmers the average annual expenditure from wage was Rs.5000 and agriculture was Rs.10000.

Table 38: Average annual expenditure (Rs) in Chik Sulikeri micro watershed

S.N	Particulars	LL (5)	MF (4)	SF (15)	SMF (7)	MDF(5)	LF (1)	All (37)
1	Service/salary	0	0	20,000	0	0	0	540.54
2	Wage	42000	8,333.33	9,000	9,500.00	9250	5000	11,702.70
3	Agriculture	0	23,750.00	32,267	31,428.57	59000	10000	29,837.84
4	Dairy Farm	0	0	6,600	2,000.00	1000	0	1,027.03
Total		42000	32,083.33	67,867	42,928.57	69250	15000	269,128.57
Average		8400	8,020.83	4,524.44	6,132.65	13850	15000	7,273.75

Horticulture species grown: The data regarding horticulture species grown in Chik Sulikeri micro watershed is presented in Table 39. The results indicate that, sampled households have grown 2 areca nut, 11 coconut and 607 mango trees in their field and also planted 2 coconut trees in their back yard.

Table 39: Horticulture species grown in Chik Sulikeri micro watershed

Sl. No.	Particulars	LL (5)		MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		F	B	F	B	F	B	F	B	F	B	F	B	F	B
1	Areca nut	0	0	0	0	2	0	0	0	0	0	0	0	2	0
2	Coconut	0	2	0	0	5	0	5	0	1	0	0	0	11	2
3	Mango	0	0	0	0	1	0	2	0	4	0	600	0	607	0

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

Forest species grown: The data regarding forest species grown in Chik Sulikeri micro watershed is presented in Table 40. The results indicate that, households have planted 3 teak trees and 43 neem trees in their field and 1 neem trees in their backyard.

Table 40: Forest species grown in Chik Sulikeri micro watershed

Sl.No.	Particulars	LL (5)		MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		F	B	F	B	F	B	F	B	F	B	F	B	F	B
1	Teak	0	0	0	0	0	0	3	0	0	0	0	0	3	0
2	Neem	0	0	1	0	26	0	11	0	3	0	2	1	43	1

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

Average Additional investment capacity: The data regarding average additional investment capacity in Chik sulikeri microwatershed is presented in Table 41. The results indicate that, households have an average investment capacity of Rs. 7243.24 for land development, Rs. 2513.51 in irrigation facility and 162.16 for improved crop production. Marginal households have an average investment capacity of Rs. 7000 for land development. Small farmers have an average investment capacity of Rs. 7866.67 for land development, Rs. 3066.67 in irrigation facility and Rs.400 for improved crop production. Semi medium farmers have an average investment capacity of Rs. 8571.43 for land development and Rs. 3285.71 in irrigation facility. Medium farmers have an average investment capacity of Rs. 10,400 for land development and Rs. 3,200 in irrigation facility. Large farmers have an average investment capacity of Rs. 10,000 for land development and Rs. 8,000 in irrigation facility.

Table 41: Average Annual expenditure of households in Chik Sulikeri microwatershed

Sl. No.	Particulars	MF (4)	SF (15)	SMF (7)	MDF (5)	LF (1)	All (37)
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1	Land development	7,000.00	7,866.67	8,571.43	10,400.00	10,000.00	7,243.24
2	Irrigation facility	0.00	3,066.67	3,285.71	3,200.00	8,000.00	2,513.51
3	Improved crop production	0.00	400.00	0.00	0.00	0.00	162.16

Source of additional investment: The data regarding Source of additional investment in Chik Sulikeri micro watershed is presented in Table 42. The results indicate that, for land development, 31.58 per cent of the farmers were dependent on government subsidy and 42.11 per cent of the farmers were dependent on loan from bank. For irrigation facility 15.79 per cent of the farmers were dependent on government subsidy and loan from bank respectively. For improved crop production 2.63 per cent of the farmers were dependent on loan from bank.

Table 42: Source of additional investment in Chik Sulikeri micro watershed

Sl. No	Item	Land development		Irrigation facility		Improved crop production	
		N	%	N	%	N	%
1	Government subsidy	12	31.58	6	15.79	0	0.0
2	Loan from bank	16	42.11	6	15.79	1	2.63

Marketing of the agricultural produce: The data regarding marketing of the agricultural produce in Chik Sulikeri micro watershed is presented in Table 43. The results indicated that, bajra, cotton, horsegram, maize, mango, navane, paddy, sorghum and tomato crops were sold to the extent of 100 per cent. Groundnut was sold to the extent of 95.50 per cent.

Table 43: Marketing of the agricultural produce in Chik Sulikeri micro watershed

Sl.No	Crops	Output obtained (q)	Output retained (q)	Output sold (q)	Output sold (%)	Avg. Price obtained (Rs/q)
1	Bajra	105.0	0.0	105.0	100.0	1666.67
2	Cotton	20.0	0.0	20.0	100.0	3000.0
3	Groundnut	312.0	28.0	284	95.5	3161.54
4	Horsegram	18.0	0.0	18.0	100.0	2100.0
5	Maize	273.0	0.0	272.0	100.0	1355.56
6	Mango	110.0	0.0	110.0	100.0	3000.0
7	Navane	45.0	0.0	45.0	100.0	1816.67
8	Paddy	269.0	0.0	269.0	100.0	1437.5
9	Sorghum	37.0	0.0	37.0	100.0	1800.0
10	Tomato	40.0	0.0	40.0	100.0	1000.0

Marketing Channels used for sale of agricultural produce: The data regarding marketing channels used for sale of agricultural produce in Chik Sulikeri micro watershed is presented in Table 44. The results indicated that, about 8.11 per cent of the famers have sold their produce in agent/traders. 91.89 per cent farmers also sold their produce in cooperative marketing society.

Table 44: Marketing Channels used for sale of agricultural produce in Chik Sulikeri micro watershed

Sl. No.	Particulars	MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Agent/Traders	1	25	1	6.67	1	14.29	0	0.	0	0	3	8.11
2	Regulated Market	3	75	15	100	7	100	5	100	1	100	34	91.89

Mode of transport of agricultural produce: The data regarding mode of transport of agricultural produce in Chik Sulikeri micro watershed is presented in Table 45. The results indicated that, 2.70 per cent of the households have used cart as a mode of transportation for their agricultural produce, and 97.30 per cent have also used tractor.

Table 45: Mode of transport of agricultural produce in Chik Sulikeri micro watershed

Sl.No.	Particulars	MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Cart	1	25	0	0.00	0	0.00	0	0.00	0	0.00	1	2.70
2	Tractor	3	75	15	100	7	100	5	100	1	100	36	97.30

Incidence of soil and water erosion problems: The data regarding incidence of soil and water erosion problems in Chik Sulikeri micro watershed is presented in Table 46. The results indicated that, 62.61 per cent of the households have experienced soil and water erosion problems in the farm i.e., 50 per cent of marginal farmers, 80 per cent of small farmers, 57.14 per cent of semi medium farmers, 80 per cent of the medium farmers and 100 per cent of large farmers have experienced soil and water erosion problems.

Table 46: Incidence of soil and water erosion problems in Chik Sulikeri micro watershed

Sl.No.	Particulars	MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Soil and water erosion problems in the farm	2	50	12	80	4	57.14	4	80	1	100	23	62.16

Interest shown towards soil testing: The data regarding incidence of soil and water erosion problems in Chik Sulikeri micro watershed is presented in Table 47. The results indicated that, 75.68 per cent have shown interest in soil test.

Table 47: Interest shown towards soil testing in Chik Sulikeri micro watershed

Sl.No.	Particulars	MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Interest in soil test	3	75.00	14	93.33	5	71.43	5	100.00	1	100.00	28	75.68

Table 48: Source of drinking water in Chik Sulikeri micro watershed

Sl. No.	Particulars	LL(5)		MF (4)		SF (15)		SMF (7)		MDF(5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Piped supply	4	80	4	100	14	93.33	6	85.71	4	80	1	100	33	89.19
2	Bore Well	1	20	0	0	1	6.67	1	14.29	1	20	0	0	4	10.81

Source of drinking water: The data regarding source of drinking water in Chik Sulikeri micro watershed is presented in Table 48. The results indicated that, piped supply was the

major source of drinking water for 89.19 per cent of the households and bore well was the source of drinking water for 10.81 per cent of the households.

Usage pattern of fuel for domestic use: The data regarding usage pattern of fuel for domestic use in Chik Sulikeri micro watershed is presented in Table 49. The results indicated that, 100 per cent of the households used fire wood as a source of fuel.

Table 49: Usage pattern of fuel for domestic use in Chik Sulikeri micro watershed

Sl. No.	Particulars	LL (5)		MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Fire Wood	5	100.00	4	100.00	15	100.00	7	100.00	5	100.00	1	100.00	37	100.00

Source of light: The data regarding source of light in Chik Sulikeri micro watershed is presented in Table 50. The results indicated that, Electricity was the major source of light for 100 per cent of the households in micro watershed.

Table 50: Source of light in Chik Sulikeri micro watershed

Sl. No.	Particulars	LL (5)		MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Electricity	5	100.00	4	100.00	15	100.00	7	100.00	5	100.00	1	100.00	37	100.00

Existence of Sanitary toilet facility: The data regarding existence of sanitary toilet facilit**y** in Chik Sulikeri micro watershed is presented in Table 51. The results indicated that, 51.35 per cent of the households possess sanitary toilet i.e. 100 per cent of the landless, marginal, medium and large farmers, 13.13 per cent of small farmers and 28.57 per cent of the semi medium farmers.

Table 51: Existence of Sanitary toilet facility in Chik Sulikeri micro watershed

Sl. No.	Particulars	LL (5)		MF (4)		SF (15)		SMF (7)		MDF(5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Sanitary toilet facility	5	100	4	100	2	13.33	2	28.57	5	100	1	100	19	51.35

Possession of PDS card: The data regarding possession of PDS card in Chik Sulikeri micro watershed is presented in Table 52. The results indicated that, 97.30 per cent of the sampled households possessed BPL card and 2.70 per cent did not possess PDS card.

Table 52: Possession of PDS card in Chik Sulikeri micro watershed

Sl. No.	Particulars	LL (5)		MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	BPL	5	100.00	4	100.00	15	100.00	7	100.00	4	80.00	1	100	36	97.3
2	Not Possessed	0	0.00	0	0.00	0	0.00	0	0.00	1	20.00	0	0.00	1	2.70

Table 53: Participation in NREGA programme in Chik Sulikeri micro watershed

Sl. No.	Particulars	LL (5)		MF (4)		SF (15)		SMF (7)		MDF(5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Participation in NREGA programme	3	60	3	75	10	66.67	3	42.86	4	80	1	100	24	64.86

Participation in NREGA program: The data regarding participation in NREGA programme in Chik Sulikeri micro watershed is presented in Table 53. The results indicated that, 64.86 per cent of the households participated in NREGA programme.

Adequacy of food items: The data regarding adequacy of food items in Chik Sulikeri micro watershed is presented in Table 54. The results indicated that, cereals were adequate for 97.30 per cent of the households, pulses were adequate for 54.05 per cent, oilseeds were adequate for 35.14 per cent, vegetables were adequate for 48.65 per cent, fruits were adequate for 78.38 per cent, milk was adequate for 54.05 per cent, eggs were adequate for 54.05 per cent and meat was adequate for 5.41 per cent of the households.

Table 54: Adequacy of food items in Chik Sulikeri micro watershed

Sl.No.	Particulars	LL (5)		MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Cereals	5	100.00	4	100.00	14	93.33	7	100.00	5	100.00	1	100.00	36	97.30
2	Pulses	3	60.00	1	25.00	11	73.33	3	42.86	2	40.00	0	0.00	20	54.05
3	Oilseed	1	20.00	2	50.00	4	26.67	3	42.86	2	40.00	1	100.00	13	35.14
4	Vegetables	3	60.00	2	50.00	6	40.00	4	57.14	3	60.00	0	0.00	18	48.65
5	Fruits	5	100.00	2	50.00	11	73.33	6	85.71	4	80.00	1	100.00	29	78.38
6	Milk	3	60.00	4	100.00	8	53.33	3	42.86	2	40.00	0	0.00	20	54.05
7	Egg	5	100.00	3	75.00	7	46.67	2	28.57	3	60.00	0	0.00	20	54.05
8	Meat	0	0.00	1	25.00	0	0.00	1	14.29	0	0.00	0	0.00	2	5.41

Response on Inadequacy of food items: The data regarding inadequacy of food items in Chik Sulikeri micro watershed is presented in Table 55. The results indicated that, cereals were inadequate for 2.70 per cent of the households, pulses were inadequate for 45.95 per cent, oilseeds were inadequate for 56.76 per cent, vegetables were inadequate for 45.95 per cent, fruits were inadequate for 24.32 per cent, milk was inadequate for 13.51 per cent and eggs were inadequate for 16.22 per cent of the households.

Table 55: Response on Inadequacy of food items in Chik Sulikeri micro watershed

Sl.No.	Particulars	LL (5)		MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Cereals	0	0.00	0	0.00	1	6.67	0	0.00	0	0.00	0	0.00	1	2.70
2	Pulses	2	40.00	3	75.00	4	26.67	4	57.14	3	60.00	1	100.00	17	45.95
3	Oilseed	4	80.00	1	25.00	10	66.67	4	57.14	2	40.00	0	0.00	21	56.76
4	Vegetables	2	40.00	2	50.00	8	53.33	3	42.86	2	40.00	0	0.00	17	45.95
5	Fruits	1	20.00	2	50.00	5	33.33	1	14.29	0	0.00	0	0.00	9	24.32
6	Milk	0	0.00	0	0.00	2	13.33	2	28.57	1	20.00	0	0.00	5	13.51
7	Egg	0	0.00	0	0.00	3	20.00	1	14.29	1	20.00	1	100.00	6	16.22

Farming constraints: The data regarding farming constraints experienced by households in Chik Sulikeri micro watershed is presented in Table 56. The results indicated that, lower fertility status of the soil was the constraint experienced by 75.68 per cent of the households, wild animal menace on farm field (64.86%), frequent incidence of pest and diseases (29.73%), inadequacy of irrigation water (16.22%), high cost of fertilizers and plant protection chemicals (43.24%), high rate of interest on credit (8.11%), low price for

the agricultural commodities (16.22%), lack of marketing facilities in the area (13.51%), lack of transport for safe transport of the agricultural produce to the market (24.32%), less rainfall (40.54%) inadequate extension services (24.32%) and source of agri technology information (13.51).

Table 56: Farming constraints Experienced in Chik Sulikeri micro watershed

Sl. No.	Particulars	MF (4)		SF (15)		SMF (7)		MDF (5)		LF (1)		All (37)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Lower fertility status of the soil	3	75	14	93.33	6	85.71	4	80	1	100	28	75.68
2	Wild animal menace on farm field	3	75	12	80	4	57.14	4	80		100		64.86
3	Frequent incidence of pest and diseases	2	50	6	40	2	28.57	1	20	0	0	11	29.73
4	Inadequacy of irrigation water	1	25	3	20	1	14.29	1	20	0	0	6	16.22
5	High cost of Fertilizers and plant protection chemicals	1	25	7	46.67	6	85.71	1	20	1	100	16	43.24
6	High rate of interest on credit	1	25	2	13.33	0	0.00	0	0	0	0	3	8.11
7	Low price for the agricultural commodities	0	0	2	13.33	2	28.57	2	40	0	0	6	16.22
8	Lack of marketing facilities in the area	1	25	3	20	1	14.29	0	0	0	0	5	13.51
9	Inadequate extension services	0	0	3	20	3	42.86	2	40	1	100	9	24.32
10	Lack of transport for safe transport of the Agril produce to the market.	0	0	5	33.33	2	28.57	2	40	0	0	9	24.32
11	Less rainfall	1	25	8	53.33	3	42.86	2	40	1	100	15	40.54
12	Source of Agri-technology information(Newspaper/TV/Mobile)	1	25	3	20	1	14.29	0	0	0	0	5	13.51

Chapter 5

SUMMARY

In order to assess the socio-economic condition of the farmers in the watershed a comprehensive questionnaire was prepared. Major components such as demographic conditions, migration details, food consumption and family expenditure pattern, material possession, land holding, land use management, cropping pattern, cost of cultivation of crops, livestock management. The statistical components such as frequency and percentage were used to analyze the data. About 37 households located in the micro watershed were interviewed for the survey.

Results indicated that 37 farmers were sampled in Chik Sulikeri micro watershed among them 5(13.51%) were landless, 4 (10.51%) were marginal farmers, 15 (40.54%) were small farmers, 7 (18.92%) were semi medium farmers, 5 (13.51%) were medium farmers and 1 (2.70%) were large farmers. The data indicated that there were 101(59.06%) men and 70 (40.94%) women among the sampled households. The average family size of landless farmers' was 3, marginal, small, medium and large farmers' was 5b and semi medium farmers' was 6. The data indicated that, 29 (16.97%) people were in 0-15 years of age, 80 (46.78%) were in 16-35 years of age, 51 (29.82%) were in 36-60 years of age and 11(6.43 %) were above 61 years of age.

The results indicated that Chik Sulikeri had 37.43 per cent illiterates, 44.44 per cent of them had primary school education, 1.17 per cent of them had middle school education, 6.43 per cent of them had high school education, 5.26 per cent of them had PUC education, 1.17 per cent of them did diploma, 2.34 per cent of them had degree education and 1.75 persons were doing others. The results indicate that, 91.89 per cent of households practicing agriculture and 8.11 per cent of the households were agricultural laborers. The results indicate that agriculture was the major occupation for 25.73 per cent of the household members, 51.46 per cent were agricultural laborers, 20.47 per cent were students and 1.17 housewives and children. In case of landless farmers, 21.43 per cent were doing agriculture, 64.29 per cent were agricultural laborers, and 14.29 per cent were housewives. In case of marginal farmers 26.32 per cent were agriculturists, 31.58 per cent were agricultural laborers and 36.84 per cent were students. In case of small farmers, 28.99 per cent were agriculturists, 53.62 per cent were agricultural laborers and 17.39 per cent were students. In case of semi medium farmers, 25.64 per cent were agriculturists, 48.72 per cent were agricultural laborer and 23.08 per cent were students. In case of medium farmers, 20 per cent were agriculturists, another 60 per cent were agricultural laborers and 20 per cent were students. In large farmers 20 per cent were agriculturists, another 40 per cent were agricultural laborers and 40 per cent were students.

The results show that 100 per cent of the populations in the micro watershed have not participated in any local institutions. The results indicate that 13.51 per cent of the households possess thatched house, 75.68 per cent of the households possess Katcha

house and 10.81 per cent of them possess Pucca house. The results shows that 89.19 per cent of the households possess TV, 67.57 per cent of the households possess Mixer grinder, 32.43 per cent of the households possess bicycle, 37.84 per cent of the households possess motor cycle, and 97.30 per cent of the households possess mobile phones. The results showed that the average value of television was Rs.4151, mixer grinder was Rs.1396, motor cycle was Rs.1500 and mobile phone was Rs.31285 and mobile was Rs.1472.

The data showed that, about 10.81 per cent of the households possess bullock cart, 18.92 per cent of them possess plough and sprayer, 94.59 per cent of them possess weeder and 2.70 per cent of them possess harvester and chaff cutter respectively. The results show that the average value of bullock cart was Rs.18250, plough was Rs.1250, the average value of weeder was Rs. 23, the average value of sprayer was Rs.4571, the average value of harvester was Rs.45000 and the average value of chaff cutter Rs.3000. The results indicate that, 16.22 per cent of the households possess bullocks, 24.32 per cent of the households possess local cow and 2.70 per cent of the households possess buffalo and sheep respectively. In case of marginal households, 25per cent possess local cow. Among small farmers, 33.33 per cent of the households possess bullock and 26.67 per cent possess local cow. In case of semi medium farmers, 14.29 per cent of households possess bullock, 28.57 per cent of households possess local cow and 14.29 per cent of households possess buffalo. In medium farmers 20 per cent local cow and in large farmers 100 per cent of the household possess local cow.

The results indicate that, average own labour men available in the micro watershed was 9.19, average own labour (women) available was 5.66, average hired labour (men) available was 8.05 and average hired labour (women) available was 9.13. In case of marginal farmers, average own labour men available was 31, average own labour (women) was 16, average hired labour (men) was 7 and average hired labour (women) available was 7.25. In case of small farmers, average own labour men available was 1.81, average own labour (women) was 1.69, average hired labour (men) was 9.27 and average hired labour (women) available was 11.63. In case of semi medium farmers, average own labour men available was 25, average own labour (women) was 15.71, average hired labour (men) was 11.29 and average hired labour (women) available was 10.57. In case of medium farmers, average own labour men available was 2.20, average own labour (women) was 2.60, average hired labour (men) was 9 and average hired labour (women) available was 10. In case of large farmers, average own labour men available was 1, average own labour (women) was 1, average hired labour (men) was 7 and average hired labour (women) available was 8.

The results indicate that, 8.11 per cent of the households opined that the hired labour was adequate and 94.59 per cent of the households opined that the hired labour was inadequate. The results indicate that, households of the Chik Sulikeri micro

watershed possess 22.83 ha (35.54%) of dry land and 41.42 ha (64.46%) of irrigated land. Marginal farmers possess 2.06 ha (80.95%) of dry land and 0.49 ha (19.05%) of irrigated land. Small farmers possess 13.89 ha (77.44%) of dry land and 4.05 ha (22.56%) of irrigated land. Semi medium possess 6.88 ha (52.80%) of dry land and 6.15 ha (47.20%) of irrigated land. Medium farmers possess 12.52 ha (100%) of irrigated land, large farmers possess 3.64 18.21 ha (100%) of irrigated land.

The results indicate that, the average value of dry land was Rs. 262,672.81 and average value of irrigated was Rs. 183,427.89. In case of marginal famers, the average land value was Rs. 435,882.36 for dry land and was Rs. 1,029,166.63 for irrigated land. In case of small famers, the average land value was Rs. 251,893.94 for dry land and Rs. 592,800. In case of semi medium famers, the average land value was Rs. 232,470.59 for dry land and Rs. 325,000 for irrigated land. In case of medium and large famers, the average irrigated land value was Rs. 215,546.22 and Rs. 220,000 respectively. The results indicate that, there were 17 functioning and 16 de-functioning bore wells in the micro watershed. The results indicate that, bore well was the major irrigation source in the micro water shed for 45.95 per cent of the farmers. The results indicate that, the depth of bore well was found to be 77.04 meters.

The results indicate that, marginal farmers were having 0.40 ha irrigated land, small farmers were having 3.24 ha of irrigated land, semi medium were having 9.39 ha of irrigated land and medium farmers had irrigated area of 12.52 ha and large farmers were having 1.62 ha of irrigated land respectively. On an average there were 27.17 ha of irrigated land. The results indicate that, farmers have grown groundnut (17.05 ha), maize (12.55 ha), bajra (4.05 ha), paddy (3.68 ha), navane (3.24 ha), mango (1.62 ha), sorghum (1.30 ha), horsegram (1.21 ha), groundnut (1.21 ha), cotton (0.81 ha) and tomato (0.40 ha) in kharif season and also grown groundnut (1.21 ha) in Rabi season. Marginal farmers have grown maize, navane and tomato. Small farmers have grown groundnut, bajra, paddy, navane, horsegram and cotton. Semi medium farmers have grown groundnut, maize, bajra, navane and groundnut. Medium farmers have grown groundnut, maize and paddy. Large farmers have grown mango. The results indicate that, the cropping intensity in Chik Sulikeri micro watershed was found to be 88.79 per cent. In case of marginal farmers it was 98.36 per cent, for small farmers it was 99.54 per cent, in case of semi medium farmers it was 89.11 per cent, and medium farmers had cropping intensity of 72.90 per cent and in large farmers it was 100 per cent.

The results indicate that, 86.49 per cent of the households have bank account and 86.49 per cent of the households have savings. The results indicate that, 86.49 per cent of the households have availed credit from different sources. The results indicate that, the total cost of cultivation for maize was Rs. 31771.63. The gross income realized by the farmers was Rs. 34174.67. The net income from Maize cultivation was Rs. 2403.04, thus the benefit cost ratio was found to be 1:1.08. The results indicate that, the total cost of

cultivation for bajra was Rs. 35771.59. The gross income realized by the farmers was Rs. 48158.68. The net income from bajra cultivation was Rs. 12387.09. Thus the benefit cost ratio was found to be 1:1.35. The results indicate that, the total cost of cultivation for sorghum was Rs. 27138.83. The gross income realized by the farmers was Rs. 33379.73. The net income from sorghum cultivation was Rs. 6240.91. Thus the benefit cost ratio was found to be 1:1.23.

The results indicate that, the total cost of cultivation for horsegram was Rs. 14751.82. The gross income realized by the farmers was Rs. 32604. The net income from horsegram cultivation was Rs. 17852.18. Thus the benefit cost ratio was found to be 1:2.21. The results indicate that, the total cost of cultivation for groundnut was Rs. 43450.70. The gross income realized by the farmers was Rs. 73850.81. The net income from groundnut cultivation was Rs. 30400.12. Thus the benefit cost ratio was found to be 1:1.7. The results indicate that, the total cost of cultivation for cotton was Rs. 48854.75. The gross income realized by the farmers was Rs. 74100. The net income from cotton cultivation was Rs. 25245.25. Thus the benefit cost ratio was found to be 1:1.52.

The results indicate that, the total cost of cultivation for tomato was Rs. 45006.53. The gross income realized by the farmers was Rs. 98800. The net income from tomato cultivation was Rs. 53793.47. Thus the benefit cost ratio was found to be 1:2.2. The results indicate that, the total cost of cultivation for navane was Rs. 19144.78. The gross income realized by the farmers was Rs. 25177.99. The net income from navane cultivation was Rs. 6033.21. Thus the benefit cost ratio was found to be 1:1.32.

The results indicate that, the total cost of cultivation for mango was Rs. 30875.21. The gross income realized by the farmers was Rs. 203775. The net income from mango cultivation was Rs. 172899.79. Thus the benefit cost ratio was found to be 1:6.6. The results indicate that, the total cost of cultivation for paddy was Rs. 141928.82. The gross income realized by the farmers was Rs. 137399.96. The net income from paddy cultivation was Rs. -4528.86. Thus the benefit cost ratio was found to be 1:0.97. The results indicate that, 21.62 per cent of the households opined that dry fodder was adequate and 13.51 per cent of the households opined that dry fodder was inadequate. Around 2.70 per cent of the households opined that green fodder was adequate.

The results indicate that, in landless farmers, the average annual gross income from wage was Rs. 103,000, in marginal farmers, the average annual gross income from wage was Rs. 27,500 and agriculture was Rs.42837.50. In small farmers, the average annual gross income from service/salary was Rs. 2000, wage was Rs.22333.33, agriculture was Rs.71713.33 and dairy farm was Rs.5060.67.In semi medium farmers, the average annual gross income from wage was Rs. 32,142.86, agriculture was Rs. 71,542.86 and dairy farm was Rs. 1,285.71. In medium farmers, the average annual gross income from wage was Rs. 19400 and agriculture was Rs. 298400 and dairy farm was Rs.

600. In large farmers, the average annual gross income from wage was Rs. 10000 and agriculture was Rs. 30000.

The results indicate that, in land less farmers, the average annual expenditure from wage was Rs. 42000. In marginal farmers, the average annual expenditure from wage was Rs.8333.33 and agriculture was Rs. 23,750. In small farmers the average annual expenditure from service/salary was Rs.20000, wage was Rs.9000, agriculture was Rs.32266.67 and dairy farm was Rs.6600. In semi medium farmers, the average annual expenditure from wage was Rs.9500, agriculture was Rs.31428.57 and dairy farm was Rs.2000. In medium farmers, the average annual expenditure from wage was Rs.9,250, agriculture was Rs. 59,000 and dairy farm was Rs.1000. In large farmers the average annual expenditure from wage was Rs.5000 and agriculture was Rs.10000.The results indicate that, sampled households have grown 2 areca nut, 11 coconut and 607 mango trees in their field and also planted 2 coconut trees in their back yard. The results indicate that, households have planted 3 teak trees and 43 neem trees in their field and 1 neem trees in their backyard.

The results indicate that, households have an average investment capacity of Rs. 7243.24 for land development, Rs. 2513.51 in irrigation facility and 162.16 for improved crop production. Marginal households have an average investment capacity of Rs. 7000 for land development. Small farmers have an average investment capacity of Rs. 7866.67 for land development, Rs. 3066.67 in irrigation facility and Rs.400 for improved crop production. Semi medium farmers have an average investment capacity of Rs. 8571.43 for land development and Rs. 3285.71 in irrigation facility. Medium farmers have an average investment capacity of Rs. 10,400 for land development and Rs. 3,200 in irrigation facility. large farmers have an average investment capacity of Rs. 10,000 for land development and Rs. 8,000 in irrigation facility.

The results indicate that, for land development, 31.58 per cent of the farmers were dependent on government subsidy and 42.11 per cent of the farmers were dependent on loan from bank. For irrigation facility 15.79 per cent of the farmers were dependent on government subsidy and loan from bank respectively. For improved crop production 2.63 per cent of the farmers were dependent on loan from bank. The results indicated that, bajra, cotton, horsegram, maize, mango, navane, paddy, sorghum and tomato crops were sold to the extent of 100 per cent. Groundnut was sold to the extent of 95.50 per cent. The results indicated that, about 8.11 per cent of the famers have sold their produce in agent/traders. 91.89 per cent farmers also sold their produce in cooperative marketing society.

The results indicated that, 2.70 per cent of the households have used cart as a mode of transportation for their agricultural produce, and 97.30 per cent have also used tractor. The results indicated that, 62.61 per cent of the households have experienced soil and water erosion problems in the farm i.e., 50 per cent of marginal farmers, 80 per cent of

small farmers, 57.14 per cent of semi medium farmers, 80 per cent of the medium farmers and 100 per cent of large farmers have experienced soil and water erosion problems.

The results indicated that, 75.68 per cent have shown interest in soil test. The results indicated that, piped supply was the major source of drinking water for 89.19 per cent of the households and bore well was the source of drinking water for 10.81 per cent of the households. The results indicated that, 100 per cent of the households used fire wood as a source of fuel. The results indicated that, Electricity was the major source of light for 100 per cent of the households in micro watershed. The results indicated that, 51.35 per cent of the households possess sanitary toilet i.e. 100 per cent of the landless, marginal, medium and large farmers, 13.13 per cent of small farmers and 28.57 per cent of the semi medium farmers. The results indicated that, 97.30 per cent of the sampled households possessed BPL card and 2.70 per cent did not possess PDS card. The results indicated that, 64.86 per cent of the households participated in NREGA programme.

The results indicated that, cereals were adequate for 97.30 per cent of the households, pulses were adequate for 54.05 per cent, oilseeds were adequate for 35.14 per cent, vegetables were adequate for 48.65 per cent, fruits were adequate for 78.38 per cent, milk was adequate for 54.05 per cent, eggs were adequate for 54.05 per cent and meat was adequate for 5.41 per cent of the households. The results indicated that, cereals were inadequate for 2.70 per cent of the households, pulses were inadequate for 45.95 per cent, oilseeds were inadequate for 56.76 per cent, vegetables were inadequate for 45.95 per cent, fruits were inadequate for 24.32 per cent, milk was inadequate for 13.51 per cent and eggs were inadequate for 16.22 per cent of the households.

The results indicated that, lower fertility status of the soil was the constraint experienced by 75.68 per cent of the households, wild animal menace on farm field (64.86%), frequent incidence of pest and diseases (29.73%), inadequacy of irrigation water (16.22%), high cost of fertilizers and plant protection chemicals (43.24%), high rate of interest on credit (8.11%), low price for the agricultural commodities (16.22%), lack of marketing facilities in the area (13.51%), lack of transport for safe transport of the agricultural produce to the market (24.32%), less rainfall (40.54%) inadequate extension services (24.32%) and source of agri technology information (13.51).