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

CHIKKASHINDHAG-1 (4D4A1X2Zc) MICROWATERSHED

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 Chikkashindhag-1 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
Date:17-10-2019

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PART-A

LAND RESOURCE INVENTORY

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EXECUTIVE SUMMARY

The land resource inventory of Chikkashindhag-1 microwatershed was conducted using village cadastral maps and IRS satellite imagery on 1:7920 scale. The false colour composites of IRS imagery were interpreted for physiography and 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 659 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 94 per cent is covered by soils, 1 per cent by rock outcrops and 5 per cent is by habitation and settlements. The salient findings from the land resource inventory are summarized briefly below.

- *The soils belong to 8 soil series and 19 soil phases (management units) and 4 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 94 per cent is suitable for agriculture.*
- *About 49 per cent of the soils are shallow to moderately shallow (25-75 cm), 38 per cent of the soils are moderately deep to deep (75-150 cm) and 8 per cent soils are very deep (>150 cm).*
- *About 7 per cent area in the microwatershed has loamy soils and 87 per cent clayey soils at the surface.*
- *About 63 per cent area has non-gravelly (<15% gravel) soils and 31 per cent has gravelly to very gravelly (15-60% gravel) soils.*

- *About 54 per cent area is low (50-100 mm/m), 25 per cent area is medium to high (101-200 mm/m) and 15 per cent area is very high (>200 mm/m) in available water capacity.*
- *About 14 per cent area of the microwatershed has nearly level (0-1% slope) lands and 80 per cent area of the microwatershed has very gently sloping (1-3% slope) lands.*
- *An area of about 36 per cent area is moderately (e2) eroded and about 58 per cent area is slightly (e1) eroded.*
- *An area of about 53 per cent soils are moderately alkaline to strongly alkaline (pH 7.8-9.0) and 41 per cent soil are very strongly alkaline (pH >9.0) 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 9 per cent area and low (<0.5%) in 85 per cent area.*
- *An area of about 75 per cent is medium (23-57 kg/ha) and 19 per cent is low (<23 kg/ha) in available phosphorus.*
- *An area of about 68 per cent is medium (145-337 kg/ha) and 26 per cent is high (>337 kg/ha) in available potassium.*
- *Available sulphur is low (<10 ppm) in 29 per cent, medium (10 -20 ppm) in 34 per cent and high (>20 ppm) in 31 per cent area of the microwatershed.*
- *An area of about 46 per cent is low (<0.5ppm) and 48 per cent is medium (0.5-1.0 ppm) in available boron content.*
- *An area of about 5 per cent is sufficient (>4.5 ppm) and 89 per cent is deficient (<4.5 ppm) in available iron content.*
- *Entire cultivated area of the microwatershed is sufficient (>1.0 ppm) in available manganese content.*
- *Entire cultivated area of the microwatershed is sufficient (>0.2 ppm) in available copper content.*
- *An area of about 81 per cent is deficient (<0.6 ppm) and 14 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	*101(15)*	*362(55)*		*Sapota*	*-*	*139(21)*
Maize	*-*	*462(70)*		*Pomegranate*	*-*	*300(45)*
Bajra	*139(21)*	*323(49)*		*Guava*	*-*	*139(21)*
Groundnut	*33(5)*	*106(16)*		*Jackfruit*	*-*	*139(21)*
Sunflower	*1(<1)*	*299(45)*		*Jamun*	*-*	*288(44)*
Cotton	*1(<1)*	*463(70)*		*Musambi*	*1(<1)*	*299(45)*
Red gram	*-*	*289(44)*		*Lime*	*1(<1)*	*299(45)*
Bengalgram	*1(<1)*	*462(70)*		*Cashew*	*-*	*139(21)*
Chilli	*106(16)*	*33(5)*		*Custard apple*	*140(21)*	*322(49)*
Tomato	*106(16)*	*33(5)*		*Amla*	*139(21)*	*323(49)*
Brinjal	*139(21)*	*323(49)*		*Tamarind*	*-*	*149(23)*
Onion	*33(5)*	*106(16)*		*Marigold*	*-*	*462(70)*
Bhendi	*33(5)*	*429(65)*		*Chrysanthemum*	*-*	*462(70)*
Drumstick	*-*	*300(45)*		*Jasmine*	*-*	*302(46)*
Mulberry	*-*	*299(45)*		*Crossandra*	*-*	*152(23)*
Mango	*-*	*98(15)*				

- *Apart from the individual crop suitability, a proposed crop plan has been prepared for the 4 identified LMUs 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 Chikkashindhag-1 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 Chikkashindhag-1 Microwatershed is located in the central part of northern Karnataka in Koppal Taluk, Koppal District, Karnataka State (Fig.2.1). It comprises parts of Koppal, Chikkashindhogi, Hireshindhogi and Katrahalli villages. It lies between $15^0$16' – $15^0$18' North latitudes and $76^0$5'– $76^0$7' East longitudes and covers an area of 659 ha. It is about 10 km from Koppal town and is surrounded by Katrahalli village on the northwest, Chikkashindhogi village on the south, Hireshindhogi village on the west and southwest and Koppal village on the east and northern side of the microwatershed.

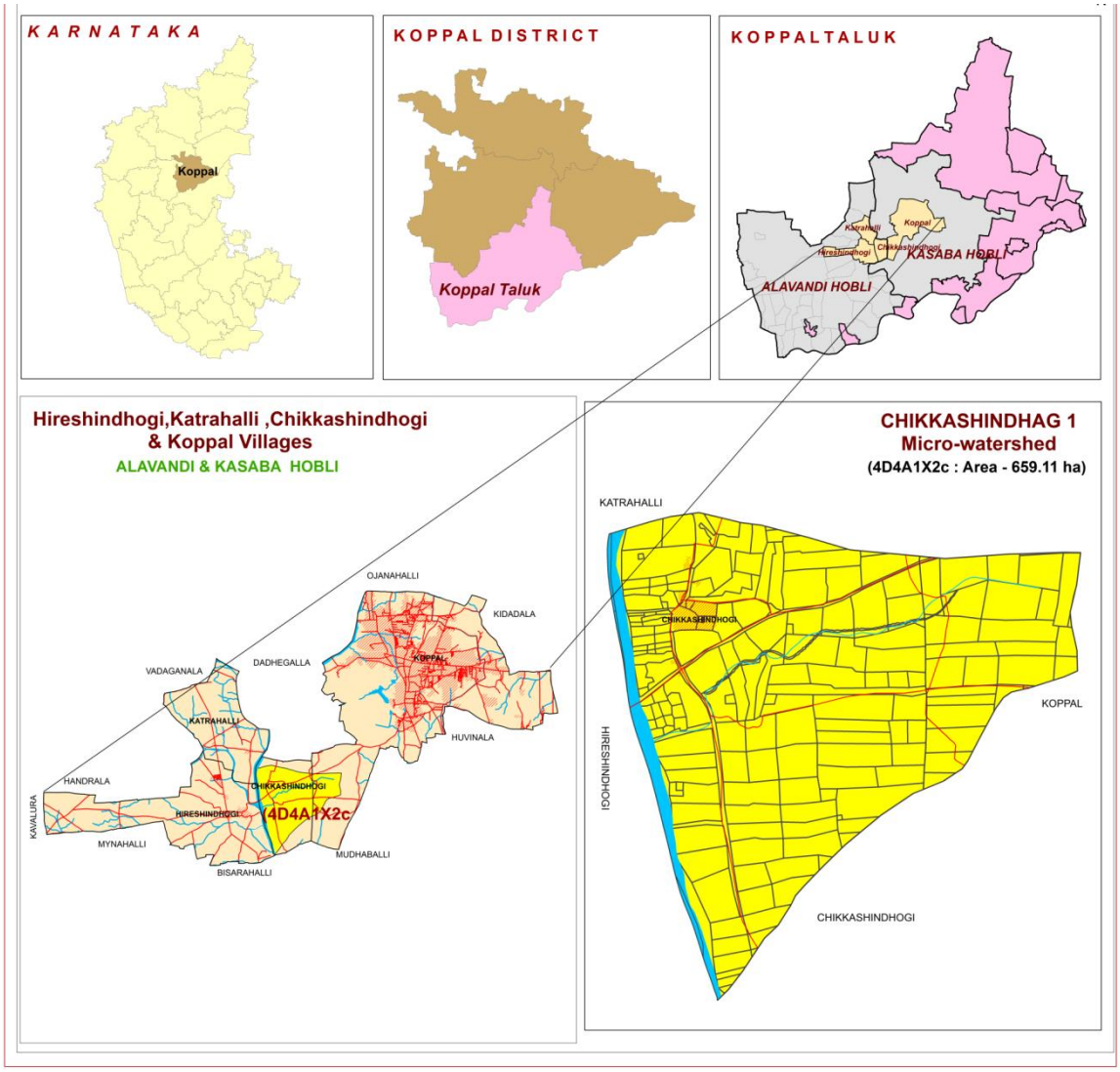


Fig.2.1 Location map of Chikkashindhag-1 Microwatershed

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.2.2a Granite and granite gneiss rocks

Fig.2.2b 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 507-537 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**	

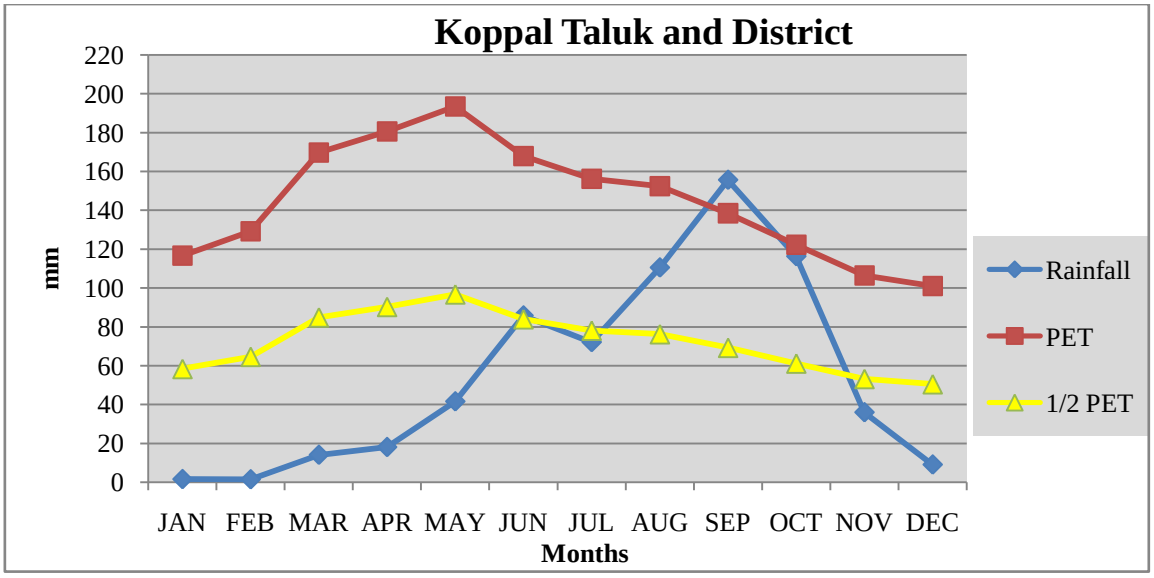


Fig. 2.3 Rainfall distribution in Koppal Taluk and District

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 Chikkashindhag-1 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 Chikkashindhag-1 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 Chikkashindhag-1 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

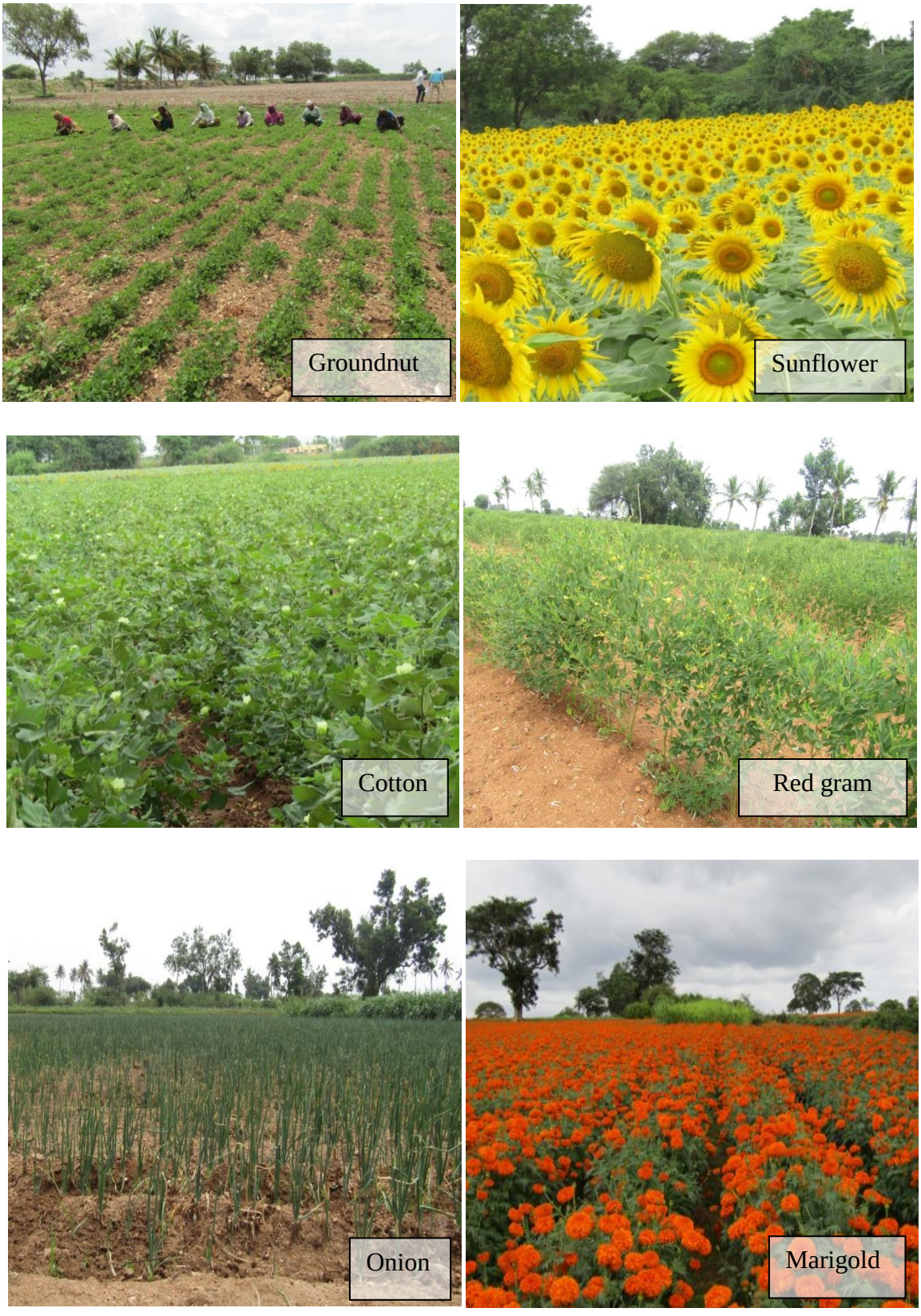


Fig.2.5 Different crops and cropping systems in Chikkashindhag-1 Microwatershed

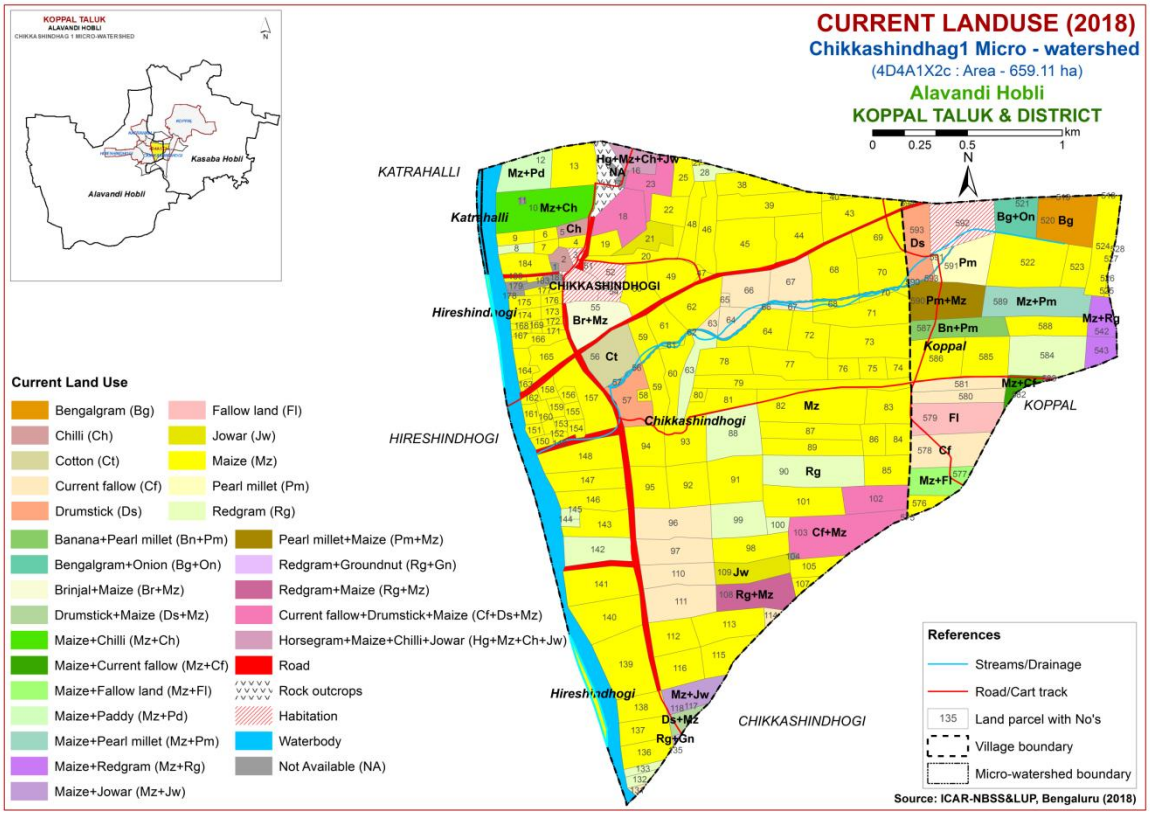


Fig.2.6 Current Land Use – Chikkashindhag-1 Microwatershed

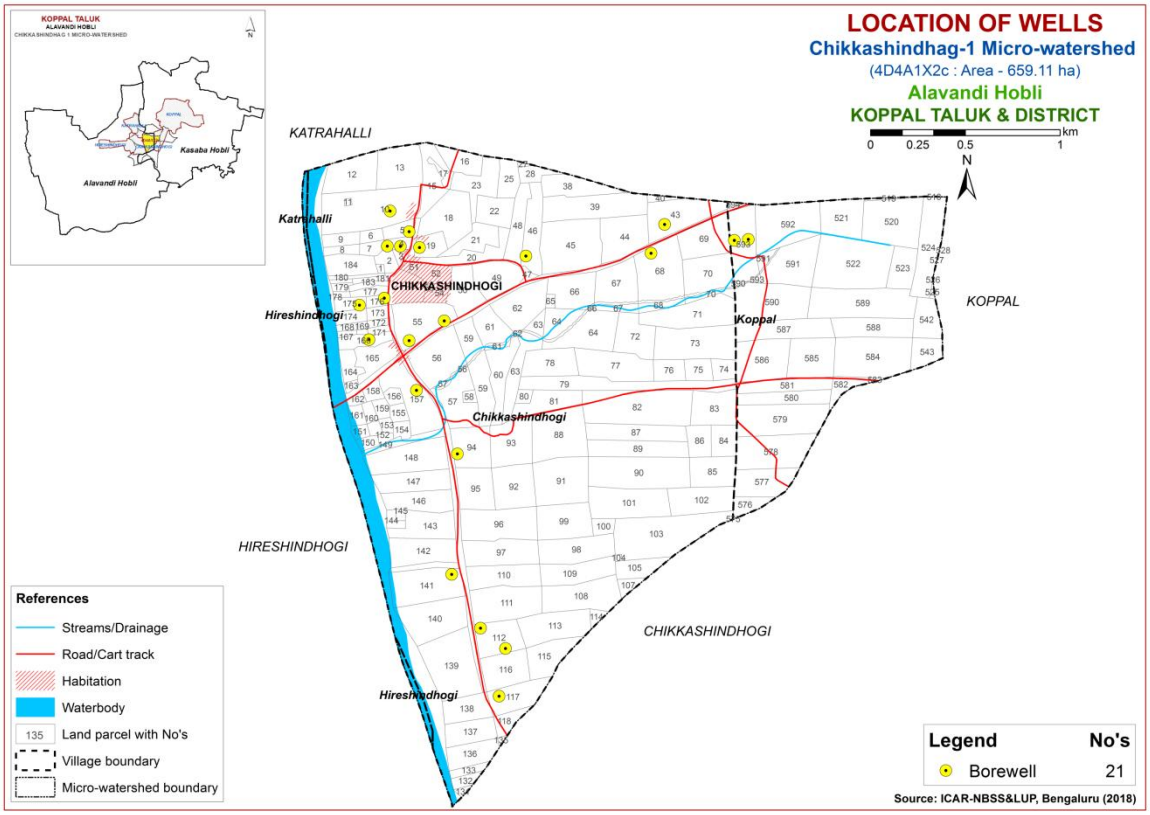


Fig.2.7 Location of wells - Chikkashindhag-1 Microwatershed

Chapter 3

SURVEY METHODOLOGY

The purpose of land resource inventory is to delineate similar areas (soil series and phases), which respond or expected to respond similarly for a given level of management. This was achieved in Chikkashindhag-1 Microwatershed by the detailed study of all the soil characteristics (depth, texture, colour, structure, consistence, coarse fragments, porosity, soil reaction, soil horizons etc.) and site characteristics (slope, 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 659 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

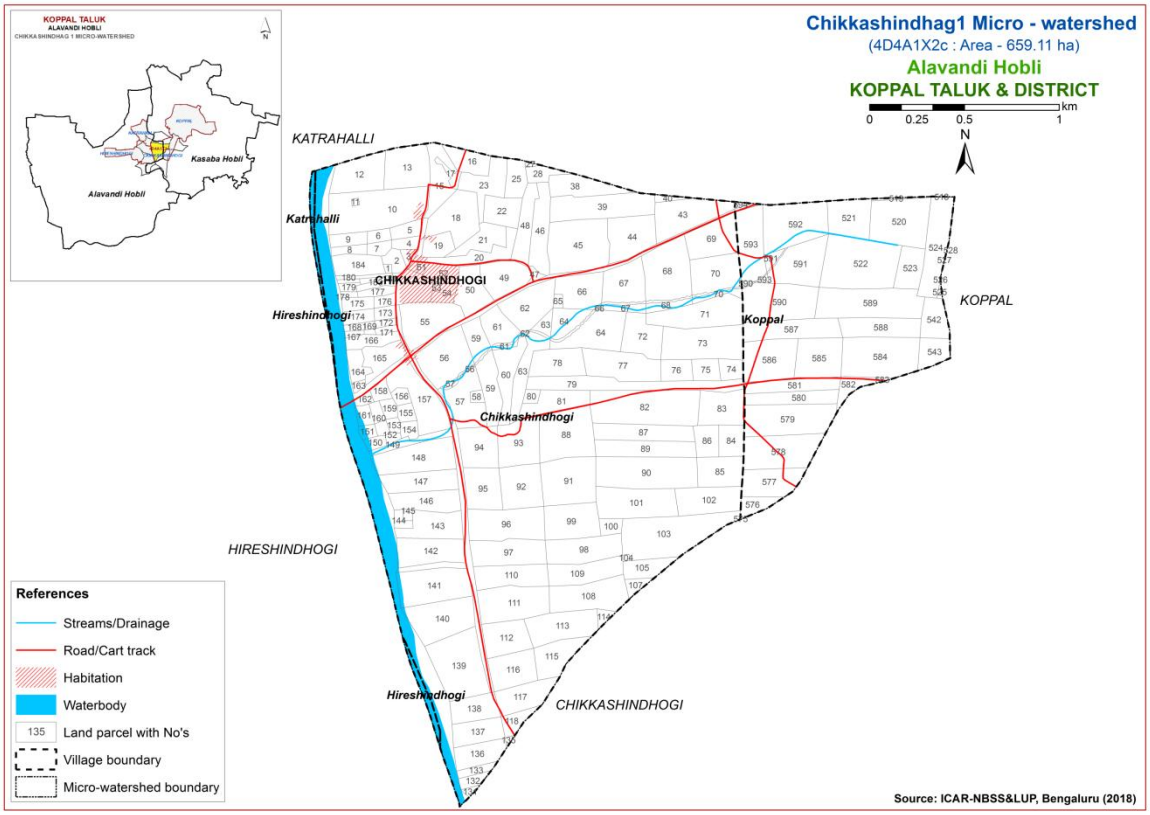


Fig 3.1 Scanned and Digitized Cadastral map of Chikkashindhag-1 Microwatershed

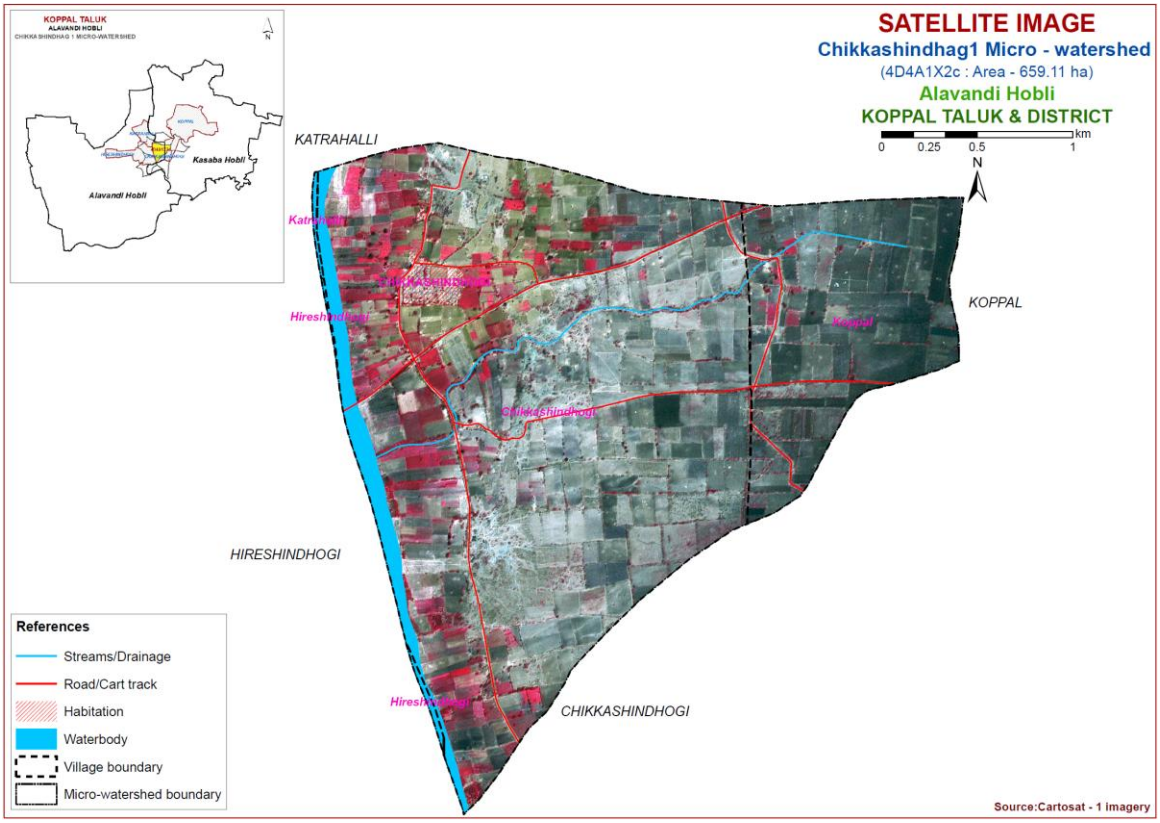


Fig.3.2 Satellite Image of Chikkashindhag-1 Microwatershed

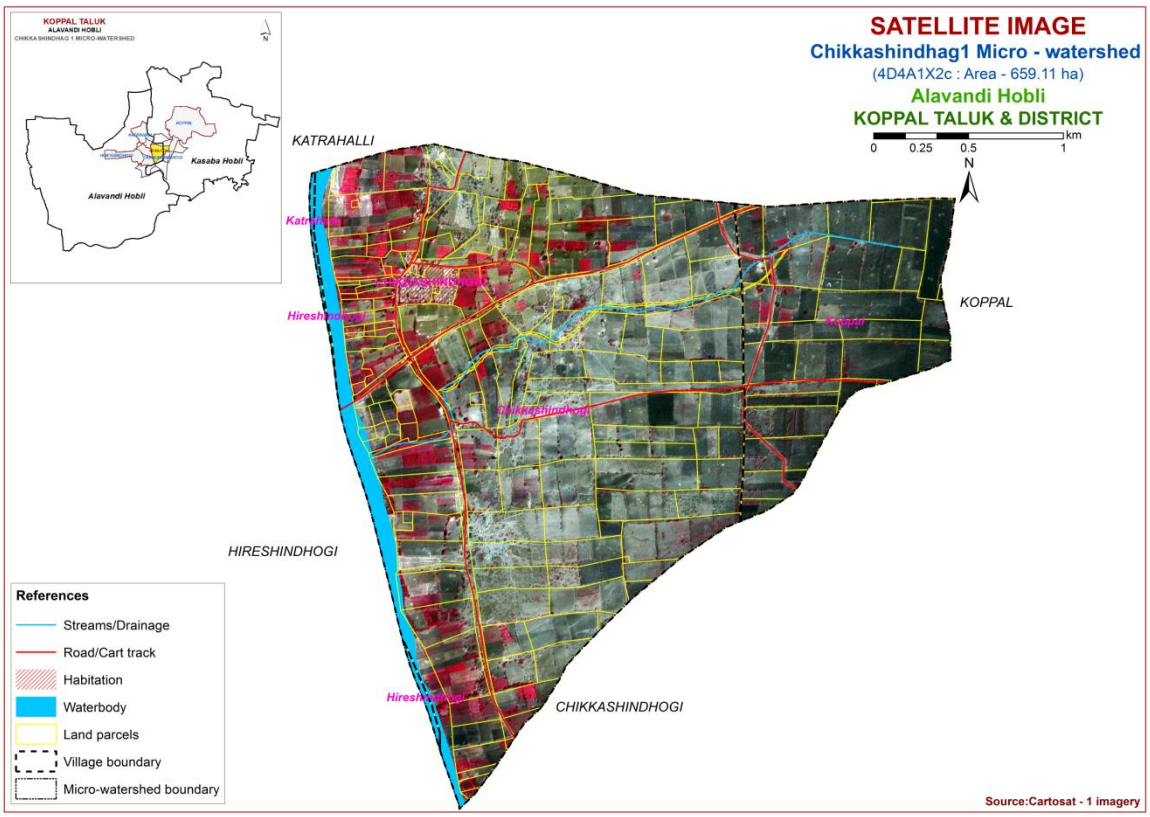


Fig.3.3 Cadastral map overlaid on IRS PAN+LISS IV merged imagery of Chikkashindhag-1 Microwatershed

3.3 Field Investigation

The field boundaries and survey numbers given on the cadastral sheet were located on the ground by following permanent features like roads, cart tracks, *nallas*, streams, tanks etc., and wherever changes were noticed, they were incorporated on the microwatershed cadastral map. Preliminary traverse of the microwatershed was carried out with the help of cadastral map, imagery and toposheets. While traversing, landforms and physiographic units identified were checked and preliminary soil legend was prepared by studying soils at few selected places. Then, intensive traversing of each physiographic unit like 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).

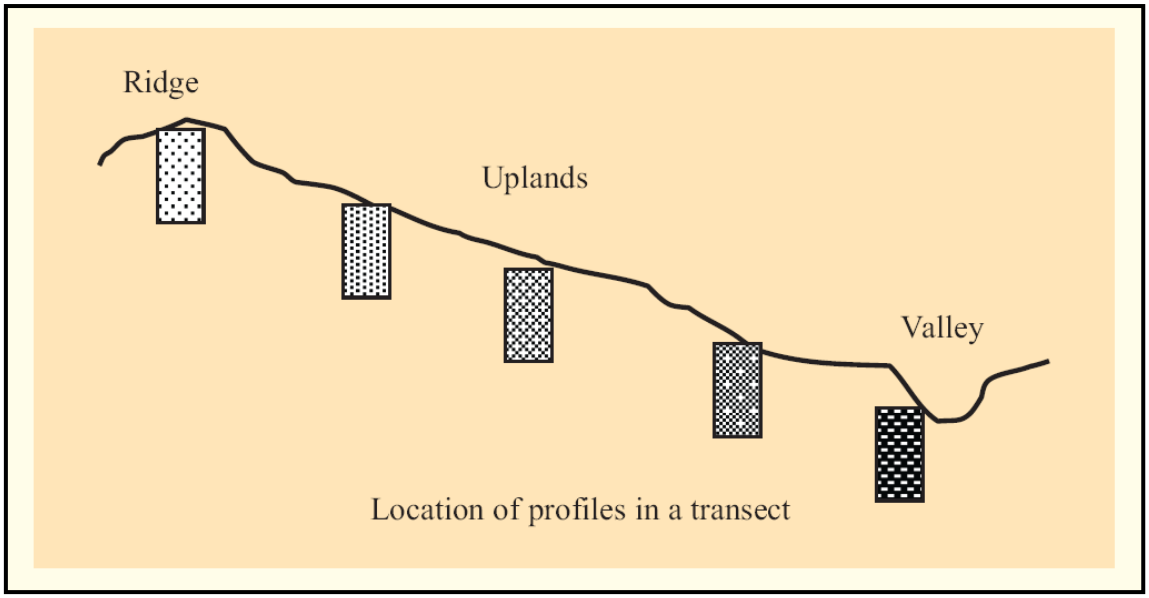


Fig: 3.4. Location of profiles in a transect

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, 8 soil series were identified in Chikkashindhag-1 Microwatershed.

Table 3.1 Differentiating Characteristics used for identifying Soil Series
(Characteristics are of Series Control Section)

Sl. No.	Soil Series	Depth (cm)	Colour (moist)	Texture	Gravel (%)	Horizon sequence	Calcareou-sness
SOILS OF GRANITE GNEISS LANDSCAPE							
1	Gollarahatti (GHT)	75-100	2.5YR3/4,3/6, 4/4,4/6	gscl	15-35	Ap-Bt-Cr	-
2	Chikkamegheri (CKM)	75-100	2.5YR2.5/3,3/4, 3/6	sc	<15	Ap-Bt-Cr	-
SOILS OF ALLUVIAL LANDSCAPE							
3	Muttal (MTL)	25-50	10YR3/2,3/3,4/2 7.5YR3/2,3/3,6/4	gc	15-35	Ap-Bw-Ck	e-ev
4	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
5	Dambarahalli (DRL)	75-100	10YR 2/1, 3/1, 4/3	c	<15	Ap-Bss	e-es
6	Handrala (HDL)	100-150	10 YR 2/1, 3/1,4/1,	c	<15	Ap-Bss-Ck	es
7	Kavalur (KVR)	100-150	10 YR 2/2, 3/1, 3/2, 3/3, 4/4	c	<15	Ap-Bss-Bck-Cr	es-ev
8	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 19 mapping units representing 8 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 19 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 2018 from

Chikkashindhag-1 farmer's fields (63 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 19 soil phases identified and mapped in the microwatershed were regrouped into 4 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 Chikkashindhag-1 Microwatershed, five soil and site characteristics, namely soil depth, soil texture, slope erosion and gravel content have been considered for defining LMUs. The land management units are expected to behave similarly for a given level of management.

Table 3.2 Soil map unit description of Chikkashindhag-1 Microwatershed

Soil map unit No*	Soil Series	Soil Phase Symbol	Mapping Unit Description	Area in ha (%)
SOILS OF GRANITE GNEISS LANDSCAPE				
	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		**33(5.05)**
137		GHTcB2	Sandy loam surface, slope 1-3%, moderate erosion	33(5.05)
	CKM	Chikkamegheri soils are moderately deep (75-100 cm), well drained, have dark brown to dark reddish brown red, sandy clay soils occurring on nearly level to very gently sloping uplands under cultivation		**106 (16.08)**
175		CKMhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	8(1.18)
176		CKMhB2g1	Sandy clay loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	6(0.88)
177		CKMiA1	Sandy clay surface, slope 0-1%, slight erosion	57(8.71)
178		CKMiB1	Sandy clay surface, slope 1-3 %, slight erosion	35(5.31)
SOILS OF ALLUVIAL LANDSCAPE				
	MTL	Muttal soils are shallow (25-50 cm), well drained, have very dark grayish brown to dark brown, calcareous black gravelly clay soils occurring on nearly level to gently sloping plains under cultivation		**158(24.1)**
303		MTLiB1g1	Sandy clay surface, slope 1-3%, slight	77(11.74)

Soil map unit No*	Soil Series	Soil Phase Symbol	Mapping Unit Description	Area in ha (%)
			erosion, gravelly (15-35%)	
304		MTLiB2	Sandy clay surface, slope 1-3%, moderate erosion	32(4.87)
305		MTLiB2g2	Sandy clay surface, slope 1-3%, moderate erosion, very gravelly (35-60%)	18(2.76)
308		MTLmB1g1	Clay surface, slope 1-3%, slight erosion, gravelly (15-35%)	31(4.73)
310		MTLmB2	Clay surface, slope 1-3%, moderate erosion	0.02 (0.00)
	RNK	Ravanaki soils are moderately shallow (50-75 cm), moderately well drained, have dark brown to very dark grayish brown and dark gray, calcareous clay black soils occurring on nearly level to very gently sloping plains under cultivation		**163 (24.74)**
332		RNKmA1g1	Clay surface, slope 0-1%, slight erosion, gravelly (15-35%)	7(1.1)
333		RNKmB1	Clay surface, slope 1-3%, slight erosion	26(3.91)
336		RNKmB2	Clay surface, slope 1-3%, moderate erosion	65(9.83)
337		RNKmB2g1	Clay surface, slope 1-3%, moderate erosion, gravelly (15-35%)	65(9.9)
	DRL	Dambarahalli soils are moderately deep (75-100 cm), moderately well drained, have dark brown to very dark gray, calcareous black cracking clay soils occurring on nearly level to very gently sloping plains under cultivation		**12(1.77)**
342		DRLiB2	Sandy clay surface, slope 1-3%, moderate erosion	12(1.77)
	HDL	Handrala soils are deep (100-150 cm), moderately well drained, have dark gray to very dark gray, calcareous black cracking clay soils occurring on very gently sloping plains under cultivation		**1(0.14)**
380		HDLmB1	Clay surface, slope 1-3%, slight erosion	1(0.14)
	KVR	Kavalur soils are deep (100-150 cm), moderately well drained, have dark yellowish brown to very dark grayish brown, calcareous black cracking clay soils occurring on nearly level to very gently sloping plains under cultivation		**98(14.85)**
388		KVRmB1	Clay surface, slope 1-3%, slight erosion	98(14.85)
	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 to very gently sloping plains under cultivation		**49(7.54)**
395		BGPmA1	Clay surface, slope 0-1%, slight erosion	28(4.32)

Soil map unit No*	Soil Series	Soil Phase Symbol	Mapping Unit Description	Area in ha (%)
396		BGPmB1	Clay surface, slope 1-3%, slight erosion	21(3.22)
999		Rockoutcrops	Rock lands, both massive and bouldery with little or no soil	**6(0.85)**
1000		Others	Habitation and water body	**32(4.87)**

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

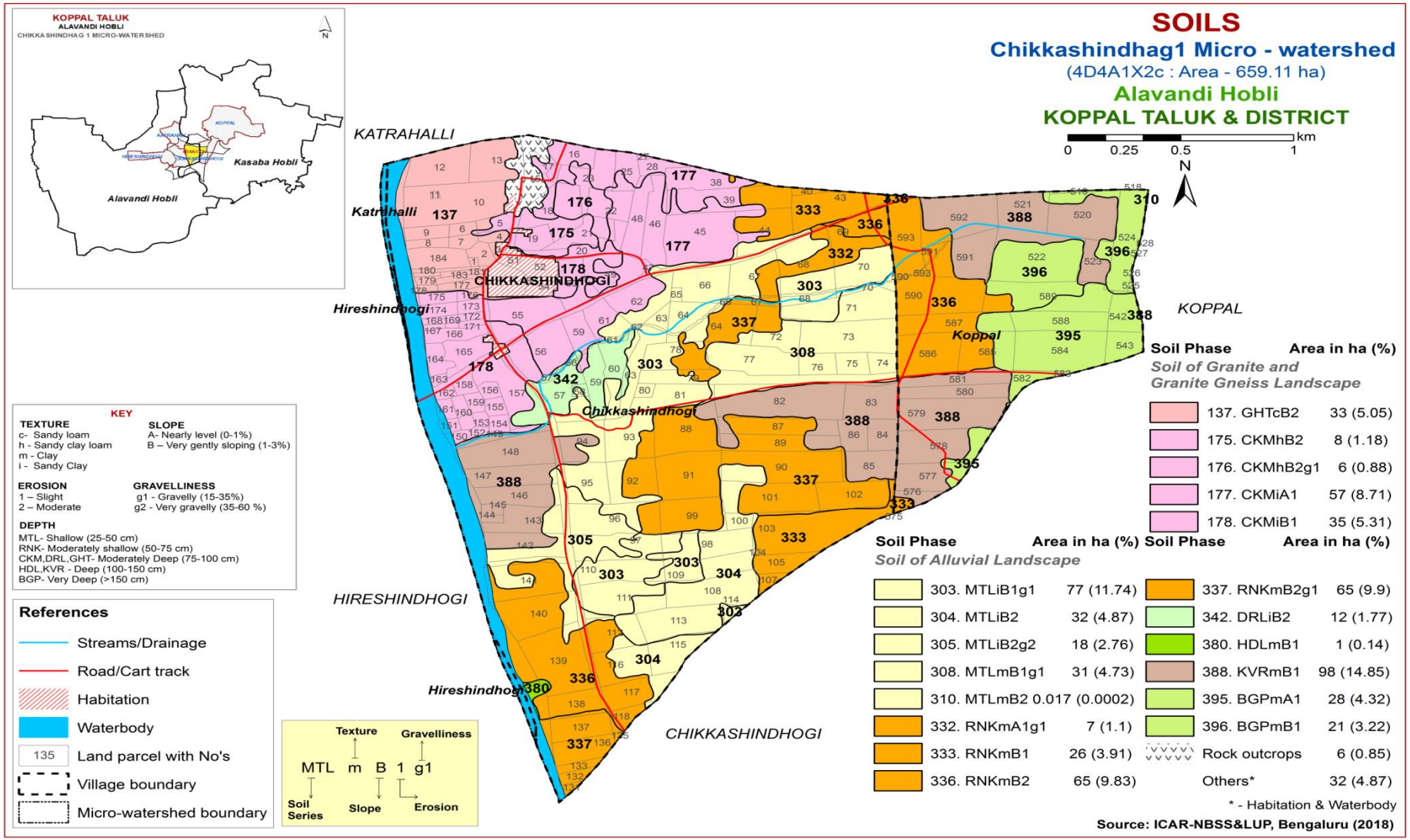


Fig 3.5 Soil Phase or Management Units- Chikkashindhag-1 Microwatershed

Chapter 4

THE SOILS

Detailed information pertaining to the nature, extent and distribution of different kinds of soils occurring in Chikkashindhag-1 Microwatershed is provided in this chapter. The microwatershed area has been identified as granite gneiss and alluvial landscapes based on geology. In all, 8 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 8 soil series identified followed by 19 soil phases (management units) mapped (Fig. 3.5) are furnished below. The physical and chemical characteristics of soil series identified in Chikkashindhag-1 microwatershed are given in Table 4.1 along with soil classification. The soils in any one map unit differ from place to place in their depth, texture, slope, gravelliness, erosion or any other site characteristic that affect management. The soil phase map can be used for identifying the suitability of areas for growing specific crops or for other alternative uses and also for deciding the type of conservation structures needed. The detailed information on soil and site-characteristics like soil depth, surface soil texture, slope, erosion, gravelliness, AWC, LCC etc, with respect to each of the soil phase identified is given village/survey number wise for the microwatershed in Appendix-I.

4.1 Soils of Granite gneiss landscape

In this landscape, 2 soil series are identified and mapped. Of these, Chikkamegheri (CKM) series occupies major area 106 ha (16%) and Gollarahatti (GHT) 33 ha (5%). The brief description of each soil series along with the soil phases identified and mapped is given below.

4.1.1 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). Only one soil phase was identified and mapped.

Landscape and soil profile characteristics of Gollarahatti (GHT) Series

4.1.2 Chikkamegheri (CKM) Series: Chikkamegheri soils are moderately deep (75-100 cm), well drained, have dark brown to dark reddish brown and red, sandy clay soils. They have developed from weathered granite gneiss and occur on nearly level to very gently sloping uplands. The Chikkamegheri series has been classified as a member of the fine, 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 24 cm. Its colour is in 7.5 YR, 5YR and 2.5 YR hue with value 2 to 4 and chroma 3 to 6. The texture varies from sandy clay loam to sandy clay with 10 to 15 per cent gravel. The thickness of B horizon ranges from 65 to 86 cm. Its colour is in 2.5 YR hue with value 2.5 to 3 and chroma 3 to 6. Its texture is dominantly sandy clay to clay. The available water capacity is medium (100-150 mm/m). Four soil phases were identified and mapped.

Landscape and soil profile characteristics of Chikkamegheri (CKM) Series

4.2 Soils of Alluvial landscape

In this landscape, 6 soil series were identified and mapped. Of these, Ravanaki (RNK) series occupies major area 163 ha (25%) followed by Muttal (MTL) 158 ha (24%), Kavalur (KVR) 98 ha (15%), Budagumpa (BGP) 49 ha (8%), Dambarahalli (DRL) 12 ha (2%) and Handrala (HDL) 1 ha (<1%)**.** The brief description along with the soil phases identified and mapped is given below.

4.2.1 Muttal (MTL) Series: Muttal soils are shallow (25-50 cm), well drained, have dark brown to very dark grayish brown, calcareous gravelly clay soils. They have developed from alluvium and occur on nearly level to very gently sloping uplands. The Muttal series has been classified as a member of the clayey, mixed (calc), isohyperthermic family of (Paralithic) Haplustepts.

The thickness of the solum ranges from 30 to 50 cm. The thickness of A-horizon ranges from 15 to 18 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 18 to 32 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. The available water capacity is low (51-100 mm/m). Five soil phases were identified and mapped.

Landscape and soil profile characteristics of Muttal (MTL) Series

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

Landscape and Soil Profile Characteristics of Ravanaki (RNK) Series

4.2.3 Dambarahalli (DRL) Series: Dambarahalli soils are moderately deep (75-100 cm), moderately well drained, have black and very dark gray to dark brown, calcareous cracking clay soils. They have developed from alluvium and occur on very gently to gently sloping uplands under cultivation. The Dambarahalli series has been classified as a member of the very-fine, smectitic (calc), isohyperthermic family of Typic Haplusterts.

The thickness of the solum ranges from 75 to 99 cm. The thickness of A-horizon ranges from 13 to 24 cm. Its colour is in 10 YR hue with value 3 to 4 and chroma 1 to 2. The texture is clay. The thickness of B horizon ranges from 54 to 85 cm. Its colour is in 10 YR hue with value 2 to 4 and chroma 1 to 3. Its texture is clay and is calcareous. The available water capacity is high (151-200 mm/m). Only one soil phase was identified and mapped.

Landscape and soil profile characteristics of Dambarahalli (DRL) Series.

4.2.4 Handrala (HDL) Series: Handrala soils are deep (100-150 cm), moderately well drained, have black to very dark brown and dark gray, cracking clay soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands. The Handrala series has been classified as a member of the very-fine, smectitic (calc), isohyperthermic family of Typic Haplusterts.

The thickness of the solum ranges from 102 to 149 cm. The thickness of A-horizon ranges from 14 to 26 cm. Its colour is in 10 YR hue with value 3 and chroma 1. The texture is clay. The thickness of B horizon ranges from 103 to 127 cm. Its colour is in 10 YR hue with value 2 to 4 and chroma 1 to 2. Texture is dominantly clay. The available water capacity is very high (>200 mm/m). Only one soil phase was identified and mapped.

Landscape and Soil Profile Characteristics of Handrala (HDL) Series

4.2.5 Kavalur (KVR) series: Kavalur soils are deep (100-150 cm), moderately well drained, have dark yellowish brown to very dark brown and very dark gray, calcareous black cracking clay soils. They have developed from alluvium and occur on very gently sloping uplands. The Kavalur series has been classified as a member of the fine, smectitic (calc), isohyperthermic family of Typic Haplusterts.

The thickness of the solum is 113 to 143 cm. The thickness of A-horizon ranges from 9 to 24 cm. Its colour is in 10 YR hue with value 3 and chroma 1. The texture is clay with no gravel. The thickness of B horizon ranges from 89 to 134 cm. Its colour is in 10 YR hue with value 3 and chroma 1. Its texture is clay. The available water capacity is very high (>200 mm/m). Only one soil phase was identified and mapped.

Landscape and soil profile characteristics of Kavalur (KVR) series

4.2.6 Budagumpa (BGP) Series: Budagumpa soils are very deep (>150 cm), well drained, have black sodic, calcareous clay soils. They have developed from alluvium and occur on very gently sloping uplands under cultivation. The Budagumpa series has been classified as member of the fine, mixed (calc), 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). Two soil phases were identified and mapped.

Landscape and Soil Profile Characteristics of Budagumpa (BGP) Series

Table: 4.1 Physical and Chemical Characteristics of Soil Series identified in Chikkashindhag-1 Microwatershed

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....

Series Name: Chikkamegheri (CKM), **Pedon:** RM-2
Location: $15^0$21'40"N, $76^0$16'43"E, Gudanahalli 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
0-10	Ap	66.80	5.51	27.69	10.14	10.04	20.29	14.75	11.58	-	scl	20.59	7.15
10-25	Bt1	39.52	7.17	53.32	8.75	9.59	7.27	8.43	5.48	-	c	26.96	13.99
25-38	Bt2	42.00	7.16	50.84	13.16	8.74	6.42	8.53	5.16	-	c	26.51	13.42
38-55	Bt3	41.77	10.31	47.92	15.19	8.54	6.33	7.38	4.32	10	c	25.28	14.10
55-70	Bt4	44.03	8.96	47.01	15.72	9.22	6.92	6.81	5.35	20	c	24.30	14.35
70-90	Bt5	56.02	8.46	35.52	11.41	17.07	12.36	10.26	4.92	25	sc	20.59	13.06

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}							%	%
0-10	7.99	-	-	0.326	0.83	4.44	9.35	4.76	0.28	0.54	14.93	12.50	0.45	119	1.73
10-25	7.36	-	-	0.345	0.99	2.40	10.37	4.84	0.10	1.18	16.48	17.60	0.33	94	2.67
25-38	6.69	-	-	0.477	0.79	0.00	10.25	4.20	0.09	1.61	16.15	16.10	0.32	100	4.00
38-55	6.45	-	-	0.548	0.63	0.00	9.43	2.86	0.10	1.52	13.91	14.80	0.31	94	4.11
55-70	6.35	-	-	0.532	0.71	0.00	9.59	2.79	0.11	1.66	14.16	14.60	0.31	97	4.56
70-90	6.44	-	-	0.613	0.27	0.00	9.58	3.10	0.19	1.87	14.74	14.70	0.41	100	5.08

Contd....

Series Name: Muttal (MTL), **Pedon:** RM-13
Location: $15^0$14'30.8"N, $75^0$56'50.6"E, Gatareddihalla village, Koppal Taluk and District
Analysis at: NBSS&LUP, Regional Centre, Bangalore. **Classification:** Clayey, mixed (calc), isohyperthermic (Paralithic) 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
0-20	Ap	39.05	13.74	47.21	3.05	5.05	8.21	14.63	8.11	15-30	c	29.95	17.94
20-34	Bwk	28.77	19.57	51.66	4.81	4.71	4.92	9.09	5.24	10	c	33.44	21.56

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}							%	%
0-20	8.27	-	-	0.202	0.79	6.10	-	-	0.62	0.25	-	36.64	0.78	-	0.69
20-34	8.36	-	-	0.177	0.99	23.04	-	-	0.29	0.38	-	39.60	0.77	-	0.96

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 (calc), 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
0-28	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

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

Contd....

Series Name: Dombarahalli (DRL)**, Pedon:** R-8
Location: $15^0$13'96.2"N, $75^0$57'48.6" E Ragunathanahalli village, Koppal Taluk and District
Analysis at: NBSS&LUP, Regional Centre, Bangalore. **Classification:** Very-fine, smectitic (calc), isohyperthermic Typic Haplusterts

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-15	Ap	28.25	19.48	52.27	4.76	4.44	4.87	8.23	5.95	-	c	39.86	27.20
15-27	BA1	21.55	20.00	58.45	3.76	2.76	3.43	6.30	5.30	-	c	46.35	34.84
27-45	Bss1	14.86	20.89	64.25	2.46	2.23	2.23	3.91	4.02	-	c	57.99	41.06
45-80	Bss2	10.42	19.04	70.54	1.74	1.97	1.27	2.78	2.66	-	c	66.36	36.24

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}							%	%
0-15	8.78	-	-	0.42	0.32	12.35	-	-	0.59	4.25	-	49.70	0.95	100.00	5.62
15-27	9.03	-	-	0.61	0.30	12.48	-	-	0.30	8.96	-	57.23	0.98	100.00	10.07
27-45	9.10	-	-	0.67	0.34	11.70	-	-	0.25	11.85	-	60.71	0.95	100.00	14.05
45-80	9.18	-	-	0.86	0.32	13.39	-	-	0.27	15.40	-	63.33	0.90	100.00	18.45

Contd....

Series Name: Handrala (HDL), **Pedon:** A2/RM-1
Location: $15^0$19'69.8"N, $75^0$58'00"E, Kavalura village, Koppal Taluk and District
Analysis at: NBSS&LUP, Regional Centre, Bangalore. **Classification:** Very-fine, smectitic (calc), isohyperthermic Typic Haplusterts

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-25	Ap	21.68	16.62	61.70	4.42	3.98	3.43	5.64	4.20	10	c	41.36	31.27
25-50	Bss1	14.93	15.76	69.32	2.64	2.53	2.99	3.33	3.44	05	c	48.92	39.19
50-82	Bss2	23.11	16.60	60.29	4.51	3.61	6.31	4.74	3.95	05	c	42.46	33.85
82-117	Bss3	10.50	18.38	71.12	1.98	1.98	1.63	2.57	2.33	05	c	52.95	42.82

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}							%	%
0-25	9.06	-	-	0.371	0.16	4.80	-	-	0.80	7.93	-	62.33	1.01	-	5.09
25-50	9.09	-	-	0.719	0.2	7.20	-	-	0.42	14.94	-	67.10	0.97	-	8.90
50-82	9.28	-	-	0.47	0.19	9.36	-	-	0.47	11.59	-	60.21	1.00	-	7.70
82-117	8.76	-	-	1.55	0.36	8.64	-	-	0.11	2.28	-	25.33	0.36	-	3.61

Contd....

Series Name: Kavalura (KVR), **Pedon:** A2/RM-9
Location: $15^0$18'86.8"N, $75^0$56'56.3"E, Kavalura village, Koppal Taluk and District
Analysis at: NBSS&LUP, Regional Centre, Bangalore. **Classification:** Fine, smectitic (calc), isohyperthermic Typic Haplusterts

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-24	Ap	36.18	17.80	46.02	7.04	7.47	6.62	9.28	5.76	10	c	28.20	18.75
24-50	Bss1	38.79	15.36	45.85	6.25	6.25	9.70	10.67	5.93	05	c	27.16	18.81
50-85	Bss2	36.80	14.66	48.54	9.63	8.23	7.03	7.58	4.33	<5	c	30.16	22.17
85-124	Bss3	22.66	17.24	60.09	4.18	3.85	5.28	5.06	4.29	<5	c	40.34	31.42

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}							%	%
0-24	8.4	-	-	0.265	0.2	8.04	-	-	0.97	0.65		43.25	0.94		0.60
24-50	9.27	-	-	0.23	0.37	8.04	-	-	0.31	3.21		41.66	0.91		3.08
50-85	9.44	-	-	0.297	0.41	8.64	-	-	0.35	6.43		43.99	0.91		5.85
85-124	9.37	-	-	0.46	0.41	11.40	-	-	0.42	7.99		51.09	0.85		6.26

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 (calc), 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

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 and 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 19 soil map units identified in the Chikkashindhag-1 microwatershed are grouped under 2 Land capability classes and 4 land capability subclasses (Fig. 5.1). Entire cultivated area of about 622 ha (94%) is suitable for agriculture. An area of about 6 ha (1%) is under rock lands and 32 ha (5%) is under habitation and settlements.

Maximum area of about 463 ha (70%) is good lands (Class II) with minor problems of soil and erosion and distributed in the major part of the microwatershed. An area about 159 ha (24%) is moderately good lands (Class III) with moderate limitations of soil and erosion and distributed in the central, southern, northern, northeastern and eastern part of the microwatershed.

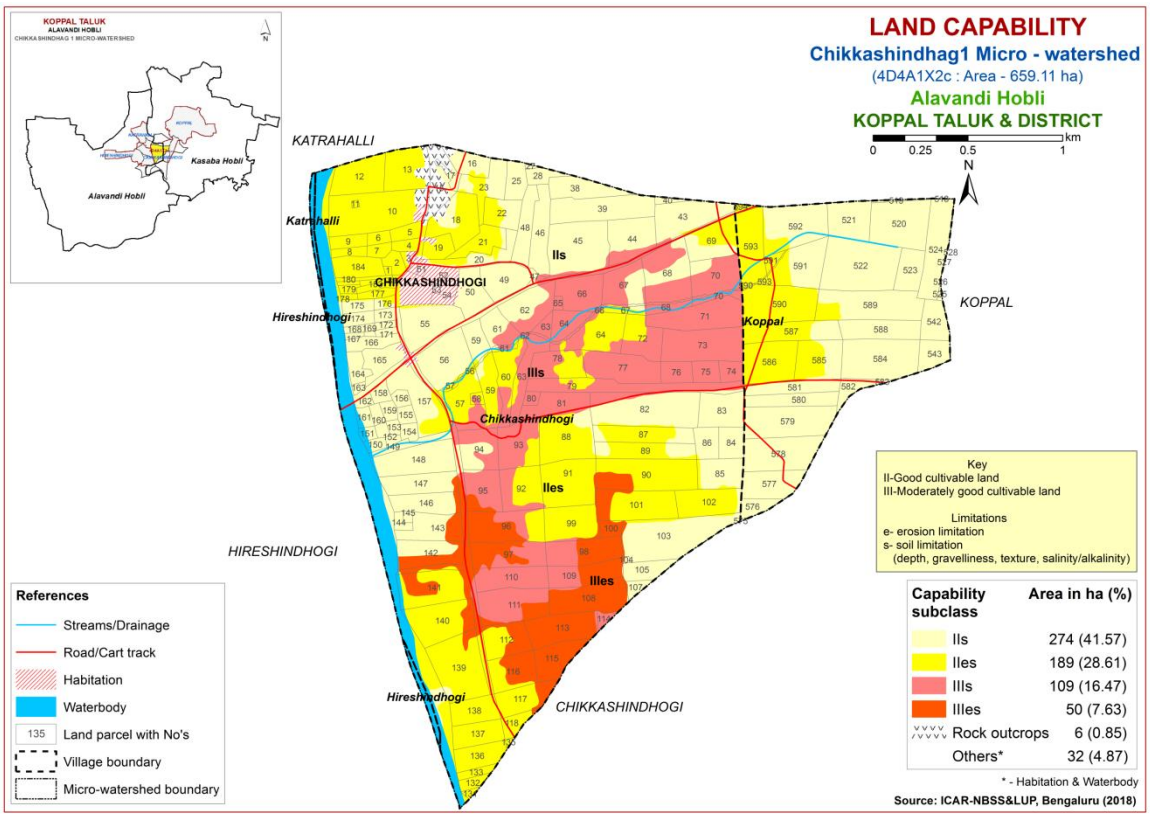


Fig. 5.1 Land Capability map of Chikkashindhag-1 Microwatershed

5.2 Soil Depth

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

An area of about 159 ha (24%) is under shallow (25-50 cm) soils and distributed in the central, northern, northeastern, eastern and southern part of the microwatershed. Moderately shallow (50-75 cm) soils occupy a major area of about 163 ha (25%) and occur in the central, northeastern, eastern, southeastern and southern part of the microwatershed. Moderately deep (75-100 cm) soils occupy an area of 151 ha (23%) and occur in the central, western, northwestern and northern part of the microwatershed. An area of about 99 ha (15%) is under deep (100-150) soils and occur in the northeastern, eastern and southwestern part of the microwatershed. Very deep (>150 cm) soils cover an area of about 50 ha (8%) and distributed in the northeastern and eastern part of the microwatershed.

The most productive lands cover about 149 ha (23%) where all climatically adapted long duration crops be grown. The problem soils cover about 159 ha (24%) area where only short duration crops can be grown and the probability of crop failure is high.

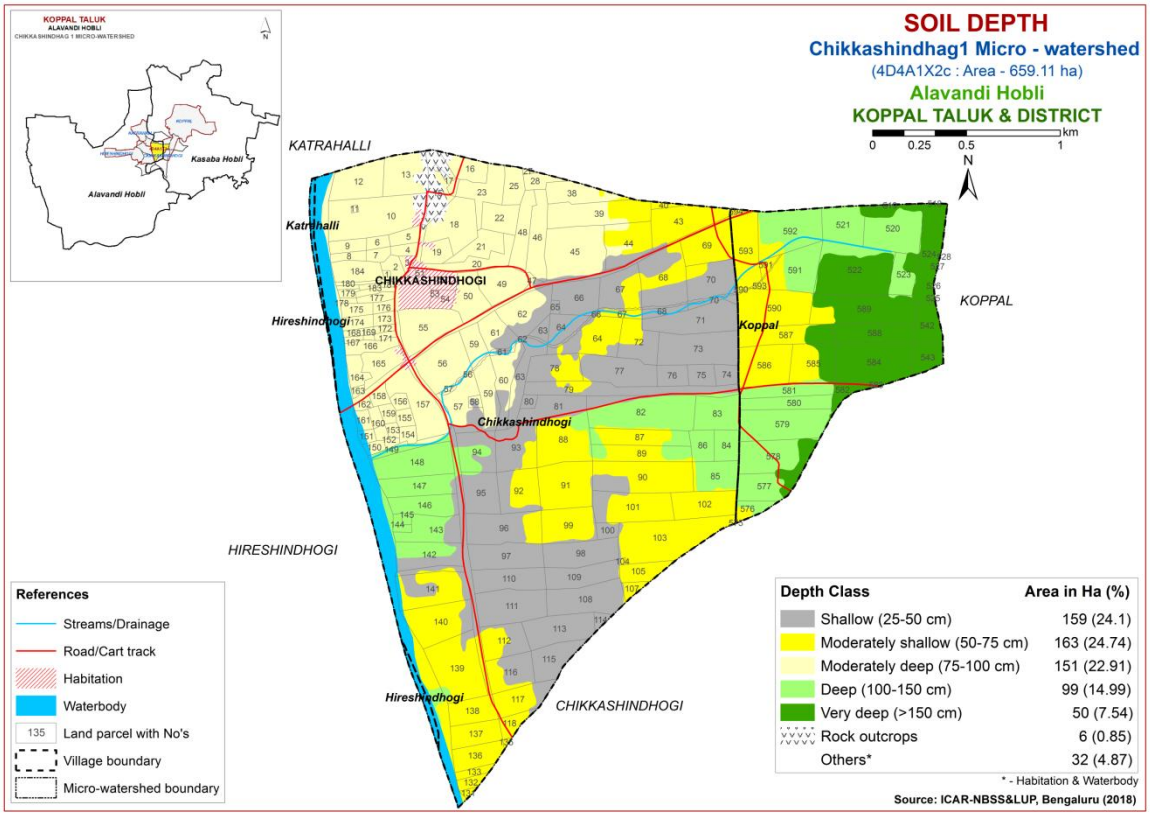


Fig. 5.2 Soil Depth map of Chikkashindhag-1 Microwatershed

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 47 ha (7%) is loamy and distributed in the northern and northwestern part of the microwatershed. Maximum area of about 575 ha (87%) has soils that are clayey at the surface and occur in the major part of the microwatershed.

Entire area has most productive lands with respect to surface soil texture where they are clayey soils (87%) 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 (7%) which also have high potential for soil-water retention and nutrient availability but have no drainage or other physical problems.

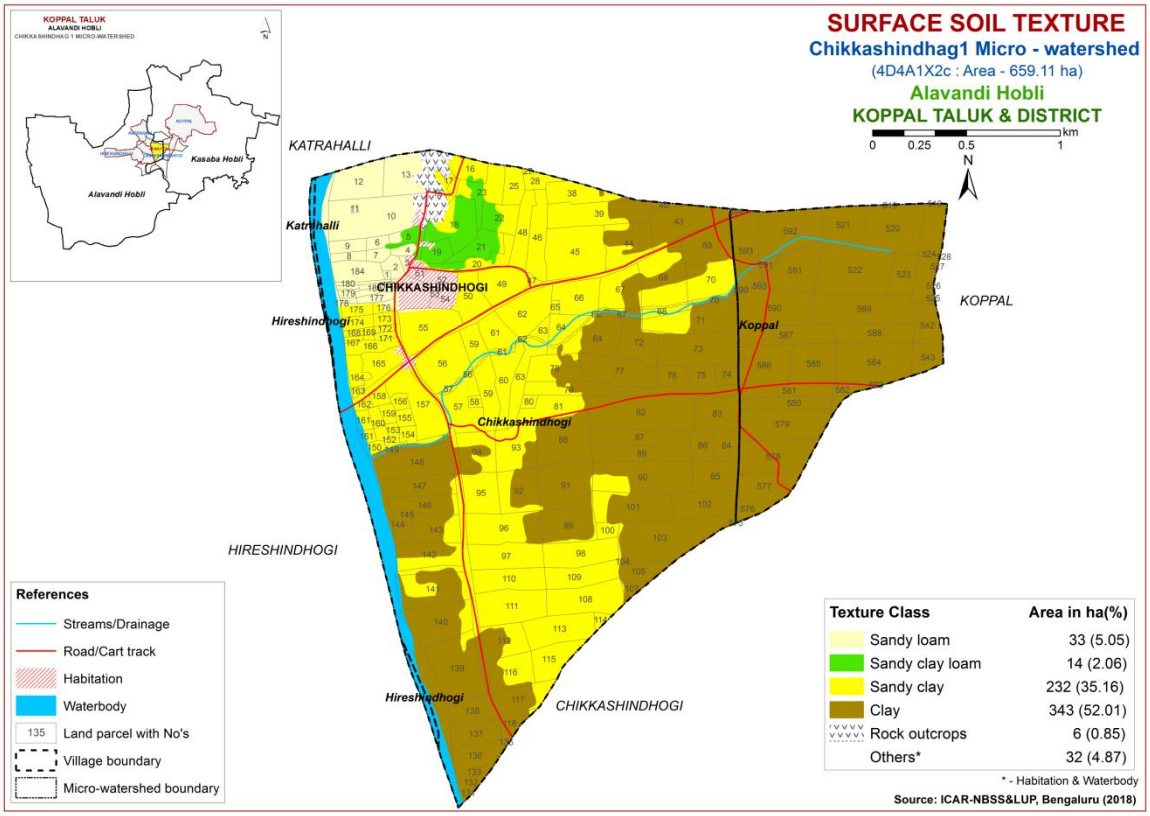


Fig. 5.3 Surface Soil Texture map of Chikkashindhag-1 Microwatershed

5.4 Soil Gravelliness

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

Maximum area of about 416 ha (63%) has non gravelly (<15%) soils and occur in the major part of the microwatershed. An area of about 187 ha (28%) has gravelly (15-35%) soils and distributed in the central, southern, southeastern, northern, northeastern and eastern part of the microwatershed. An area of about 18 ha (3%) has very gravelly (35-60%) soils and occur in the southern part of the microwatershed.

An area of about 416 ha (63%) 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 205 ha

(31%) that are gravelly to very gravelly where only medium or short duration crops can be grown.

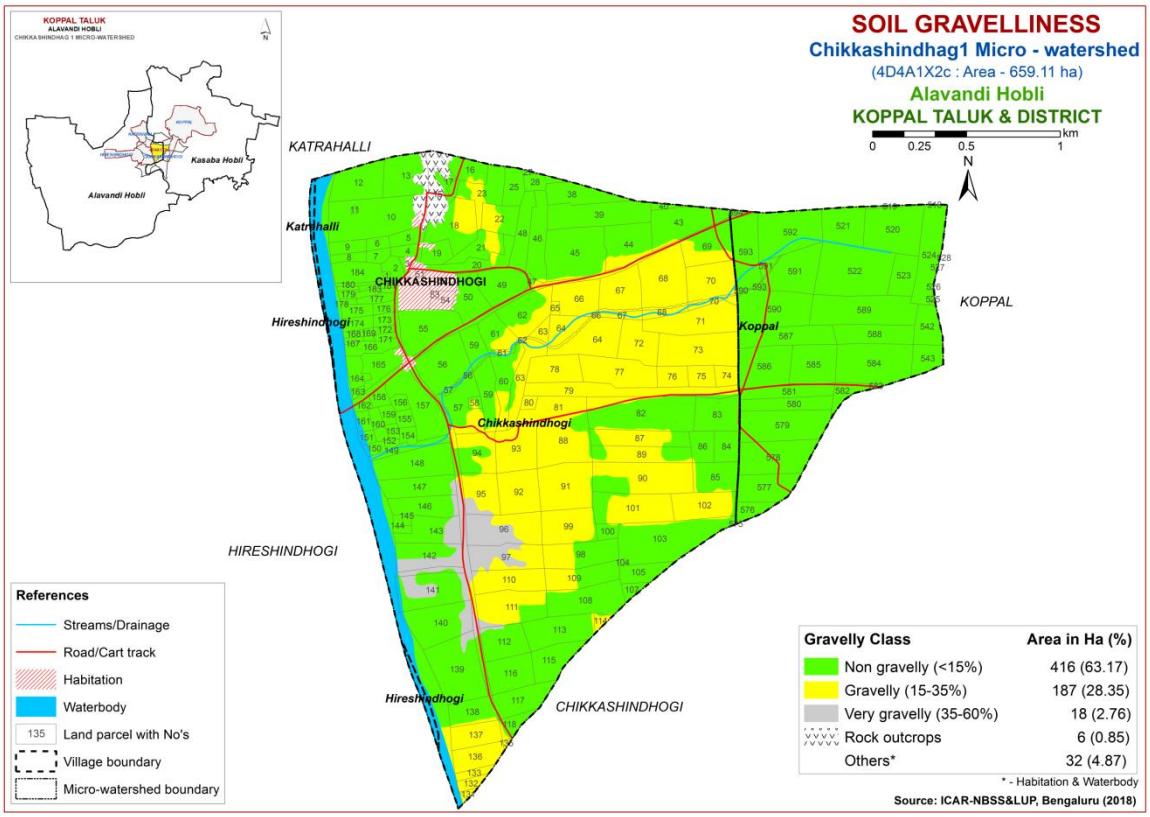


Fig. 5.4 Soil Gravelliness map of Chikkashindhag-1 Microwatershed

5.5 Available Water Capacity

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

Major area of about 355 ha (54%) has soils that are low (50-100 mm/m) in available water capacity and distributed in the major part of the microwatershed. An area of about 168 ha (25%) is medium to high (101-200 mm/m) in available water capacity and occur in the central, southern, southwestern, western, northwestern, northern, northeastern and eastern part of the microwatershed. An area of about 99 ha (15%) is very high (>200 mm/m) in available water capacity and occur in the eastern and northeastern part of the microwatershed.

An area of about 355 ha (54%) 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 149 ha (23%) has soils that have very high potential (150->200 mm/m) with regard to available water capacity where all climatically adapted long duration crops can be grown successfully.

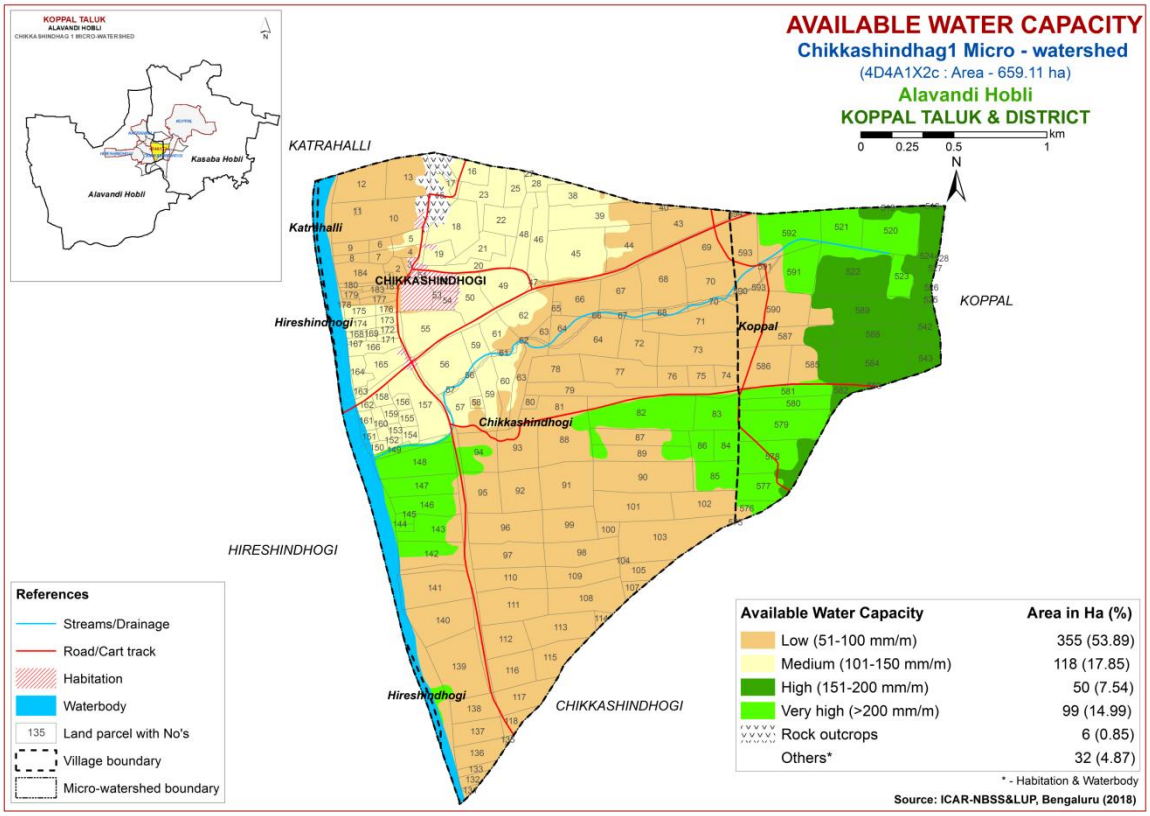


Fig. 5.5 Soil Available Water Capacity map of Chikkashindhag-1 Microwatershed

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 93 ha (14%) falls under nearly level (0-1% slope) lands and distributed in the northern and eastern part of the microwatershed. Maximum area of about 528 ha (80%) falls under very gently sloping (1-3% slope) lands and distributed in the major part of the microwatershed.

Entire area 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.

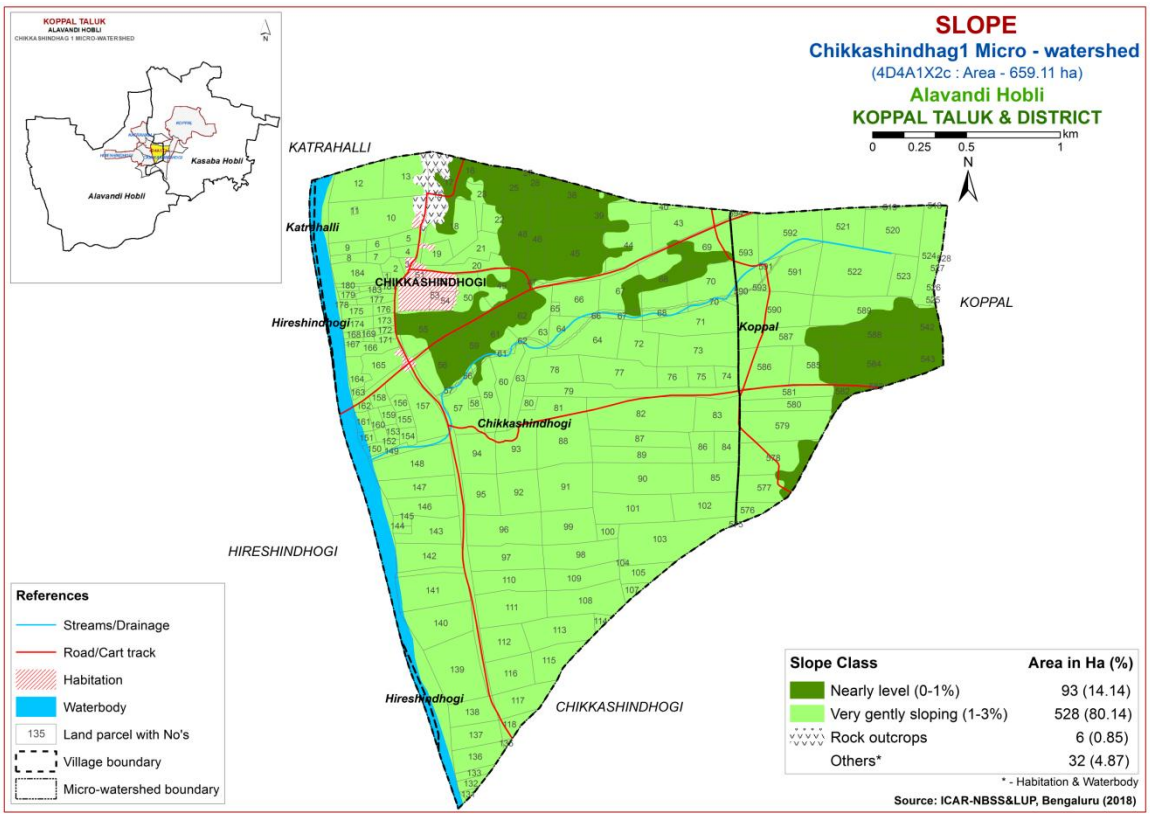


Fig. 5.6 Soil Slope map of Chikkashindhag-1 Microwatershed

5.7 Soil Erosion

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

Soils that are slightly eroded (e1 class) cover a major area of 383 ha (58%) and distributed in the major part of the microwatershed. Soils that are moderately eroded (e2 class) cover an area of 239 ha (36%) and distributed in the central, southern, southeastern, eastern, northeastern, northern and northwestern part of the microwatershed.

An area of about 239 ha (36%) 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.

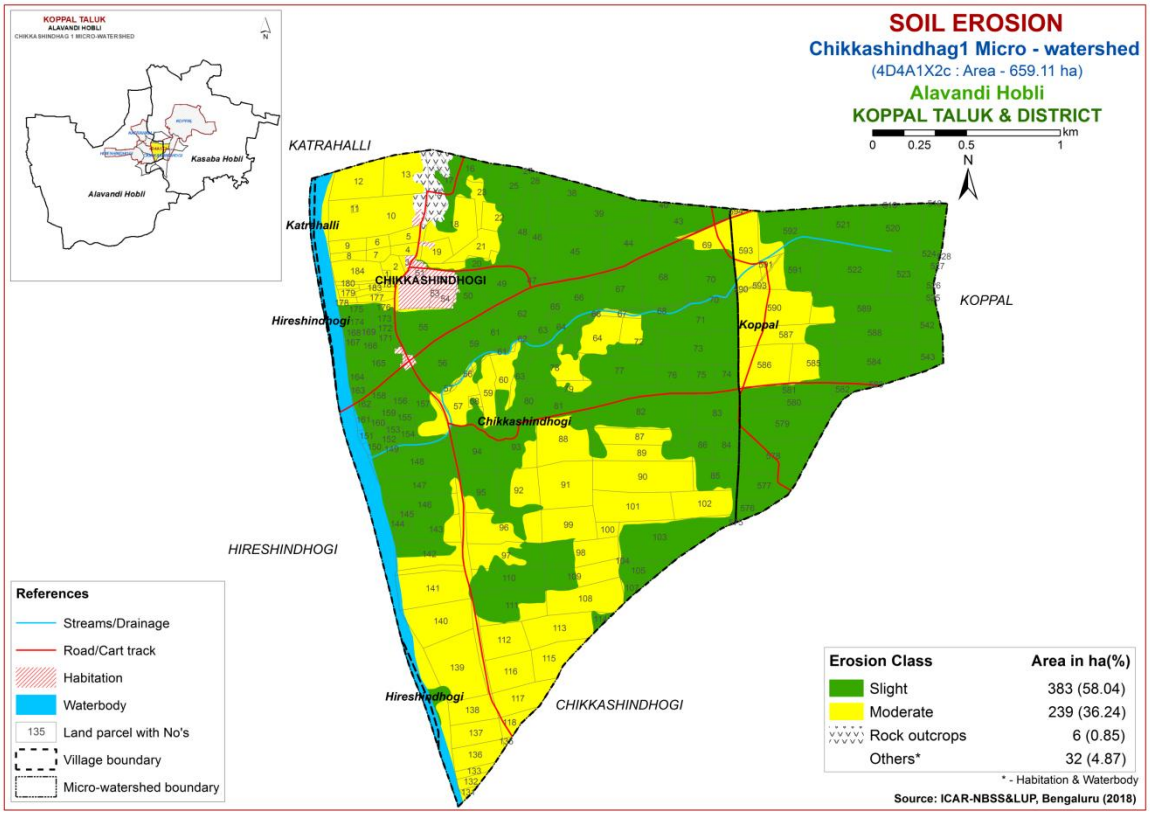


Fig. 5.7 Soil Erosion map of Chikkashindhag-1 Microwatershed

Chapter 6

FERTILITY STATUS

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

Soil fertility data generated has been assessed and individual maps for all the nutrients for the microwatershed have been generated using 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 Chikkashindhag-1 microwatershed for soil reaction (pH) showed that an area of about 351 ha (53%) is under moderately alkaline to strongly alkaline (pH 7.8-9.0) in soil reaction and occur in the major part of the microwatershed. Very strongly alkaline (pH 7.8-9.0) soils cover an area of about 271 ha (41%) and occur in the central, western, southern, northeastern and eastern part of the microwatershed (Fig.6.1). Thus, entire area of the microwatershed falls under alkaline 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 an area of about 62 ha (9%) and occur in the northwestern, western, southwestern and southern part of the microwatershed. Maximum area of about 559 ha (85%) is low (<0.5%) in organic carbon and distributed in the major part of the microwatershed (Fig.6.3).

6.4 Available Phosphorus

Major area of about 494 ha (75%) is medium (23-57 kg/ha) in available phosphorus and distributed in the major part of the microwatershed. Low (<23 kg/ha) in

available phosphorus cover an area of about 127 ha (19%) and distributed in the northeastern, eastern and southeastern part of the microwatershed (Fig 6.4).

6.5 Available Potassium

Maximum area of about 448 ha (68%) is medium (145-337 kg/ha) and distributed in the major part of the microwatershed. An area of about 174 ha (26%) is high (>337 kg/ha) and distributed in the northeastern, northwestern, western, southwestern and southern part of the microwatershed (Fig.6.5).

6.6 Available Sulphur

An area of about 192 ha (29%) is low (<10 ppm) in available sulpur and distributed in the northeastern, eastern, southeastern and southern part of the microwatershed. Maximum area of about 226 ha (34%) is medium (10-20 ppm) and occur in the central, northern, northeastern, southern, eastern and western part of the microwatershed. An area of about 204 ha (31%) is high (>20 ppm) and distributed in the northern, northwestern, western, southwestern and southern part of the microwatershed (Fig.6.6).

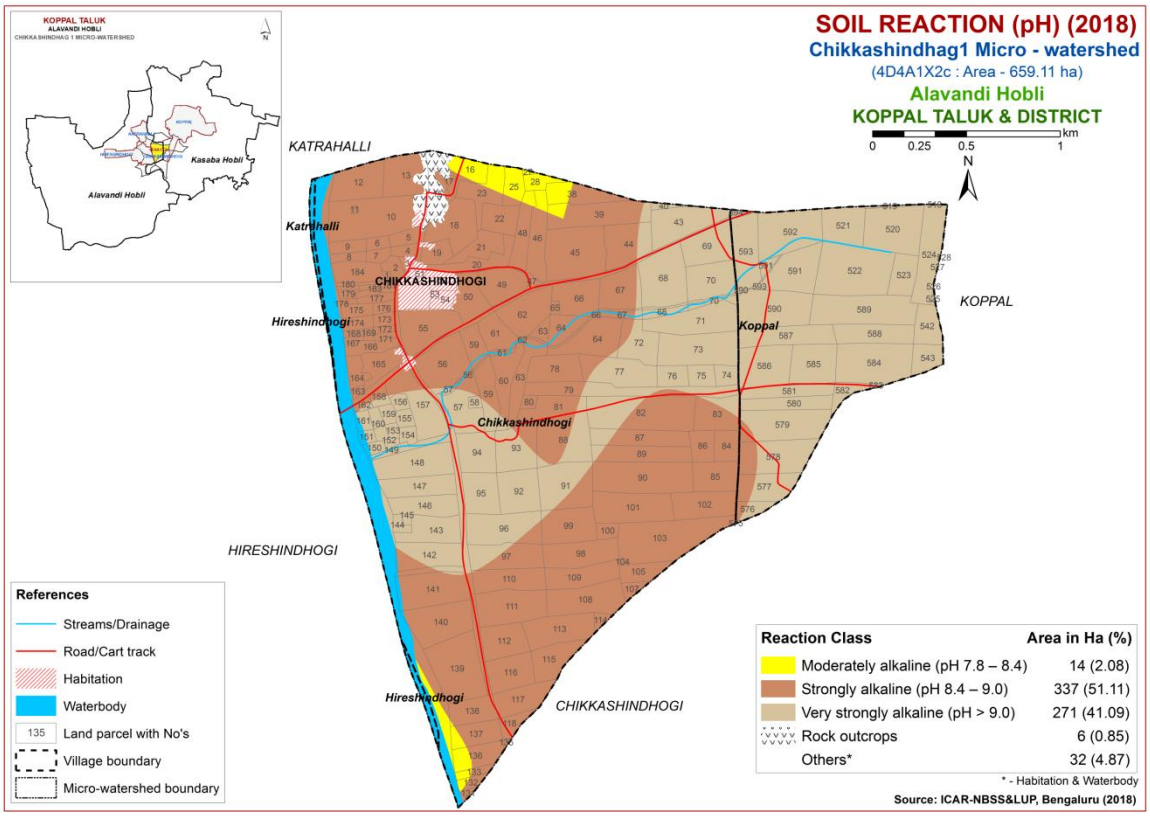


Fig.6.1 Soil Reaction (pH) map of Chikkashindhag-1 Microwatershed

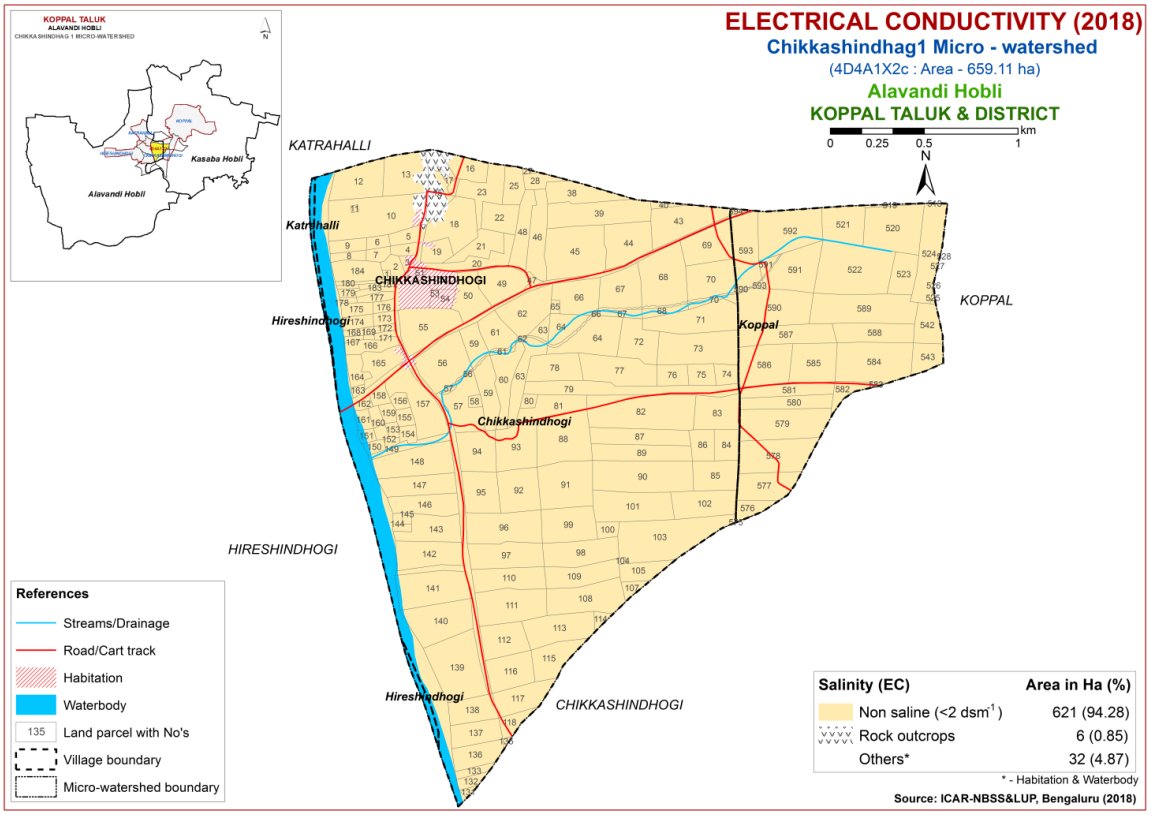


Fig.6.2 Electrical Conductivity (EC) map of Chikkashindhag-1 Microwatershed

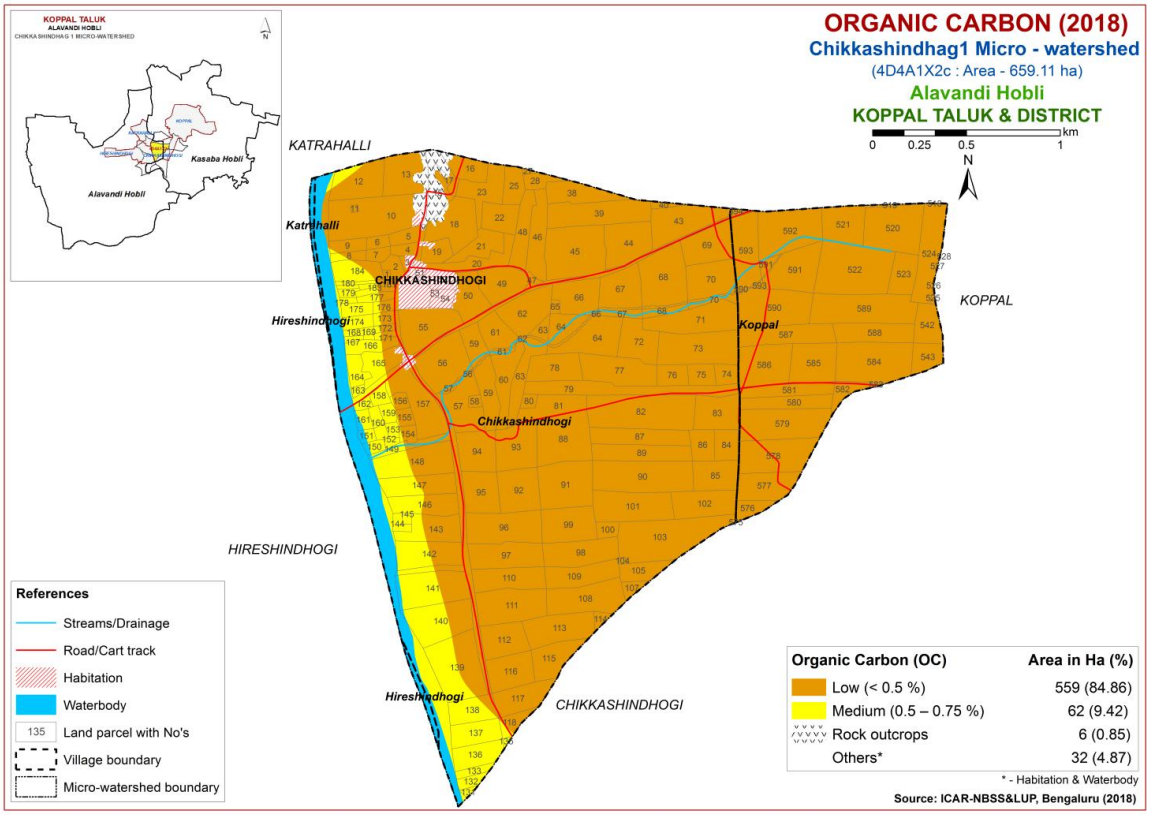


Fig.6.3 Soil Organic Carbon (OC) map of Chikkashindhag-1 Microwatershed

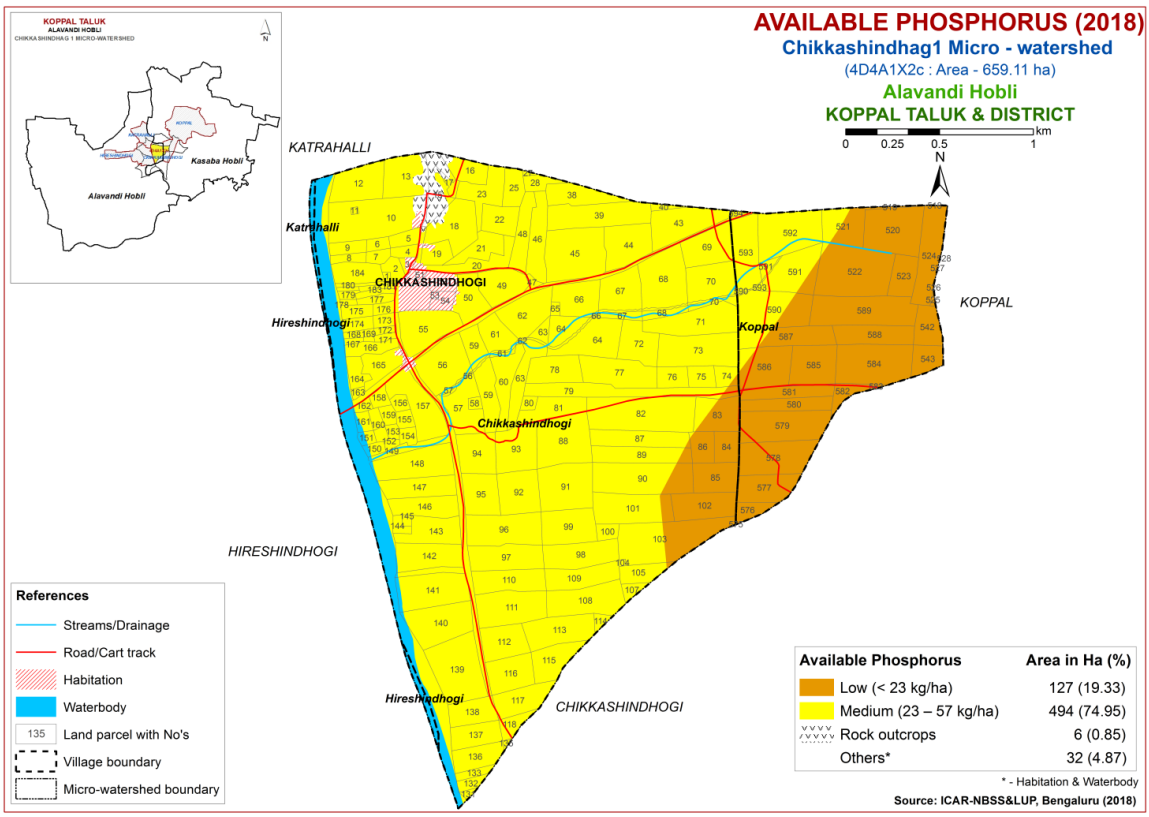


Fig.6.4 Soil Available Phosphorus map of Chikkashindhag-1 Microwatershed

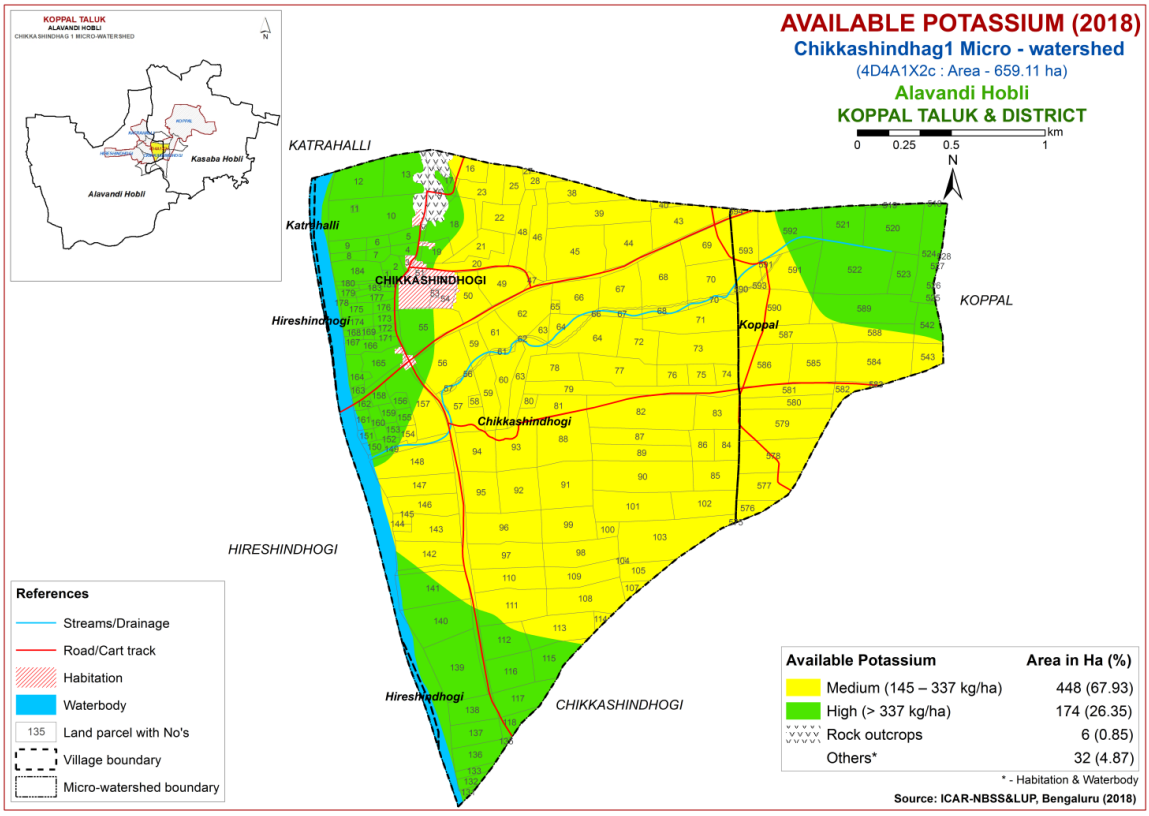


Fig.6.5 Soil Available Potassium map of Chikkashindhag-1 Microwatershed

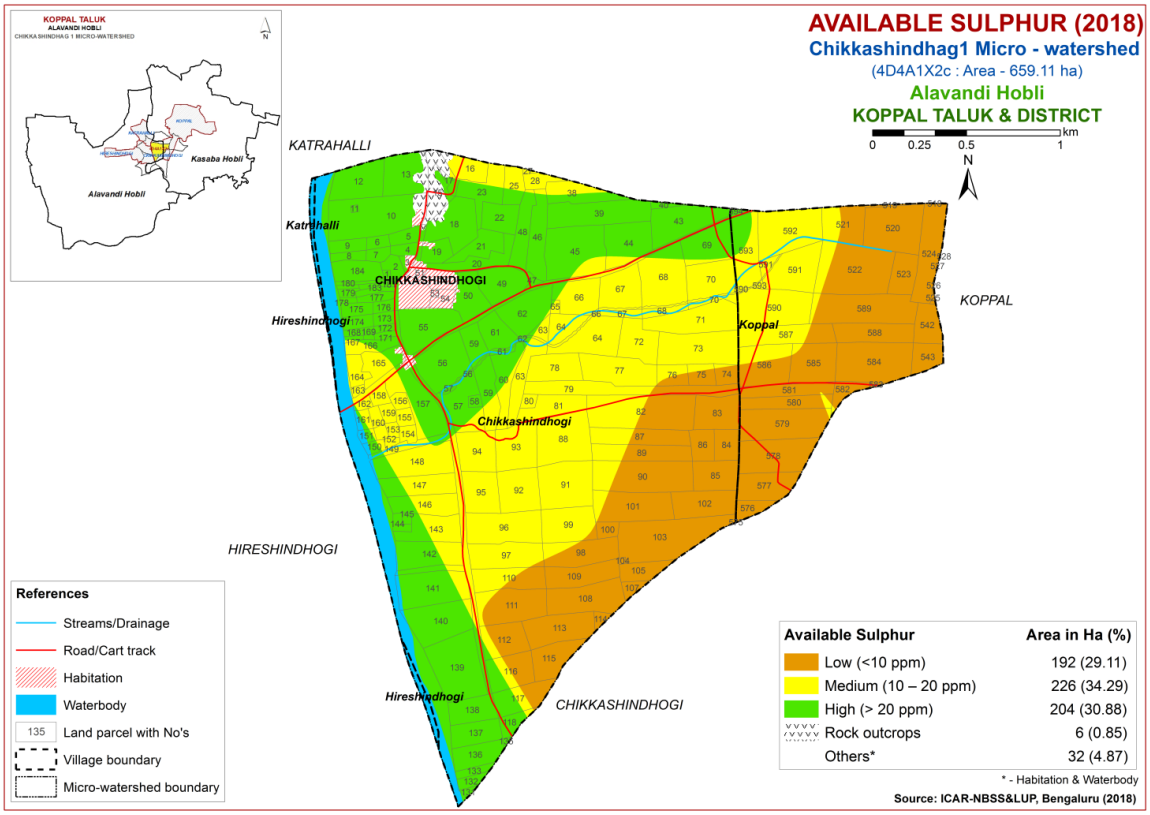


Fig.6.6 Soil Available Sulphur map of Chikkashindhag-1 Microwatershed

6.7 Available Boron

Available boron is low (<0.5 ppm) in 306 ha (46%) area and distributed in the central, northern, southeastern, eastern and northeastern part of the microwatershed. Maximum area of about 315 ha (48%) is medium (0.5-1.0 ppm) and occur in the northern, northeastern, eastern, southern, southwestern, western and northwestern part of the microwatershed (Fig.6.7).

6.8 Available Iron

Available iron content is sufficient (>4.5 ppm) in an area of about 32 ha (5%) and distributed in the northwestern and southern part of the microwatershed. Maximum area of about 590 ha (89%) is deficient (<4.5 ppm) and distributed in the major 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).

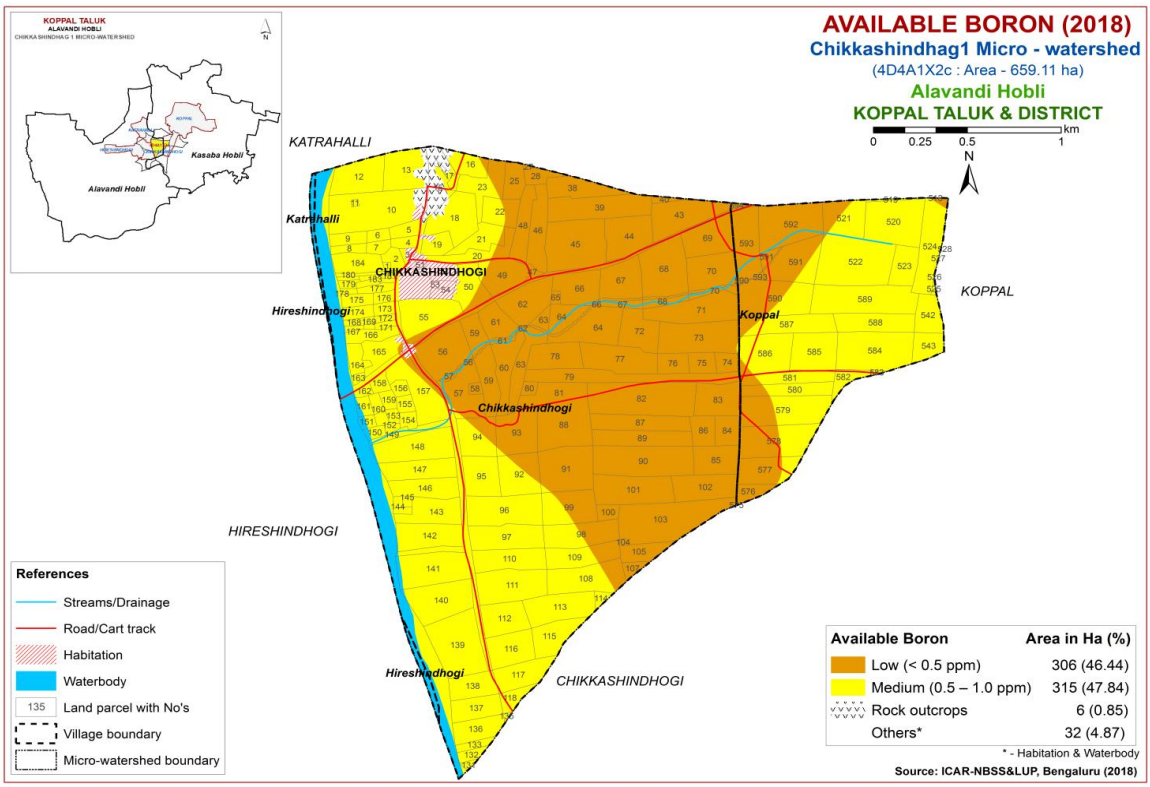


Fig.6.7 Soil Available Boron map of Chikkashindhag-1 Microwatershed

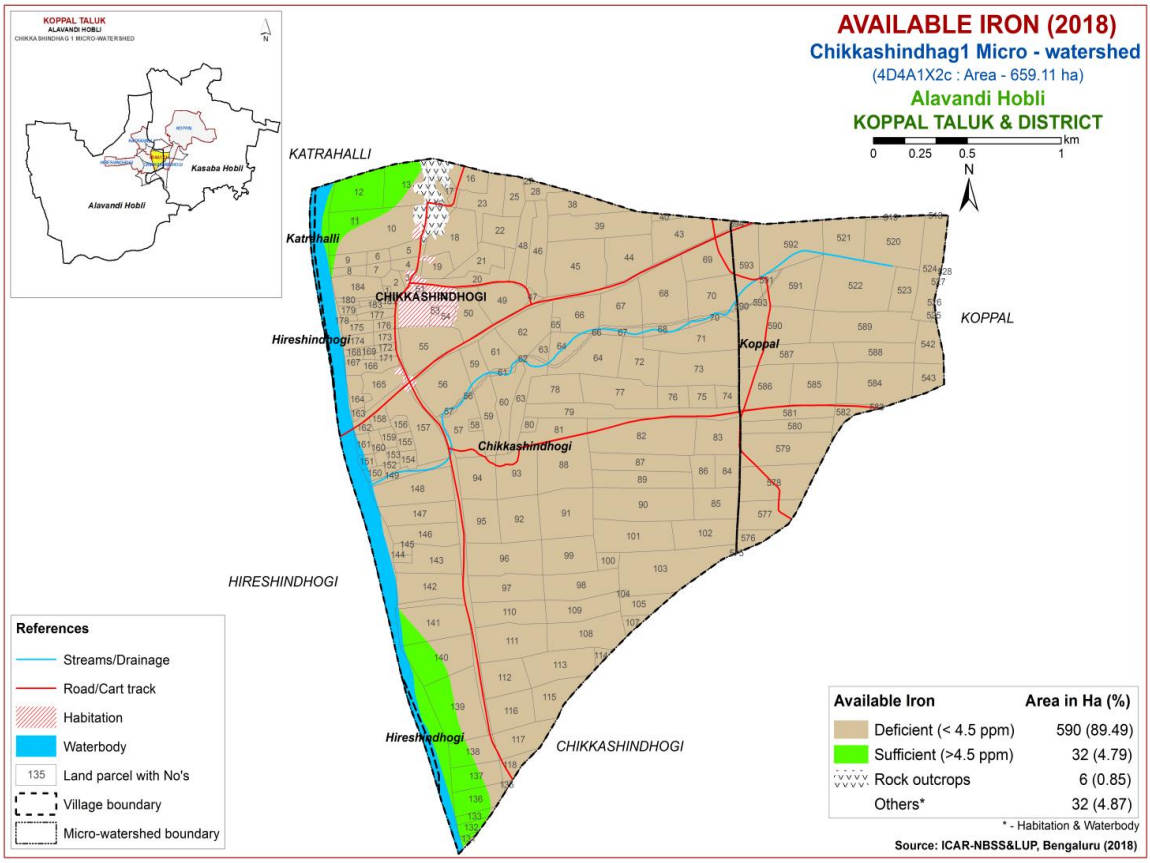


Fig.6.8 Soil Available Iron map of Chikkashindhag-1 Microwatershed

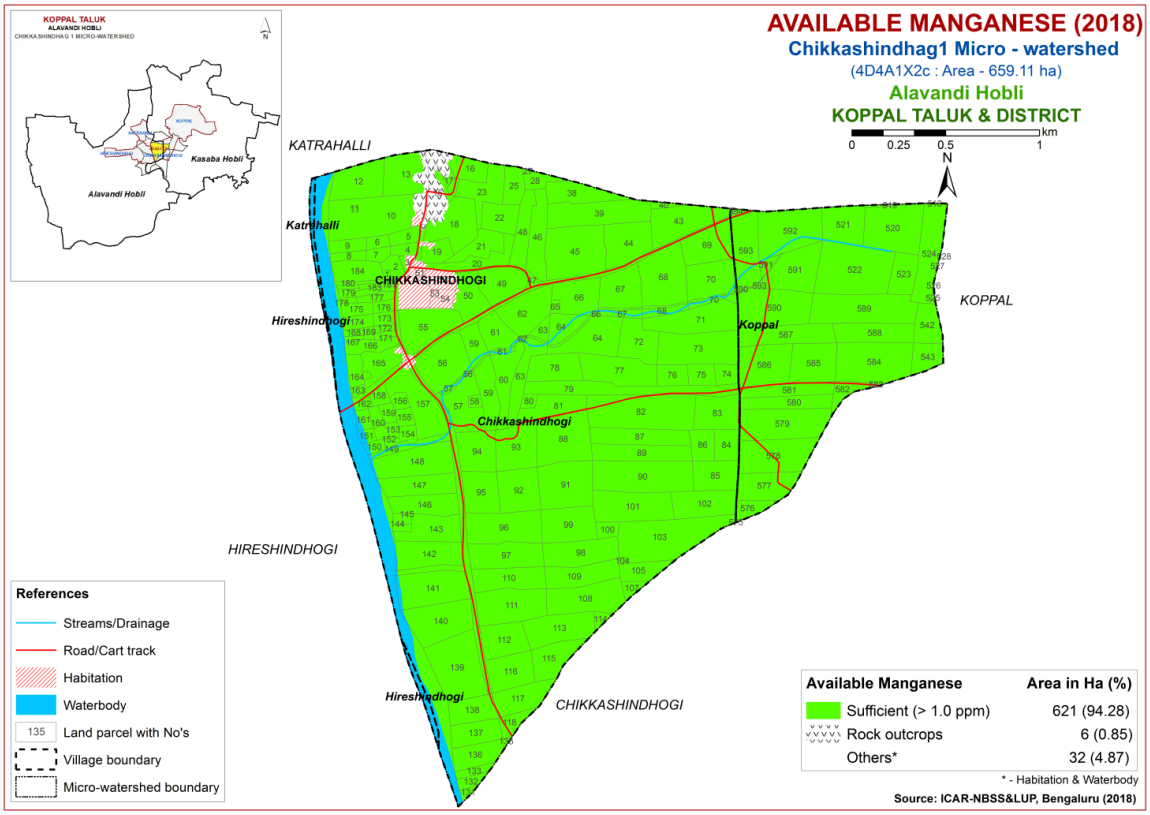


Fig.6.9 Soil Available Manganese map of Chikkashindhag-1 Microwatershed

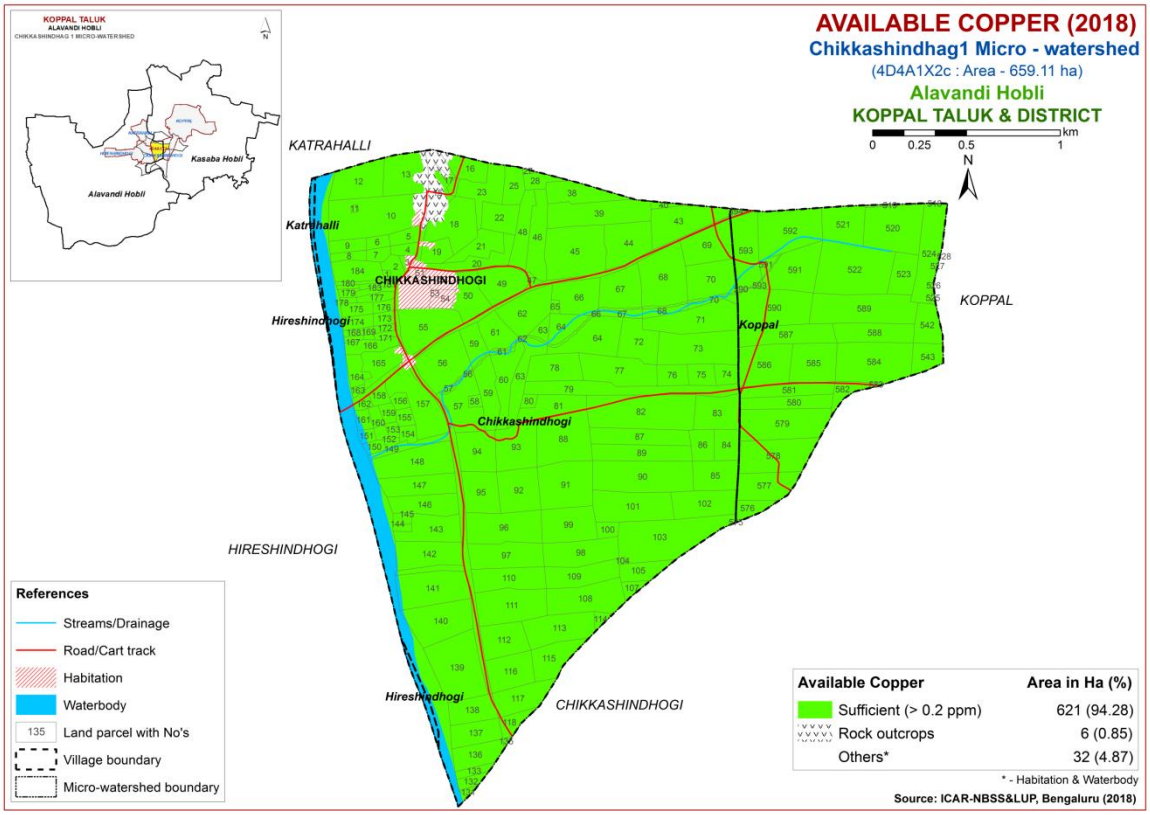


Fig.6.10 Soil Available Copper map of Chikkashindhag-1 Microwatershed

6.11 Available Zinc

Available zinc content is deficient (<0.6 ppm) in a major area of about 532 ha (81%) and distributed in the major part of the microwatershed. An area of about 89 ha (14%) is sufficient (>0.6 ppm) and distributed in the northwestern and southern part of the microwatershed (Fig 6.11).

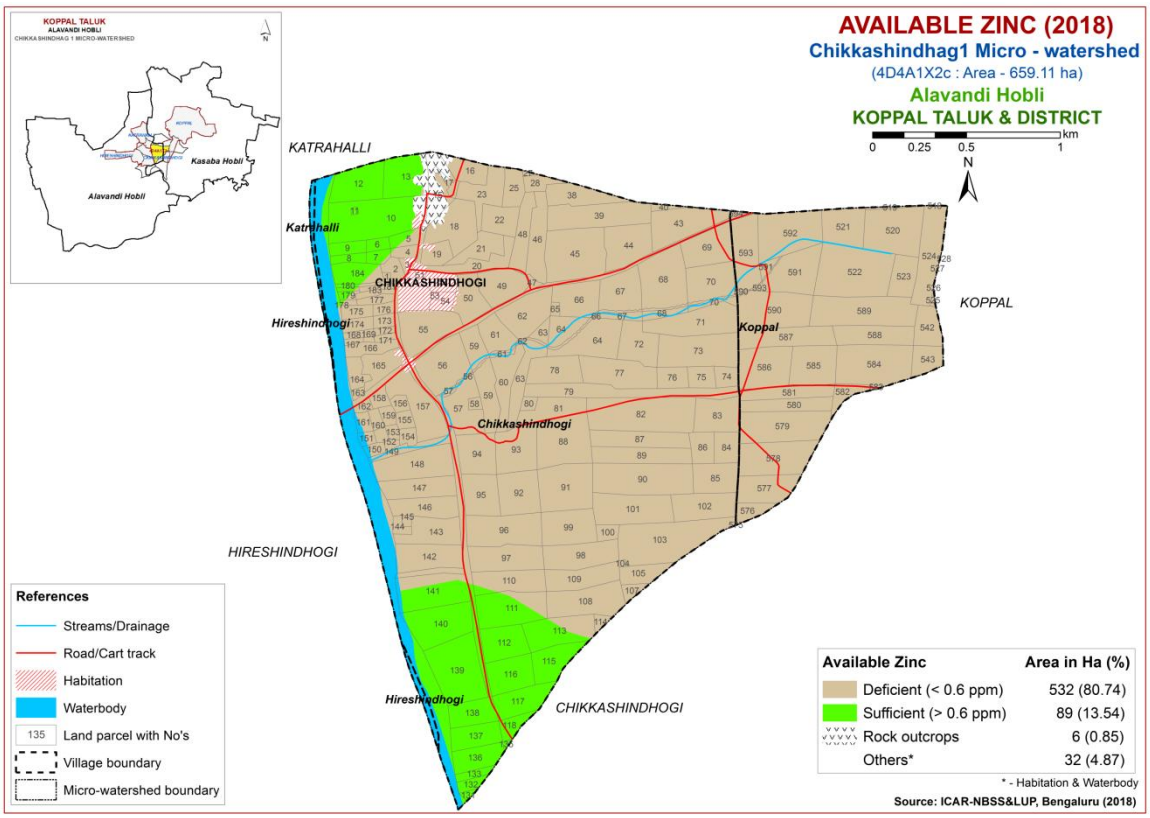


Fig.6.11 Soil Available Zinc map of Chikkashindhag-1 Microwatershed

Chapter 7

LAND SUITABILITY FOR MAJOR CROPS

The soil and land resource units (soil phases) of Chikkashindhag-1 Microwatershed were assessed for their suitability for growing food, fodder, fibre and other horticulture crops by following the procedure as outlined in FAO, 1976 and 1983. Crop requirements were developed for each of the crop from the available research data and also by referring to Naidu *et. al.* (2006) and Natarajan *et. al* (2015). The soil and land characteristics (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.

An area of about 101 ha (15%) area is highly suitable (Class S1) for growing sorghum and occur in the southern, northern, northwestern and western part of the microwatershed. Maximum area of about 362 ha (55%) is moderately suitable (Class S2)

for growing sorghum and distributed in the major part of the microwatershed. They have minor limitations of rooting depth, gravelliness, calcareousness and nutrient availability. An area of about 159 ha (24%) is marginally suitable (Class S3) for growing sorghum and occur in the central, southern, northern, northeastern and eastern part of the microwatershed with moderate limitations of rooting depth and calcareousness.

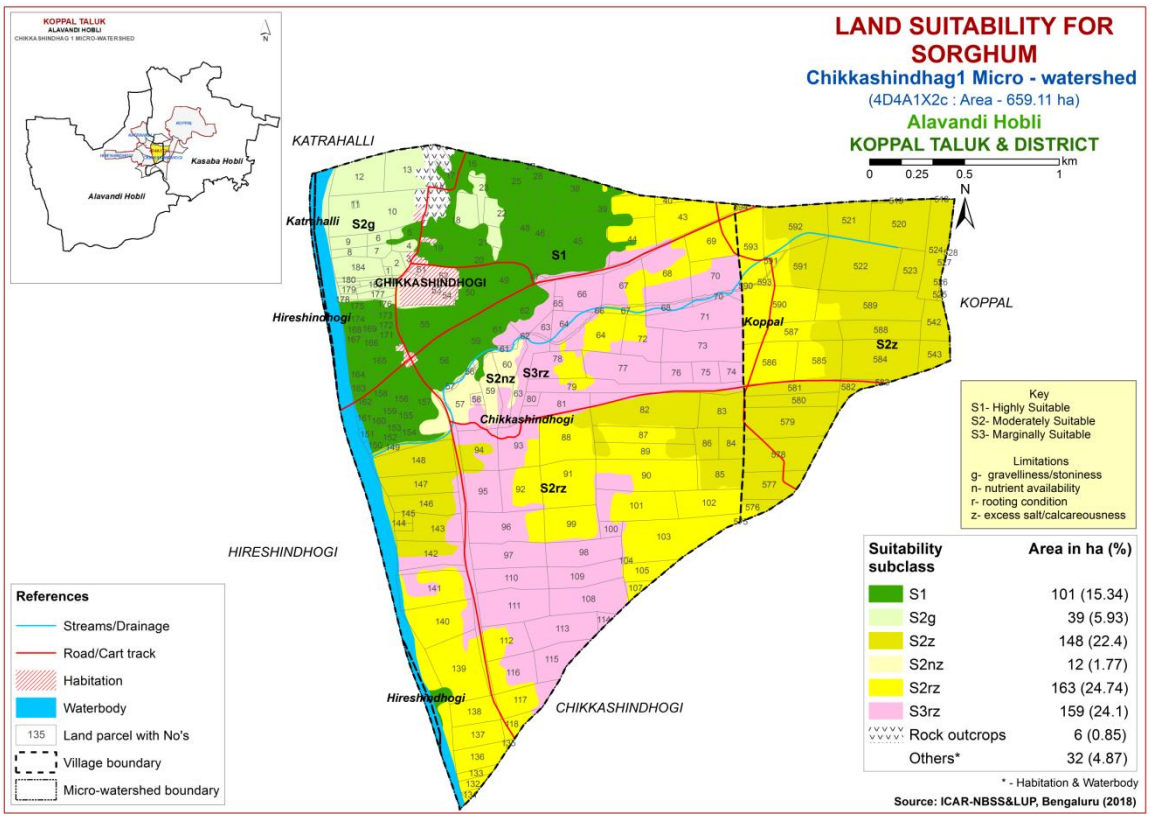


Fig. 7.1 Land Suitability map of Sorghum

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.

Maximum area of about 462 ha (70%) is moderately suitable (Class S2) for growing maize and distributed in the major part of the microwatershed with minor limitations of texture, calcareousness and gravelliness. An area of about 159 ha (24%) is marginally suitable (Class S3) for growing maize and occur in the central, southern, northern, northeastern and eastern part of the microwatershed with moderate limitations of texture and calcareousness.

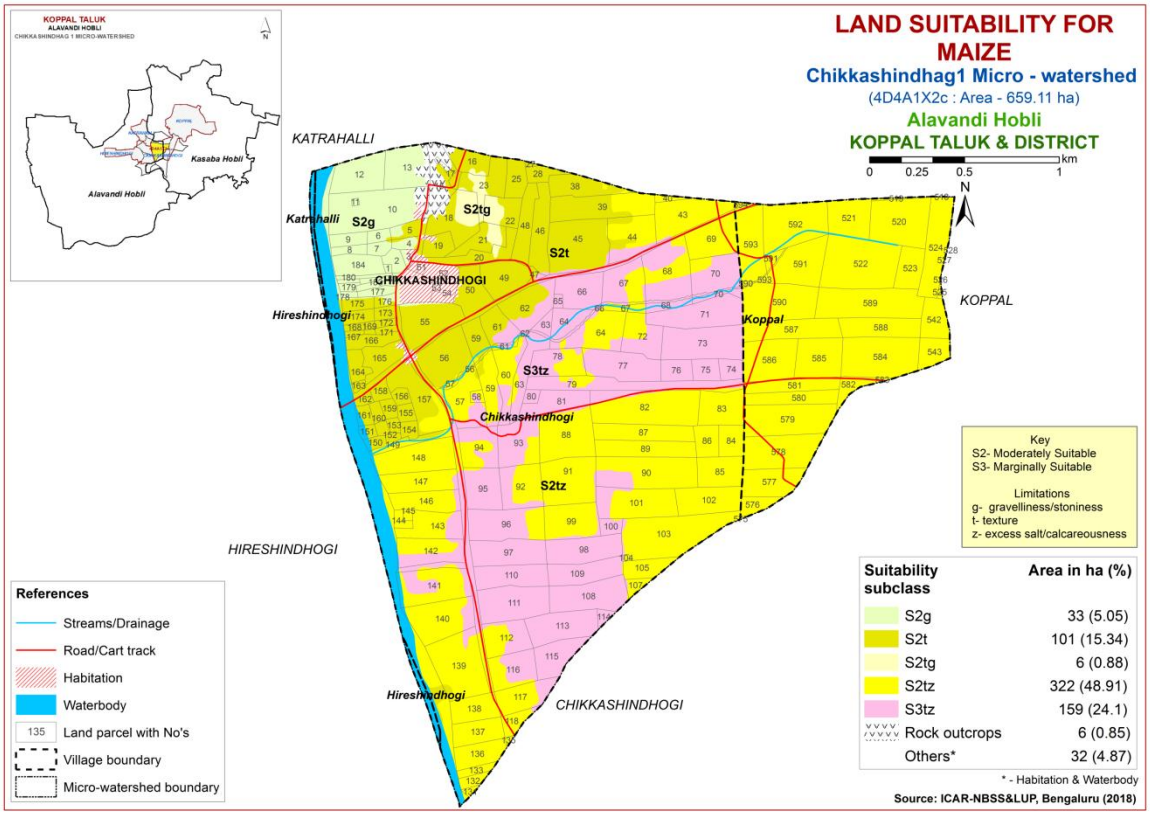


Fig. 7.2 Land Suitability map of Maize

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 139 ha (21%) is highly suitable (Class S1) for growing bajra and distributed in the northern, western and northwestern part of the microwatershed. Maximum area of about 323 ha (49%) is moderately suitable (Class S2) for growing bajra and distributed in the central, northeastern, eastern, southeastern, southern and southwestern part of the microwatershed with minor limitations of texture and calcareousness. An area of about 159 ha (24%) is marginally suitable (Class S3) for growing bajra and distributed in the central, southern, northern, northeastern and eastern part of the microwatershed with moderate limitations of rooting depth and calcareousness.

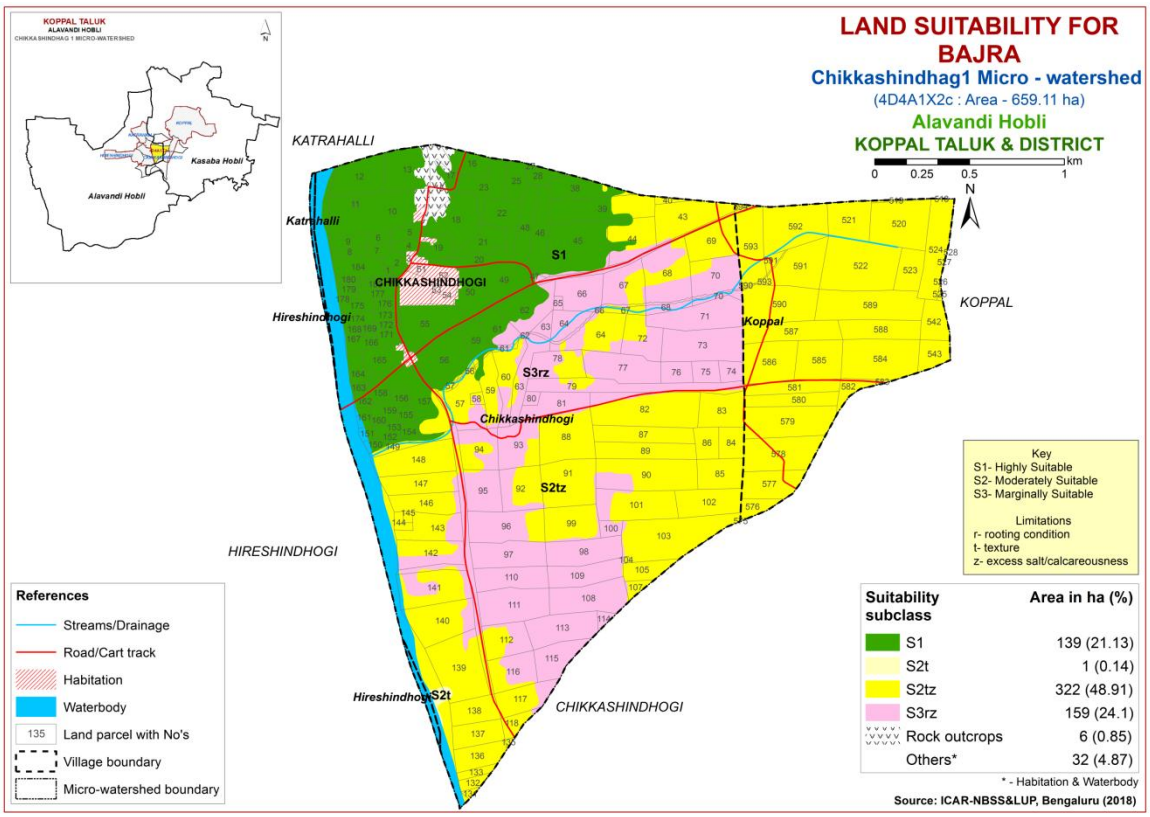


Fig. 7.3 Land Suitability map of Bajra

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 33 ha (5%) is highly suitable (Class S1) for growing groundnut and distributed in the northwestern part of the microwatershed. An area of about 106 ha (16%) is moderately suitable (Class S2) for growing groundnut and distributed in the northern, northwestern and western part of the microwatershed. They have minor limitation of texture. Maximum area of about 482 ha (73%) is marginally suitable (Class S3) for growing groundnut and distributed in the major part of the microwatershed with moderate limitations of texture and calcareousness.

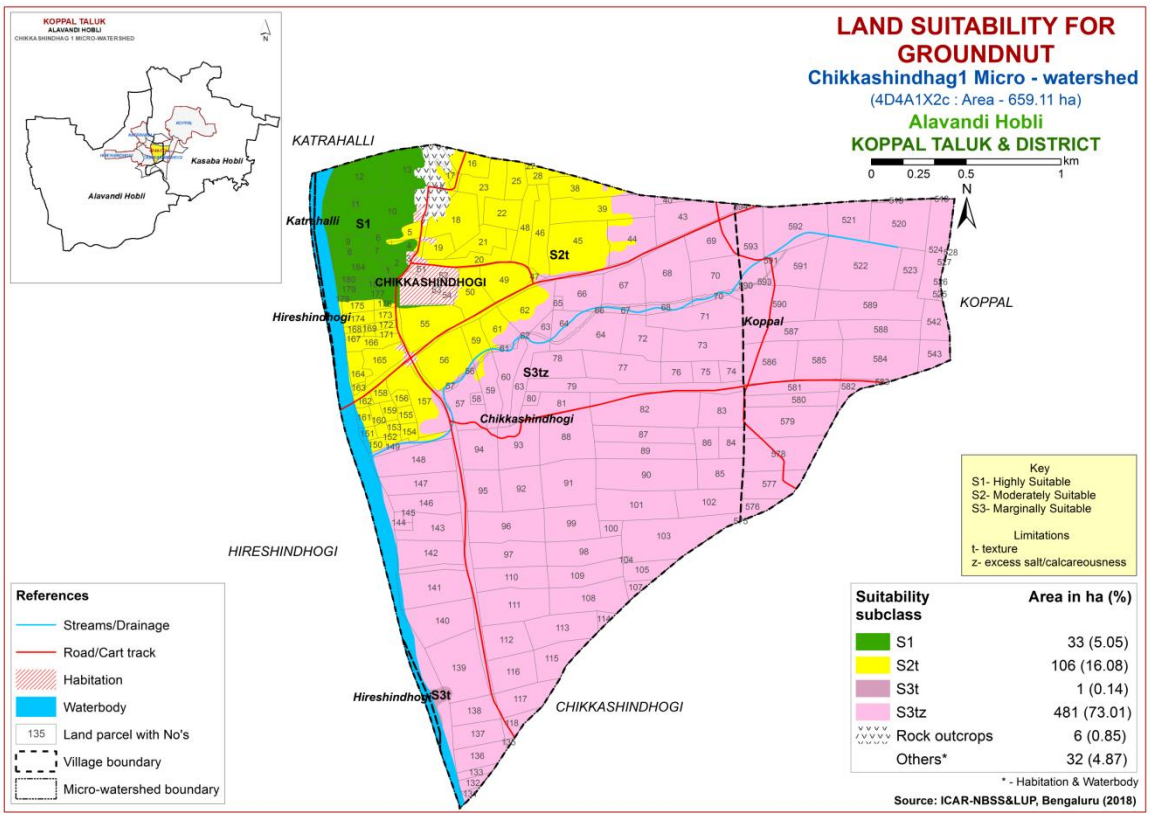


Fig. 7.4 Land Suitability map of Groundnut

7.5 Land Suitability for Sunflower (*Helianthus annus*)

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

An area of about 1 ha (<1%) is highly suitable (Class S1) for growing sunflower and distributed in the southern part of the microwatershed. Maximum area of about 299 ha (45%) is moderately suitable (Class S2) for growing sunflower and distributed in the central, southwestern, western, northwestern, northern, northeastern and eastern part of the microwatershed with minor limitations of gravelliness, rooting depth and calcareousness. An area of about 163 ha (25%) is marginally suitable (Class S3) for growing sunflower and occur in the central, northeastern, eastern, southeastern and southern part of the microwatershed with moderate limitations of calcareousness and rooting depth. An area of about 159 ha (24%) is currently not suitable (Class N1) for growing sunflower with severe limitations of rooting depth and calcareousness and occur in the central, northern, northeastern, eastern and southern part of the microwatershed.

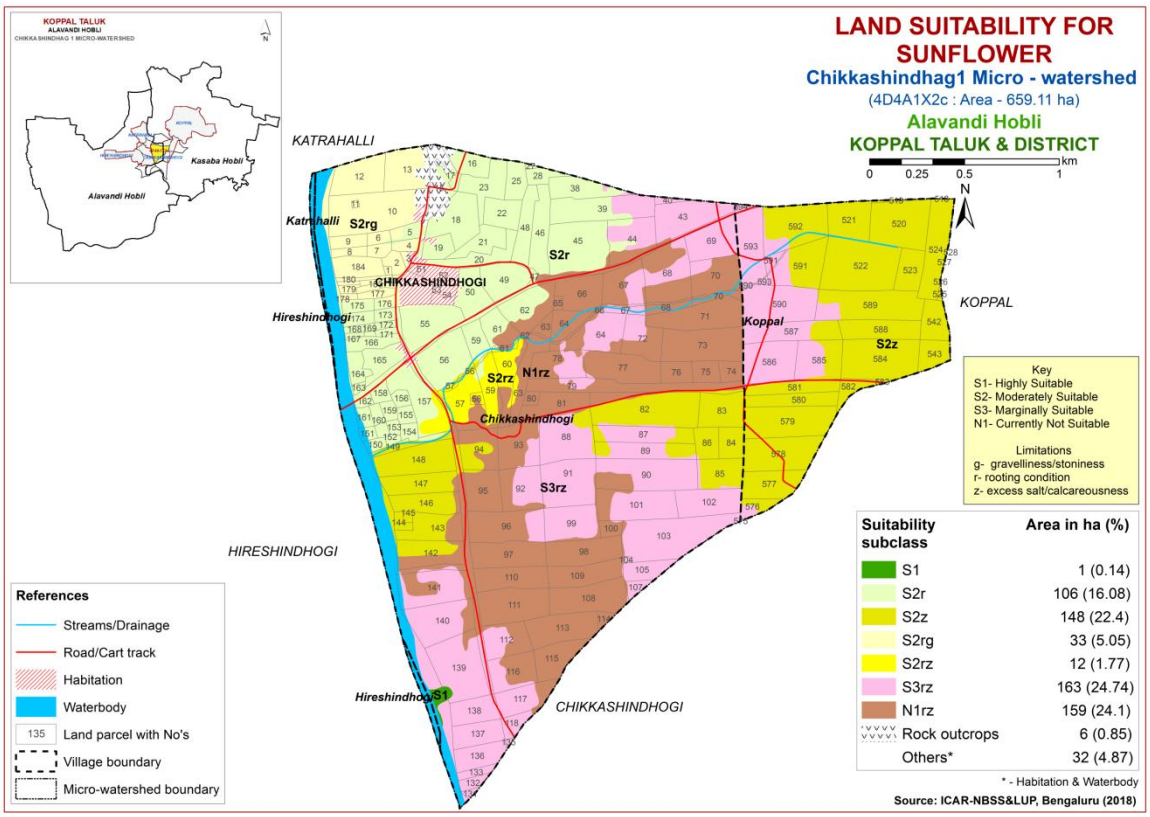


Fig. 7.5 Land Suitability map of Sunflower

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 1 ha (<1%) is highly (Class S1) suitable for growing cotton and occur in the southern part of the microwatershed. Maximum area of about 463 ha (70%) is moderately suitable (Class S2) for growing cotton and distributed in the major part of the microwatershed with minor limitations of gravelliness, calcareousness and rooting depth. An area of about 159 ha (24%) is marginally suitable (Class S3) for growing cotton and occur in the central, northern, northeastern, eastern and southern part of the microwatershed with moderate limitations of rooting depth and calcareousness.

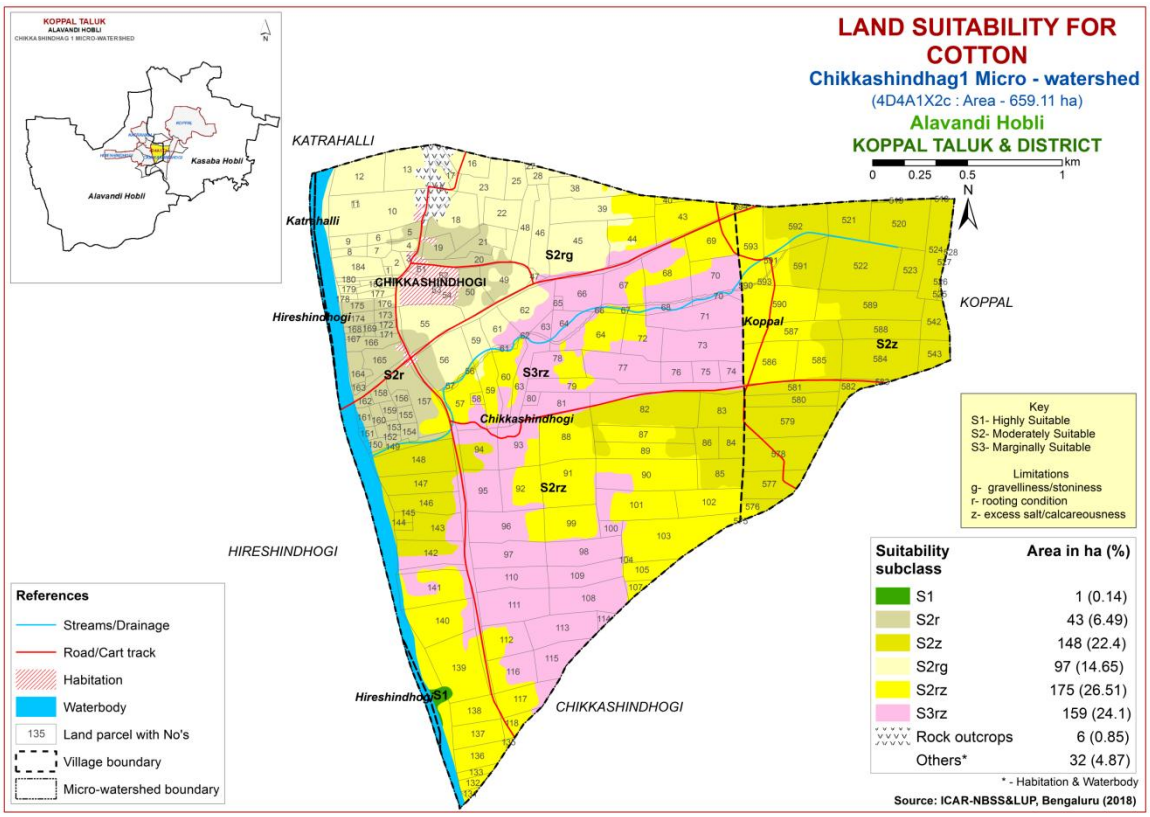


Fig. 7.6 Land Suitability map of Cotton

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 289 ha (44%) is moderately suitable (Class S2) for growing red gram and occur in the central, southwestern, western, northwestern, northern, northeastern, southern and eastern part of the microwatershed. They have minor limitations of texture, rooting depth, calcareousness and gravelliness. An area of about 175 ha (27%) is marginally suitable (Class S3) for growing red gram and distributed in the central, northeastern, eastern, southeastern and southern part of the microwatershed with moderate limitations of rooting depth and calcareousness. An area of about 159 ha (24%) is currently not suitable (Class N1) for growing red gram and occur in the central, northern, northeastern, eastern and southern part of the microwatershed with severe limitations of rooting depth and calcareousness.

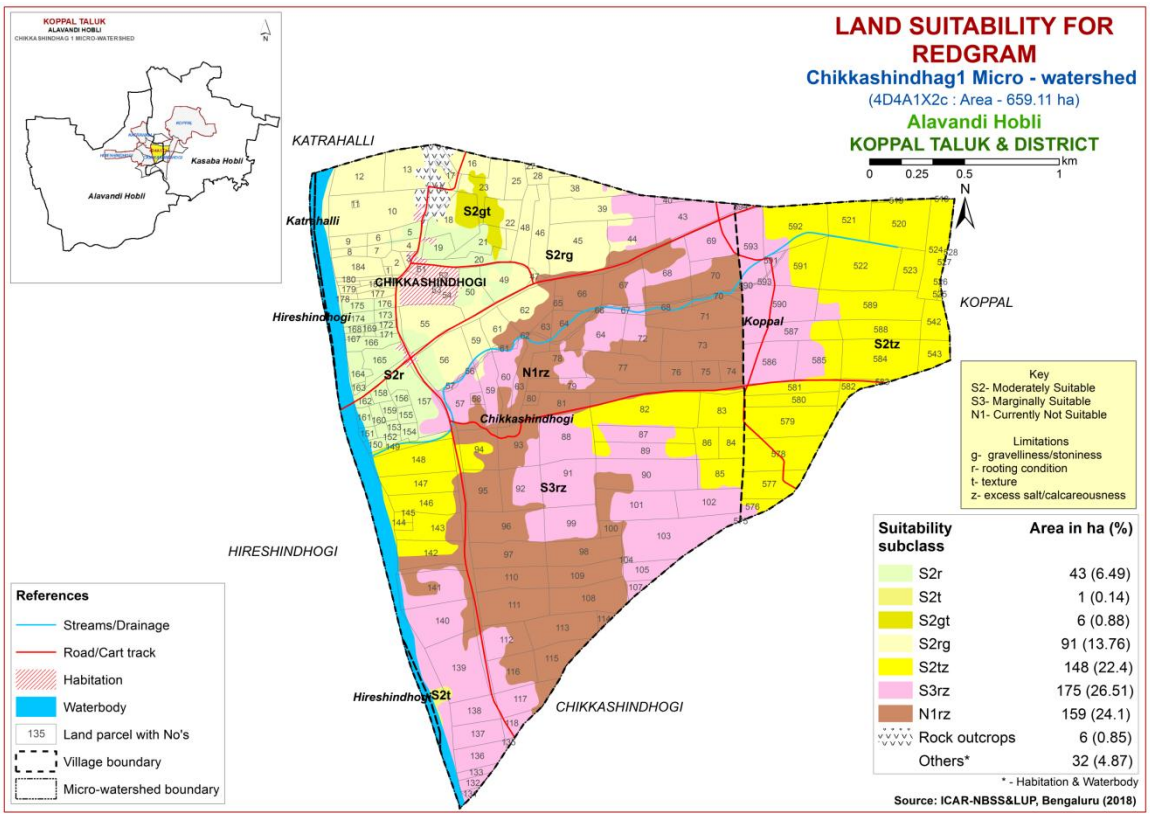


Fig. 7.7 Land Suitability map of Red gram

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.

Highly suitable (Class S1) lands for growing Bengal gram occur in an area of 1 ha (<1%) and distributed in the southern part of the microwatershed. Maximum area of about 462 ha (70%) is moderately suitable (Class S2) for growing Bengal gram and distributed in the major part of the microwatershed. They have minor limitations of rooting depth, gravelliness, calcareousness and texture. An area of about 159 ha (24%) is marginally suitable (Class S3) for growing Bengal gram and occur in the central, northern, northeastern, eastern and southern part of the microwatershed with moderate limitations of rooting depth and calcareousness.

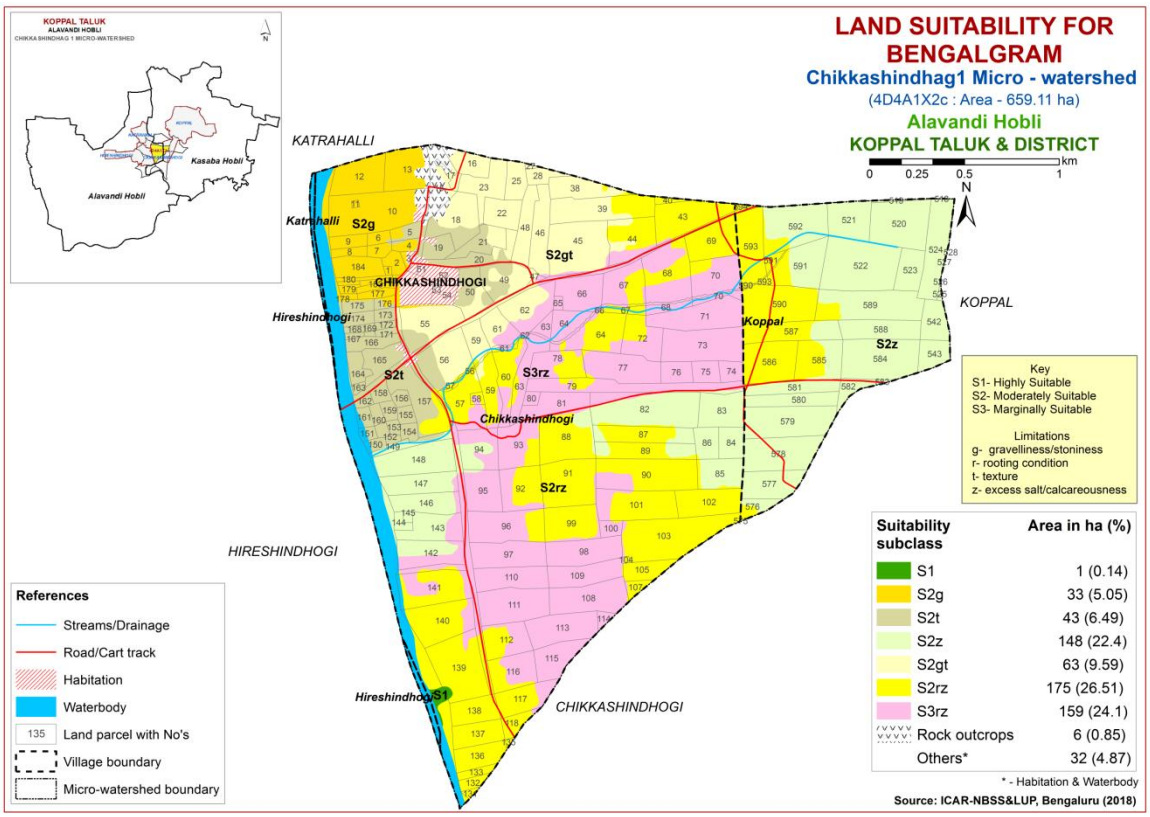


Fig. 7.8 Land Suitability map of Bengal gram

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 106 ha (16%) is highly suitable (Class S1) for growing chilli and distributed in the northern, northwestern and western part of the microwatershed. An area of about 33 ha (5%) is moderately suitable (Class S2) for growing chilli and distributed in the northwestern part of the microwatershed with minor limitation of gravelliness. Major area of about 482 ha (73%) is marginally suitable (Class S3) for growing chilli and occur in the major part of the microwatershed with moderate limitations of texture, rooting depth and calcareousness.

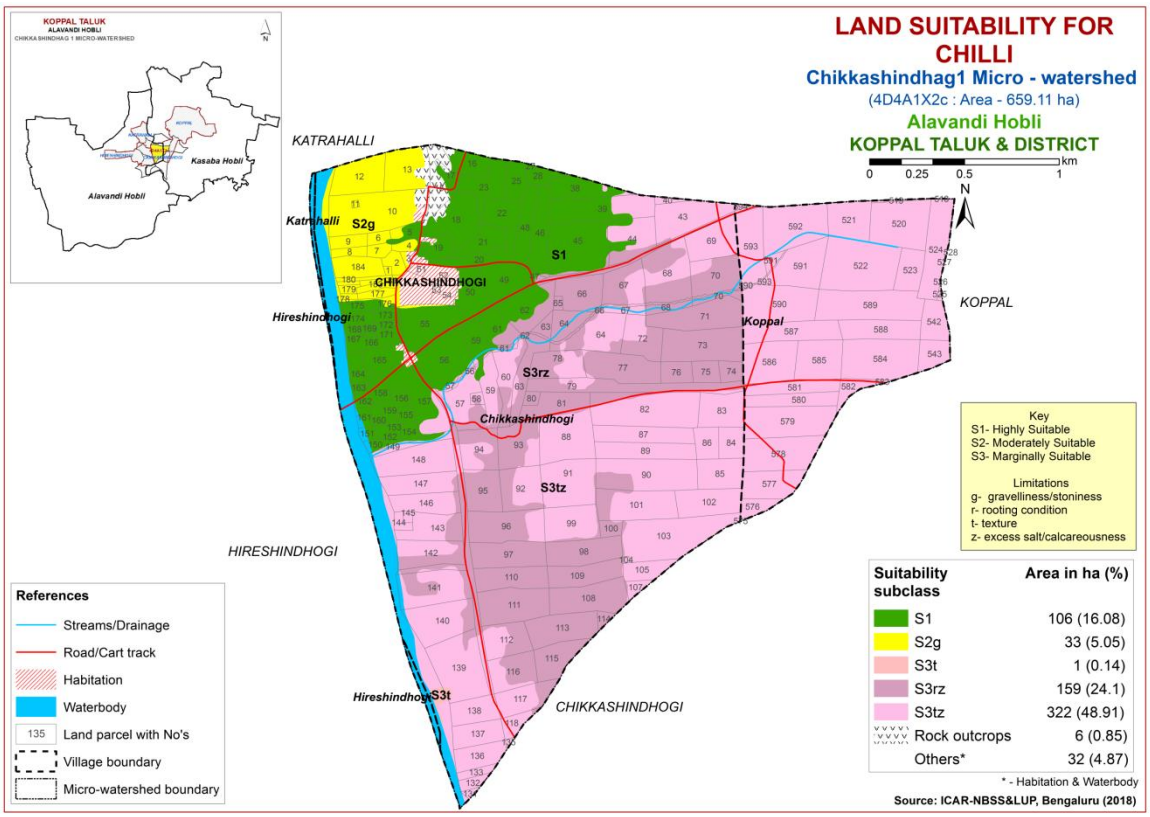


Fig. 7.9 Land Suitability map of Chilli

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 106 ha (16%) is highly suitable (Class S1) for growing tomato and distributed in the northwestern, northern and western part of the microwatershed. An area of about 33 ha (5%) is moderately suitable (Class S2) for growing tomato and distributed in the northwestern part of the microwatershed with minor limitation of gravelliness. Major area of about 482 ha (73%) is marginally suitable (Class S3) for growing tomato and occur in the major part of the microwatershed with moderate limitations of texture, rooting depth and calcareousness.

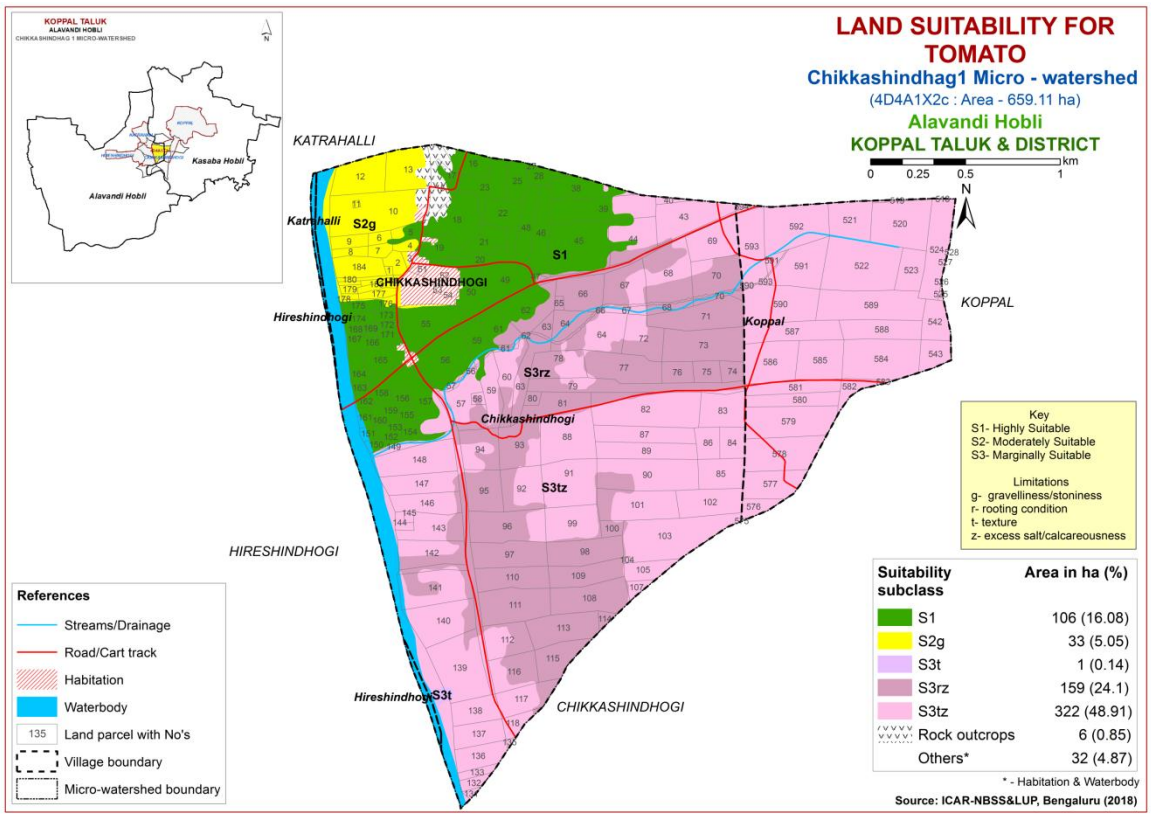


Fig. 7.10 Land Suitability map of Tomato

7.11 Land Suitability for Brinjal (*Solanum melongena*)

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

Highly suitable (Class S1) lands for growing brinjal occur in an area of 139 ha (21%) and distributed in the northern, northwestern and western part of the microwatershed. Maximum area of about 323 ha (49%) is moderately suitable (Class S2) for brinjal and distributed in the central, northeastern, eastern, southeastern, southern and southwestern part of the microwatershed. They have minor limitations of rooting depth, calcareousness and texture. An area about of 159 ha (24%) is marginally suitable (Class S3) and distributed in the central, northern, northeastern, eastern and southern part of the microwatershed with moderate limitation of rooting depth.

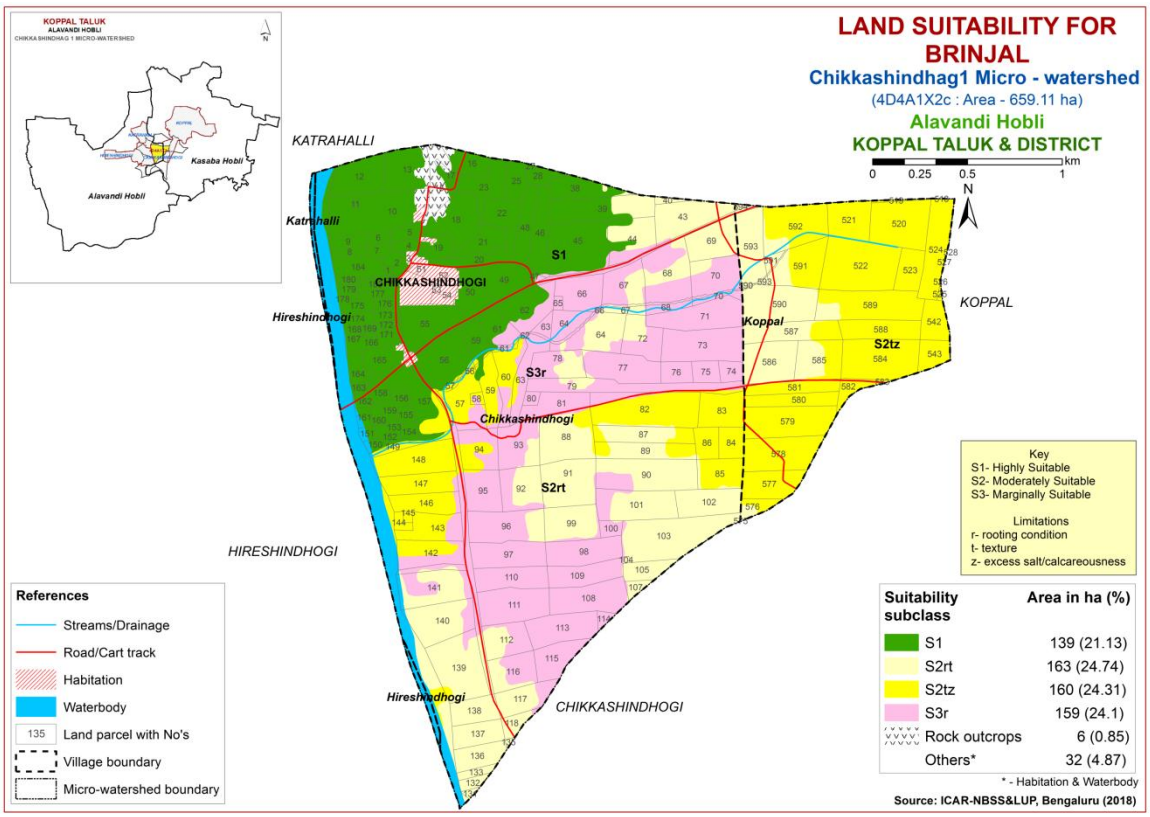


Fig 7.11 Land Suitability map of Brinjal

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

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

Highly suitable (Class S1) lands for growing onion occur in an area of 33 ha (5%) and distributed in the northwestern part of the microwatershed. An area of about 106 ha (16%) is moderately suitable (Class S2) for onion and distributed in the western, northwestern and northern part of the microwatershed. They have minor limitation of texture. Major area of about 482 ha (73%) is marginally suitable (Class S3) and distributed in the major part of the microwatershed with moderate limitations of rooting depth, calcareousness and texture.

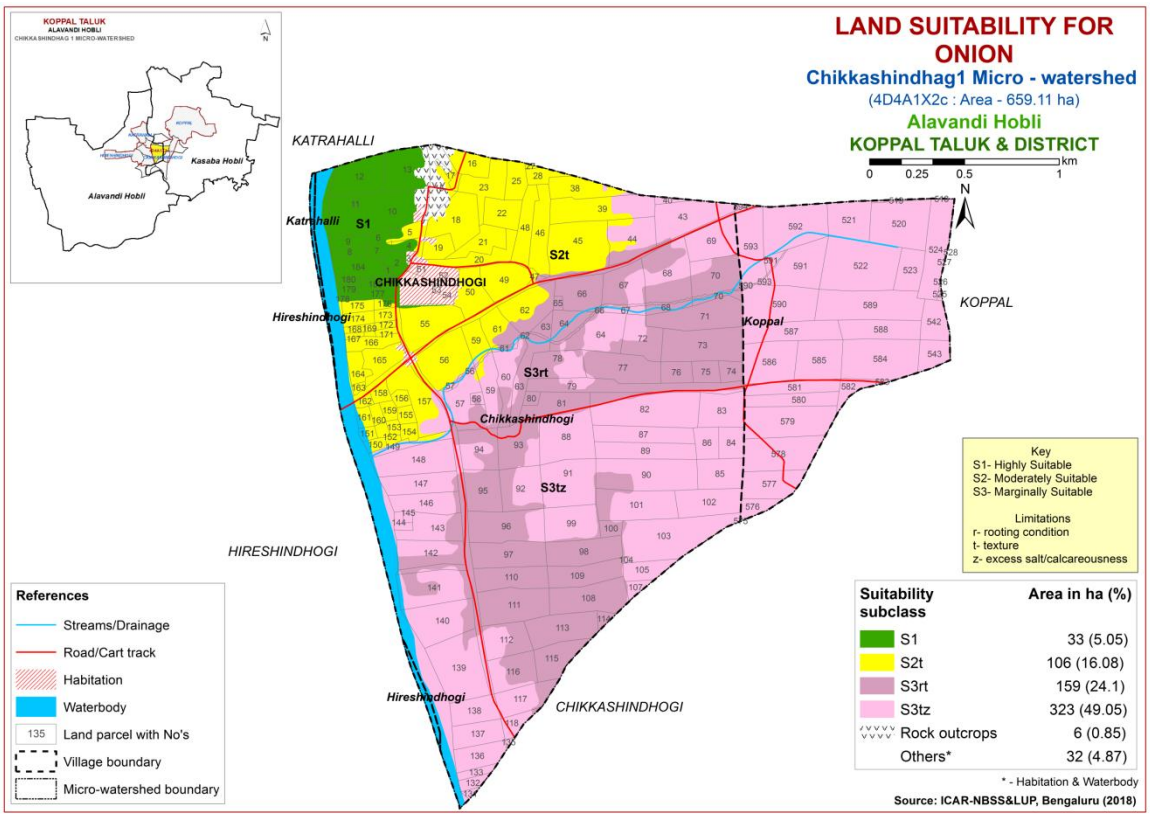


Fig 7.12 Land Suitability map of Onion

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) lands for growing bhendi occur in area of 33 ha (5%) and distributed in the northwestern part of the microwatershed. Maximum area of about 429 ha (65%) is moderately suitable (Class S2) for bhendi and distributed in the major part of the microwatershed. They have minor limitations of rooting depth, calcareousness and texture. An area about of 159 ha (24%) is marginally suitable (Class S3) and distributed in the central, northern, northeastern, eastern and southern part of the microwatershed with moderate limitation of rooting depth.

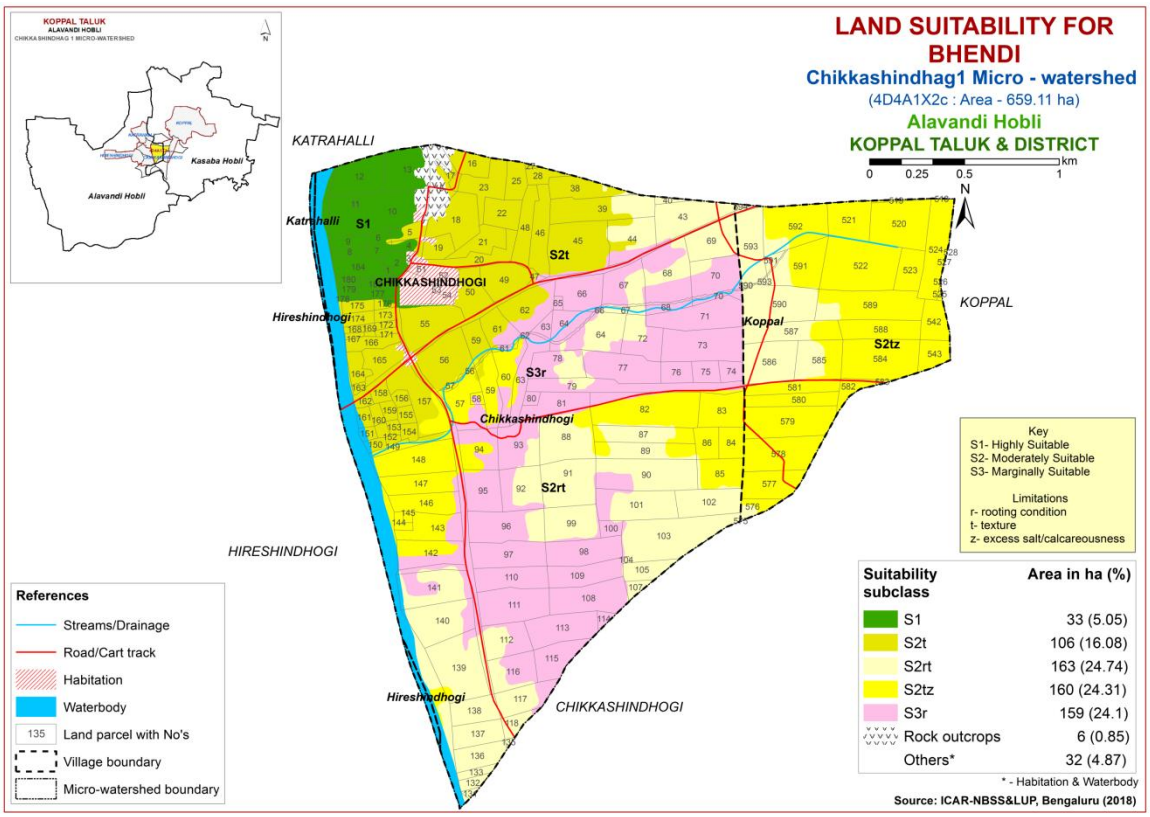


Fig 7.13 Land Suitability map of Bhendi

7.14 Land Suitability for Drumstick (*Moringa oleifera)*

Drumstick is one of the most important vegetable crop grown in 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.

Maximum area of 300 ha (45%) is moderately suitable (Class S2) for growing drumstick and distributed in the central, southwestern, western, northwestern, northern, northeastern, southern and eastern part of the microwatershed with minor limitations of texture, rooting depth, calcareousness and gravelliness. An area of about 163 ha (25%) is marginally suitable (Class S3) for growing drumstick and occur in the central, northeastern, eastern, southeastern and southern part of the microwatershed with moderate limitations of rooting depth and calcareousness. An area of about 159 ha (24%) is currently not suitable (Class N1) for growing drumstick and occur in the central, northern, northeastern, eastern and southern part of the microwatershed with severe limitations of rooting depth and calcareousness.

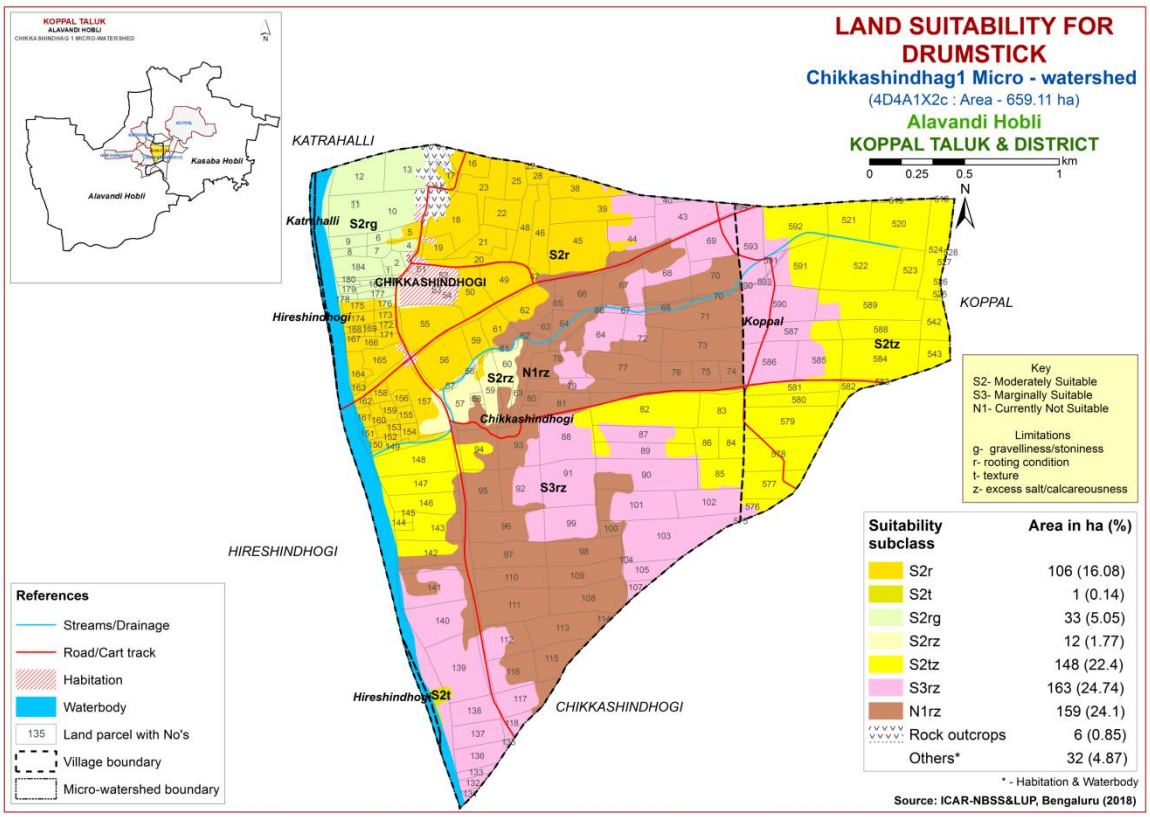


Fig. 7.14 Land Suitability map of Drumstick

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.

Moderately suitable (Class S2) lands occupy a major area of about 299 ha (45%) and occur in the central, southern, southwestern, western, northwestern, northern, northeastern and eastern part of the microwatershed. They have minor limitations of texture, rooting depth and calcareousness. Marginally suitable (Class S3) lands cover an area of about 163 ha (25%) and occur in the central, northeastern, eastern, southeastern and southern part of the microwatershed. They have moderate limitations of rooting depth and calcareousness. An area of about 159 ha (24%) is currently not suitable (Class N1) for growing mulberry and occur in the central, northern, northeastern, eastern and southern part of the microwatershed with severe limitations of rooting depth and calcareousness.

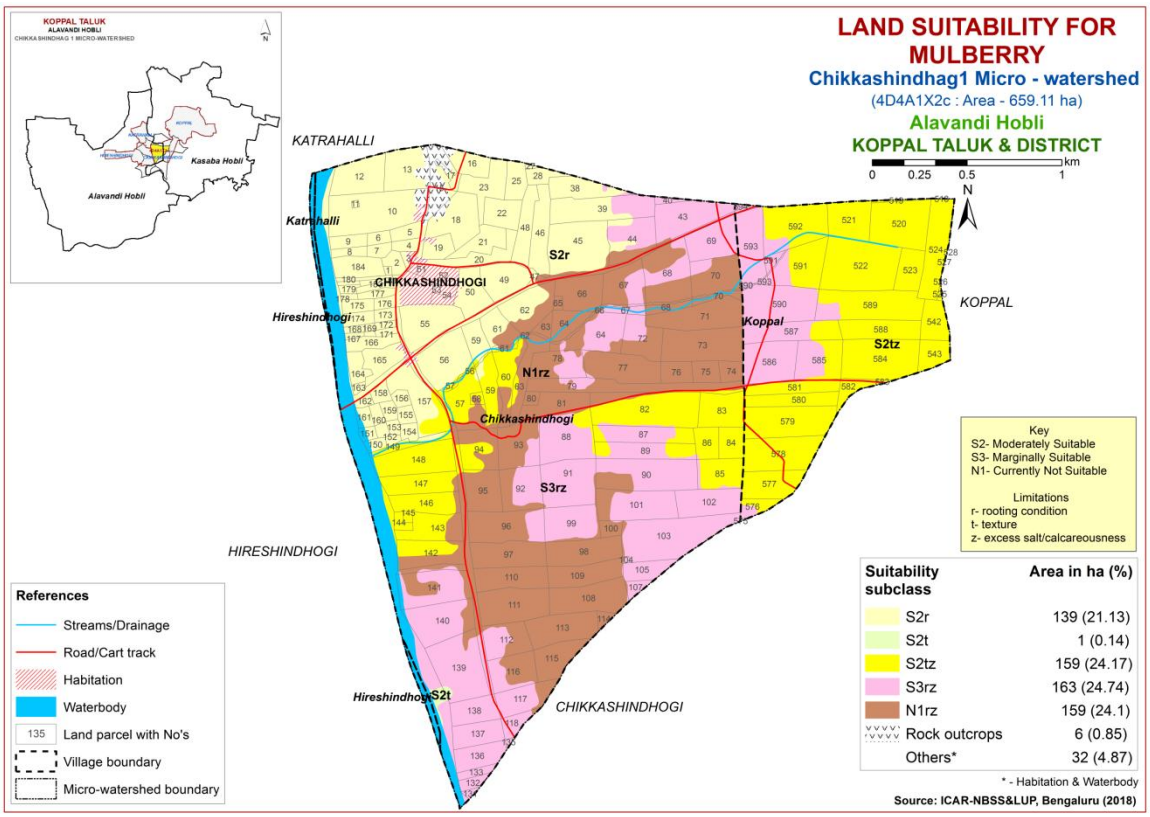


Fig. 7.15 Land Suitability map of Mulberry

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 98 ha (15%) and occur in the northeastern, eastern and southwestern part of the microwatershed. They have minor limitations of rooting depth and calcareousness. Marginally suitable (Class S3) lands cover an area of about 202 ha (31%) and occur in the northeastern, eastern, southern, western, northwestern and northern part of the microwatershed. They have moderate limitations of texture, rooting depth and calcareousness. Maximum area of about 322 ha (49%) is currently not suitable (Class N1) for growing mango and occur in the central, northern, northeastern, eastern, southeastern and southern part of the microwatershed with severe limitations of calcareousness, texture and rooting depth.

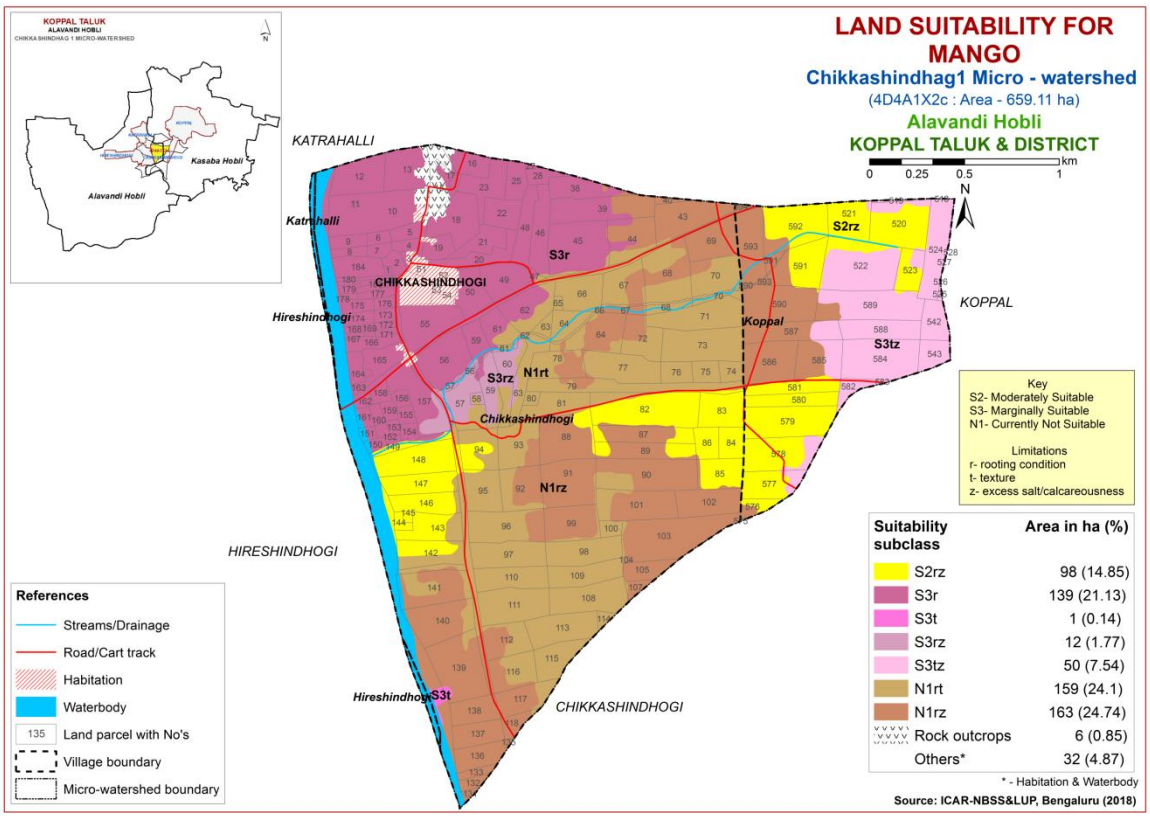


Fig. 7.16 Land Suitability map of Mango

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 139 ha (21%) is moderately suitable (Class S2) for growing sapota and distributed in the western, northwestern and northern part of the microwatershed with minor limitations of gravelliness and rooting depth. Major area of about 323 ha (49%) is marginally (Class S3) suitable for growing sapota and occur in the central, northeastern, eastern, southeastern, southwestern and southern part of the microwatershed with moderate limitations of texture, rooting depth and calcareousness. An area of about 159 ha (24%) is currently not suitable (Class N1) for growing sapota and occur in the central, northern, northeastern, eastern and southern part of the microwatershed with severe limitations of rooting depth and calcareousness.

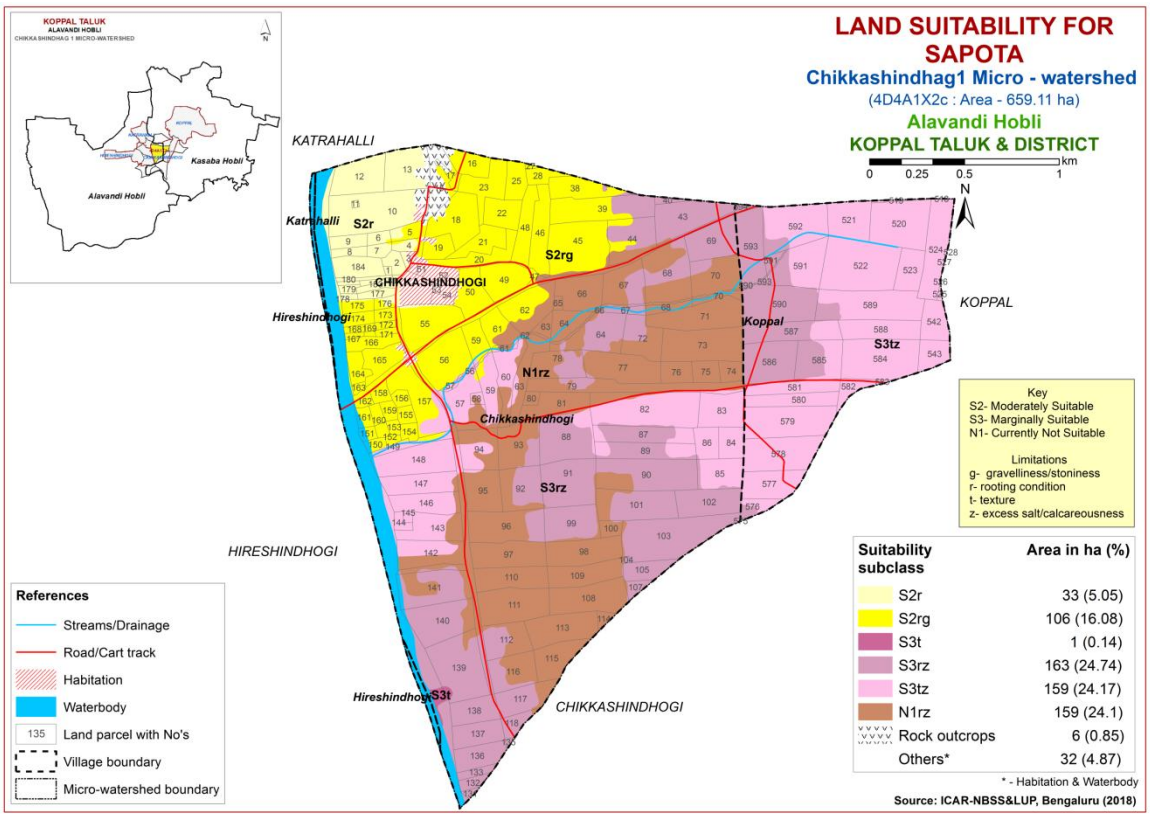


Fig. 7.17 Land Suitability map of Sapota

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.

Maximum area of about 300 ha (45%) is moderately suitable (Class S2) for growing pomegranate and occur in the central, southern, southwestern, western, northwestern, northern, northeastern and eastern part of the microwatershed with minor limitations of texture, rooting depth, calcareousness and gravelliness. Marginally suitable (Class S3) lands cover an area of about 163 ha (25%) and occur in the central, northeastern, eastern, southeastern and southern part of the microwatershed. They have moderate limitations of rooting depth and calcareousness. An area of about 159 ha (24%) is currently not suitable (Class N1) for growing pomegranate and occur in the central, northern, northeastern, eastern and southern part of the microwatershed with severe limitations of rooting depth and calcareousness.

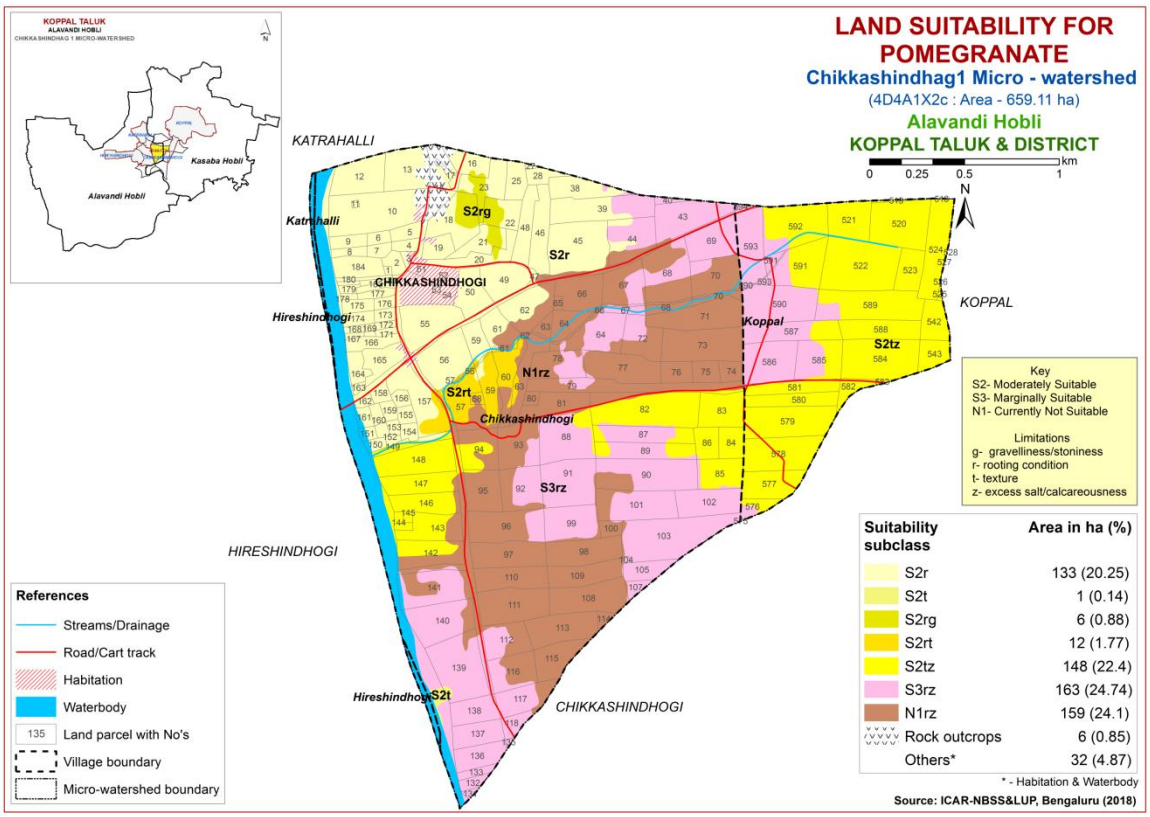


Fig. 7.18 Land Suitability map of Pomegranate

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 139 ha (21%) is moderately suitable (Class S2) for growing guava and distributed in the western, northwestern and northern part of the microwatershed with minor limitations of rooting depth and texture. Maximum area of 323 ha (49%) is marginally (Class S3) suitable for growing guava and occur in the central, northeastern, eastern, southeastern, southern and southwestern part of the microwatershed with moderate limitations of texture and calcareousness. An area of about 159 ha (24%) is currently not suitable (Class N1) for growing guava and occur in the central, northern, northeastern, eastern and southern part of the microwatershed with severe limitations of rooting depth and texture.

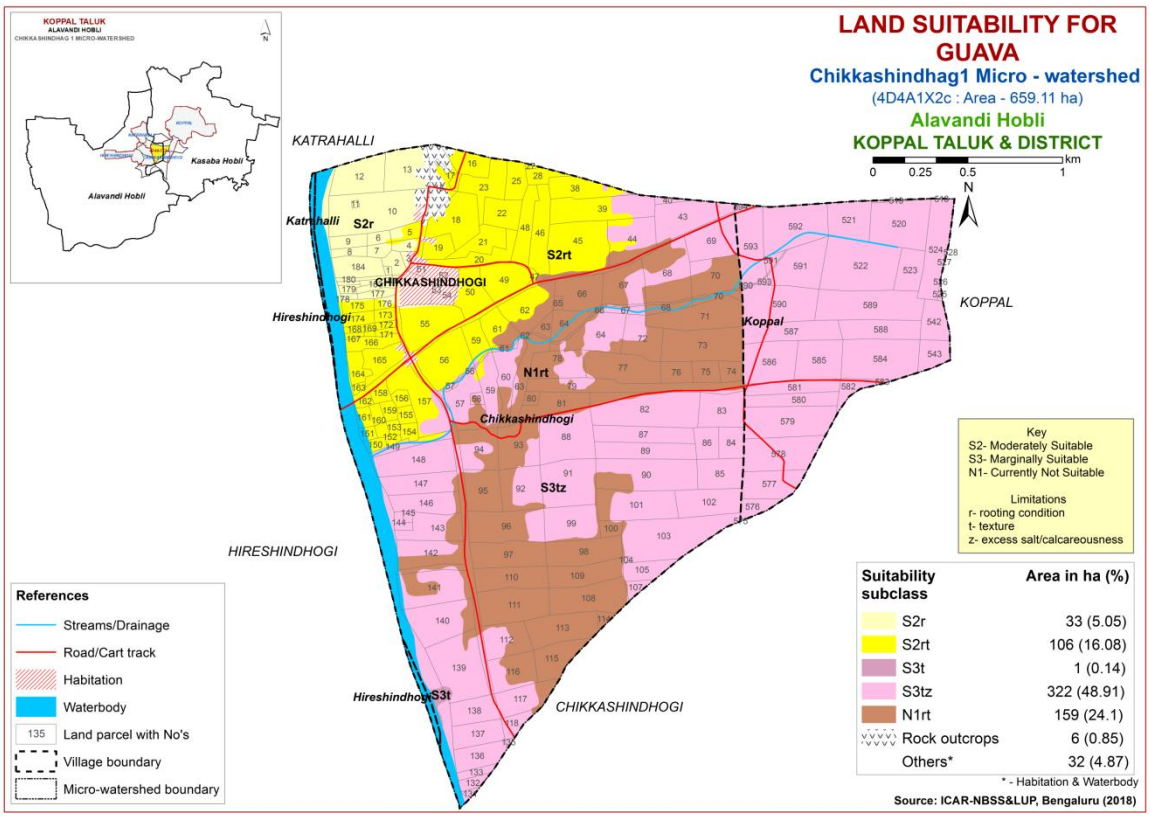


Fig. 7.19 Land Suitability map of Guava

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.

An area of about 139 ha (21%) is moderately suitable (Class S2) for growing jackfruit and distributed in the western, northwestern and northern part of the microwatershed with minor limitations of gravelliness and rooting depth. Major area of about 323 ha (49%) is marginally (Class S3) suitable for growing jackfruit and occur in the central, northeastern, eastern, southeastern, southern and southwestern part of the microwatershed with moderate limitations of texture and calcareousness. An area of about 159 ha (24%) is currently not suitable (Class N1) for growing jackfruit and occur in the central, northern, northeastern, eastern and southern part of the microwatershed with severe limitations of rooting depth and texture.

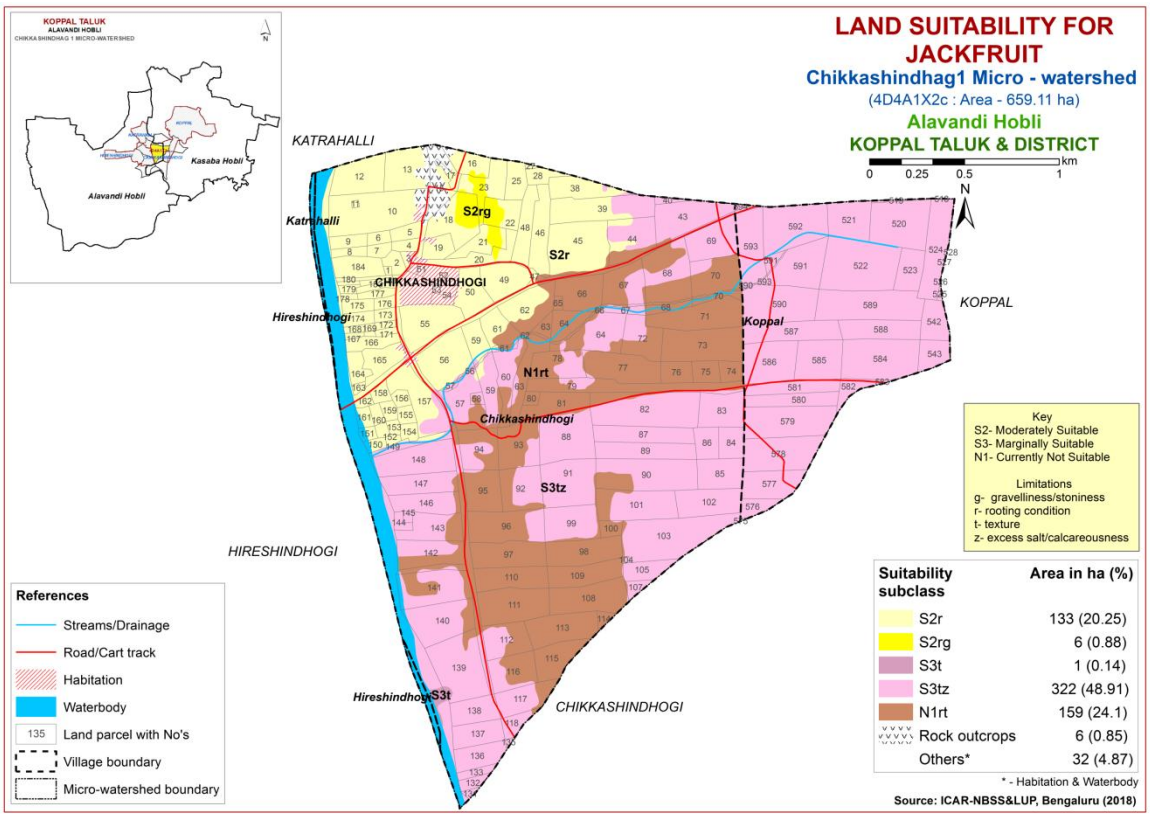


Fig. 7.20 Land Suitability map of Jackfruit

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.

Maximum area of 288 ha (44%) is moderately suitable (Class S2) for growing jamun and occur in the central, southern, southwestern, northern, northeastern and eastern part of the microwatershed with minor limitations of texture, rooting depth, calcareousness and gravelliness. Marginally suitable (Class S3) lands cover an area of about 175 ha (27%) and occur in the central, northeastern, eastern, southeastern and southern part of the microwatershed. They have moderate limitations of rooting depth, texture and calcareousness. An area of about 159 ha (24%) is currently not suitable (Class N1) for growing jamun and occur in the central, northern, northeastern, eastern and southern part of the microwatershed with severe limitations of rooting depth and texture.

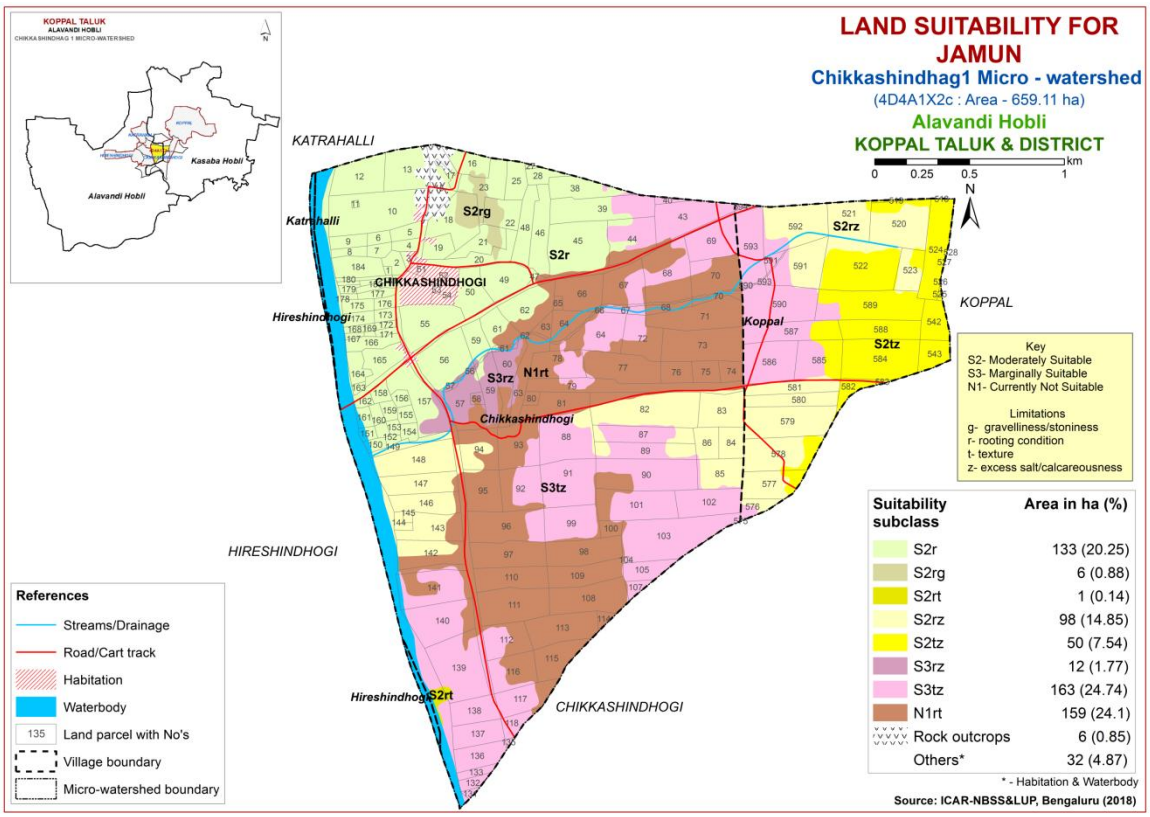


Fig. 7.21 Land Suitability map of Jamun

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) lands for growing musambi cover an area of about 1 ha (<1%) and occur in the southern part of the microwatershed. Maximum area of about 299 ha (45%) is moderately suitable (Class S2) for growing musambi and occur in the central, southwestern, western, northwestern, northern, northeastern and eastern part of the microwatershed with minor limitations of rooting depth, calcareousness and gravelliness. Marginally suitable (Class S3) lands cover an area of about 163 ha (25%) and occur in the central, northeastern, eastern, southeastern and southern part of the microwatershed. They have moderate limitations of rooting depth and calcareousness. An area of about 159 ha (24%) is currently not suitable (Class N1) for growing musambi and occur in the central, northern, northeastern, eastern and southern part of the microwatershed with severe limitations of rooting depth and calcareousness.

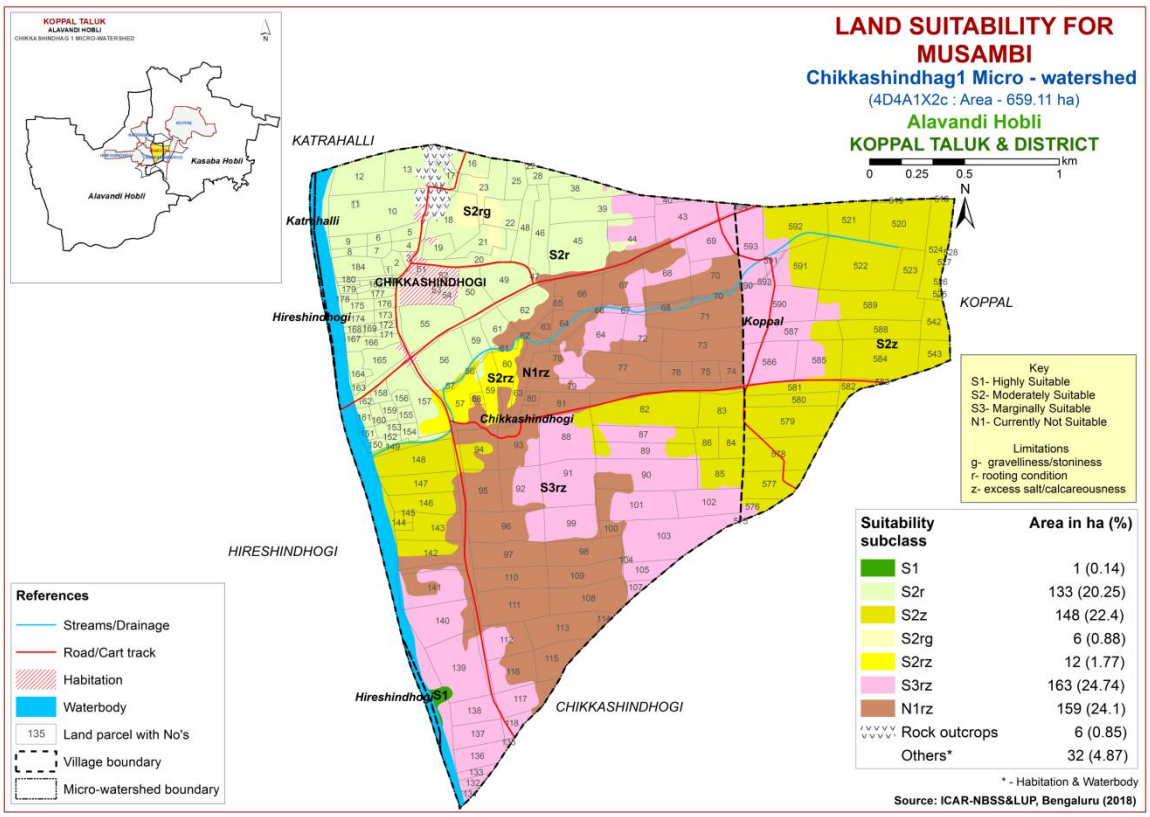


Fig. 7.22 Land Suitability map of Musambi

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 1 ha (<1%) is highly suitable (Class S1) for growing lime and occurs in the southern part of the microwatershed. Maximum area of about 299 ha (45%) is moderately suitable (Class S2) for growing lime and occur in the central, southwestern, western, northwestern, northern, northeastern and eastern part of the microwatershed with minor limitations of rooting depth, calcareousness and gravelliness. Marginally suitable (Class S3) lands cover an area of about 163 ha (25%) and occur in the central, northeastern, eastern, southeastern and southern part of the microwatershed. They have moderate limitations of rooting depth and calcareousness. An area of about 159 ha (24%) is currently not suitable (Class N1) for growing lime and occur in the central, northern, northeastern, eastern and southern part of the microwatershed with severe limitations of rooting depth and calcareousness.

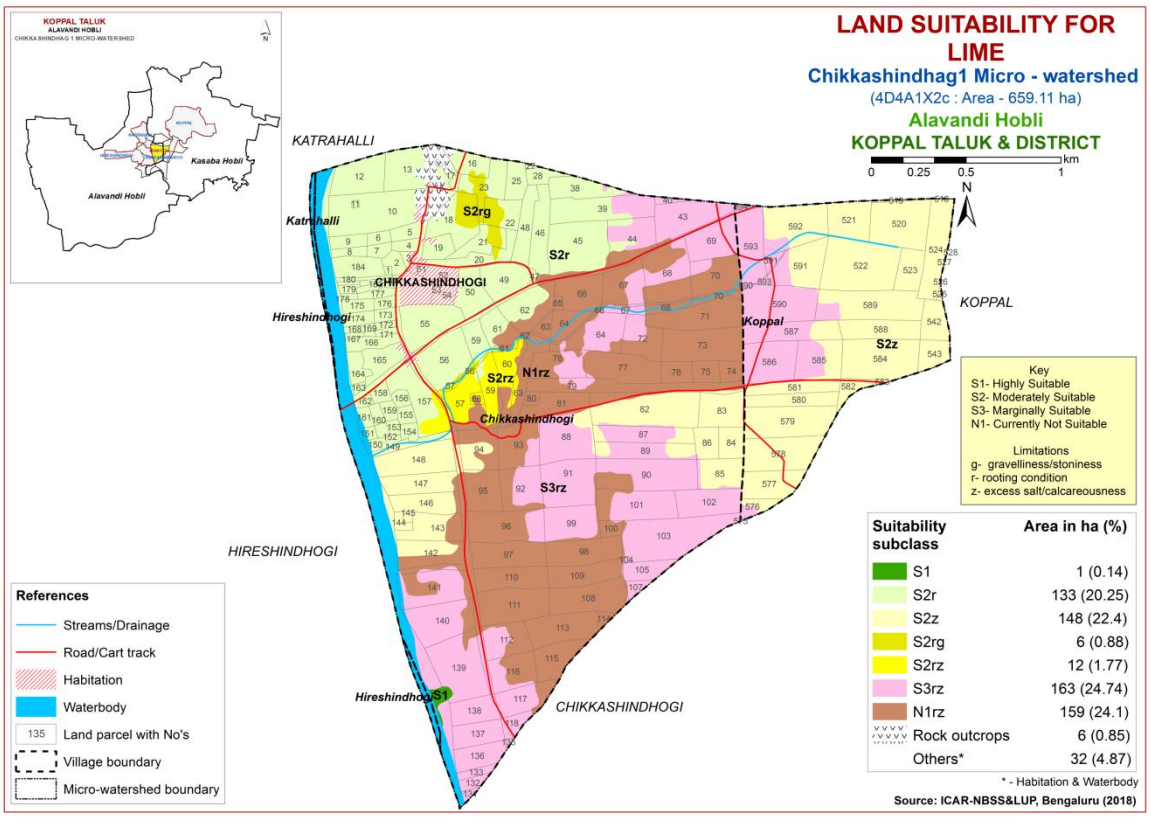


Fig. 7.23 Land Suitability map of Lime

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.

An area of about 139 ha (21%) is moderately suitable (Class S2) for growing cashew and distributed in the western, northwestern and northern part of the microwatershed with minor limitations of rooting depth and texture. Currently not suitable (Class N1) lands cover a major area of about 482 ha (73%) and distributed in the major part of the microwatershed with severe limitations of texture, rooting depth and calcareousness.

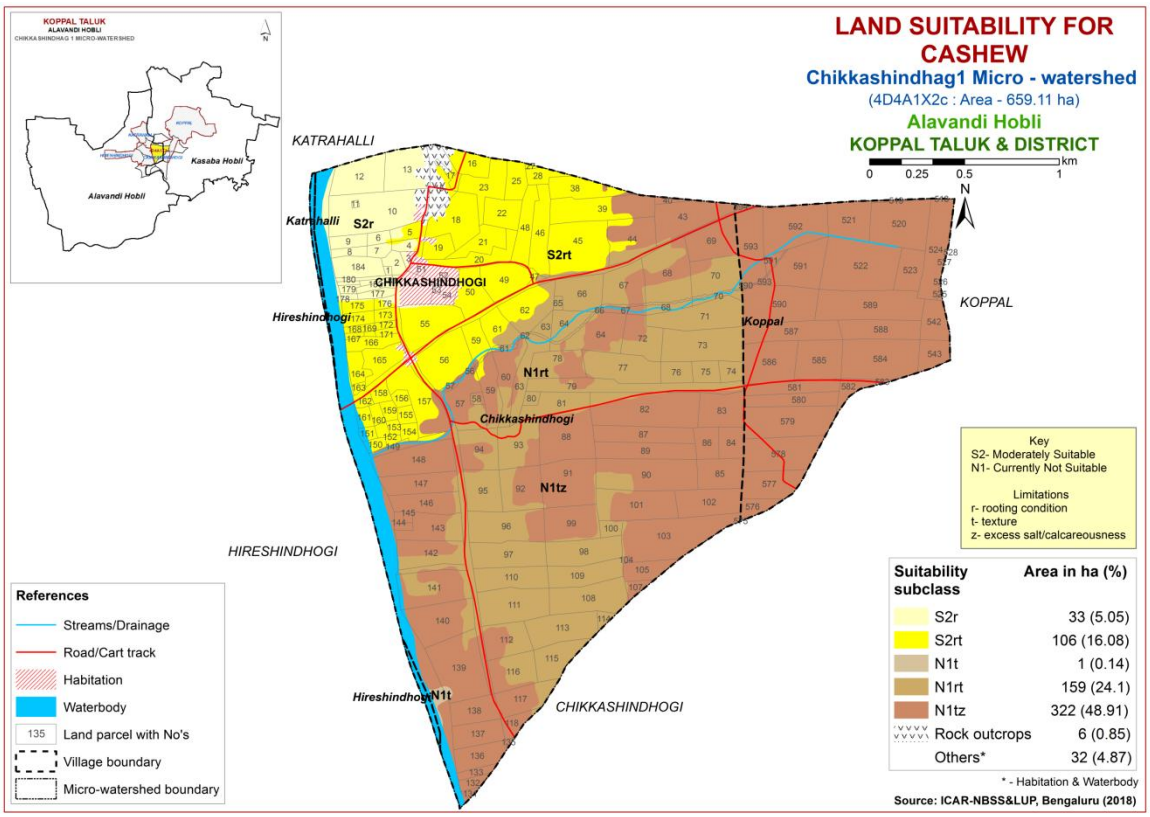


Fig. 7.24 Land Suitability map of Cashew

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 140 ha (21%) is highly suitable (Class S1) for growing custard apple and occur in the southern, western, northwestern and northern part of the microwatershed. Major area of about 322 ha (49%) is moderately suitable (Class S2) for growing custard apple and occur in the central, northeastern, eastern, southeastern, southern and southwestern part of the microwatershed with minor limitations of rooting depth and calcareousness. Marginally suitable (Class S3) lands cover an area of about 159 ha (24%) for growing custard apple and occur in the central, northern, northeastern, eastern and southern part of the microwatershed. They have moderate limitations of calcareousness and gravelliness.

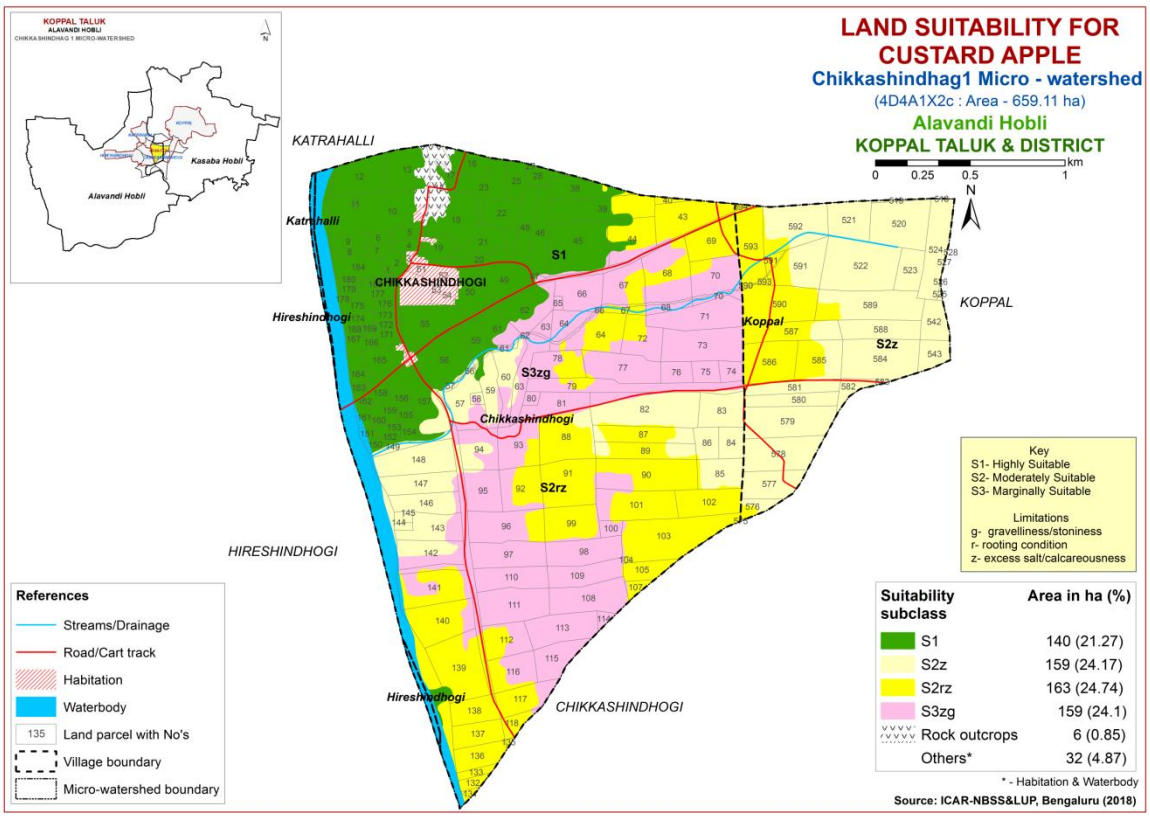


Fig. 7.25 Land Suitability map of Custard Apple

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) lands for growing amla cover an area of about 139 ha (21%) and occur in the western, northwestern and northern part of the microwatershed. Major area of about 323 ha (49%) is moderately suitable (Class S2) for growing amla and occur in the central, northeastern, eastern, southeastern, southern and southwestern part of the microwatershed with minor limitations of rooting depth, calcareousness and texture. An area of about 159 ha (24%) is marginally suitable (Class S3) for growing amla and occur in the central, northern, northeastern, eastern and southern part of the microwatershed with moderate limitations of calcareousness and texture.

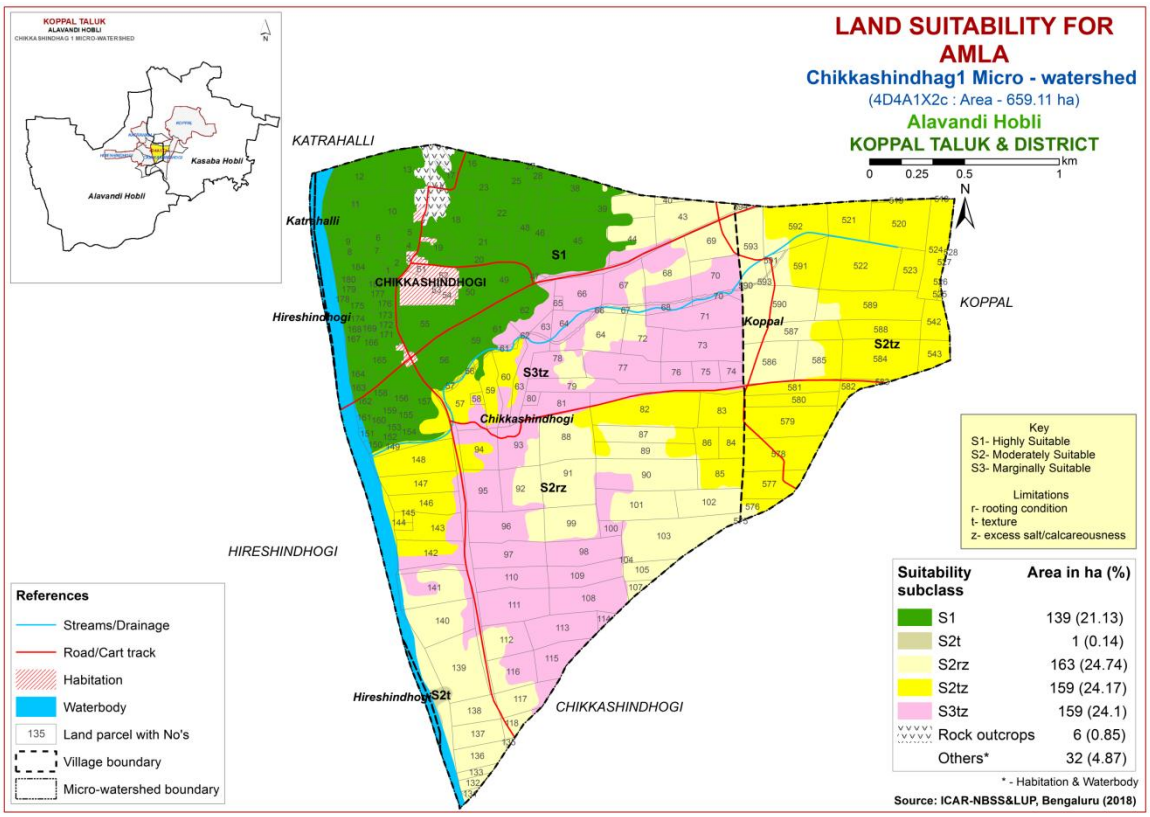


Fig. 7.26 Land Suitability map of Amla

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 149 ha (23%) is moderately suitable (Class S2) for growing tamarind and occur in the southwestern, southern, eastern and northeastern part of the microwatershed with minor limitations of rooting depth, calcareousness and texture. Marginally suitable (Class S3) lands cover an area of 151 ha (23%) for growing tamarind and occur in the central, western, northwestern and northern part of the microwatershed. They have moderate limitations of rooting depth and calcareousness. An area of about 322 ha (49%) is currently not suitable (Class N1) for growing tamarind and distributed in the central, northern, northeastern, eastern, southeastern and southern part of the microwatershed. They have severe limitations of rooting depth and calcareousness.

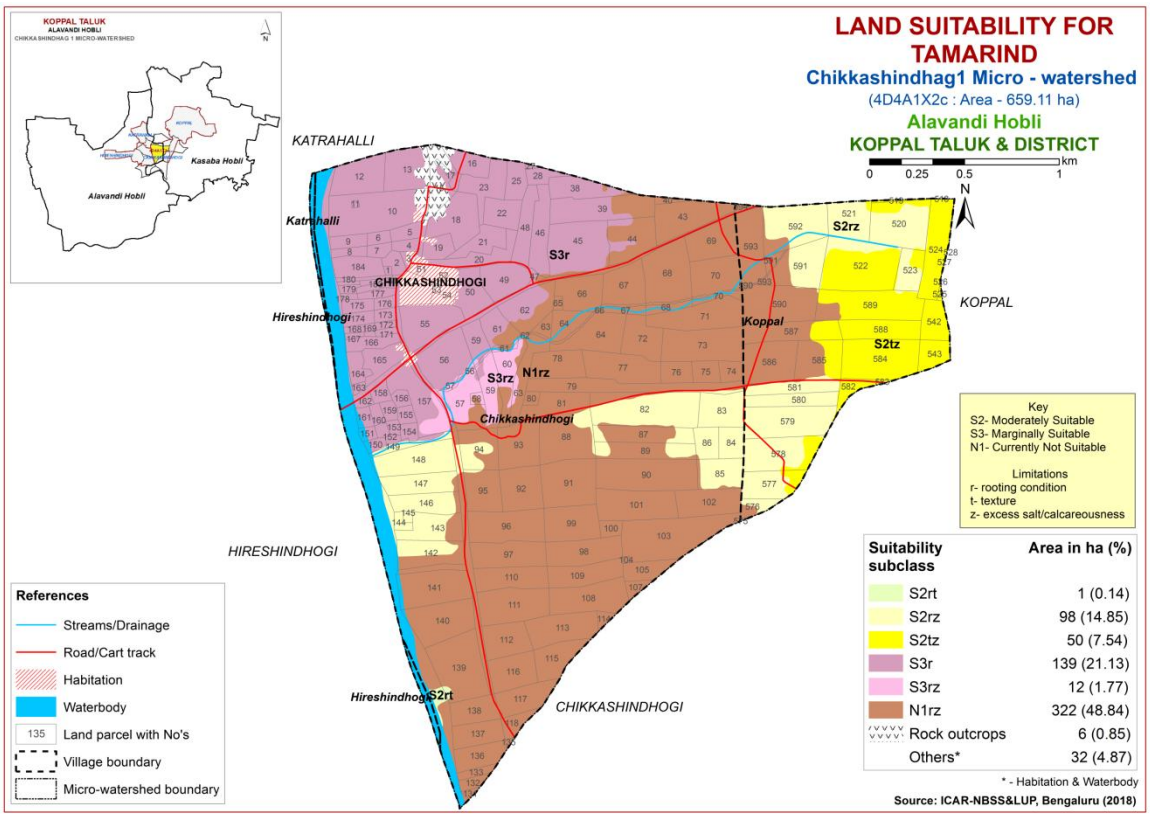


Fig. 7.27 Land Suitability map of Tamarind

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.

Maximum area of about 462 ha (70%) is moderately suitable (Class S2) for growing marigold and distributed in the major part of the microwatershed with minor limitations of texture, rooting depth, calcareousness and gravelliness. An area of about 159 ha (24%) is marginally suitable (Class S3) for growing marigold and occur in the central, northern, northeastern, eastern and southern part of the microwatershed with moderate limitations of rooting depth and calcareousness.

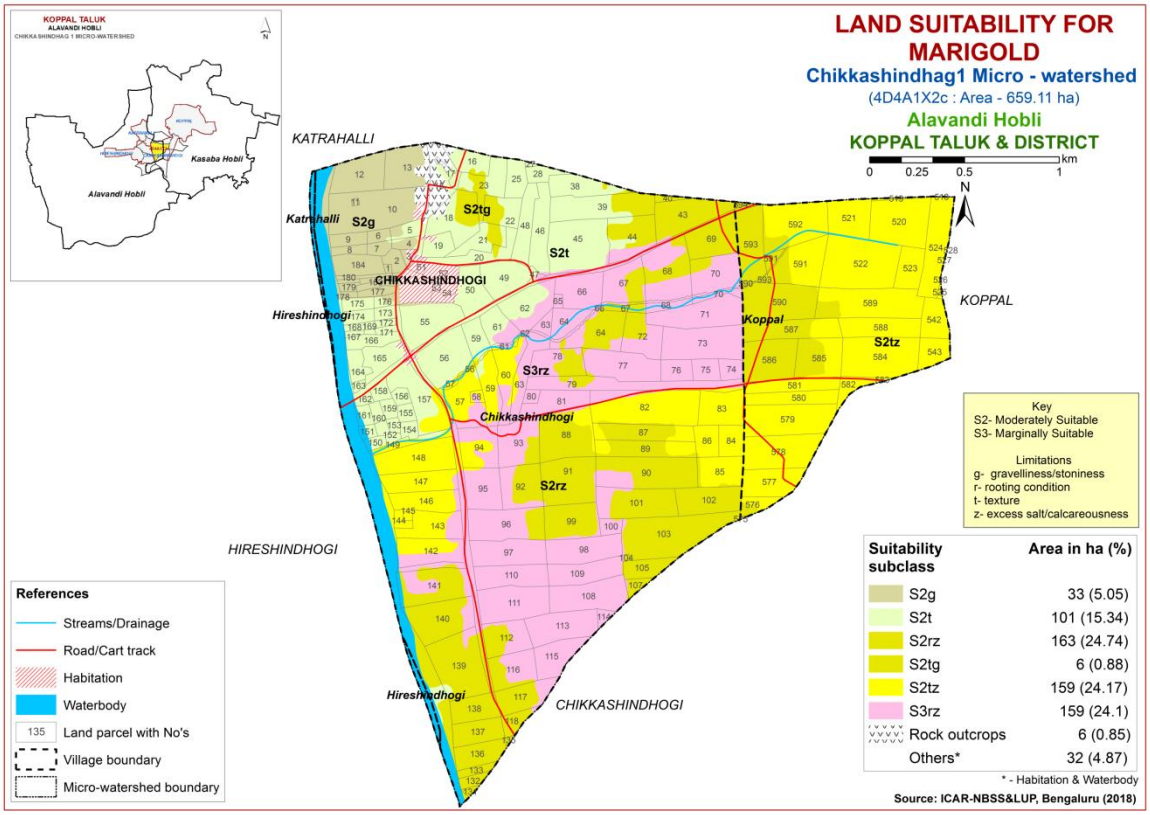


Fig. 7.28 Land Suitability map of Marigold

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.

Maximum area of about 462 ha (70%) is moderately suitable (Class S2) for growing chrysanthemum and distributed in the major part of the microwatershed with minor limitations of texture, rooting depth, calcareousness and gravelliness. An area of about 159 ha (24%) is marginally suitable (Class S3) for growing chrysanthemum and occur in the central, northern, northeastern, eastern and southern part of the microwatershed with moderate limitations of rooting depth and calcareousness.

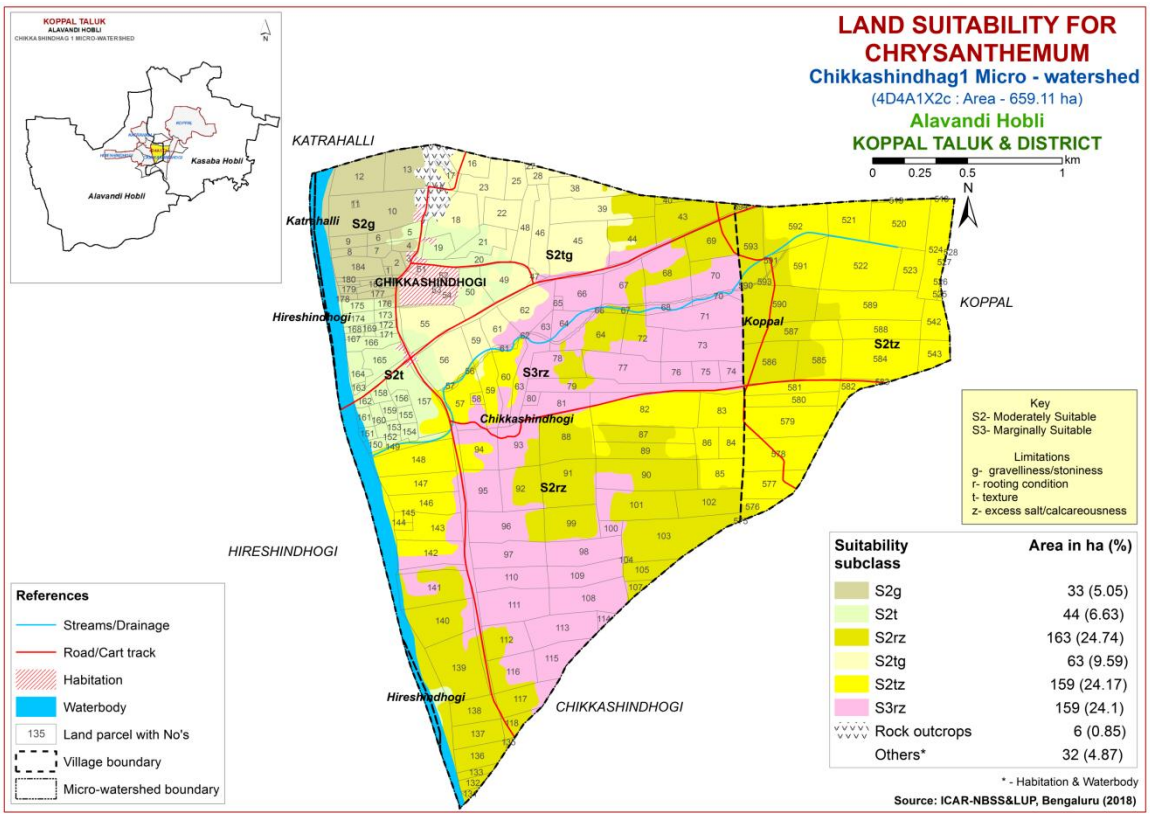


Fig. 7.29 Land Suitability map of Chrysanthemum

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.

An area of about 302 ha (46%) is moderately suitable (Class S2) for growing jasmine and occur in the central, southeastern, southern, western, northwestern, northern, northeastern and eastern part of the microwatershed. They have minor limitations of gravelliness, texture, calcareousness and rooting depth. Major area of about 319 ha (48%) is marginally suitable (Class S3) for growing jasmine and occur in the central, northern, northeastern, eastern, southern and southwestern part of the microwatershed. They have moderate limitations of rooting depth, texture and calcareousness.

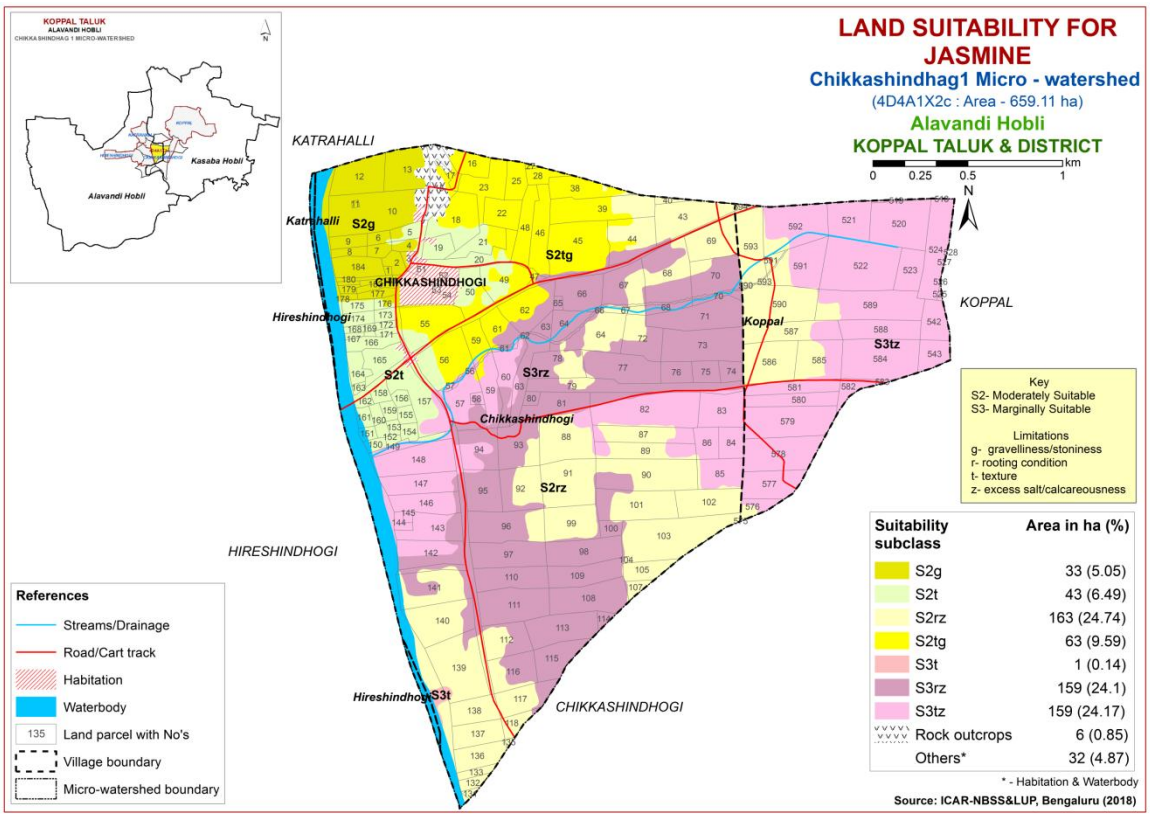


Fig. 7.30 Land Suitability map of Jasmine

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 152 ha (23%) is moderately suitable (Class S2) for growing crossandra and occur in the central, northern, western and northwestern part of the microwatershed. They have minor limitations of gravelliness, texture and calcareousness. Major area of about 470 ha (71%) is marginally suitable (Class S3) for growing crossandra and occur in the major part of the microwatershed. They have moderate limitations of rooting depth, texture and calcareousness.

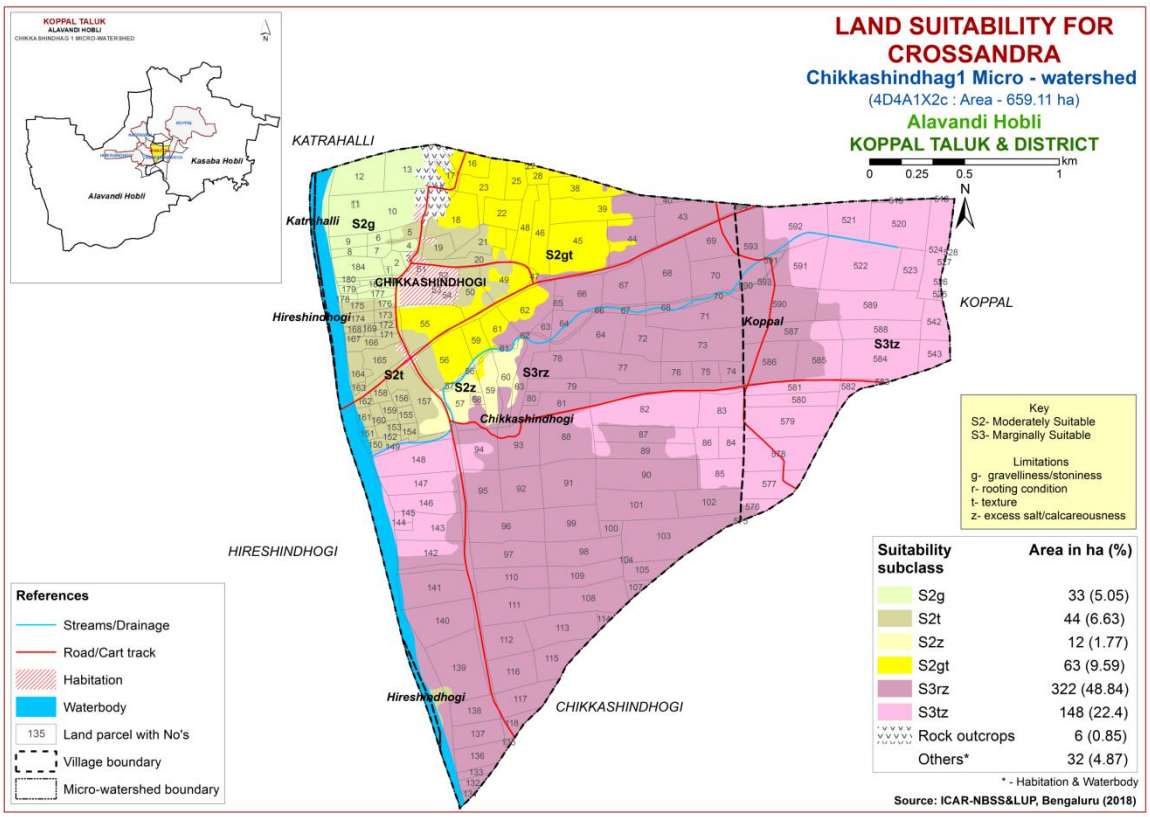


Fig. 7.31 Land Suitability map of Crossandra

Table 7.1 Soil-Site Characteristics of Chikkashindhag-1 Microwatershed

Soil Map Units	Climate (P) (mm)	Growing period (Days)	Drainage Class	Soil depth (cm)	Soil texture		Gravelliness		AWC (mm/m	Slope (%)	Erosion	pH	EC	ESP	CEC [Cmol (p+)kg-1]	BS (%)
					Surface	Sub-surface	Surface	Sub-surface								
GHTcB2	662	<90	WD	75-100	sl	gscl	<15	15-35	101-150	1-3	Moderate	5.70	0.06	4.10	3.17	73
CKMhB2	662	<90	WD	75-100	scl	sc	<15	<15	101-150	1-3	Moderate	7.99	0.326	1.73	12.50	119
CKMhB2g1	662	<90	WD	75-100	scl	sc	15-35	<15	101-150	1-3	Moderate	7.99	0.326	1.73	12.50	119
CKMiA1	662	<90	WD	75-100	sc	sc	<15	<15	101-150	0-1	Slight	7.99	0.326	1.73	12.50	119
CKMiB1	662	<90	WD	75-100	sc	sc	<15	<15	101-150	1-3	Slight	7.99	0.326	1.73	12.50	119
MTLiB1g1	662	<90	WD	25-50	sc	gc	15-35	15-35	51-100	1-3	Slight	8.27	0.202	0.69	36.64	-
MTLiB2	662	<90	WD	25-50	sc	gc	<15	15-35	51-100	1-3	Moderate	8.27	0.202	0.69	36.64	-
MTLiB2g2	662	<90	WD	25-50	sc	gc	35-60	15-35	51-100	1-3	Moderate	8.27	0.202	0.69	36.64	-
MTLmB1g1	662	<90	WD	25-50	c	gc	15-35	15-35	51-100	1-3	Slight	8.27	0.202	0.69	36.64	-
MTLmB2	662	<90	WD	25-50	c	gc	<15	15-35	51-100	1-3	Moderate	8.27	0.202	0.69	36.64	-
RNKmA1g1	662	<90	MWD	50-75	c	c	15-35	<15	51-100	0-1	Slight	8.86	0.483	6.78	37.00	-
RNKmB1	662	<90	MWD	50-75	c	c	<15	<15	51-100	1-3	Slight	8.86	0.483	6.78	37.00	-
RNKmB2	662	<90	MWD	50-75	c	c	<15	<15	51-100	1-3	Moderate	8.86	0.483	6.78	37.00	-
RNKmB2g1	662	<90	MWD	50-75	c	c	15-35	<15	51-100	1-3	Moderate	8.86	0.483	6.78	37.00	-
DRLiB2	662	<90	MWD	75-100	sc	c	<15	<15	151-200	1-3	Moderate	8.78	0.42	5.62	49.70	100
HDLmB1	662	<90	MWD	100-150	c	c	<15	<15	>200	1-3	Slight	9.06	0.371	5.09	62.33	-
KVRmB1	662	<90	MWD	100-150	c	c	<15	<15	>200	1-3	Slight	8.4	0.265	0.60	43.25	-
BGPmA1	662	<90	MWD	>150	c	c	<15	<15	>200	0-1	Slight	9.2	0.27	3.84	19.60	100
BGPmB1	662	<90	MWD	>150	c	c	<15	<15	>200	1-3	Slight	9.2	0.27	3.84	19.60	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/Somewhat 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 19 soil map units identified in Chikkashindhag-1 microwatershed have been grouped into 4 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 Unit 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 4 Land Management Units along with brief description of soil and site characteristics are given below.

LMUs	Mapping unit	Soil and site characteristics
1	395.BGPmA1 396.BGPmB1 380.HDLmB1 388.KVRmB1 342.DRLiB2	Moderately deep to very deep, black calcareous clay soils, 0-3% slope, slight to moderate erosion, non-gravelly (<15%).
2	175.CKMhB2 176.CKMhB2g1 177.CKMiA1 178.CKMiB1 137.GHTcB2	Moderately deep, red sandy clay to sandy clay loam soils, 0-3% slope, slight to moderate erosion, non-gravelly to gravelly (<15-35%).
3	332.RNKmA1g1 333.RNKmB1 336.RNKmB2 337.RNKmB2g1	Moderately shallow, black calcareous clay soils, 0-3% slope, slight to moderate erosion, non-gravelly to gravelly (<15-35%).
4	303.MTLiB1g1 304.MTLiB2 305.MTLiB2g2 308.MTLmB1g1 310.MTLmB2	Shallow, black calcareous clay soils, 1-3% slope, slight to moderate erosion, non-gravelly to very gravelly (<15-60%).

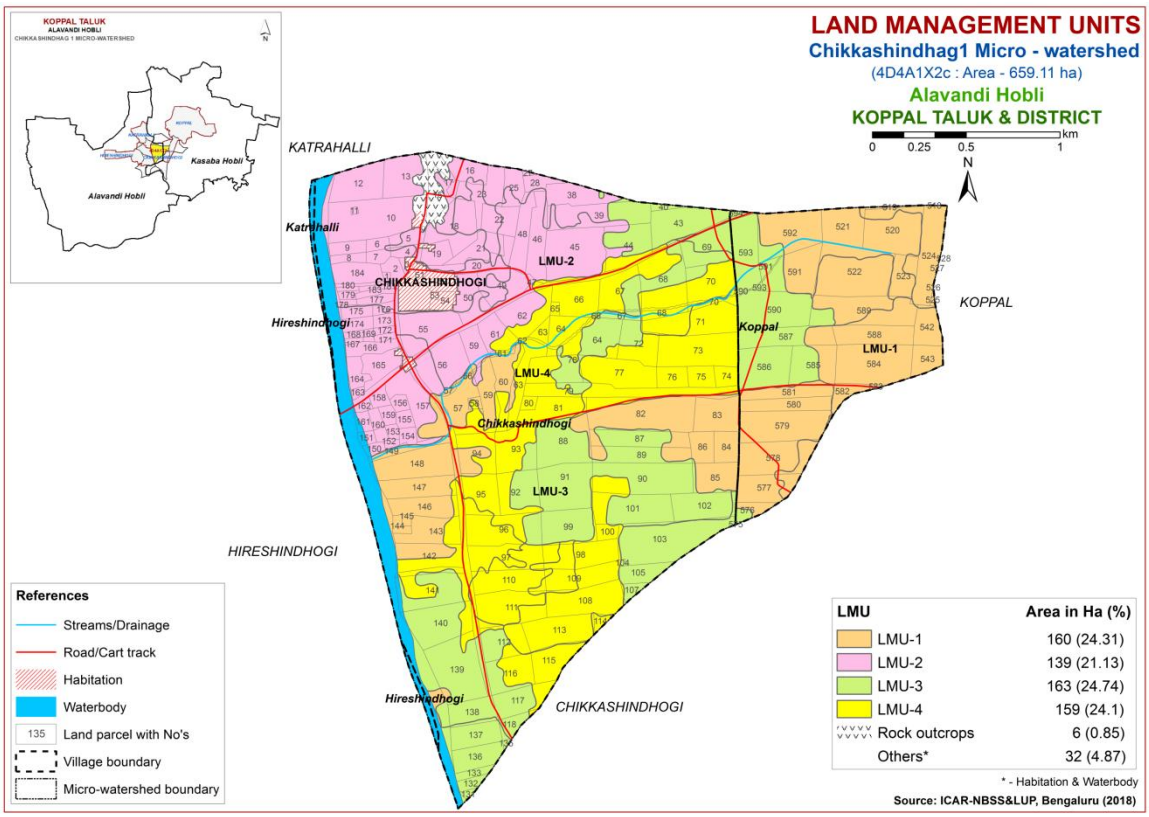


Fig 7.32 Land Management Units map of Chikkashindhag-1 microwatershed

7.33 Proposed Crop Plan for Chikkashindhag-1 Microwatershed

After assessing the land suitability for the 31 crops, the proposed crop plan has been prepared for the 4 identified LMUs 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 Chikkashindhag-1 Microwatershed

LMU	Soil Map Units	Survey Number	Soil and site characteristics	Field Crops	Horticulture Crops	Suitable Interventions
1	395.BGPmA1 396.BGPmB1 380.HDLmB1 388.KVRmB1 342.DRLiB2	**Chikkashindhogi**:57,58,59, 60,82,83,84,85,86,142,143,144, 145,146,147,148 **Koppal**:518,519,520,521,522,523,524,525, 526,527,528,542, 543,576,577,578,579,580,581,582, 583,584,588,589, 591,592	Moderately deep to very deep, black calcareous clay soils, 0-3% slope, slight to moderate erosion, non-gravelly (<15%).	Maize, Sorghum, Sunflower, Cotton, Bengal gram, Safflower, Linseed, Bajra, Soybean	**Fruit crops**: Sapota, Pomegranate, Jamun, Lime, Musambi, Tamarind, Amla, Custard apple **Vegetables**: Drumstick, Chilli, Coriander, Tomato, Bhendi **Flowers**: Marigold, Chrysanthemum, Crossandra, Jasmine	Application of FYM, Biofertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices
2	175.CKMhB2 176.CKMhB2g1 177.CKMiA1 178.CKMiB1 137.GHTcB2	**Chikkashindhogi**:1,2,4,5,6, 7,8,9,10,11,12,13,16,17,18,19,20,21,22,23,25,27,28,38,39,45,46,47,48,49,50,55,56,61,62,149,150,151,152,153,154,155,156,157,158,159,160,161,162,163,164,165,166,167,168,169,170,171,172,173,174,175,176,177,178,179, 180,181,182,183,184	Moderately deep, red sandy clay to sandy clay loam soils, 0-3% slope, slight to moderate erosion, non-gravelly to gravelly (<15-35%).	Maize, Sorghum, Sunflower, Bajra, Finger millet, Groundnut, Red gram, Cowpea, Field bean, Castor, Mulberry	**Fruit crops**: Mango, Pomegranate, Guava, Sapota, Jackfruit, Jamun, Tamarind, Lime, Musambi, Amla, Custard apple, Cashew **Vegetable crops**: Drumstick, Tomato, Bhendi, Chilli, Brinjal, Onion, Curry leaves **Flower crops**: Marigold, Chrysanthemum, Jasmine, Crossandra	Drip irrigation, mulching, suitable soil and water conservation practices (Crescent Bunding with Catch Pit etc)
3	332.RNKmA1g1 333.RNKmB1 336.RNKmB2 337.RNKmB2g1	**Chikkashindhogi**:40,43,44, 64,69,87,88,89,90,91,92,99, 101,102,103,104,105,107,112,117,118,131,132,133,135,	Moderately shallow, black calcareous clay soils, 0-3%	Sorghum, Bajra, Bengal gram, linseed, Safflower,	**Fruit crops**: Amla, Custard apple Flower crops: Marigold, Jasmine	Application of FYM, Biofertilizers and micronutrients, drip irrigation, mulching,

LMU	Soil Map Units	Survey Number	Soil and site characteristics	Field Crops	Horticulture Crops	Suitable Interventions
		136,137,138,139,140, 141 **Koppal**:575,585,586,587,590,593,594	slope, slight to moderate erosion, non-gravelly to gravelly (<15-35%).	Coriander	Chrysanthemum	suitable soil and water conservation practices
4	303.MTLiB1g1 304.MTLiB2 305.MTLiB2g2 308.MTLmB1g1 310.MTLmB2	**Chikkashindhogi**:63,65,66,67,68,70,71,72,73,74,75,76,77,78,79,80,81,93,94,95,96,97,98,100,108,109,110,111,113,114,115,116	Shallow, black calcareous clay soils, 1-3% slope, slight to moderate erosion, non-gravelly to very gravelly (<15-60%).	Bengal gram	**Agri-Silvi-Pasture**: Hybrid Napier, *Styloxanthes hamata*, *Styloxanthes scabra*	Use of short duration varieties, sowing across the slope

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 Chikkashindhag-1 Microwatershed

- The soil phases with sizeable area identified in the microwatershed belonged to the soil series of Ravanaki (RNK) series occupies major area of 163 ha (25%) followed by Muttal (MTL) 158 ha (24%), Chikkamegheri (CKM) 106 ha (16%), Kavalur (KVR) 98 ha (15%), Budagumpa (BGP) 49 ha (8%), Gollarahatti (GHT) 33 ha (5%), Dambarahalli (DRL) 12 ha (2%) and Handrala (HDL) 1 ha (<1%).
- As per land capability classification, Maximum area of about 463 ha (70%) in the microwatershed falls under good lands (Class II) with minor limitations of soil and

erosion. An area of about 159 ha (24%) is under moderately good lands (Class III) with severe limitations of soil and erosion.

- On the basis of soil reaction, an area of about 351 ha (53%) are moderately alkaline to strongly alkaline (pH 7.8-9.0) and 271 ha (41%) are very strongly alkaline (pH >9.0) 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.

Alkaline soils

Entire area in the microwatershed has comes under alkaline condition (moderately alkaline to very strongly alkaline).

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 factor affecting the soil health in the microwatershed. An area of about 239 ha (36%) 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 Chikkashindhag-1 Microwatershed.
- **Organic Carbon:** The OC content is low (<0.5%) in an area of about 559 ha (85%) and medium (0.5-0.75%) in an area 62 ha (9%) of the microwatershed. These areas needs to be further improved by applying farmyard manure and rotating crops with cereals and legumes or mixed cropping.
- **Promoting Green Manuring:** Growing of green manuring crops costs Rs. 1250/ha (green manuring seeds) and about Rs. 2000/ha towards cultivation that totals to Rs. 3250/- per ha. On the other hand, application of organic manure @ 10 tons/ha costs Rs. 5000/ha. The practice needs to be continued for 2-3 years or more. Nitrogen

fertilizer needs to be supplemented by 25% in addition to the recommended level in entire area where OC is low to 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 494 ha (75%) is medium (23-57 kg/ha) and 127 ha (19%) is low (<23 kg/ha) in available phosphorus content. Hence all the plots, where available phosphorus is low to medium, for all the crops, 25% additional P-needs to be applied
- **Available Potassium:** Available potassium content is medium (145-337 kg/ha) in 448 ha (68%) and high in 174 ha (26%) of the microwatershed. All the plots, where available potassium is 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 204 ha (31%), medium (10-20ppm) in 226 ha (34%) and low (<10 ppm) in 192 ha (29%) 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 306 ha (46%) is low (<0.5 ppm) and 315 ha (48%) is medium (0.5-1.0 ppm) in the available boron content. Hence, 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) in 590 ha (89%) and sufficient (>4.5 ppm) in 32 ha (5%) 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 532 ha (81%) and sufficient (>0.6 ppm) in 89 ha (14%) of the microwatershed. For deficient areas, application of zinc sulphate @ 25kg/ha is recommended.

Soil Alkalinity: Entire area in the microwatershed has soils that are moderately alkaline to very strongly 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.

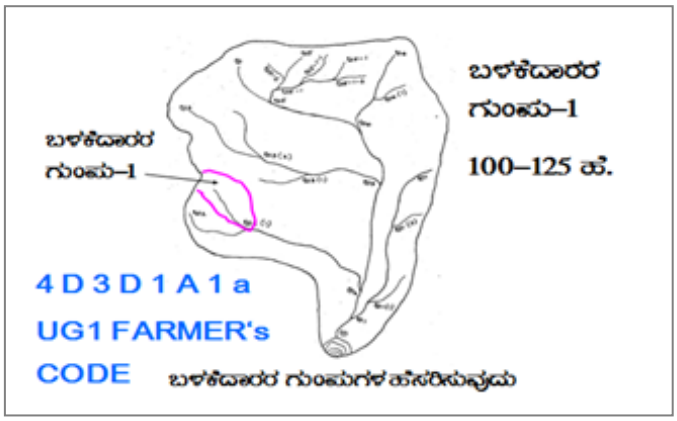
Land Suitability for various crops: Areas that are highly, moderately and marginally suitable and not suitable for growing various crops are indicated. Along with the suitability, various constraints that are limiting the productivity are also indicated. For example, in case of cotton, gravel content, 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 Chikkashindhag-1 Microwatershed, the land resource inventory database generated under Sujala-III project has been transformed as information through series of interpretative (thematic) maps using soil phase map as a base. The various thematic maps (1:7920 scale) generated were

- Soil depth
- Surface soil texture
- Available water capacity
- Soil slope
- Soil gravelliness
- Land capability
- Present land use and land cover
- Crop suitability 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.

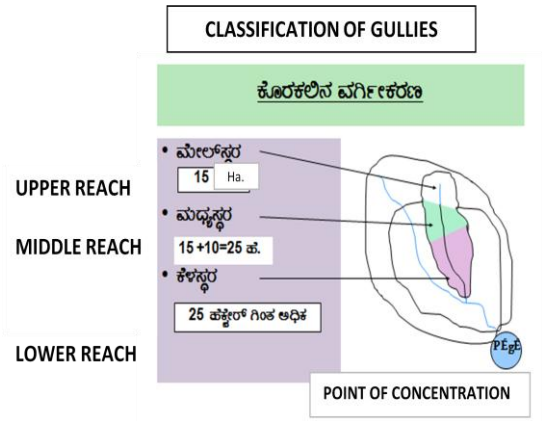
- Naming of user groups and farmers
- Identification of arable and non arable lands
- Identification of drainage lines and gullies
- Identification of non treatable areas
- Identification of priority areas in the arable lands
- Treatment plan for arable lands
- Location of water harvesting and recharge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

9.1 Treatment Plan

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

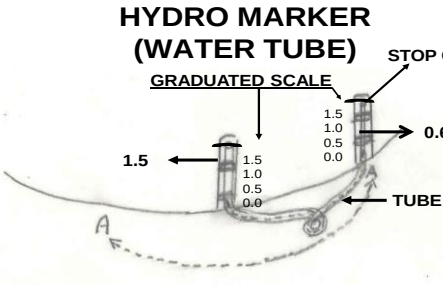
9.1.1 Arable Land Treatment

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.

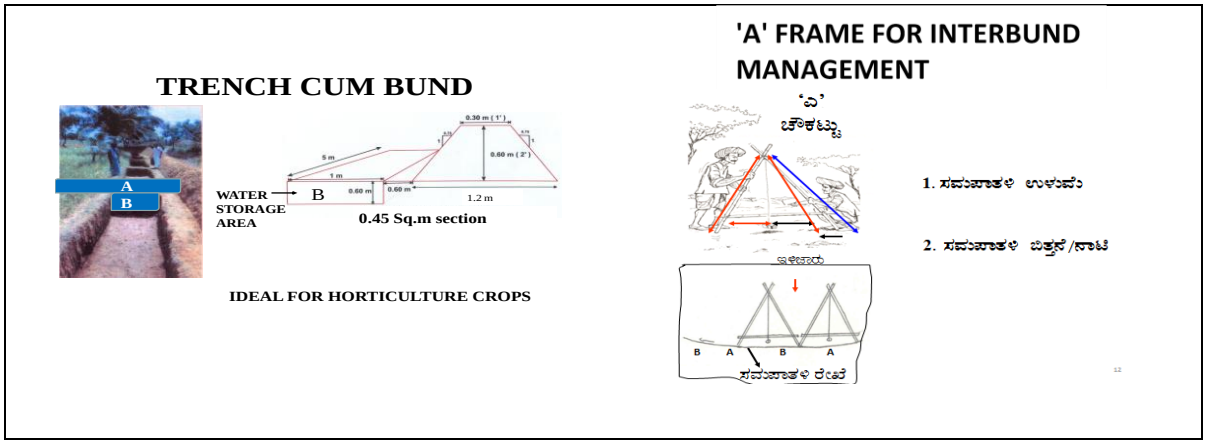
Recommended Bund Section

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 82 ha (12%) needs Trench cum Bunding, 446 ha (68%) needs Graded Bunding and 93 ha (14%) 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.

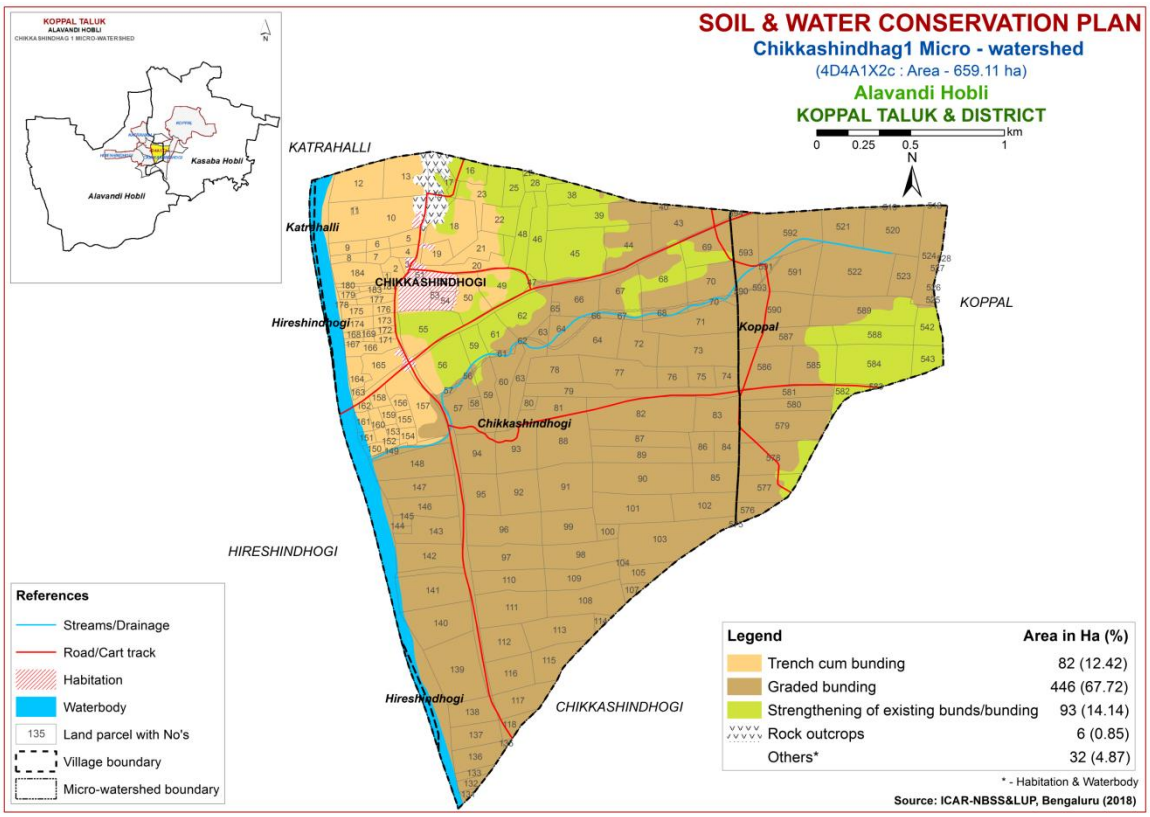


Fig. 9.1 Soil and Water Conservation Plan map of Chikkashindhag-1 Microwatershed

9.3 Greening of Microwatershed

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

Chikkashindhag-1 (1X2c) 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
Chikkashindhogi	1	0.18	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	2	1.08	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Chilli (Ch)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	3	0.56	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Chikkashindhogi	4	0.89	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	2 Borewell	IIes	Trench cum bunding
Chikkashindhogi	5	1.28	CKMhB2	LMU-2	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Chilli (Ch)	1 Borewell	IIes	Trench cum bunding
Chikkashindhogi	6	0.79	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	7	0.86	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	8	0.88	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	9	1.32	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	10	10.37	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize+Chilli (Mz+Ch)	1 Borewell	IIes	Trench cum bunding
Chikkashindhogi	11	0.14	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	12	4.92	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize+Paddy (Mz+Pd)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	13	5.11	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	15	3.63	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Not Available	Ro	Ro
Chikkashindhogi	16	2.52	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Horsegram+Maize+Chilli+(Hg+Mz+Ch+Jw)	Not Available	IIs	Graded bunding
Chikkashindhogi	17	0.68	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Not Available (NA)	Not Available	IIs	Graded bunding
Chikkashindhogi	18	5.55	CKMhB2g1	LMU-2	Moderately deep (75-100 cm)	Sandy clay loam	Gravelly (15-35%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Current fallow+Maize (Cf+Mz)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	19	1.84	CKMhB2	LMU-2	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	1 Borewell	IIes	Trench cum bunding
Chikkashindhogi	20	3.24	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	21	2.81	CKMhB2	LMU-2	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	22	2.88	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	23	3.88	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Current fallow+Maize (Cf+Mz)	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
Chikkashindhogi	25	2.11	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	27	0.14	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	28	1.29	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIs	Graded bunding
Chikkashindhogi	38	3.6	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	39	6.81	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	40	0.45	RNKmB1	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	43	5.89	RNKmB1	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	1 Borewell	IIs	Graded bunding
Chikkashindhogi	44	5.17	RNKmB1	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	45	8.49	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	46	4.12	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Maize (Mz)	1 Borewell	IIs	Graded bunding
Chikkashindhogi	47	0.4	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	48	3.24	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	49	4	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	50	3.57	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	51	0.3	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Chikkashindhogi	52	1.7	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Chikkashindhogi	53	0.16	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Chikkashindhogi	54	1.07	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Chikkashindhogi	55	5.69	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Brinjal+Maize (Br+Mz)	2 Borewell	IIs	Graded bunding
Chikkashindhogi	56	6.14	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Cotton (Ct)	Not Available	IIs	Graded bunding
Chikkashindhogi	57	4.66	DRLiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Drumstick (Ds)	Not Available	IIes	Graded bunding
Chikkashindhogi	58	0.44	DRLiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding
Chikkashindhogi	59	5.42	DRLiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding
Chikkashindhogi	60	3.73	DRLiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Chikkashindhogi	61	3.02	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	62	4.99	CKMiA1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Nearly level (0-1%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	63	4.12	MTLiB1g1	LMU-4	Shallow (25-50 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Redgram (Rg)	Not Available	IIIs	Graded bunding
Chikkashindhogi	64	7.61	RNKmB2g1	LMU-3	Moderately shallow (50-75 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding
Chikkashindhogi	65	0.35	MTLiB1g1	LMU-4	Shallow (25-50 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Current fallow (Cf)	Not Available	IIIs	Graded bunding
Chikkashindhogi	66	4.19	MTLiB1g1	LMU-4	Shallow (25-50 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Current fallow (Cf)	Not Available	IIIs	Graded bunding
Chikkashindhogi	67	5.32	MTLiB1g1	LMU-4	Shallow (25-50 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Current fallow (Cf)	Not Available	IIIs	Graded bunding
Chikkashindhogi	68	8.1	MTLiB1g1	LMU-4	Shallow (25-50 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	1 Borewell	IIIs	Graded bunding
Chikkashindhogi	69	4.75	RNKmB2	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding
Chikkashindhogi	70	5.49	MTLiB1g1	LMU-4	Shallow (25-50 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIIs	Graded bunding
Chikkashindhogi	71	6.32	MTLmB1g1	LMU-4	Shallow (25-50 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIIs	Graded bunding
Chikkashindhogi	72	4.09	MTLmB1g1	LMU-4	Shallow (25-50 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIIs	Graded bunding
Chikkashindhogi	73	7.32	MTLmB1g1	LMU-4	Shallow (25-50 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIIs	Graded bunding
Chikkashindhogi	74	1.34	MTLmB1g1	LMU-4	Shallow (25-50 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIIs	Graded bunding
Chikkashindhogi	75	1.65	MTLmB1g1	LMU-4	Shallow (25-50 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIIs	Graded bunding
Chikkashindhogi	76	1.86	MTLmB1g1	LMU-4	Shallow (25-50 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIIs	Graded bunding
Chikkashindhogi	77	5.7	MTLmB1g1	LMU-4	Shallow (25-50 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIIs	Graded bunding
Chikkashindhogi	78	4.02	MTLiB1g1	LMU-4	Shallow (25-50 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIIs	Graded bunding
Chikkashindhogi	79	6.91	MTLmB1g1	LMU-4	Shallow (25-50 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIIs	Graded bunding
Chikkashindhogi	80	0.58	MTLiB1g1	LMU-4	Shallow (25-50 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIIs	Graded bunding
Chikkashindhogi	81	3.66	MTLiB1g1	LMU-4	Shallow (25-50 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIIs	Graded bunding
Chikkashindhogi	82	10.3	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	83	4.32	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	84	2.2	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	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
Chikkashindhogi	85	3.8	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	86	2.1	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	87	4.52	RNKmB2g1	LMU-3	Moderately shallow (50-75 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding
Chikkashindhogi	88	7.24	RNKmB2g1	LMU-3	Moderately shallow (50-75 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Chikkashindhogi	89	4.58	RNKmB2g1	LMU-3	Moderately shallow (50-75 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding
Chikkashindhogi	90	8.79	RNKmB2g1	LMU-3	Moderately shallow (50-75 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Chikkashindhogi	91	6.91	RNKmB2g1	LMU-3	Moderately shallow (50-75 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding
Chikkashindhogi	92	4.9	RNKmB2g1	LMU-3	Moderately shallow (50-75 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding
Chikkashindhogi	93	5.16	MTLiB1g1	LMU-4	Shallow (25-50 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIIs	Graded bunding
Chikkashindhogi	94	4.28	MTLiB1g1	LMU-4	Shallow (25-50 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	1 Borewell	IIIs	Graded bunding
Chikkashindhogi	95	4.11	MTLiB1g1	LMU-4	Shallow (25-50 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIIs	Graded bunding
Chikkashindhogi	96	6.6	MTLiB2g2	LMU-4	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Current fallow (Cf)	Not Available	IIIes	Graded bunding
Chikkashindhogi	97	5.28	MTLiB2g2	LMU-4	Shallow (25-50 cm)	Sandy clay	Very gravelly (35-60%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Current fallow (Cf)	Not Available	IIIes	Graded bunding
Chikkashindhogi	98	5.16	MTLiB2	LMU-4	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIIes	Graded bunding
Chikkashindhogi	99	5.22	RNKmB2g1	LMU-3	Moderately shallow (50-75 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Chikkashindhogi	100	0.98	MTLiB2	LMU-4	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Chikkashindhogi	101	6.61	RNKmB2g1	LMU-3	Moderately shallow (50-75 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding
Chikkashindhogi	102	4.73	RNKmB2g1	LMU-3	Moderately shallow (50-75 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Currentfallow+Maize (Cf+Mz)	Not Available	IIes	Graded bunding
Chikkashindhogi	103	10.43	RNKmB1	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Currentfallow+Maize (Cf+Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	104	0.12	RNKmB1	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Not Available (NA)	Not Available	IIs	Graded bunding
Chikkashindhogi	105	2.29	RNKmB1	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	107	0.82	RNKmB1	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	108	6.09	MTLiB2	LMU-4	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Maize (Rg+Mz)	Not Available	IIIes	Graded bunding
Chikkashindhogi	109	4.29	MTLiB2	LMU-4	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	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
Chikkashindhogi	110	4.48	MTLiB1g1	LMU-4	Shallow (25-50 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Current fallow (Cf)	Not Available	IIIs	Graded bunding
Chikkashindhogi	111	6.41	MTLiB1g1	LMU-4	Shallow (25-50 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Current fallow (Cf)	Not Available	IIIs	Graded bunding
Chikkashindhogi	112	4.1	RNKmB2	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	2 Borewell	IIes	Graded bunding
Chikkashindhogi	113	5.43	MTLiB2	LMU-4	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIIes	Graded bunding
Chikkashindhogi	114	0.55	MTLiB1g1	LMU-4	Shallow (25-50 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Current fallow (Cf)	Not Available	IIIs	Graded bunding
Chikkashindhogi	115	3.75	MTLiB2	LMU-4	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIIes	Graded bunding
Chikkashindhogi	116	4.26	MTLiB2	LMU-4	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIIes	Graded bunding
Chikkashindhogi	117	3.89	RNKmB2	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize+| (Mz+Jw)	1 Borewell	IIes	Graded bunding
Chikkashindhogi	118	1.45	RNKmB2	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Drumstick+Maize (Ds+Mz)	Not Available	IIes	Graded bunding
Chikkashindhogi	131	0.27	RNKmB2g1	LMU-3	Moderately shallow (50-75 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Current fallow (Cf)	Not Available	IIes	Graded bunding
Chikkashindhogi	132	0.84	RNKmB2g1	LMU-3	Moderately shallow (50-75 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Chikkashindhogi	133	0.82	RNKmB2g1	LMU-3	Moderately shallow (50-75 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Chikkashindhogi	135	0.14	RNKmB2g1	LMU-3	Moderately shallow (50-75 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Groundnut (Rg+Gn)	Not Available	IIes	Graded bunding
Chikkashindhogi	136	3.08	RNKmB2g1	LMU-3	Moderately shallow (50-75 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding
Chikkashindhogi	137	3.18	RNKmB2g1	LMU-3	Moderately shallow (50-75 cm)	Clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding
Chikkashindhogi	138	3.23	RNKmB2	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding
Chikkashindhogi	139	8.43	RNKmB2	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding
Chikkashindhogi	140	6.44	RNKmB2	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding
Chikkashindhogi	141	6.6	RNKmB2	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	1 Borewell	IIes	Graded bunding
Chikkashindhogi	142	4.79	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Redgram (Rg)	Not Available	IIs	Graded bunding
Chikkashindhogi	143	4.21	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	144	0.68	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Redgram (Rg)	Not Available	IIs	Graded bunding
Chikkashindhogi	145	0.3	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Redgram (Rg)	Not Available	IIs	Graded bunding
Chikkashindhogi	146	3.77	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	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
Chikkashindhogi	147	4.13	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	148	6.22	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Chikkashindhogi	149	0.39	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	150	0.69	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	151	0.62	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	152	0.48	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	153	0.49	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	154	0.81	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	155	0.82	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	156	0.75	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	157	5.82	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	1 Borewell	IIs	Trench cum bunding
Chikkashindhogi	158	0.94	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	159	0.78	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	160	0.65	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	161	0.86	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	162	0.55	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	163	0.33	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	164	1.5	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	165	2.86	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	166	1.8	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	1 Borewell	IIs	Trench cum bunding
Chikkashindhogi	167	0.3	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	168	0.4	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	169	0.22	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	170	0.16	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum 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
Chikkashindhogi	171	0.45	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	172	0.45	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	173	0.78	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	174	1.12	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Trench cum bunding
Chikkashindhogi	175	1.17	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	1 Borewell	IIs	Trench cum bunding
Chikkashindhogi	176	0.7	CKMiB1	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	1 Borewell	IIs	Trench cum bunding
Chikkashindhogi	177	0.85	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	178	0.27	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	179	0.45	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	180	0.24	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	181	0.27	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	182	0.22	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	183	0.64	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Trench cum bunding
Chikkashindhogi	184	2.84	GHTcB2	LMU-2	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Trench cum bunding
Hireshindhogi	RIVER	1.75	Waterbody	Others	Others	Others	Others	Others	Others	Others	Maize (Mz)	Not Available	Others	Others
Katrahalli	RIVER	1.11	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody	Not Available	Others	Others
Koppal	518	0.04	BGPmB1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Very gently sloping (1-3%)	Slight	Bengalgram (Bg)	Not Available	IIs	Graded bunding
Koppal	519	0.27	BGPmB1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Very gently sloping (1-3%)	Slight	Bengalgram (Bg)	Not Available	IIs	Graded bunding
Koppal	520	7.35	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Bengalgram (Bg)	Not Available	IIs	Graded bunding
Koppal	521	4.44	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Bengalgram+Onion (Bg+On)	Not Available	IIs	Graded bunding
Koppal	522	10.18	BGPmB1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Koppal	523	2.9	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Koppal	524	5.99	BGPmB1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Koppal	525	0.15	BGPmB1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	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
Koppal	526	0.001	BGPmB1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Koppal	527	0.01	BGPmB1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Koppal	528	0.01	BGPmB1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Koppal	542	2.8	BGPmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Maize+Redgram (Mz+Rg)	Not Available	IIs	Graded bunding
Koppal	543	2.31	BGPmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Maize+Redgram (Mz+Rg)	Not Available	IIs	Graded bunding
Koppal	575	0.001	RNKmB1	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Koppal	576	1.53	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Koppal	577	4.38	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Maize+Fallow land (Mz+Fl)	Not Available	IIs	Graded bunding
Koppal	578	6.73	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Current fallow (Cf)	Not Available	IIs	Graded bunding
Koppal	579	7.54	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Fallow land (Fl)	Not Available	IIs	Graded bunding
Koppal	580	3.33	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Current fallow (Cf)	Not Available	IIs	Graded bunding
Koppal	581	3.19	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Current fallow (Cf)	Not Available	IIs	Graded bunding
Koppal	582	1.54	BGPmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Maize+Current fallow (Mz+Cf)	Not Available	IIs	Graded bunding
Koppal	583	0.14	BGPmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Redgram+Maize (Rg+Mz)	Not Available	IIs	Graded bunding
Koppal	584	8.35	BGPmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIs	Graded bunding
Koppal	585	5.11	RNKmB2	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding
Koppal	586	6.02	RNKmB2	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding
Koppal	587	5.2	RNKmB2	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Banana+Pearl Millet (Bn+Pm)	Not Available	IIes	Graded bunding
Koppal	588	4.33	BGPmA1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Nearly level (0-1%)	Slight	Maize (Mz)	Not Available	IIs	Graded bunding
Koppal	589	8.62	BGPmB1	LMU-1	Very deep (>150 cm)	Clay	Non gravelly (<15%)	High (151-200 mm/m)	Very gently sloping (1-3%)	Slight	Maize+Pearl Millet (Mz+Pm)	Not Available	IIs	Graded bunding
Koppal	590	7.53	RNKmB2	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Pearl Millet+Maize (Pm+Mz)	Not Available	IIes	Graded bunding
Koppal	591	6.25	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Pearl Millet (Pm)	Not Available	IIs	Graded bunding
Koppal	592	7.47	KVRmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Habitation	Not Available	IIs	Graded bunding
Koppal	593	5.38	RNKmB2	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Drumstick (Ds)	2 Borewell	IIes	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Koppal	594	0.17	RNKmB2	LMU-3	Moderately shallow (50-75 cm)	Clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Maize (Mz)	Not Available	IIes	Graded bunding

Appendix II

Chikkashindhag-1 (1X2c) 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
Chikkashindhogi	1	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	2	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	3	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Chikkashindhogi	4	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	5	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	6	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	7	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	8	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	9	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	10	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	11	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 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)
Chikkashindhogi	12	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 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)
Chikkashindhogi	13	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 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)
Chikkashindhogi	15	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Chikkashindhogi	16	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Low (< 0.5 %)	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)
Chikkashindhogi	17	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	18	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	19	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	20	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	21	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	22	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	23	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Chikkashindhogi	25	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	27	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	28	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	38	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	39	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	40	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	43	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	44	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	45	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	46	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	47	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	48	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	49	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	50	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	51	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Chikkashindhogi	52	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Chikkashindhogi	53	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Chikkashindhogi	54	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Chikkashindhogi	55	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	56	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	57	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	58	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	59	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	60	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Chikkashindhogi	61	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	62	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	63	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	64	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	65	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	66	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	67	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	68	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	69	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	70	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	71	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	72	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	73	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	74	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	75	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	76	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	77	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	78	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	79	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	80	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	81	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	82	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	83	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Chikkashindhogi	84	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	85	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	86	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	87	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	88	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	89	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	90	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	91	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	92	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)
Chikkashindhogi	93	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	94	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)
Chikkashindhogi	95	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)
Chikkashindhogi	96	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)
Chikkashindhogi	97	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)
Chikkashindhogi	98	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	99	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Chikkashindhogi	100	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	101	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	102	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	103	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	104	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	105	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	107	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Chikkashindhogi	108	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	109	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	110	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)
Chikkashindhogi	111	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	112	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	113	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	114	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	115	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	116	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	117	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	118	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	131	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	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)
Chikkashindhogi	132	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	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)
Chikkashindhogi	133	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	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)
Chikkashindhogi	135	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	136	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	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)
Chikkashindhogi	137	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	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)
Chikkashindhogi	138	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	139	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	140	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	141	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	142	Very strongly alkaline (pH > 9.0)	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)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	143	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Chikkashindhogi	144	Very strongly alkaline (pH > 9.0)	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)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	145	Very strongly alkaline (pH > 9.0)	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)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	146	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)
Chikkashindhogi	147	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)
Chikkashindhogi	148	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)
Chikkashindhogi	149	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	150	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	151	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	152	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	153	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	154	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)
Chikkashindhogi	155	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	156	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	157	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	158	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	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)
Chikkashindhogi	159	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	160	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	161	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	162	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	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)
Chikkashindhogi	163	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	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)
Chikkashindhogi	164	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	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)
Chikkashindhogi	165	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	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)
Chikkashindhogi	166	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Chikkashindhogi	167	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	168	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	169	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	170	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	171	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	172	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	173	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	174	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	175	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	176	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	177	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	178	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	179	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	180	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Chikkashindhogi	181	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	182	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	183	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Chikkashindhogi	184	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	High (> 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hireshindhogi	RIVER	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Katrahalli	RIVER	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Koppal	518	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	519	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	520	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	521	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Koppal	522	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	523	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	524	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	525	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	526	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	527	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	528	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	542	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	543	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	575	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	576	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	577	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	578	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	579	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	580	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	581	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	582	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	583	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	584	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	585	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	586	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	587	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 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)
Koppal	588	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Koppal	589	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	590	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Koppal	591	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Koppal	592	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Koppal	593	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	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)	Deficient (< 0.6 ppm)
Koppal	594	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Appendix III

Chikkashindhag-1 (1X2c) 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	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Jasmine	Bhendi	Brinjal	Crossandra	Drumstick	Mulberry	Onion
Chikkashindhogi	1	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Chikkashindhogi	2	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Chikkashindhogi	3	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Chikkashindhogi	4	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Chikkashindhogi	5	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	6	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Chikkashindhogi	7	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Chikkashindhogi	8	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Chikkashindhogi	9	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Chikkashindhogi	10	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Chikkashindhogi	11	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Chikkashindhogi	12	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Chikkashindhogi	13	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Chikkashindhogi	15	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
Chikkashindhogi	16	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	17	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	18	S3r	S2tg	S2rg	S2g	S2rt	S2rg	S3r	S2rg	S2gt	S2r	S2gt	S1	S2rg	S1	S2rt	S2rg	S2rg	S2t	S1	S1	S2tg	S2tg	S2rg	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	19	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	20	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	21	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	22	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	23	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	25	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	27	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Jasmine	Bhendi	Brinjal	Crossandra	Drumstick	Mulberry	Onion
Chikkashindhogi	28	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	38	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	39	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	40	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	43	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	44	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	45	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	46	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	47	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	48	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	49	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	50	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	51	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
Chikkashindhogi	52	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
Chikkashindhogi	53	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
Chikkashindhogi	54	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
Chikkashindhogi	55	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	56	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	57	S3rz	S2tz	S3tz	S2nz	S3tz	S2rz	S3rz	S2rz	S2rz	S2rz	S3rz	S2tz	S3tz	S2z	N1tz	S3rz	S2rz	S3tz	S3tz	S3tz	S2tz	S2tz	S2rt	S2tz	S3tz	S2tz	S2tz	S2z	S2rz	S2tz	S3tz
Chikkashindhogi	58	S3rz	S2tz	S3tz	S2nz	S3tz	S2rz	S3rz	S2rz	S2rz	S2rz	S3rz	S2tz	S3tz	S2z	N1tz	S3rz	S2rz	S3tz	S3tz	S3tz	S2tz	S2tz	S2rt	S2tz	S3tz	S2tz	S2tz	S2z	S2rz	S2tz	S3tz
Chikkashindhogi	59	S3rz	S2tz	S3tz	S2nz	S3tz	S2rz	S3rz	S2rz	S2rz	S2rz	S3rz	S2tz	S3tz	S2z	N1tz	S3rz	S2rz	S3tz	S3tz	S3tz	S2tz	S2tz	S2rt	S2tz	S3tz	S2tz	S2tz	S2z	S2rz	S2tz	S3tz
Chikkashindhogi	60	S3rz	S2tz	S3tz	S2nz	S3tz	S2rz	S3rz	S2rz	S2rz	S2rz	S3rz	S2tz	S3tz	S2z	N1tz	S3rz	S2rz	S3tz	S3tz	S3tz	S2tz	S2tz	S2rt	S2tz	S3tz	S2tz	S2tz	S2z	S2rz	S2tz	S3tz
Chikkashindhogi	61	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	62	S3r	S2t	S2rg	S1	S2rt	S2rg	S3r	S2r	S2gt	S2r	S2rg	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2tg	S2r	S1	S2tg	S2t	S1	S2gt	S2r	S2r	S2t
Chikkashindhogi	63	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	64	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Jasmine	Bhendi	Brinjal	Crossandra	Drumstick	Mulberry	Onion
Chikkashindhogi	65	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	66	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	67	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	68	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	69	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	70	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	71	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	72	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	73	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	74	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	75	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	76	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	77	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	78	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	79	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	80	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	81	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	82	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Chikkashindhogi	83	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Chikkashindhogi	84	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Chikkashindhogi	85	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Chikkashindhogi	86	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Chikkashindhogi	87	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	88	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	89	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	90	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Jasmine	Bhendi	Brinjal	Crossandra	Drumstick	Mulberry	Onion
Chikkashindhogi	91	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	92	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	93	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	94	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	95	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	96	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	97	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	98	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	99	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	100	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	101	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	102	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	103	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	104	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	105	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	107	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	108	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	109	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	110	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	111	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	112	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	113	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	114	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	115	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	116	N1rt	S3tz	N1rz	S3rz	N1rt	S3rz	N1rz	N1rz	S3rz	N1rz	N1rz	S3tz	N1rt	S3zg	N1rt	N1rt	N1rz	S3tz	S3rz	S3rz	S3rz	S3rz	N1rz	S3rz	S3rz	S3r	S3r	S3rz	N1rz	N1rz	S3rt
Chikkashindhogi	117	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Jasmine	Bhendi	Brinjal	Crossandra	Drumstick	Mulberry	Onion
Chikkashindhogi	118	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	131	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	132	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	133	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	135	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	136	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	137	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	138	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	139	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	140	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	141	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Chikkashindhogi	142	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Chikkashindhogi	143	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Chikkashindhogi	144	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Chikkashindhogi	145	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Chikkashindhogi	146	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Chikkashindhogi	147	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Chikkashindhogi	148	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Chikkashindhogi	149	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	150	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	151	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	152	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	153	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	154	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	155	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	156	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Jasmine	Bhendi	Brinjal	Crossandra	Drumstick	Mulberry	Onion
Chikkashindhogi	157	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	158	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	159	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	160	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	161	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	162	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	163	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	164	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	165	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	166	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	167	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	168	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	169	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	170	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	171	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	172	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	173	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	174	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	175	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	176	S3r	S2t	S2rg	S1	S2rt	S2r	S3r	S2r	S2t	S2r	S2r	S1	S2r	S1	S2rt	S2r	S2r	S2t	S1	S1	S2t	S2t	S2r	S1	S2t	S2t	S1	S2t	S2r	S2r	S2t
Chikkashindhogi	177	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Chikkashindhogi	178	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Chikkashindhogi	179	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Chikkashindhogi	180	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Chikkashindhogi	181	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Chikkashindhogi	182	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Jasmine	Bhendi	Brinjal	Crossandra	Drumstick	Mulberry	Onion
Chikkashindhogi	183	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Chikkashindhogi	184	S3r	S2g	S2r	S2g	S2r	S2rg	S3r	S2r	S2g	S2rg	S2rg	S1	S2r	S1	S2r	S2r	S2r	S1	S2g	S2g	S2g	S2g	S2r	S1	S2g	S1	S1	S2g	S2rg	S2r	S1
Hireshindhogi	RIVER	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
Katrahalli	RIVER	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
Koppal	518	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	519	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	520	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	521	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	522	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	523	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	524	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	525	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	526	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	527	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	528	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	542	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	543	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	575	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Koppal	576	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	577	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	578	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	579	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	580	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	581	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	582	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	583	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Jasmine	Bhendi	Brinjal	Crossandra	Drumstick	Mulberry	Onion
Koppal	584	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	585	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Koppal	586	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Koppal	587	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Koppal	588	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	589	S3tz	S2tz	S3tz	S2z	S3tz	S2z	S2tz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2tz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	590	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Koppal	591	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	592	S2rz	S2tz	S3tz	S2z	S3tz	S2z	S2rz	S2z	S2z	S2z	S2tz	S2tz	S3tz	S2z	N1tz	S2rz	S2z	S3tz	S3tz	S3tz	S2tz	S2tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz	S2tz	S2tz	S3tz
Koppal	593	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz
Koppal	594	N1rz	S2tz	S3rz	S2rz	S3tz	S2rz	N1rz	S3rz	S2rz	S3rz	S3rz	S2rz	S3tz	S2rz	N1tz	S3tz	S3rz	S3tz	S3tz	S3tz	S2rz	S2rz	S3rz	S2tz	S2rz	S2rt	S2rt	S3rz	S3rz	S3rz	S3tz

PART-B

SOCIO-ECONOMIC STATUS OF FARM HOUSEHOLDS

CONTENTS

LIST OF TABLES

Chapter 1

SALIENT FINDINGS OF THE SURVEY

- *The data indicated that there were 109 (54.50%) men and 90 (45%) were women among the sampled households.*
- *The average family size of landless farmers' was 3.5, marginal farmers' was 7.1, small farmers' was 6.1, semi medium farmers' was 6.1, medium farmers' was 9.5 and for large farmers it was 6.*
- *The data indicated that, 42 (21%) people were in 0-15 years of age, 88 (44%) were in 16-35 years of age, 51 (25.50 %) were in 36-60 years of age and 19 (9.50 %) were above 61 years of age.*
- *The results indicated that the Chikkasindhogi-1 had 29.50 per cent illiterates, 12.50 per cent of them had primary school education, 22.50 per cent of them had middle school education, 25.50 per cent of them had high school education, 4 per cent of them had PUC education, 1 per cent of them had diploma, 0.5 per cent of them had ITI and 4.5 per cent of them had degree education.*
- *The results indicate that, 93.55 per cent of households practicing agriculture and 6.45 per cent of the household heads were agricultural labourers.*
- *The results indicate that agriculture was the major occupation for 67 per cent of the household members, 2 per cent were agricultural labourers, 1 per cent had household industry, 27.5 per cent of them were student, 1.5 per cent of them were housewife and 0.5 per cent of them were in government and private services.*
- *The results shows that 8 per cent of the households participated in user groups and 91.50 per cent of them have not participated in any local institutions.*
- *The results indicate that 35.48 per cent of the households possess thatched house, 6.45 per cent of the households possess Katcha house, 54.84 per cent of them possess pucca house and 3.23 per cent of them possess semi pucca house.*
- *The results shows that 93.55 per cent of the households possess TV, 77.42 per cent of the households possess Mixer grinder, 51.61 per cent of the households possess motor cycle, 6.45 per cent of the households possess tempo, 3.23 per cent of the households possess refrigerator and bicycle, and 93.55 per cent of the households possess mobile phones.*
- *The average value of television was Rs.6276, mixer grinder was Rs.1515, motor cycle was Rs.52437, mobile phone was Rs.1710, refrigerator was Rs.8000 and bicycle was Rs.3000.*
- *About 22.58 per cent of the households possess plough, 3.23 per cent of them possess tractor, 12.90 per cent of them posses bullocks cart, 38.17 per cent of them power tiller and 93.55 per cent of them possess weeder.*
- *The results show that the average value of plough was Rs.1,500, the average value of tractor was Rs. 5,00,000 and the average value of sprayer was Rs.3,953, the average value of bullock cart Rs.18,500, and the average value of weeder Rs.95.*

- *The results indicate that, 16.13 per cent of the households possess bullocks, 22.58 per cent of the households possess local cow, 3.23 per cent of the households possess crossbred cow, 22.58 per cent of the households possess local cow and buffalo, 3.23 per cent of the households possess crossbred cow, goat and poultry birds.*
- *The results indicate that, average own labour men available in the micro watershed was 2.27, average own labour (women) available was 1.90, average hired labour (men) available was 3.47 and average hired labour (women) available was 7.77.*
- *The results indicate that, 90.32 per cent of the household opined that hired labour was adequate and 3.23 per cent of the households opined that hired labour was inadequate.*
- *The results indicate that, 6 (3.0%) persons were migrated from the micro watershed which includes 3 persons from semi medium farmers and 3 persons from medium farmer category.*
- *People have migrated on average of 299.2 Kms and average duration was 8 months. Semi medium farmers have migrated 433.33 kms and on an average 10 months in a year.*
- *Improved quality of the life was the major positive consequence of migration of 16.67 per cent of the households and construction house was the major positive consequence for 33.33 per cent.*
- *Increased workload for other family members was the major negative consequence of migration.*
- *The results indicate that, households of the Chikkasindhogi-1 micro watershed possess 17.89 ha (39.72%) of dry land and 27.14 ha (60.28%) of irrigated land.*
- *The average value of dry land was Rs. 267994.14 and average value of irrigated was Rs.1, 89,272.*
- *The results indicate that, there were 14 functioning bore wells and 1 functioning open well in the micro watershed.*
- *Bore well was the major irrigation source in the micro water shed which was possessed by small farmers, medium farmers, semi medium farmers and large farmers.*
- *The depth of bore well was found to be 47.64 meters and the depth of open well was found to be 0.29 meters.*
- *The results indicate that, marginal farmers had irrigated area of 1.75 hectares, small farmers had 6.67 hectares, semi medium farmers had 8.73 hectares, medium farmers had 7.69 hectares and large farmers had 4.05 hectares of irrigated land.*
- *The results indicate that, farmers have grown Maize (26.34 ha), Tomato (2.4 ha), Cotton (2.05 ha), Groundnut (1.68 ha), Pearlmillet (2.59 ha), Paddy (0.81 ha), Sorghum (0.81 ha), Bengal gram (0.51 ha), Chilly (0.4 ha).*
- *The results indicate that, the cropping intensity in Chikkasindhogi-1 micro watershed was found to be 96.83 per cent. In case of marginal farmers it was 87.82 per cent, for small farmers it was 93.99 per cent, in case of semi medium farmers it was 100 per*

cent, medium farmers had cropping intensity of 100 per cent and large farmers had 100 per cent.

- *The results indicate that, 90.32 per cent of the households possess bank account and 12.90 per cent of them have savings. Around 50 per cent of landless, 44.44 per cent of marginal, 22.22 per cent of small, 50 per cent semi medium, 50 per cent of medium farmers and 100 per cent of large farmers have borrowed credit from different sources.*
- *About 10 per cent have availed loan in cooperative bank, 40 per cent have availed loan from friends and relatives and 100 per cent have availed loan from grameena bank.*
- *The results indicate that, 90.91 per cent of the households have borrowed loan for agriculture, 4.55 per cent have borrowed for buying irrigation related equipments and 4.55 per cent have borrowed for social functions like marriage, from institutional and non institutional sources.*
- *Results indicated that 100 per cent of the households did not repay their loan borrowed from institutional sources.*
- *The results indicate that, the total cost of cultivation for maize was Rs. 234356.79. The gross income realized by the farmers was Rs. 167960. The net income from Maize cultivation was Rs. -66396.80, thus the benefit cost ratio was found to be 1:0.72.*
- *The total cost of cultivation for tomato was Rs. 46729.38. The gross income realized by the farmers was Rs. 67925.00. The net income from tomato cultivation was Rs. 21195.62. Thus the benefit cost ratio was found to be 1:1.45.*
- *The total cost of cultivation for groundnut was Rs. 72133.49. The gross income realized by the farmers was Rs. 62490.23. The net income from groundnut cultivation was Rs. -9643.26. Thus the benefit cost ratio was found to be 1:0.87.*
- *The total cost of cultivation for cotton was Rs. 44743.83. The gross income realized by the farmers was Rs. 75381.17. The net income from cotton cultivation was Rs. 30637.34. Thus the benefit cost ratio was found to be 1:1.68.*
- *The total cost of cultivation for bengal gram was Rs. 251848.19. The gross income realized by the farmers was Rs. 111150. The net income from bengal gram cultivation was Rs. -140698.19, thus the benefit cost ratio was found to be 1:0.44.*
- *The total cost of cultivation for sorghum was Rs. 25747.08. The gross income realized by the farmers was Rs. 24700. The net income from sorghum cultivation was Rs. -1047.08. Thus the benefit cost ratio was found to be 1:0.96.*
- *The total cost of cultivation for chilly was Rs. 76456.11. The gross income realized by the farmers was Rs. 98800. The net income from chilly cultivation was Rs. 22343.89. Thus the benefit cost ratio was found to be 1:1.29.*
- *The total cost of cultivation for paddy was Rs. 50384.32. The gross income realized by the farmers was Rs. 38902.50. The net income from paddy cultivation was Rs. -11481.82. Thus the benefit cost ratio was found to be 1:0.77.*

- *The results indicate that, 35.48 per cent of the households opined that dry fodder was adequate. Only 19.35 per cent of the households have opined that the green fodder is adequate. The data also revealed that 19.35 per cent of the households opined that dry fodder and green fodder were inadequate.*
- *The results indicate that the average annual gross income was Rs. 22500 for landless farmers, for marginal farmers it was Rs. 61655.56, for small farmers it was Rs.56222, for semi medium farmers it was Rs.94688, for medium farmers it was Rs.191500 and for large farmers it was Rs.73000.*
- *The results indicate that the average annual expenditure is Rs. 13296.47. For landless farmers it was 6250, for marginal farmers it was Rs 8969, for small farmers it was Rs. 4464.51, for semi medium farmers it was Rs. 10348.48 and for medium farmers it was Rs. 70500 and for large farmers it was Rs. 55000.*
- *The results indicate that, sampled households have grown 22 coconut, 19 mango and 3 sapota trees in their field. Farmers have also grown 5 coconut trees in their backyard.*
- *The results indicate that, 93.55 per cent of the households are interested in growing horticultural crops which include 100 per cent of marginal, small, semi medium, medium and large farmers.*
- *Households have planted 31 neem trees, 1 banyan tree in field and 9 neem trees in backyard.*
- *The results indicate that, households have an average investment capacity of Rs. 6193 for land development, Rs. 2241 for irrigation facility, Rs.4113 for improved crop production and Rs.1774 for improved livestock management.*
- *Loan from bank is the major source of investment for 78.13 per cent of households for land development. For irrigation facility 25 per cent of the households depend on loan from bank, 12.5 per cent depend on own funds and 9.38 per cent of the households depend on soft loans. For improved crop production 59.38 per cent of the households depend on bank loan and for improved livestock management 21.88 per cent of the households depend on bank loan.*
- *The results indicated that, Bengal gram, chilly, cotton, maize and tomato were sold to the extent of 100 per cent.*
- *The results indicated that, About 73.33 per cent of the households have sold agricultural produce to the local/village merchants includes 100 per cent of the marginal farmers, 85.71 per cent of the small farmers, 66.67 per cent of the semi medium farmers and 33.33 per cent medium farmers. About 23.33 per cent of the households have sold in regulated markets, which include 14.29 per cent of small farmers, 33.33 per cent of semi medium farmers, 66.67 per cent of the medium farmers and 100 per cent of the large farmers.*
- *About 9.68 per cent of the households have used tractor as mode of transport and 116.13 per cent have used truck.*

- *The results indicated that, 90.32 per cent of the households have experienced the soil and water erosion problems i.e. 88.89 per cent of marginal farmers and 100 per cent of small, semi medium, medium and large farmers. 90.32 per cent of the households have shown interest in soil testing.*
- *The results indicated that, 51.61 per cent of the households have adopted field bunding, 3.23 per cent of the households have adopted contour bunds, 3.23 per cent of the households have adopted farm pond, 29.03 per cent have adopted bore well recharge pit and 45.16 per cent of the households are following summer ploughing.*
- *About 100 per cent of the households who adopted field bunding, farm pond and contour bund and 33.33 per cent the households who adopted bore well recharge pit, opined that they were in good condition. Around 66 per cent of the households opined that bore well recharge pits require full replacement.*
- *The results indicated that 87.10 per cent of soil conservation structure is constructed by farmers on their own, 41.94 per cent of the soil conservation structures are constructed by the government and another 3.23 per cent is constructed by farmer organizations.*
- *The results indicated that, canal was the major source of drinking water for 93.55 per cent of the households and bore well was the source of drinking water for 3.23 per cent of the households.*
- *About 83.87 percent used fire wood and another 12.9 percent of the households used LPG. Electricity was the major source of light for all the households in micro watershed.*
- *About 25.81 per cent of the households possess sanitary toilet i.e. 100 per cent of landless, 11.11 per cent of marginal, 11.11 per cent of small, 25 per cent of semi medium, 50 per cent of medium farmers and 100 per cent of large farmers had sanitary toilet facility.*
- *The results indicated that, 87.10 per cent of the sampled households possessed BPL card, 3.23 per cent of the households possessed APL and 6.45 per cent did not possess PDS card.*
- *About 67.74 per cent of the households participated in NREGA programme which included 100 per cent of the landless, 55.56 percent of the marginal, 55.56 per cent of the small, 75 per cent of the semi medium, 100 percent of the medium and 100 per cent of the large farmers.*
- *The results indicated that, cereals were adequate for 90.32 per cent of the households, pulses were adequate for 87.10 per cent, oilseeds were adequate for 3.23 per cent, vegetables were adequate for 80.65 per cent, fruits were adequate for 22.58 per cent, milk was adequate for 83.87 per cent, egg were adequate for 16.13 per cent and meat was adequate for 6.45 per cent of the households.*
- *Cereals were inadequate for 3.23 per cent of the households, pulses were inadequate for 6.45 per cent, oilseeds were inadequate for 3.23 per cent, fruits were inadequate*

for 25.18 per cent, eggs were inadequate for 35.48 per cent and meat was inadequate for 41.94 per cent of the households.

- *Oilseeds were market surplus for 70.97 per cent of the households, vegetables were market surplus for 3.23 per cent, fruits were market surplus for 16.13 per cent, eggs were market surplus for 6.45 per cent and meat was market surplus for 9.68 per cent of the households.*
- *The results indicated that, lower fertility status of the soil was the constraint experienced by 48.39 per cent of the households, wild animal menace on farm field (74.19%), frequent incidence of pest and diseases (3.23%), inadequacy of irrigation water (38.71%), high cost of fertilizers and plant protection chemicals (41.94%), high rate of interest on credit (29.03%), low price for the agricultural commodities (3.23%), lack of marketing facilities in the area (9.68%), lack of transport for safe transport of the agricultural produce to the market (16.13%), less rainfall (87.10%) and source of Agri–technology information (News paper/TV/Mobile) (16.13%).*

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

Chikkasindhogi-1 micro-watershed (Bhagyanagar sub-watershed, Koppal Taluk and District) is located at North latitude 15^0 18' 46.51" and 15^0 16' 56.901" and East longitude 76^0 7' 51.521" and 76^0 5' 56.794" covering an area of 659.39 ha and spread across Koppal, Katrihalli, Chikkasindhogi and Hiresindhogi 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 31 households located in the micro watershed were interviewed for the survey.

SALIENT FEATURES OF THE SURVEY

Households sampled for socio-economic survey: The data on households sampled for socio economic survey in Chikkasindhogi-1 micro watershed is presented in Table 1 and it indicated that 31 farmers were sampled in Chikkasindhogi-1 micro watershed among them 9 (29.03%) were marginal farmers, 9 (29.03%) were small farmers, 8 (25.81%) were semi medium farmers, 2 (6.45%) were medium farmers and 1 (3.23%) was large farmer. Apart from these 2 landless farmers were also interviewed for the survey.

Table 1: Households sampled for socio economic survey in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)		MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Farmers	2	6.45	9	29.03	9	29.03	8	25.81	2	6.45	1	3.23	31	100

Population characteristics: The population characteristics of households sampled for socio-economic survey in Chikkasindhogi-1 micro watershed is presented in Table 2. The data indicated that there were 109 (54.50%) men and 90 (45%) were women among the sampled households. The average family size of landless farmers' was 3.5, marginal farmers' was 7.1, small farmers' was 6.1, semi medium farmers' was 6.1, medium farmers' was 9.5 and for large farmers it was 6.

Table 2: Population characteristics of Chikkasindhogi-1 micro-watershed

Sl.No.	Particulars	LL (7)		MF (64)		SF (55)		SMF (49)		MDF (19)		LF (6)		All (200)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Male	5	71.43	31	48.44	30	54.55	29	59.18	10	52.63	4	66.67	109	54.50
2	Female	2	28.57	32	50	25	45.45	20	40.82	9	47.37	2	33.33	90	45.00
Total		7	100	64	100	55	100	49	100	19	100	6	100	200	100
Average		3.5		7.1		6.1		6.1		9.5		6.0		6.5	

Age wise classification of population: The age wise classification of household members in Chikkasindhogi-1 micro watershed is presented in Table 3. The data indicated that, 42 (21%) people were in 0-15 years of age, 88 (44%) were in 16-35 years of age, 51 (25.50 %) were in 36-60 years of age and 19 (9.50 %) were above 61 years of age.

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

Sl. No.	Particulars	LL (7)		MF(64)		SF (55)		SMF(49)		MDF(19)		LF (6)		All (200)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	0-15 years of age	3	42.86	18	28.13	12	21.82	7	14.29	2	10.53	0	0	42	21.00
2	16-35 years of age	1	14.29	26	40.63	24	43.64	24	48.98	9	47.37	4	66.67	88	44.00
3	36-60 years of age	2	28.57	16	25.00	12	21.82	14	28.57	5	26.32	2	33.33	51	25.50
4	> 61 years	1	14.29	4	6.25	7	12.73	4	8.16	3	15.79	0	0	19	9.50
Total		7	100	64	100	55	100	49	100	19	100	6	100	200	100

Education level of household members: Education level of household members in Chikkasindhogi-1 micro watershed is presented in Table 4. The results indicated that the

Chikkasindhogi-1 had 29.50 per cent illiterates, 12.50 per cent of them had primary school education, 22.50 per cent of them had middle school education, 25.50 per cent of them had high school education, 4 per cent of them had PUC education, 1 per cent of them had diploma, 0.5 per cent of them had ITI and 4.5 per cent of them had degree education.

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

Sl.No.	Particulars	LL (7)		MF (64)		SF (55)		SMF (49)		MDF (19)		LF (6)		All (200)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Illiterate	3	42.86	17	26.56	17	30.91	17	34.69	3	15.79	2	33.33	59	29.50
2	Primary School	0	0	13	20.31	6	10.91	5	10.20	1	5.26	0	0	25	12.50
3	Middle School	2	28.57	21	32.81	13	23.64	7	14.29	2	10.53	0	0	45	22.50
4	High School	2	28.57	9	14.06	17	30.91	12	24.49	7	36.84	4	66.67	51	25.50
5	PUC	0	0	3	4.69	0	0	3	6.12	2	10.53	0	0	8	4.00
6	Diploma	0	0	0	0	0	0	1	2.04	1	5.26	0	0	2	1.00
7	ITI	0	0	0	0	1	1.82	0	0	0	0	0	0	1	0.50
8	Degree	0	0	1	1.56	1	1.82	4	8.16	3	15.79	0	0	9	4.50
Total		7	100	64	100	55	100	49	100	19	100	6	100	200	100

Occupation of household heads: The data regarding the occupation of the household heads in Chikkasindhogi-1 micro watershed is presented in Table 5. The results indicate that, 93.55 per cent of households practicing agriculture and 6.45 per cent of the household heads were agricultural labourers.

Table 5: Occupation of household heads in Chikkasindhogi-1 micro watershed

Sl. No.	Particulars	LL (2)		MF (9)		SF (9)		SMF (8)		MDF(2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Agriculture	0	0.00	9	100.00	9	100.00	8	100.00	2	100.00	1	100.00	29	93.55
2	Agricultural Labour	2	100.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	6.45
Total		2	100.00	9	100.00	9	100.00	8	100.00	2	100.00	1	100.00	31	100.00

Occupation of the household members: The data regarding the occupation of the household members in Chikkasindhogi-1 micro watershed is presented in Table 6. The results indicate that agriculture was the major occupation for 67 per cent of the household members, 2 per cent were agricultural labourers, 1 per cent had household industry, 27.5 per cent of them were student, 1.5 per cent of them were housewife and 0.5 per cent of them were in government and private services. In case of landless households 57.14 per cent were agricultural labourers and 42.86 per cent were students. In case of marginal farmers 64.06 per cent were agriculturist, 34.38 per cent were student, and about 1.56 per cent were in government service. In case of small farmers, 72.73 per cent of the household members were practicing agriculture and 25.45 per cent of them were students. In case of semi medium farmers 75.15 per cent of the household members were practicing agriculture, 22.45 per cent of them were private service and 2.04 per cent of them had household industry. In case of medium farmers, 57.89 per cent of the household members

were practicing agriculture, 26.32 per cent were students and 5.26 per cent were in private sector. In case of large farmers, 83.33 per cent of the household members were practicing agriculture and 16.67 per cent had household industry.

Table 6: Occupation of family members in Chikkasindhogi-1 micro watershed

Sl. No.	Particulars	LL (7)		MF(64)		SF (55)		SMF(49)		MDF(19)		LF (6)		All (200)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Agriculture	0	0	41	64.06	40	72.73	37	75.51	11	57.89	5	83.33	134	67.00
2	Agricultural Labour	4	57.14	0	0	0	0	0	0	0	0	0	0	4	2.00
3	Household industry	0	0	0	0	0	0	1	2.04	0	0	1	16.67	2	1.00
4	Government Service	0	0	1	1.56	0	0	0	0	0	0	0	0	1	0.50
5	Private Service	0	0	0	0	0	0	0	0	1	5.26	0	0	1	0.50
6	Student	3	42.86	22	34.38	14	25.45	11	22.45	5	26.32	0	0	55	27.50
7	Housewife	0	0	0	0	1	1.82	0	0	2	10.53	0	0	3	1.50
Total		7	100	64	100	55	100	49	100	19	100	6	100	200	100

Institutional participation of the household members: The data regarding the institutional participation of the household members in Chikkasindhogi-1 micro watershed is presented in Table 7. The results shows that 8 per cent of the households participated in user groups and 91.50 per cent of them have not participated in any local institutions. About 9.38 per cent of marginal farmers have participated in user groups and 90.63 per cent have not participated in any local institutions. Small farmers participated in user groups (10.91%) and raitha sangha (1.82%). About 4.08 per cent of semi medium farmers have participated in user group and among medium farmers no one participated in any local institutions. Large farmers also participated in user groups (33.33).

Table 7. Institutional Participation of household members in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (7)		MF (64)		SF (55)		SMF (49)		MDF (19)		LF (6)		All (200)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	User Group	0	0	6	9.38	6	10.91	2	4.08	0	0	2	33.33	16	8.00
2	Raitha Sangha	0	0	0	0	1	1.82	0	0	0	0	0	0	1	0.50
3	No Participation	7	100	58	90.63	48	87.27	47	95.92	19	100	4	66.67	183	91.50
Total		7	100	64	100	55	100	49	100	19	100	6	100	200	100

Type of house owned: The data regarding the type of house owned by the households in Chikkasindhogi-1 micro watershed is presented in Table 8. The results indicate that 35.48 per cent of the households possess thatched house, 6.45 per cent of the households possess Katcha house, 54.84 per cent of them possess pucca house and 3.23 per cent of them possess semi pucca house. With regard to landless households, 50 per cent of them possess thatched house and 50 per cent possess katcha house. In case of marginal farmers, 55.56 per cent of the households possess katcha house and 44.44 per cent of them possess pucca house. In case of small farmers, 22.22 per cent of the households possess thatched house, 11.11 per cent of them possess katcha and semi pucca house, 55.56 per cent of the households possess pucca house. In case of semi medium farmers, 37.50 per cent of the

households possess thatched house and 62.50 per cent of them possess pucca house. Cent per cent of medium and large farmers possess pucca house.

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

Sl.No.	Particulars	LL (2)		MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Thatched	1	50.00	5	55.56	2	22.22	3	37.50	0	0.00	0	0.00	11	35.48
2	Katcha	1	50.00	0	0.00	1	11.11	0	0.00	0	0.00	0	0.00	2	6.45
3	Pucca/RCC	0	0.00	4	44.44	5	55.56	5	62.50	2	100.00	1	100.00	17	54.84
4	Semi pacca	0	0.00	0	0.00	1	11.11	0	0.00	0	0.00	0	0.00	1	3.23
Total		2	100.00	9	100.00	9	100.00	8	100.00	2	100.00	1	100.00	31	100.00

Durable Assets owned by the households: The data regarding the Durable Assets owned by the households in Chikkasindhogi-1 micro watershed is presented in Table 9. The results shows that 93.55 per cent of the households possess TV, 77.42 per cent of the households possess Mixer grinder, 51.61 per cent of the households possess motor cycle, 6.45 per cent of the households possess tempo, 3.23 per cent of the households possess refrigerator and bicycle, and 93.55 per cent of the households possess mobile phones.

Table 9. Durable Assets owned by households in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)		MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Television	0	0	9	100	9	100	8	100	2	100	1	100	29	93.55
2	Mixer/Grinder	0	0	7	77.78	7	77.78	7	87.50	2	100	1	100	24	77.42
3	Refrigerator	0	0	1	11.11	0	0	0	0	0	0	0	0	1	3.23
4	Bicycle	0	0	1	11.11	0	0	0	0	0	0	0	0	1	3.23
5	Motor Cycle	0	0	3	33.33	4	44.44	6	75.00	2	100	1	100	16	51.61
6	Tempo	0	0	0	0	1	11.11	1	12.50	0	0	0	0	2	6.45
7	Mobile Phone	1	50	9	100	9	100	7	87.50	2	100	1	100	29	93.55
8	Blank	1	50	0	0	0	0	0	0	0	0	0	0	1	3.23

Average value of durable assets: The data regarding the average value of durable assets owned by the households in Chikkasindhogi-1 micro watershed is presented in Table 10. The results shows that the average value of television was Rs.6276, mixer grinder was Rs.1515, motor cycle was Rs.52437, mobile phone was Rs.1710, refrigerator was Rs.8000 and bicycle was Rs.3000.

Table 10. Average value of durable assets owned by households in Chikkasindhogi-1 micro watershed

Average value (Rs.)

S.N.	Particulars	LL (2)	MF (9)	SF (9)	SMF (8)	MDF (2)	LF (1)	All (31)
1	Television	0.00	6,333.00	6,000.00	6,125.00	7,000.00	8,000.00	6,276.00
2	Mixer/Grinder	0.00	1,313.00	1,544.00	1,511.00	2,250.00	1,500.00	1,515.00
3	Refrigerator	0.00	8,000.00	0.00	0.00	0.00	0.00	8,000.00
4	Bicycle	0.00	3,000.00	0.00	0.00	0.00	0.00	3,000.00
5	Motor Cycle	0.00	41,666.00	36,250.00	30,666.00	175,000.00	35,000.00	52,437.00
6	Mobile Phone	4,000.00	1,722.00	2,000.00	1,558.00	1,142.00	1,333.00	1,710.00

Farm Implements owned: The data regarding the farm implements owned by the households in Chikkasindhogi-1 micro watershed is presented in Table 11. About 22.58

per cent of the households possess plough, 3.23 per cent of them possess tractor, 12.90 per cent of them posses bullocks cart, 38.17 per cent of them power tiller and 93.55 per cent of them possess weeder.

Table 11. Farm Implements owned by households in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)		MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Bullock Cart	0	0.00	0	0.00	1	11.11	1	12.50	2	100.00	0	0.00	4	12.90
2	Plough	0	0.00	1	11.11	1	11.11	3	37.50	2	100.00	0	0.00	7	22.58
3	Tractor	0	0.00	0	0.00	0	0.00	0	0.00	1	50.00	0	0.00	1	3.23
4	Sprayer	0	0.00	3	33.33	5	55.56	3	37.50	1	50.00	0	0.00	12	38.71
5	Weeder	0	0.00	9	100.00	9	100.00	8	100.00	2	100.00	1	100.00	29	93.55
6	Blank	2	100.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	6.45

Average value of farm implements: The data regarding the average value of farm Implements owned by the households in Chikkasindhogi-1 micro watershed is presented in Table 12. The results show that the average value of plough was Rs.1,500, the average value of tractor was Rs. 5,00,000 and the average value of sprayer was Rs.3,953, the average value of bullock cart Rs.18,500, and the average value of weeder Rs.95.

Table 12. Average value of farm implements owned by households in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)	MF (9)	SF (9)	SMF (8)	MDF (2)	LF (1)	All (31)
1	Bullock Cart	0.00	0.00	18,000.00	18,000.00	19,000.00	0.00	18,500.00
2	Plough	0.00	1,500.00	1,500.00	1,500.00	1,500.00	0.00	1,500.00
3	Tractor	0.00	0.00	0.00	0.00	500,000.00	0.00	500,000.00
4	Sprayer	0.00	4,666.00	2,688.00	5,000.00	5,000.00	0.00	3,953.00
5	Weeder	0.00	90.00	91.00	96.00	150.00	87.00	95.00

Livestock possession by the households: The data regarding the Livestock possession by the households in Chikkasindhogi-1 micro watershed is presented in Table 13. The results indicate that, 16.13 per cent of the households possess bullocks, 22.58 per cent of the households possess local cow, 3.23 per cent of the households possess crossbred cow, 22.58 per cent of the households possess local cow and buffalo, 3.23 per cent of the households possess crossbred cow, goat and poultry birds.

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

Sl.No.	Particulars	LL (2)		MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Bullock	0	0.00	1	11.11	1	11.11	1	12.50	2	100.00	0	0.00	5	16.13
2	Local cow	0	0.00	2	22.22	2	22.22	1	12.50	2	100.00	0	0.00	7	22.58
3	Crossbred cow	0	0.00	1	11.11	0	0.00	0	0.00	0	0.00	0	0.00	1	3.23
4	Buffalo	0	0.00	1	11.11	1	11.11	4	50.00	1	50.00	0	0.00	7	22.58
5	Goat	0	0.00	0	0.00	1	11.11	0	0.00	0	0.00	0	0.00	1	3.23
6	Poultry birds	0	0.00	0	0.00	1	11.11	0	0.00	0	0.00	0	0.00	1	3.23
7	blank	2	100.00	5	55.56	4	44.44	3	37.50	0	0.00	0	0.00	14	45.16

Average Labour availability: The data regarding the average labour availability in Chikkasindhogi-1 micro watershed is presented in Table 14. The results indicate that, average own labour men available in the micro watershed was 2.27, average own labour (women) available was 1.90, average hired labour (men) available was 3.47 and average hired labour (women) available was 7.77.

Table 14. Average Labour availability in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)	MF (9)	SF (9)	SMF (8)	MDF (2)	LF (1)	All (31)
		N	N	N	N	N	N	N
1	Own labour Male	0.50	2.11	2.44	2.50	3.00	0.00	2.27
2	Own Labour Female	0.50	1.78	2.11	1.88	3.00	0.00	1.90
3	Hired labour Male	0.00	3.67	3.33	3.88	5.00	0.00	3.47
4	Hired labour Female	0.00	7.56	7.44	8.88	13.50	0.00	7.77

Adequacy of Hired Labour: The data regarding the adequacy of hired labour in Chikkasindhogi-1 micro watershed is presented in Table 15. The results indicate that, 90.32 per cent of the household opined that hired labour was adequate and 3.23 per cent of the households opined that hired labour was inadequate. About 100 per cent of the marginal farmers, 88.89 per cent of small, 100 per cent of semi medium and 100 per cent of medium farmers have opined that hired labour was adequate.

Table 15. Adequacy of Hired Labour in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)		MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Adequate	1	50.00	9	100.00	8	88.89	8	100.00	2	100.00	0	0.00	28	90.32
2	Inadequate	1	50.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	3.23

Migration among the households: The data regarding the migration among the households in Chikkasindhogi-1 micro watershed is presented in Table 16. The results indicate that, 6 (3.0%) persons were migrated from the micro watershed which includes 3 persons from semi medium farmers and 3 persons from medium farmer category.

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

Sl.No.	Particulars	LL (7)		MF (64)		SF (55)		SMF (49)		MDF (19)		LF (6)		All (200)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Migration	0	0.00	0	0.00	0	0.00	3	6.12	3	15.79	0	0.00	6	3.00

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

Sl.No.	Particulars	LL (0)	MF (0)	SF (0)	SMF (3)	MDF (3)	LF (0)	All (6)
1	Avg. Distance (kms)	0.00	0.00	0.00	433.33	98.00	0.00	299.20
2	Avg. Duration (months)	0.00	0.00	0.00	10.00	5.00	0.00	8.00

Average distance and duration of migration: The data regarding the average distance and duration of migration in Chikkasindhogi-1 micro watershed is presented in Table 17. The results indicate that, people have migrated on average of 299.2 Kms and average duration was 8 months. Semi medium farmers have migrated 433.33 kms and on an

average 10 months in a year. Medium farmers have migrated 98 kms and on an average 5 months in a year.

Purpose of migration: The data regarding the average distance and duration of migration in Chikkasindhogi-1 micro watershed is presented in Table 18. The results indicate that, job/work was the reason for migration of all the migrants.

Table 18. Purpose of migration by household members in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	SMF (3)		MDF (3)		All (6)	
		N	%	N	%	N	%
1	Job/wage/work	3	100.00	3	100.00	6	100.00
Total		3	100.00	3	100.00	6	100.00

Positive consequences of migration: The data regarding the positive consequences of migration in Chikkasindhogi-1 micro watershed is presented in Table 19. The results indicate that, improved quality of the life was the major positive consequence of migration of 16.67 per cent of the households and construction house was the major positive consequence for 33.33 per cent.

Table 19. Positive consequences of migration by household members in Chikkasindhagi -1 micro watershed

Sl.No.	Particulars	SMF (3)		MDF (3)		All (6)	
		N	%	N	%	N	%
1	Construction of house	1	33.33	1	33.33	2	33.33
2	Improved quality of life	1	33.33	0	0.00	1	16.67
3	None	1	33.33	1	33.33	2	33.33

Negative consequences of migration: The data regarding the negative consequences of migration in Chikkasindhogi-1 micro watershed is presented in Table 20. The results indicate that, increased workload for other family members was the major negative consequence of migration.

Table 20. Negative consequences of migration by household members in Chikkasindhogi-1 micro watershed

Sl. No.	Particulars	SMF (3)		MDF (3)		All (6)	
		N	%	N	%	N	%
1	Workload for other members of the family increased	0	0	2	66.67	2	33.33

Distribution of land (ha): The data regarding the distribution of land (ha) in Chikkasindhogi-1 micro watershed is presented in Table 21. The results indicate that, households of the Chikkasindhogi-1 micro watershed possess 17.89 ha (39.72%) of dry land and 27.14 ha (60.28%) of irrigated land. Marginal farmers possess 3.56 ha (86.87%) of dry land and 0.54 ha (13.13%) of irrigated land. Small possess 5.42 ha (60.63%) of dry land and 3.52 ha (39.37%) of irrigated land. Semi medium possess 8.90 ha (58.42%) of dry land and 6.34 ha (41.58%) of irrigated land. Medium farmers possess 6.63 ha (100%) of irrigated land and large farmers possess 10.12 ha (100%) of irrigated.

Table 21. Distribution of land (Ha) in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		ha	%	ha	%	ha	%	ha	%	ha	%	ha	%
1	Dry	3.56	86.87	5.42	60.63	8.90	58.42	0	0	0	0	17.89	39.72
2	Irrigated	0.54	13.13	3.52	39.37	6.34	41.58	6.63	100	10.12	100	27.14	60.28
Total		4.10	100	8.94	100	15.24	100	6.63	100	10.12	100	45.03	100

Average land value (Rs./ha): The data regarding the average land value (Rs./ha) in Chikkasindhogi-1 micro watershed is presented in Table 22. The results indicate that, the average value of dry land was Rs. 267994.14 and average value of irrigated was Rs.1,89,272. In case of marginal famers, the average land value was Rs. 670428 for dry land. In case of small famers, the average land value was Rs. 3, 75, 214 for dry land. In case of semi medium famers, the average land value was Rs. 1, 90,642.25 for dry land. In case of medium famers, the average land value was Rs. 84,496 for dry land.

Table 22. Average land value (Rs./ha) in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	MF (9)	SF (9)	SMF (8)	MDF (2)	LF (1)	All (31)
1	Dry	870,113.63	287,552.24	291,909.09	0.00	0.00	405,705.88
2	Irrigated	2,971,428.58	1,022,068.97	630,906.77	241,269.84	395,200.00	545,042.49

Status of bore wells: The data regarding the status of bore wells in Chikkasindhogi-1 micro watershed is presented in Table 23. The results indicate that, there were 14 functioning and 0 de-functioning bore wells in the micro watershed.

Table 23. Status of bore wells in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)	MF (9)	SF (9)	SMF (8)	MDF (2)	LF (1)	All (31)
1	De-functioning	0	0	0	0	0	0	0
2	Functioning	0	2	4	5	2	1	14

Status of open wells: The data regarding the status of open wells in Chikkasindhogi-1 micro watershed is presented in Table 24. The results indicate that, there was only 1 functioning open well in the micro watershed.

Table 24. Status of open wells in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)	MF (9)	SF (9)	SMF (8)	MDF (2)	LF (1)	All (31)
1	De-functioning	0	0	1	0	0	0	1
2	Functioning	0	0	1	0	0	0	1

Source of irrigation: The data regarding the source of irrigation in Chikkasindhogi-1 micro watershed is presented in Table 25. The results indicate that, bore well was the major irrigation source in the micro water shed which was possessed by small farmers, medium farmers, semi medium farmers and large farmers.

Table 25. Source of irrigation in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Bore Well	2	22.22	4	44.44	5	62.50	2	100.00	1	100.00	14	45.16
2	Open Well	0	0.00	1	11.11	0	0.00	0	0.00	0	0.00	1	3.23
3	Tank	0	0.00	0	0.00	1	12.50	0	0.00	0	0.00	1	3.23

Depth of water (Avg in meters): The data regarding the depth of water in Chikkasindhogi-1 micro watershed is presented in Table 26. The results indicate that, the depth of bore well was found to be 47.64 meters and the depth of open well was found to be 0.29 meters.

Table 26. Depth of water (Avg in meters) in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)	MF (9)	SF (9)	SMF (8)	MDF (2)	LF (1)	All (31)
1	Bore Well	0.00	22.18	51.14	58.29	121.92	106.68	47.64
2	Open Well	0.00	0.00	1.02	0.00	0.00	0.00	0.29

Irrigated Area (ha): The data regarding the irrigated area (ha) in Chikkasindhogi-1 micro watershed is presented in Table 27. The results indicate that, marginal farmers had irrigated area of 1.75 hectares, small farmers had 6.67 hectares, semi medium farmers had 8.73 hectares, medium farmers had 7.69 hectares and large farmers had 4.05 hectares of irrigated land.

Table 27. Irrigated Area (ha) in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	MF (9)	SF (9)	SMF (8)	MDF (2)	LF (1)	All (31)
1	Kharif	0.54	3.52	6.30	6.48	2.02	18.86
2	Perennial Crops	0.81	1.62	1.21	1.21	2.02	6.88
3	Rabi	0.40	1.62	1.21	0.00	0.00	3.24
4	Summer	0.00	0.00	0.00	0.00	0.00	0.00
Total		1.75	6.76	8.73	7.69	4.05	28.98

Cropping pattern: The data regarding the cropping pattern in Chikkasindhogi-1 micro watershed is presented in Table 28. The results indicate that, farmers have grown Maize (26.34 ha), Tomato (2.4 ha), Cotton (2.05 ha), Groundnut (1.68 ha), Pearlmillet (2.59 ha), Paddy (0.81 ha), Sorghum (0.81 ha), Bengal gram (0.51 ha), Chilly (0.4 ha). Marginal farmers have grown maize, tomato, groundnut and bengal gram. Small farmers have grown maize, tomato, cotton, groundnut, paddy, sorghum and bengalgram. Semi medium farmers have grown maize, tomato, cotton, pearlmillet and chilly. Medium farmers have grown maize, tomato and cotton. Large farmers have grown maize.

Table 28. Cropping pattern in Chikkasindhogi-1 micro watershed

Sl.No	Particulars	MF (9)	SF (9)	SMF (8)	MDF (2)	LF (1)	All (31)
1	Kharif - Maize	2.76	4.17	12.37	5.01	2.02	26.34
2	Kharif - Tomato	0.13	1.06	0.4	0.81	0	2.4
3	Kharif - Cotton	0	0.43	0.81	0.81	0	2.05
4	Kharif - Ground nut	0.43	1.24	0	0	0	1.68
5	Kharif - Pearlmillet [bajra]	0	0	1.21	0	0	1.64
6	Rabi - Ground nut	0.91	0	0	0	0	0.91
7	Kharif - Paddy	0	0.81	0	0	0	0.81
8	Kharif - Sorghum	0	0.81	0	0	0	0.81
9	Kharif - Bengal gram	0.1	0.4	0	0	0	0.51
10	Kharif - Chilly	0	0	0.4	0	0	0.4
Total		4.76	8.94	15.2	6.63	2.02	37.55

Cropping intensity: The data regarding the cropping intensity in Chikkasindhogi-1 micro watershed is presented in Table 29. The results indicate that, the cropping intensity in Chikkasindhogi-1 micro watershed was found to be 96.83 per cent. In case of Marginal farmers it was 87.82 per cent, for small farmers it was 93.99 per cent, in case of semi medium farmers it was 100 per cent, medium farmers had cropping intensity of 100 per cent and large farmers had 100 per cent.

Table 29. Cropping intensity in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)	MF (9)	SF (9)	SMF (8)	MDF (2)	LF (1)	All (31)
1	Cropping Intensity	0.00	87.82	93.99	100.00	100.00	100.00	96.83

Possession of Bank account: The data regarding the possession of Bank account and savings in Chikkasindhogi-1 micro watershed is presented in Table 30. The results indicate that, 90.32 per cent of the households possess bank account and 12.90 per cent of them have savings.

Table 30. Possession of Bank account and savings in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)		MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Account	1	50.00	9	100.00	7	77.78	8	100.00	2	100.00	1	100.00	28	90.32
2	Savings	0	0.00	0	0.00	0	0.00	3	37.50	1	50.00	0	0.00	4	12.90

Borrowing status: The data regarding the possession of borrowing status in Chikkasindhogi-1 micro watershed is presented in Table 31. The results indicate that, 50 per cent of landless, 44.44 per cent of marginal, 22.22 per cent of small, 50 per cent semi medium, 50 per cent of medium farmers and 100 per cent of large farmers have borrowed credit from different sources.

Table 31. Borrowing status in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)		MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Credit Availed	1	50.00	4	44.44	2	22.22	4	50.00	1	50.00	1	100.00	13	41.94

Source of credit: The data regarding the source of credit availed by households in Chikkasindhogi-1 micro watershed is presented in Table 32. The results indicate that, 10 per cent have availed loan in cooperative bank, 40 per cent have availed loan from friends and relatives and 100 per cent have availed loan from grameena bank.

Table 32. Source of credit availed by households in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (0)		MF (5)		SF (6)		SMF (7)		MDF (1)		LF (1)		All (20)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Cooperative Bank	0	0.00	0	0.00	0	0.00	1	14.29	0	0.00	1	100.00	2	10.00
2	Friends/Relatives	0	0	1	20.00	2	33.33	3	42.86	0	0.00	1	100.00	8	40.00
3	Grameena Bank	0	0.00	5	100.00	6	100.00	7	100.00	1	100.00	1	100.00	20	100.00

Average credit amount: The data regarding the average credit amount availed by households in Chikkasindhogi-1 micro watershed is presented in Table 33. The results

indicate that, marginal, small, semi medium, medium and large farmers have availed Rs.61000, Rs.37500, Rs. 69285, Rs. 100000 and Rs.60000 respectively.

Table 33. Average Credit amount availed by households in Chikkasindhogi-1 micro watershed

S.N.	Particulars	LL (0)	MF (5)	SF (6)	SMF (7)	MDF (1)	LF (1)	All (20)
1	Average Credit	0.00	61,000.00	37,500.00	69,285.71	100,000.00	60,000.00	59,750.00

Purpose of credit borrowed (institutional Source): The data regarding the purpose of credit borrowed from institutional sources by households in Chikkasindhogi-1 micro watershed is presented in Table 34. The results indicate that, 90.91 per cent of the households have borrowed loan for agriculture, 4.55 per cent have borrowed for buying irrigation related equipments and 4.55 per cent have borrowed for social functions like marriage.

Table 34. Purpose of credit borrowed (institutional Source) by households in Chikkasindhogi-1 micro watershed

Sl. No.	Particulars	MF (5)		SF (6)		SMF (8)		MDF(1)		LF (2)		All (22)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Agriculture production	5	100.00	6	100.00	6	75.00	1	100.00	2	100.00	20	90.91
2	Bore well/irrigation related equipments	0	0.00	0	0.00	1	12.50	0	0.00	0	0.00	1	4.55
3	Social functions like marriage	0	0.00	0	0.00	1	12.50	0	0.00	0	0.00	1	4.55

Purpose of credit borrowed (Private Credit): The data regarding the purpose of credit borrowed from private sources by households in Chikkasindhogi-1 micro watershed is presented in Table 35. The results indicate that, the main purpose of borrowing credit was agricultural production for 75 per cent of the households, purchase of farm machinery for 12.50 per cent of the households and social functions like marriage for 12.50 per cent of the households.

Table 35. Purpose of credit borrowed (Private Credit) by households in Chikkasindhogi-1 micro watershed

Sl. No.	Particulars	LL (1)		MF (1)		SF (2)		SMF (3)		LF (1)		All (8)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Agriculture production	0	0	1	100	1	50	3	100	1	100	6	75.00
2	Purchase–agricultural implements/ farm machinery	0	0	0	0	1	50	0	0	0	0	1	12.50
3	Social functions like marriage	1	100	0	0	0	0	0	0	0	0	1	12.50

Table 36. Repayment status of households (institutional sources) in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (0)		MF (5)		SF (6)		SMF (8)		MDF (1)		LF (2)		All (22)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Partially paid	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
2	Un paid	0	0.00	5	100.00	6	100.00	8	100.00	1	100.00	2	100.00	22	100.00

Repayment status of households (institutional sources): The Results (Table 36) indicated that 100 per cent of the households did not repay their loan.

Repayment status of households (Private): The Results (Table 37) indicated that 75 per cent of the households have not repaid their loan i.e 100 per cent of marginal, small and large farmers and 66.67 per cent of semi medium farmers.

Table 37. Repayment status of households (Private) in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (1)		MF (1)		SF (2)		SMF (3)		MDF (0)		LF (1)		All (8)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Un paid	0	0.00	1	100.00	2	100.00	2	66.67	0	0.00	1	100.00	6	75.00

Opinion on institutional sources of credit: The results (Table 38) indicate that, 4.55 per cent of the households opined that credit helped to perform timely agricultural operations, it was easily accessible, loan amount was adequate to fulfil the requirement and they forced to sell the produce at low price to repay the loan in time. Around 63.64 per cent of them opined that credit has higher rate of interest and 13.64 per cent had no opinion about credit.

Table 38. Opinion on institutional sources of credit in Chikkasindhogi-1 micro watershed

Sl. No.	Particulars	MF(5)		SF(6)		SMF(8)		MDF(1)		LF(2)		All(22)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Helped to perform timely agricultural operations	0	0	0	0	1	12.50	0	0	0	0	1	4.55
2	Easy accessibility of credit	0	0	1	16.67	0	0	0	0	0	0	1	4.55
3	Higher rate of interest	4	80	2	33.33	5	62.50	1	100	2	100	14	63.64
4	Loan amount was adequate to fulfil the requirement	1	20	0	0	0	0	0	0	0	0	1	4.55
5	None	0	0	1	16.67	2	25.00	0	0	0	0	3	13.64
6	Forced to sell the produce at low price to repay loan in time	0	0	1	16.67	0	0	0	0	0	0	1	4.55

Table 39. Opinion on non-institutional sources of credit in Chikkasindhogi-1 micro watershed

Sl. No.	Particulars	MF(1)		SF(2)		SMF(3)		LF(1)		All (8)	
		N	%	N	%	N	%	N	%	N	%
1	Helped to perform timely agricultural operations	0	0	1	50	0	0	0	0	1	12.50
2	Higher rate of interest	0	0	1	50	2	66.67	1	100	4	50
3	None	1	100	0	0	0	0	0	0	1	12.50

Opinion on non-institutional sources of credit: The results (Table 39) indicate that, 4.55 per cent of the households opined that credit helped to perform timely agricultural operations, it was easily accessible, loan amount was adequate to fulfil the requirement and they forced to sell the produce at low price to repay the loan in time. Around 63.64 per cent of them opined that credit has higher rate of interest and 13.64 per cent had no opinion about credit.

Cost of Cultivation of Maize: The data regarding the cost of cultivation of maize in Chikkasindhogi-1 micro watershed is presented in Table 40. The results indicate that, the total cost of cultivation for maize was Rs. 234356.79. The gross income realized by the farmers was Rs. 167960. The net income from Maize cultivation was Rs. -66396.80, thus the benefit cost ratio was found to be 1:0.72.

Table 40. Cost of Cultivation of maize in Chikkasindhogi-1 micro watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	407.55	52117.00	22.24
2	Bullock		Pairs/day	12.35	7410.00	3.16
3	Tractor		Hours	24.70	14820.00	6.32
4	Machinery		Hours	24.70	12350.00	5.27
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	61.75	7718.75	3.29
6	Seed Inter Crop		Kgs.	0.00	0.00	0.00
7	FYM		Quintal	0.00	0.00	0.00
8	Fertilizer + micronutrients		Quintal	61.75	53105.00	22.66
9	Pesticides (PPC)		Kgs / liters	12.35	14820.00	6.32
10	Irrigation		Number	24.70	0.00	0.00
11	Repairs			0.00	0.00	0.00
12	Msc. Charges (Marketing costs etc)			0.00	0.00	0.00
13	Depreciation charges			0.00	1333.80	0.57
14	Land revenue and Taxes			0.00	41.17	0.02
II	**Cost B1**					
16	Interest on working capital				9077.25	3.87
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				172792.96	73.73
III	**Cost B2**					
18	Rental Value of Land				6666.67	2.84
19	**Cost B2 = (Cost B1 + Rental value)**				179459.63	76.58
IV	**Cost C1**					
20	Family Human Labour			172.90	33592.00	14.33
21	**Cost C1 = (Cost B2 + Family Labour)**				213051.63	90.91
V	**Cost C2**					
22	Risk Premium				0.00	0.00
23	**Cost C2 = (Cost C1 + Risk Premium)**				213051.63	90.91
VI	**Cost C3**					
24	Managerial Cost				21305.16	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				234356.79	100.00
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		123.50	148200.00	
		b) Main Crop Sales Price (Rs.)			1200.00	
	By Product	e) Main Product (q)		24.70	19760.00	
		f) Main Crop Sales Price (Rs.)			800.00	
b.	Gross Income (Rs.)				167960.00	
c.	Net Income (Rs.)				-66396.80	
d.	Cost per Quintal (Rs./q.)				1897.63	
e.	Benefit Cost Ratio (BC Ratio)				1:0.72	

Cost of cultivation of Tomato: The data regarding the cost of cultivation of tomato in Chikkasindhogi-1 micro watershed is presented in Table 41. The results indicate that, the total cost of cultivation for tomato was Rs. 46729.38. The gross income realized by the farmers was Rs. 67925.00. The net income from tomato cultivation was Rs. 21195.62. Thus the benefit cost ratio was found to be 1:1.45.

Table 41. Cost of Cultivation of Tomato in Chikkasindhogi-1 micro watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	73.28	14943.50	31.98
2	Bullock		Pairs/day	0	0	0
3	Tractor		Hours	12.35	7410	15.86
4	Machinery		Hours	12.35	2470	5.29
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	16.47	988.00	2.11
6	Seed Inter Crop		Kgs.	4.12	329.33	0.70
7	FYM		Quintal	2.47	3705.00	7.93
8	Fertilizer + micronutrients		Quintal	2.47	2717.00	5.81
9	Pesticides (PPC)		Kgs / ltrs	2.47	3705.00	7.93
10	Irrigation		Number	0	0	0
11	Repairs			0	0	0
12	Msc. Charges (Marketing costs etc)			0	0	0
13	Depreciation charges			0	0.02	0
14	Land revenue and Taxes			0	6.59	0.01
II	**Cost B1**					
16	Interest on working capital				1613.32	3.45
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				37887.76	81.08
III	**Cost B2**					
18	Rental Value of Land				0	0
19	**Cost B2 = (Cost B1 + Rental value)**				37887.76	81.08
IV	**Cost C1**					
20	Family Human Labour			11.53	2593.50	5.55
21	**Cost C1 = (Cost B2 + Family Labour)**				40481.26	86.63
V	**Cost C2**					
22	Risk Premium				2000	4.28
23	**Cost C2 = (Cost C1 + Risk Premium)**				42481.26	90.91
VI	**Cost C3**					
24	Managerial Cost				4248.13	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				46729.38	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		12.35	49400	
		b) Main Crop Sales Price (Rs.)			4000	
		c) Intercrop (q)		4.12	18525.00	
		d) Intercrop Sales Price (Rs.)			4500	
b.	Gross Income (Rs.)				67925.00	
c.	Net Income (Rs.)				21195.62	
d.	Cost per Quintal (Rs./q.)				2837.82	
e.	Benefit Cost Ratio (BC Ratio)				1:1.45	

Cost of cultivation of Groundnut: The data regarding the cost of cultivation of groundnut in Chikkasindhogi-1 micro watershed is presented in Table 42. The results indicate that, the total cost of cultivation for groundnut was Rs. 72133.49. The gross income realized by the farmers was Rs. 62490.23. The net income from groundnut cultivation was Rs. -9643.26. Thus the benefit cost ratio was found to be 1:0.87.

Table 42. Cost of Cultivation of Groundnut in Chikkasindhogi-1 micro watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	70.59	9198.56	12.75
2	Bullock		Pairs/day	10.94	6562.04	9.10
3	Tractor		Hours	5.66	3394.90	4.71
4	Machinery		Hours	0.00	0.00	0.00
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	142.86	20057.53	27.81
6	Seed Inter Crop		Kgs.	0.00	0.00	0.00
7	FYM		Quintal	0.00	0.00	0.00
8	Fertilizer + micronutrients		Quintal	12.53	11906.27	16.51
9	Pesticides (PPC)		Kgs / liters	1.70	2043.71	2.83
10	Irrigation		Number	0.00	0.00	0.00
11	Repairs			0.00	0.00	0.00
12	Msc. Charges (Marketing costs etc)			0.00	0.00	0.00
13	Depreciation charges			0.00	61.87	0.09
14	Land revenue and Taxes			0.00	20.58	0.03
II	**Cost B1**					
16	Interest on working capital				4080.90	5.66
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				57326.37	79.47
III	**Cost B2**					
18	Rental Value of Land				3333.33	4.62
19	**Cost B2 = (Cost B1 + Rental value)**				60659.70	84.09
IV	**Cost C1**					
20	Family Human Labour			26.21	4916.20	6.82
21	**Cost C1 = (Cost B2 + Family Labour)**				65575.90	90.91
V	**Cost C2**					
22	Risk Premium				0.00	0.00
23	**Cost C2 = (Cost C1 + Risk Premium)**				65575.90	90.91
VI	**Cost C3**					
24	Managerial Cost				6557.59	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				72133.49	100.00
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		19.78	59326.17	
		b) Main Crop Sales Price (Rs.)			3000.00	
	By Product	e) Main Product (q)		3.96	3164.06	
		f) Main Crop Sales Price (Rs.)			800.00	
b.	Gross Income (Rs.)				62490.23	
c.	Net Income (Rs.)				-9643.26	
d.	Cost per Quintal (Rs./q.)				3647.64	
e.	Benefit Cost Ratio (BC Ratio)				1:0.87	

Cost of cultivation of Cotton: The data regarding the cost of cultivation of cotton in Chikkasindhogi-1 micro watershed is presented in Table 43. The results indicate that, the total cost of cultivation for cotton was Rs. 44743.83. The gross income realized by the farmers was Rs. 75381.17. The net income from cotton cultivation was Rs. 30637.34. Thus the benefit cost ratio was found to be 1:1.68.

Table 43. Cost of Cultivation of Cotton in Chikkasindhogi-1 micro watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	49.84	6587.47	14.72
2	Bullock		Pairs/day	1.65	1029.17	2.30
3	Tractor		Hours	3.96	2439.27	5.45
4	Machinery		Hours	0.00	0.00	0.00
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	2.80	2751.63	6.15
6	Seed Inter Crop		Kgs.	846.42	0.00	0.00
7	FYM		Quintal	0.00	0.00	0.00
8	Fertilizer + micronutrients		Quintal	14.34	13300.37	29.73
9	Pesticides (PPC)		Kgs / liters	1.18	1299.25	2.90
10	Irrigation		Number	4.37	0.00	0.00
11	Repairs			0.00	0.00	0.00
12	Msc. Charges (Marketing costs etc)			0.00	0.00	0.00
13	Depreciation charges			0.00	415.35	0.93
14	Land revenue and Taxes			0.00	41.17	0.09
II	**Cost B1**					
16	Interest on working capital				2082.15	4.65
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				29945.82	66.93
III	**Cost B2**					
18	Rental Value of Land				4333.33	9.68
19	**Cost B2 = (Cost B1 + Rental value)**				34279.15	76.61
IV	**Cost C1**					
20	Family Human Labour			30.48	6397.05	14.30
21	**Cost C1 = (Cost B2 + Family Labour)**				40676.21	90.91
V	**Cost C2**					
22	Risk Premium				0.00	0.00
23	**Cost C2 = (Cost C1 + Risk Premium)**				40676.21	90.91
VI	**Cost C3**					
24	Managerial Cost				4067.62	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				44743.83	100.00
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		25.13	75381.17	
		b) Main Crop Sales Price (Rs.)			3000.00	
b.	Gross Income (Rs.)				75381.17	
c.	Net Income (Rs.)				30637.34	
d.	Cost per Quintal (Rs./q.)				1780.70	
e.	Benefit Cost Ratio (BC Ratio)				1:1.68	

Cost of Cultivation of Bengal gram: The data regarding the cost of cultivation of bengal gram in Chikkasindhogi-1 micro watershed is presented in Table 44. The results indicate that, the total cost of cultivation for bengal gram was Rs. 251848.19. The gross income realized by the farmers was Rs. 111150. The net income from bengal gram cultivation was Rs. -140698.19, thus the benefit cost ratio was found to be 1:0.44.

Table 44. Cost of Cultivation of Bengal gram in Chikkasindhogi-1 micro watershed

Sl.No	Particulars	Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**				
1	Hired Human Labour	Man days	208.71	27935.70	11.09
2	Bullock	Pairs/day	6.18	3705.00	1.47
3	Tractor	Hours	58.05	34827.00	13.83
4	Machinery	Hours	7.41	2470.00	0.98
5	Seed Main Crop (Establishment and Maintenance)	Kgs (Rs.)	605.15	72618.00	28.83
6	Seed Inter Crop	Kgs.	0.00	0.00	0.00
7	FYM	Quintal	0.00	0.00	0.00
8	Fertilizer + micronutrients	Quintal	45.70	39149.50	15.54
9	Pesticides (PPC)	Kgs / liters	6.18	8892.00	3.53
10	Irrigation	Number	0.00	0.00	0.00
11	Repairs		0.00	0.00	0.00
12	Msc. Charges (Marketing costs etc)		0.00	0.00	0.00
13	Depreciation charges		0.00	44.46	0.02
14	Land revenue and Taxes		0.00	41.17	0.02
II	**Cost B1**				
16	Interest on working capital			14479.14	5.75
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**			204161.97	81.07
III	**Cost B2**				
18	Rental Value of Land			4833.33	1.92
19	**Cost B2 = (Cost B1 + Rental value)**			208995.30	82.98
IV	**Cost C1**				
20	Family Human Labour		107.45	19957.60	7.92
21	**Cost C1 = (Cost B2 + Family Labour)**			228952.90	90.91
V	**Cost C2**				
22	Risk Premium			0.00	0.00
23	**Cost C2 = (Cost C1 + Risk Premium)**			228952.90	90.91
VI	**Cost C3**				
24	Managerial Cost			22895.29	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**			251848.19	100.00
VII	**Economics of the Crop**				
a.	Main Product	a) Main Product (q)	29.64	111150.00	
		b) Main Crop Sales Price(Rs.)		3750.00	
b.	Gross Income (Rs.)			111150.00	
c.	Net Income (Rs.)			-140698.19	
d.	Cost per Quintal (Rs./q.)			8496.90	
e.	Benefit Cost Ratio (BC Ratio)			1:0.44	

Cost of Cultivation of Sorghum: The data regarding the cost of cultivation of sorghum in Chikkasindhogi-1 micro watershed is presented in Table 45. The results indicate that, the total cost of cultivation for sorghum was Rs. 25747.08. The gross income realized by the farmers was Rs. 24700. The net income from sorghum cultivation was Rs. -1047.08. Thus the benefit cost ratio was found to be 1:0.96.

Table 45. Cost of Cultivation of Sorghum in Chikkasindhogi-1 micro watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	51.87	6866.60	26.67
2	Bullock		Pairs/day	1.24	741.00	2.88
3	Tractor		Hours	4.94	2964.00	11.51
4	Machinery		Hours	3.71	1852.50	7.19
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	12.35	1482.00	5.76
6	Seed Inter Crop		Kgs.	0.00	0.00	0.00
7	FYM		Quintal	0.00	0.00	0.00
8	Fertilizer + micronutrients		Quintal	4.94	3581.50	13.91
9	Pesticides (PPC)		Kgs / liters	0.00	0.00	0.00
10	Irrigation		Number	0.00	0.00	0.00
11	Repairs			0.00	0.00	0.00
12	Msc. Charges (Marketing costs etc)			0.00	0.00	0.00
13	Depreciation charges			0.00	9.88	0.04
14	Land revenue and Taxes			0.00	41.17	0.16
II	**Cost B1**					
16	Interest on working capital				607.62	2.36
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				18146.27	70.48
III	**Cost B2**					
18	Rental Value of Land				2666.67	10.36
19	**Cost B2 = (Cost B1 + Rental value)**				20812.93	80.84
IV	**Cost C1**					
20	Family Human Labour			13.59	2593.50	10.07
21	**Cost C1 = (Cost B2 + Family Labour)**				23406.43	90.91
V	**Cost C2**					
22	Risk Premium				0.00	0.00
23	**Cost C2 = (Cost C1 + Risk Premium)**				23406.43	90.91
VI	**Cost C3**					
24	Managerial Cost				2340.64	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				25747.08	100.00
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		9.88	19760.00	
		b) Main Crop Sales Price (Rs.)			2000.00	
	By Product	e) Main Product (q)		6.18	4940.00	
		f) Main Crop Sales Price (Rs.)			800.00	
b.	Gross Income (Rs.)				24700.00	
c.	Net Income (Rs.)				-1047.08	
d.	Cost per Quintal (Rs./q.)				2605.98	
e.	Benefit Cost Ratio (BC Ratio)				1:0.96	

Cost of Cultivation of Chilly: The data regarding the cost of cultivation of chilly in Chikkasindhogi-1 micro watershed is presented in Table 46. The results indicate that, the total cost of cultivation for chilly was Rs. 76456.11. The gross income realized by the farmers was Rs. 98800. The net income from chilly cultivation was Rs. 22343.89. Thus the benefit cost ratio was found to be 1:1.29.

Table 46. Cost of Cultivation of Chilly in Chikkasindhogi-1 micro watershed

Sl.No	Particulars	Units	Phy Units	Value (Rs.)	% to C3
I	**Cost A1**				
1	Hired Human Labour	Man days	76.57	9509.50	12.44
2	Bullock	Pairs/day	7.41	4816.50	6.30
3	Tractor	Hours	4.94	3211.00	4.20
4	Machinery	Hours	0.00	0.00	0.00
5	Seed Main Crop (Establishment and Maintenance)	Kgs (Rs.)	4.94	4693.00	6.14
6	Seed Inter Crop	Kgs.	0.00	0.00	0.00
7	FYM	Quintal	0.00	0.00	0.00
8	Fertilizer + micronutrients	Quintal	24.70	21711.30	28.40
9	Pesticides (PPC)	Kgs/liters	2.47	2964.00	3.88
10	Irrigation	Number	7.41	0.00	0.00
11	Repairs		0.00	0.00	0.00
12	Msc. Charges (Marketing costs etc)		0.00	0.00	0.00
13	Depreciation charges		0.00	1227.59	1.61
14	Land revenue and Taxes		0.00	41.17	0.05
II	**Cost B1**				
16	Interest on working capital			3524.20	4.61
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**			51698.25	67.62
III	**Cost B2**				
18	Rental Value of Land			4000.00	5.23
19	**Cost B2 = (Cost B1 + Rental value)**			55698.25	72.85
IV	**Cost C1**				
20	Family Human Labour		64.22	13807.30	18.06
21	**Cost C1 = (Cost B2 + Family Labour)**			69505.55	90.91
V	**Cost C2**				
22	Risk Premium			0.00	0.00
23	**Cost C2 = (Cost C1 + Risk Premium)**			69505.55	90.91
VI	**Cost C3**				
24	Managerial Cost			6950.56	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**			76456.11	100.00
VII	**Economics of the Crop**				
a.	Main Product	a) Main Product (q)	24.70	98800.00	
		b) Main Crop Sales Price (Rs.)		4000.00	
b.	Gross Income (Rs.)			98800.00	
c.	Net Income (Rs.)			22343.89	
d.	Cost per Quintal (Rs./q.)			3095.39	
e.	Benefit Cost Ratio (BC Ratio)			1:1.29	

Cost of Cultivation of Paddy: The data regarding the cost of cultivation of paddy in Chikkasindhogi-1 micro watershed is presented in Table 47. The results indicate that, the total cost of cultivation for paddy was Rs. 50384.32. The gross income realized by the farmers was Rs. 38902.50. The net income from paddy cultivation was Rs. -11481.82. Thus the benefit cost ratio was found to be 1:0.77.

Table 47. Cost of Cultivation of Paddy in Chikkasindhogi-1 micro watershed

Sl.No	Particulars	Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**				
1	Hired Human Labour	Man days	24.70	3285.10	6.52
2	Bullock	Pairs/day	9.88	5928.00	11.77
3	Tractor	Hours	3.71	2223.00	4.41
4	Machinery	Hours	2.47	1235.00	2.45
5	Seed Main Crop (Establishment and Maintenance)	Kgs (Rs.)	61.75	9262.50	18.38
6	Seed Inter Crop	Kgs.	0.00	0.00	0.00
7	FYM	Quintal	0.00	0.00	0.00
8	Fertilizer + micronutrients	Quintal	9.88	9509.50	18.87
9	Pesticides (PPC)	Kgs / liters	1.24	1173.25	2.33
10	Irrigation	Number	1.24	0.00	0.00
11	Repairs		0.00	0.00	0.00
12	Msc. Charges (Marketing costs etc)		0.00	0.00	0.00
13	Depreciation charges		0.00	9.88	0.02
14	Land revenue and Taxes		0.00	41.17	0.08
II	**Cost B1**				
16	Interest on working capital			2393.43	4.75
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**			35060.83	69.59
III	**Cost B2**				
18	Rental Value of Land			4000.00	7.94
19	**Cost B2 = (Cost B1 + Rental value)**			39060.83	77.53
IV	**Cost C1**				
20	Family Human Labour		32.11	6743.10	13.38
21	**Cost C1 = (Cost B2 + Family Labour)**			45803.93	90.91
V	**Cost C2**				
22	Risk Premium			0.00	0.00
23	**Cost C2 = (Cost C1 + Risk Premium)**			45803.93	90.91
VI	**Cost C3**				
24	Managerial Cost			4580.39	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**			50384.32	100.00
VII	**Economics of the Crop**				
a.	Main Product	a) Main Product (q)	24.70	37050.00	
		b) Main Crop Sales Price (Rs.)		1500.00	
	By Product	e) Main Product (q)	3.71	1852.50	
		f) Main Crop Sales Price (Rs.)		500.00	
b.	Gross Income (Rs.)			38902.50	
c.	Net Income (Rs.)			-11481.82	
d.	Cost per Quintal (Rs./q.)			2039.85	
e.	Benefit Cost Ratio (BC Ratio)			1:0.77	

Adequacy of fodder: The data regarding the adequacy of fodder in Chikkasindhogi-1 micro watershed is presented in Table 48. The results indicate that, 35.48 per cent of the households opined that dry fodder was adequate which includes 22.22 per cent of marginal, 33.33 per cent of small, 50 per cent of semi medium and 100 per cent of medium farmers. Only 19.35 per cent of the households have opined that the green fodder is adequate. The data also revealed that 19.35 per cent of the households opined that dry fodder and green fodder were inadequate.

Table 48. Adequacy of fodder in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Adequate-Dry Fodder	2	22.22	3	33.33	4	50	2	100	0	0	11	35.48
2	Inadequate-Dry Fodder	2	22.22	2	22.22	1	12.50	0	0	1	100	6	19.35
3	Adequate-Green Fodder	5	55.56	2	22.22	3	37.50	2	100	0	0	12	38.71
4	Inadequate-Green Fodder	2	22.22	3	33.33	0	0	0	0	1	100	6	19.35

Average annual gross income: The data regarding the average annual gross income in Chikkasindhogi-1 micro watershed is presented in Table 49. The results indicate that the average annual gross income was Rs. 22500 for landless farmers, for marginal farmers it was Rs. 61655.56, for small farmers it was Rs.56222, for semi medium farmers it was Rs.94688, for medium farmers it was Rs.191500 and for large farmers it was Rs.73000.

Table 49. Average annual gross income in Chikkasindhogi-1 micro watershed

(Avg value in Rs.)

Sl. No.	Particulars	LL (2)	MF (9)	SF (9)	SMF (8)	MDF (2)	LF (1)	All (31)
1	Service/salary	0.00	13,333.33	0.00	22,500.00	40,000.00	0.00	12,258.06
2	Business	0.00	0.00	0.00	1,250.00	50,000.00	0.00	3,548.39
3	Wage	22,500.00	16,777.78	17,777.78	17,500.00	7,500.00	25,000.00	17,290.32
4	Agriculture	0.00	28,655.56	35,555.56	50,313.50	85,000.00	48,000.00	38,658.32
7	Dairy Farm	0.00	2,888.89	1,777.78	3,125.00	9,000.00	0.00	2,741.94
8	Goat Farming	0.00	0.00	1,111.11	0.00	0.00	0.00	322.58
Income(Rs.)		22,500.00	61,655.56	56,222.22	94,688.50	191,500.00	73,000.00	74,819.61

Table 50. Average annual expenditure in Chikkasindhogi-1 micro watershed

(Avg value in Rs.)

Sl.No.	Particulars	LL (2)	MF (9)	SF (9)	SMF (8)	MDF (2)	LF (1)	All (31)
1	Service/salary	0	50,000	0	35,000	25,000	0	110,000
2	Business	0	0	0	5,000	50,000	0	55,000
3	Wage	12,500	8,111.11	9,555.56	11,286.86	8,000	20,000	69,453.52
4	Agriculture	0	16,111.11	19,625.00	27,501.00	50,000	35,000	148,237.11
5	Dairy Farm	0	6,500	6,000	4,000	8,000	0	24,500
6	Goat Farming	0	0	5,000	0	0	0	5,000
Total		12,500	80,722.22	40,180.56	82,787.86	141,000	55,000	412,190.63
Average		6,250	8,969.14	4,464.51	10,348.48	70,500	55,000	13,296.47

Average annual expenditure: The data regarding the average annual expenditure in Chikkasindhogi-1 micro watershed is presented in Table 50. The results indicate that the

average annual expenditure is Rs. 13296.47. For landless farmers it was 6250, for marginal farmers it was Rs 8969, for small farmers it was Rs. 4464.51, for semi medium farmers it was Rs. 10348.48 and for medium farmers it was Rs. 70500 and for large farmers it was Rs. 55000.

Horticulture species grown: The data regarding horticulture species grown in Chikkasindhogi-1 micro watershed is presented in Table 51. The results indicate that, sampled households have grown 22 coconut, 19 mango and 3 sapota trees in their field. Farmers have also grown 5 coconut trees in their backyard.

Table 51. Horticulture species grown in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)		MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		F	B	F	B	F	B	F	B	F	B	F	B	F	B
1	Coconut	0	0	7	1	6	1	1	3	7	0	1	0	22	5
2	Mango	0	0	0	0	0	0	19	0	0	0	0	0	19	0
3	Sapota	0	0	0	0	0	0	3	0	0	0	0	0	3	0

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

Interest towards cultivation of horticulture crops: The data regarding horticulture species grown in Chikkasindhogi-1 micro watershed is presented in Table 52. The results indicate that, 93.55 per cent of the households are interested in growing horticultural crops which include 100 per cent of marginal, small, semi medium, medium and large farmers.

Table 52. Interest towards cultivation of horticulture crops in Chikkasindhogi-1 micro watershed

Sl. No.	Particulars	MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All(31)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Interested towards cultivation of horticulture crops	9	100	9	100	8	100	2	100	1	100	29	93.55

Forest species grown: The data regarding forest species grown in Chikkasindhogi-1 micro watershed is presented in Table 53. The results indicate that, households have planted 31 neem trees, 1 banyan tree in field and 9 neem trees in backyard. Marginal farmers have planted 7 neem trees. Small farmers have planted 9 neem trees. Semi medium farmers have planted 18 neem trees. Medium farmers have planted 6 neem trees and large farmers have grown 1 banyan tree.

Table 53: Forest species grown in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		F	B	F	B	F	B	F	B	F	B	F	B
1	Neem	7	0	8	1	10	8	6	0	0	0	31	9
2	Banyan	0	0	0	0	0	0	0	0	1	0	1	0

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

Average additional investment capacity: The data regarding average additional investment capacity in Chikkasindhogi-1 micro watershed is presented in Table 54. The results indicate that, households have an average investment capacity of Rs. 6193 for land

development, Rs. 2241 for irrigation facility, Rs.4113 for improved crop production and Rs.1774 for improved livestock management.

Table 54. Average additional investment capacity of households in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	MF (9)	SF (9)	SMF(8)	MDF(2)	LF (1)	All (31)
1	Land development	6,667.56	5,888.89	7,250.00	8,000.00	5,000.00	6,193.81
2	Irrigation facility	1,222.22	2,000.00	3,250.00	6,000.00	2,500.00	2,241.94
3	Improved crop production	4,000.00	4,500.89	4,125.00	6,000.00	6,000.00	4,113.16
4	Improved livestock management	1,555.56	1,333.33	2,375.00	5,000.00	0.00	1,774.19

Source of additional investment: The data regarding source of additional investment in Chikkasindhogi-1 micro watershed is presented in Table 55. The results indicate that, loan from bank is the major source of investment for 78.13 per cent of households for land development. For irrigation facility 25 per cent of the households depend on loan from bank, 12.5 per cent depend on own funds and 9.38 per cent of the households depend on soft loans. For improved crop production 59.38 per cent of the households depend on bank loan and for improved livestock management 21.88 per cent of the households depend on bank loan.

Table 55. Source of additional investment of households in Chikkasindhogi-1 micro watershed

Sl.No	Item	Land development		Irrigation facility		Improved crop production		Improved livestock management	
		N	%	N	%	N	%	N	%
1	Loan from bank	25	78.13	8	25.0	19	59.38	7	21.88
2	Own funds	4	12.5	4	12.5	3	9.38	4	12.5
3	Soft loan	0	0.0	3	9.38	3	9.38	0	0.0

Marketing of the agricultural produce: The data regarding marketing of the agricultural produce in Chikkasindhogi-1 micro watershed is presented in Table 56. The results indicated that, Bengal gram, chilly, cotton, maize and tomato were sold to the extent of 100 per cent.

Table 56. Marketing of the agricultural produce in Chikkasindhogi-1 micro watershed

Sl.No	Crops	Output obtained (q)	Output retained (q)	Output sold (q)	Output sold (%)	Avg. Price obtained (Rs/q)
1	Bajra	23	8	15	65.22	3008
2	Bengal Gram	9	0	9	100	2500
3	Chilly	10	0	10	100	4000
4	Cotton	48	0	48	100	3000
5	Ground Nut	45	2	43	95.56	3333.33
6	Maize	530	0	530	100	1137.26
7	Paddy	20	5	15	75	1500
8	Sorghum	8	2	6	75	2000
9	Tomato	220	0	220	100	785.71

Marketing Channels used for sale of agricultural produce: The data regarding marketing channels used for sale of agricultural produce in Chikkasindhogi-1 micro watershed is presented in Table 57. The results indicated that, About 54.84 per cent of the households have sold agricultural produce to the local/village merchants. Another 54.84 per cent have sold their produce in cooperative marketing society, 9.68 per cent have sold in regulated markets, 3.23 per cent of them have sold through contract marketing arrangement and another 3.23 per cent have sold through agents or traders. Marginal farmers have mostly sold through village merchants, regulated markets and cooperative marketing society. Some semi medium farmers have sold through contract marketing arrangement and 100 per cent of large farmers have sold through village merchants.

Table 57. Marketing Channels used for sale of agricultural produce in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Agent/Traders	0	0	1	11.11	0	0	0	0	0	0	1	3.23
2	Local/village Merchant	5	55.56	5	55.56	4	50	2	100	1	100	17	54.84
3	Regulated Market	1	11.11	0	0	2	25	0	0	0	0	3	9.68
4	Cooperative marketing Society	5	55.56	6	66.67	4	50	2	100	0	0	17	54.84
5	Contract marketing arrangement	0	0	0	0	1	12.5	0	0	0	0	1	3.23

Mode of transport of agricultural produce: The data regarding incidence of soil and water erosion problems in Chikkasindhogi-1 micro watershed is presented in Table 58. The results indicated that 9.68 per cent of the households have used tractor as mode of transport and 116.13 per cent have used truck.

Table 58. Mode of transport of agricultural produce in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Tractor	0	0	2	22.22	0	0	0	0	1	100	3	9.68
2	Truck	11	122.22	10	111.11	11	137.50	4	200	0	0	36	116.13

Incidence of soil and water erosion problems: The data regarding incidence of soil and water erosion problems in Chikkasindhogi-1 micro watershed is presented in Table 59. The results indicated that, 90.32 per cent of the households have experienced the soil and water erosion problems i.e. 88.89 per cent of marginal farmers and 100 per cent of small, semi medium, medium and large farmers.

Table 59. Incidence of soil and water erosion problems in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Soil and water erosion problems in the farm	8	88.89	9	100	8	100	2	100	1	100	28	90.32

Interest towards soil testing: The data regarding interest shown towards soil testing in Chikkasindhogi-1 micro watershed is presented in Table 60. The results indicated that, 90.32 per cent of the households have shown interest in soil testing i.e. 88.89 per cent of marginal farmers, 100 per cent of small farmers, 100 per cent of semi medium, 100 per cent of medium farmers and 100 per cent large farmers have shown interest in soil testing.

Table 60. Interest shown towards soil testing in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Interest in soil test	8	88.89	9	100	8	100	2	100	1	100	28	90.32

Soil and water conservation practices and structures adopted: The data regarding soil and water conservation practices and structures adopted in Chikkasindhogi-1 micro watershed is presented in Table 61. The results indicated that, 51.61 per cent of the households have adopted field bunding, 3.23 per cent of the households have adopted contour bunds, 3.23 per cent of the households have adopted farm pond, 29.03 per cent have adopted bore well recharge pit and 45.16 per cent of the households are following summer ploughing.

Table 61. Soil and water conservation practices and structures adopted in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Field Bunding	5	55.56	7	77.78	3	37.50	1	50	0	0	16	51.61
2	Contour Bund	0	0	1	11.11	0	0	0	0	0	0	1	3.23
3	Farm Pond	0	0	0	0	1	12.50	0	0	0	0	1	3.23
4	Bore well recharge pit	2	22.22	2	22.22	3	37.50	1	50	1	100	9	29.03
5	Summer Ploughing	5	55.56	6	66.67	3	37.50	0	0	0	0	14	45.16

Status of soil and water conservation structures adopted: The data regarding status of soil and water conservation structures adopted in Chikkasindhogi-1 micro watershed is presented in Table 62. The results indicated that, 100 per cent of the households who adopted field bunding, farm pond and contour bund and 33.33 per cent the households who adopted bore well recharge pit, opined that they were in good condition. Around 66 per cent of the households opined that bore well recharge pits require full replacement.

Table 62. Status of soil and water conservation structures adopted in Chikkasindhogi-1 micro watershed

Sl. No	Item	Good		Slightly Damaged		Severely Damaged		Full Replacement Required	
		N	%	N	%	N	%	N	%
1	Bore well recharge pit	1	33.33	0	0	0	0	2	66.67
2	Contour Bund	1	100	0	0	0	0	0	0
3	Farm Pond	1	100	0	0	0	0	0	0
4	Field Bunding	16	100	0	0	0	0	0	0

Agencies involved in soil conservation structures: The data regarding agencies involved in soil conservation structures in Chikkasindhogi-1 micro watershed is presented

in Table 63. The results indicated that 87.10 per cent of soil conservation structure is constructed by farmers on their own, 41.94 per cent of the soil conservation structures are constructed by the government and another 3.23 per cent is constructed by farmer organizations.

Table 63. Agencies involved in soil conservation structures in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Own	8	88.89	9	1000	7	87.50	2	1000	1	1000	27	87.10
2	Govt.	4	44.44	6	66.67	3	37.50	0	00	0	00	13	41.94
3	Farmer organization	0	00	1	11.11	0	00	0	00	0	00	1	3.23

Source of drinking water: The data regarding source of drinking water in Chikkasindhogi-1 micro watershed is presented in Table 64. The results indicated that, canal was the major source of drinking water for 93.55 per cent of the households and bore well was the source of drinking water for 3.23 per cent of the households.

Table 64. Source of drinking water in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)		MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Bore Well	0	0	0	0	1	11.11	0	0	0	0	0	0	1	3.23
2	Canal/Nala	2	100	8	88.89	8	88.89	8	100	2	100	1	100	29	93.55

Usage pattern of fuel for domestic use: The data regarding usage pattern of fuel for domestic use in Chikkasindhogi-1 micro watershed is presented in Table 65. The results indicated that, 83.87 percent used fire wood and another 12.9 percent of the households used LPG.

Table 65. Usage pattern of fuel for domestic use in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)		MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Fire Wood	2	100	8	88.89	7	77.78	7	87.50	1	50	1	100	26	83.87
2	LPG	0	0	0	0	2	22.22	1	12.50	1	50	0	0	4	12.90

Source of light: The data regarding source of light in Chikkasindhogi-1 micro watershed is presented in Table 66. The results indicated that, Electricity was the major source of light for all the households in micro watershed.

Table 66. Source of light in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)		MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Electricity	2	100	9	100	9	100	8	100	2	100	1	100	31	100

Existence of Sanitary toilet facility: The data regarding existence of sanitary toilet facility in Chikkasindhogi-1 micro watershed is presented in Table 67. The results indicated that, 25.81 per cent of the households possess sanitary toilet i.e. 100 per cent of landless, 11.11 per cent of marginal, 11.11 per cent of small, 25 per cent of semi

medium, 50 per cent of medium farmers and 100 per cent of large farmers had sanitary toilet facility.

Table 67. Existence of Sanitary toilet facility in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)		MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Sanitary toilet facility	2	100	1	11.11	1	11.11	2	25	1	50	1	100	8	25.81

Possession of PDS card: The data regarding possession of PDS card in Chikkasindhogi-1 micro watershed is presented in Table 68. The results indicated that, 87.10 per cent of the sampled households possessed BPL card, 3.23 per cent of the households possessed APL and 6.45 per cent did not possess PDS card.

Table 68. Possession of PDS card in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	LL (2)		MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	APL	0	0	0	0	0	0	0	0	1	50	0	0	1	3.23
2	BPL	1	50	8	88.89	8	88.89	8	100	1	50	1	100	27	87.10
3	Not Possessed	1	50	0	0	1	11.11	0	0	0	0	0	0	2	6.45

Participation in NREGA programme: The data regarding participation in NREGA programme in Chikkasindhogi-1 micro watershed is presented in Table 69. The results indicated that, 67.74 per cent of the households participated in NREGA programme which included 100 per cent of the landless, 55.56 percent of the marginal, 55.56 per cent of the small, 75 per cent of the semi medium, 100 percent of the medium and 100 per cent of the large farmers.

Table 69. Participation in NREGA programme in Chikkasindhogi-1 micro watershed

Sl. No.	Particulars	LL (2)		MF (9)		SF (9)		SMF(8)		MDF(2)		LF(1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Participation in NREGA programme	2	100	5	55.56	5	55.56	6	75	2	100	1	100	21	67.74

Table 70. Adequacy of food items in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	MF (9)		SF (9)		SMF (8)		MDF(2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Cereals	9	100	8	88.89	8	100	2	100	1	100	28	90.32
2	Pulses	9	100	7	77.78	8	100	2	100	1	100	27	87.10
3	Oilseed	0	0	0	0	1	12.50	0	0	0	0	1	3.23
4	Vegetables	8	88.89	6	66.67	8	100	2	100	1	100	25	80.65
5	Fruits	2	22.22	2	22.22	2	25	1	50	0	0	7	22.58
6	Milk	8	88.89	8	88.89	8	100	1	50	1	100	26	83.87
7	Egg	1	11.11	1	11.11	3	37.50	0	0	0	0	5	16.13
8	Meat	0	0	1	11.11	1	12.50	0	0	0	0	2	6.45

Adequacy of food items: The data regarding adequacy of food items in Chikkasindhogi-1 micro watershed is presented in Table 70. The results indicated that, cereals were adequate for 90.32 per cent of the households, pulses were adequate for 87.10 per cent,

oilseeds were adequate for 3.23 per cent, vegetables were adequate for 80.65 per cent, fruits were adequate for 22.58 per cent, milk was adequate for 83.87 per cent, egg were adequate for 16.13 per cent and meat was adequate for 6.45 per cent of the households.

Response on Inadequacy of food items: The data regarding inadequacy of food items in Chikkasindhogi-1 micro watershed is presented in Table 71. The results indicated that, cereals were inadequate for 3.23 per cent of the households, pulses were inadequate for 6.45 per cent, oilseeds were inadequate for 3.23 per cent, fruits were inadequate for 25.18 per cent, eggs were inadequate for 35.48 per cent and meat was inadequate for 41.94 per cent of the households.

Table 71. Response on Inadequacy of food items in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Cereals	0	0	1	11.11	0	0	0	0	0	0	1	3.23
2	Pulses	0	0	2	22.22	0	0	0	0	0	0	2	6.45
3	Oilseed	0	0	0	0	0	0	0	0	1	100	1	3.23
4	Vegetables	0	0	0	0	0	0	0	0	0	0	0	0
5	Fruits	4	44.44	1	11.11	2	25	0	0	1	100	8	25.81
6	Milk	0	0	0	0	0	0	0	0	0	0	0	0
7	Egg	3	33.33	3	33.33	3	37.50	1	50	1	100	11	35.48
8	Meat	4	44.44	2	22.22	5	62.50	1	50	1	100	13	41.94

Response on market surplus of food items: The data regarding market surplus of food items in Chikkasindhogi-1 micro watershed is presented in Table 72. The results indicated that, oilseeds were market surplus for 70.97 per cent of the households, vegetables were market surplus for 3.23 per cent, fruits were market surplus for 16.13 per cent, eggs were market surplus for 6.45 per cent and meat was market surplus for 9.68 per cent of the households.

Table 72. Response on Market surplus of food items in Chikkasindhogi-1 micro watershed

Sl.No.	Particulars	MF (9)		SF (9)		SMF (8)		MDF (2)		All (31)	
		N	%	N	%	N	%	N	%	N	%
1	Oilseed	8	88.89	6	66.67	7	87.50	1	50.00	22	70.97
2	Vegetables	0	0.00	1	11.11	0	0.00	0	0.00	1	3.23
3	Fruits	1	11.11	2	22.22	2	25.00	0	0.00	5	16.13
4	Egg	1	11.11	0	0.00	1	12.50	0	0.00	2	6.45
5	Meat	1	11.11	1	11.11	1	12.50	0	0.00	3	9.68

Farming constraints: The data regarding farming constraints experienced by households in Chikkasindhogi-1 micro watershed is presented in Table 73. The results indicated that, lower fertility status of the soil was the constraint experienced by 48.39 per cent of the households, wild animal menace on farm field (74.19%), frequent incidence of pest and diseases (3.23%), inadequacy of irrigation water (38.71%), high cost of fertilizers and plant protection chemicals (41.94%), high rate of interest on credit (29.03%), low price

for the agricultural commodities (3.23%), lack of marketing facilities in the area (9.68%), lack of transport for safe transport of the agricultural produce to the market (16.13%), less rainfall (87.10%) and source of Agri–technology information (News paper/TV/Mobile) (16.13%).

Table 73. Farming constraints Experienced in Chikkasindhogi-1 micro watershed

Sl. No.	Particulars	MF (9)		SF (9)		SMF (8)		MDF (2)		LF (1)		All (31)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Lower fertility status of the soil	3	33.33	7	77.78	4	50	1	50	0	0	15	48.39
2	Wild animal menace on farm field	8	88.89	6	66.67	7	87.50	1	50	1	100	23	74.19
3	Frequent incidence of pest and diseases	0	0	0	0	0	0	1	50	0	0	1	3.23
4	Inadequacy of irrigation water	4	44.44	2	22.22	5	62.50	1	50	0	0	12	38.71
5	High cost of Fertilizers and plant protection chemicals	3	33.33	4	44.44	5	62.50	0	0	1	100	13	41.94
6	High rate of interest on credit	2	22.22	2	22.22	3	37.50	2	100	0	0	9	29.03
7	Low price for the agricultural commodities	0	0	1	11.11	0	0	0	0	0	0	1	3.23
8	Lack of marketing facilities in the area	1	11.11	1	11.11	1	12.50	0	0	0	0	3	9.68
9	Lack of transport for safe transport of the Agril produce to the market.	3	33.33	1	11.11	1	12.50	0	0	0	0	5	16.13
10	Less rainfall	8	88.89	9	100	8	100	2	100	0	0	27	87.10
11	Source of Agri-technology information(Newspaper/TV/Mobile)	2	22.22	1	11.11	2	25	0	0	0	0	5	16.13

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 31 households located in the micro watershed were interviewed for the survey.

The data indicated that there were 109 (54.50%) men and 90 (45%) were women among the sampled households. The average family size of landless farmers' was 3.5, marginal farmers' was 7.1, small farmers' was 6.1, semi medium farmers' was 6.1, medium farmers' was 9.5 and for large farmers it was 6.

The data indicated that, 42 (21%) people were in 0-15 years of age, 88 (44%) were in 16-35 years of age, 51 (25.50 %) were in 36-60 years of age and 19 (9.50 %) were above 61 years of age. The results indicated that the Chikkasindhogi-1 had 29.50 per cent illiterates, 12.50 per cent of them had primary school education, 22.50 per cent of them had middle school education, 25.50 per cent of them had high school education, 4 per cent of them had PUC education, 1 per cent of them had diploma, 0.5 per cent of them had ITI and 4.5 per cent of them had degree education.

The results indicate that, 93.55 per cent of households practicing agriculture and 6.45 per cent of the household heads were agricultural labourers. The results indicate that agriculture was the major occupation for 67 per cent of the household members, 2 per cent were agricultural labourers, 1 per cent had household industry, 27.5 per cent of them were student, 1.5 per cent of them were housewife and 0.5 per cent of them were in government and private services. The results shows that 8 per cent of the households participated in user groups and 91.50 per cent of them have not participated in any local institutions.

The results indicate that 35.48 per cent of the households possess thatched house, 6.45 per cent of the households possess Katcha house, 54.84 per cent of them possess pucca house and 3.23 per cent of them possess semi pucca house. The results shows that 93.55 per cent of the households possess TV, 77.42 per cent of the households possess Mixer grinder, 51.61 per cent of the households possess motor cycle, 6.45 per cent of the households possess tempo, 3.23 per cent of the households possess refrigerator and bicycle, and 93.55 per cent of the households possess mobile phones. The average value of television was Rs.6276, mixer grinder was Rs.1515, motor cycle was Rs.52437, mobile phone was Rs.1710, refrigerator was Rs.8000 and bicycle was Rs.3000.

About 22.58 per cent of the households possess plough, 3.23 per cent of them possess tractor, 12.90 per cent of them posses bullocks cart, 38.17 per cent of them power tiller and 93.55 per cent of them possess weeder. The results show that the average value of plough was Rs.1,500, the average value of tractor was Rs. 5,00,000 and the average value of sprayer was Rs.3,953, the average value of bullock cart Rs.18,500, and the average value of weeder Rs.95.

The results indicate that, 16.13 per cent of the households possess bullocks, 22.58 per cent of the households possess local cow, 3.23 per cent of the households possess crossbred cow, 22.58 per cent of the households possess local cow and buffalo, 3.23 per cent of the households possess crossbred cow, goat and poultry birds.

The results indicate that, average own labour men available in the micro watershed was 2.27, average own labour (women) available was 1.90, average hired labour (men) available was 3.47 and average hired labour (women) available was 7.77. The results indicate that, 90.32 per cent of the household opined that hired labour was adequate and 3.23 per cent of the households opined that hired labour was inadequate. About 100 per cent of the marginal farmers, 88.89 per cent of small, 100 per cent of semi medium and 100 per cent of medium farmers have opined that hired labour was adequate.

The results indicate that, 6 (3.0%) persons were migrated from the micro watershed which includes 3 persons from semi medium farmers and 3 persons from medium farmer category. People have migrated on average of 299.2 Kms and average duration was 8 months. Semi medium farmers have migrated 433.33 kms and on an average 10 months in a year. Medium farmers have migrated 98 kms and on an average 5 months in a year. Job/work was the reason for migration of all the migrants. Improved quality of the life was the major positive consequence of migration of 16.67 per cent of the households and construction house was the major positive consequence for 33.33 per cent. Increased workload for other family members was the major negative consequence of migration.

The results indicate that, households of the Chikkasindhogi-1 micro watershed possess 17.89 ha (39.72%) of dry land and 27.14 ha (60.28%) of irrigated land. Marginal farmers possess 3.56 ha (86.87%) of dry land and 0.54 ha (13.13%) of irrigated land. Small possess 5.42 ha (60.63%) of dry land and 3.52 ha (39.37%) of irrigated land. Semi medium possess 8.90 ha (58.42%) of dry land and 6.34 ha (41.58%) of irrigated land. Medium farmers possess 6.63 ha (100%) of irrigated land and large farmers possess 10.12 ha (100%) of irrigated. The average value of dry land was Rs. 267994.14 and average value of irrigated was Rs.1, 89,272. In case of marginal famers, the average land value was Rs. 670428 for dry land. In case of small famers, the average land value was Rs. 3, 75, 214 for dry land. In case of semi medium famers, the average land value was Rs. 1, 90,642.25 for dry land. In case of medium famers, the average land value was Rs. 84,496 for dry land.

The results indicate that, there were 14 functioning bore wells and 1 functioning open well in the micro watershed. Bore well was the major irrigation source in the micro water shed which was possessed by small farmers, medium farmers, semi medium farmers and large farmers. The depth of bore well was found to be 47.64 meters and the depth of open well was found to be 0.29 meters. The results indicate that, marginal farmers had irrigated area of 1.75 hectares, small farmers had 6.67 hectares, semi medium farmers had 8.73 hectares, medium farmers had 7.69 hectares and large farmers had 4.05 hectares of irrigated land.

The results indicate that, farmers have grown Maize (26.34 ha), Tomato (2.4 ha), Cotton (2.05 ha), Groundnut (1.68 ha), Pearlmillet (2.59 ha), Paddy (0.81 ha), Sorghum (0.81 ha), Bengal gram (0.51 ha), Chilly (0.4 ha). Marginal farmers have grown maize, tomato, groundnut and bengal gram. Small farmers have grown maize, tomato, cotton, groundnut, paddy, sorghum and bengalgram. Semi medium farmers have grown maize, tomato, cotton, pearlmillet and chilly. Medium farmers have grown maize, tomato and cotton. Large farmers have grown maize. The results indicate that, the cropping intensity in Chikkasindhogi-1 micro watershed was found to be 96.83 per cent. In case of marginal farmers it was 87.82 per cent, for small farmers it was 93.99 per cent, in case of semi medium farmers it was 100 per cent, medium farmers had cropping intensity of 100 per cent and large farmers had 100 per cent.

The results indicate that, 90.32 per cent of the households possess bank account and 12.90 per cent of them have savings. Around 50 per cent of landless, 44.44 per cent of marginal, 22.22 per cent of small, 50 per cent semi medium, 50 per cent of medium farmers and 100 per cent of large farmers have borrowed credit from different sources. About 10 per cent have availed loan in cooperative bank, 40 per cent have availed loan from friends and relatives and 100 per cent have availed loan from grameena bank. The results indicate that, 90.91 per cent of the households have borrowed loan for agriculture, 4.55 per cent have borrowed for buying irrigation related equipments and 4.55 per cent have borrowed for social functions like marriage, from institutional and non institutional sources. Results indicated that 100 per cent of the households did not repay their loan borrowed from institutional sources.

The results indicate that, the total cost of cultivation for maize was Rs. 234356.79. The gross income realized by the farmers was Rs. 167960. The net income from Maize cultivation was Rs. -66396.80, thus the benefit cost ratio was found to be 1:0.72. The total cost of cultivation for tomato was Rs. 46729.38. The gross income realized by the farmers was Rs. 67925.00. The net income from tomato cultivation was Rs. 21195.62. Thus the benefit cost ratio was found to be 1:1.45. The total cost of cultivation for groundnut was Rs. 72133.49. The gross income realized by the farmers was Rs. 62490.23. The net income from groundnut cultivation was Rs. -9643.26. Thus the benefit cost ratio was found to be 1:0.87. The total cost of cultivation for cotton was Rs. 44743.83. The gross

income realized by the farmers was Rs. 75381.17. The net income from cotton cultivation was Rs. 30637.34. Thus the benefit cost ratio was found to be 1:1.68. The total cost of cultivation for bengal gram was Rs. 251848.19. The gross income realized by the farmers was Rs. 111150. The net income from bengal gram cultivation was Rs. -140698.19, thus the benefit cost ratio was found to be 1:0.44. The total cost of cultivation for sorghum was Rs. 25747.08. The gross income realized by the farmers was Rs. 24700. The net income from sorghum cultivation was Rs. -1047.08. Thus the benefit cost ratio was found to be 1:0.96. The total cost of cultivation for chilly was Rs. 76456.11. The gross income realized by the farmers was Rs. 98800. The net income from chilly cultivation was Rs. 22343.89. Thus the benefit cost ratio was found to be 1:1.29. The total cost of cultivation for paddy was Rs. 50384.32. The gross income realized by the farmers was Rs. 38902.50. The net income from paddy cultivation was Rs. -11481.82. Thus the benefit cost ratio was found to be 1:0.77.

The results indicate that, 35.48 per cent of the households opined that dry fodder was adequate which includes 22.22 per cent of marginal, 33.33 per cent of small, 50 per cent of semi medium and 100 per cent of medium farmers. Only 19.35 per cent of the households have opined that the green fodder is adequate. The data also revealed that 19.35 per cent of the households opined that dry fodder and green fodder were inadequate.

The results indicate that the average annual gross income was Rs. 22500 for landless farmers, for marginal farmers it was Rs. 61655.56, for small farmers it was Rs.56222, for semi medium farmers it was Rs.94688, for medium farmers it was Rs.191500 and for large farmers it was Rs.73000. The results indicate that the average annual expenditure is Rs. 13296.47. For landless farmers it was 6250, for marginal farmers it was Rs 8969, for small farmers it was Rs. 4464.51, for semi medium farmers it was Rs. 10348.48 and for medium farmers it was Rs. 70500 and for large farmers it was Rs. 55000.

The results indicate that, sampled households have grown 22 coconut, 19 mango and 3 sapota trees in their field. Farmers have also grown 5 coconut trees in their backyard. The results indicate that, 93.55 per cent of the households are interested in growing horticultural crops which include 100 per cent of marginal, small, semi medium, medium and large farmers. Households have planted 31 neem trees, 1 banyan tree in field and 9 neem trees in backyard.

The results indicate that, households have an average investment capacity of Rs. 6193 for land development, Rs. 2241 for irrigation facility, Rs.4113 for improved crop production and Rs.1774 for improved livestock management. Loan from bank is the major source of investment for 78.13 per cent of households for land development. For irrigation facility 25 per cent of the households depend on loan from bank, 12.5 per cent depend on own funds and 9.38 per cent of the households depend on soft loans. For

improved crop production 59.38 per cent of the households depend on bank loan and for improved livestock management 21.88 per cent of the households depend on bank loan.

The results indicated that, Bengal gram, chilly, cotton, maize and tomato were sold to the extent of 100 per cent. The results indicated that, About 73.33 per cent of the households have sold agricultural produce to the local/village merchants includes 100 per cent of the marginal farmers, 85.71 per cent of the small farmers, 66.67 per cent of the semi medium farmers and 33.33 per cent medium farmers. About 23.33 per cent of the households have sold in regulated markets, which include 14.29 per cent of small farmers, 33.33 per cent of semi medium farmers, 66.67 per cent of the medium farmers and 100 per cent of the large farmers. 9.68 per cent of the households have used tractor as mode of transport and 116.13 per cent have used truck.

The results indicated that, 90.32 per cent of the households have experienced the soil and water erosion problems i.e. 88.89 per cent of marginal farmers and 100 per cent of small, semi medium, medium and large farmers. 90.32 per cent of the households have shown interest in soil testing.

The results indicated that, 51.61 per cent of the households have adopted field bunding, 3.23 per cent of the households have adopted contour bunds, 3.23 per cent of the households have adopted farm pond, 29.03 per cent have adopted bore well recharge pit and 45.16 per cent of the households are following summer ploughing. 100 per cent of the households who adopted field bunding, farm pond and contour bund and 33.33 per cent the households who adopted bore well recharge pit, opined that they were in good condition. Around 66 per cent of the households opined that bore well recharge pits require full replacement. The results indicated that 87.10 per cent of soil conservation structure is constructed by farmers on their own, 41.94 per cent of the soil conservation structures are constructed by the government and another 3.23 per cent is constructed by farmer organizations.

The results indicated that, canal was the major source of drinking water for 93.55 per cent of the households and bore well was the source of drinking water for 3.23 per cent of the households. 83.87 percent used fire wood and another 12.9 percent of the households used LPG. Electricity was the major source of light for all the households in micro watershed. About 25.81 per cent of the households possess sanitary toilet i.e. 100 per cent of landless, 11.11 per cent of marginal, 11.11 per cent of small, 25 per cent of semi medium, 50 per cent of medium farmers and 100 per cent of large farmers had sanitary toilet facility.

The results indicated that, 87.10 per cent of the sampled households possessed BPL card, 3.23 per cent of the households possessed APL and 6.45 per cent did not possess PDS card. About 67.74 per cent of the households participated in NREGA programme which included 100 per cent of the landless, 55.56 percent of the marginal,

55.56 per cent of the small, 75 per cent of the semi medium, 100 percent of the medium and 100 per cent of the large farmers.

The results indicated that, cereals were adequate for 90.32 per cent of the households, pulses were adequate for 87.10 per cent, oilseeds were adequate for 3.23 per cent, vegetables were adequate for 80.65 per cent, fruits were adequate for 22.58 per cent, milk was adequate for 83.87 per cent, egg were adequate for 16.13 per cent and meat was adequate for 6.45 per cent of the households. Cereals were inadequate for 3.23 per cent of the households, pulses were inadequate for 6.45 per cent, oilseeds were inadequate for 3.23 per cent, fruits were inadequate for 25.18 per cent, eggs were inadequate for 35.48 per cent and meat was inadequate for 41.94 per cent of the households. Oilseeds were market surplus for 70.97 per cent of the households, vegetables were market surplus for 3.23 per cent, fruits were market surplus for 16.13 per cent, eggs were market surplus for 6.45 per cent and meat was market surplus for 9.68 per cent of the households.

The results indicated that, lower fertility status of the soil was the constraint experienced by 48.39 per cent of the households, wild animal menace on farm field (74.19%), frequent incidence of pest and diseases (3.23%), inadequacy of irrigation water (38.71%), high cost of fertilizers and plant protection chemicals (41.94%), high rate of interest on credit (29.03%), low price for the agricultural commodities (3.23%), lack of marketing facilities in the area (9.68%), lack of transport for safe transport of the agricultural produce to the market (16.13%), less rainfall (87.10%) and source of Agri–technology information (News paper/TV/Mobile) (16.13%).