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

TALKAL-2 (4D5B2K1d) MICROWATERSHED

Yadgir Taluk and District, Karnataka

Karnataka Watershed Development Project – II

SUJALA – III

World Bank funded Project

THE WORLD BANK

ICAR – NATIONAL BUREAU OF SOIL SURVEY AND LAND USE PLANNING

ICAR - NBSS & LUP

WATERSHED DEVELOPMENT DEPARTMENT
GOVT. OF KARNATAKA, BANGALORE

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

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

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

The natural resources (land, water and vegetation) of the state need adequate and constant care and management, backed by site-specific technological interventions and investments particularly by the government. Detailed database pertaining to the nature of the land resources, their constraints, inherent potentials and suitability for various land

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

ICAR-NBSS&LUP, Regional Centre, Bangalore has taken up a project sponsored by the Karnataka Watershed Development Project-II, (Sujala-III), Government of Karnataka funded by the World Bank under Component-1 Land Resource Inventry. This study was taken up to demonstrate the utility of such a database in reviewing, monitoring and evaluating all the land based watershed development programs on a scientific footing. To meet the requirements of various land use planners at grassroots level, the present study on "Land Resource Inventory and Socio-Economic Status of Farm Households for Watershed Planning and Development of Talak-2 Microwatershed, Yadgir Taluk and District, Karnataka" for integrated development was taken up in collaboration with the State Agricutural Universities, IISC, KSRSAC, KSNDMC as Consortia partners. The project provides detailed land resource information at cadastral level (1:7920 scale) for all the plots and socio-economic status of farm households covering thirty per cent farmers randomely selected representing landed and landless class of farmers in the micro-watershed. The project report with the accompanying maps for the Microwatershed will provide required detailed database for evolving effective land use plan, alternative land use options and conservation plans for the planners, administrators, agricutural extention personnel, KVK officials, developmental departments and other land users to manage the land resources in a sustainable manner.

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

Nagpur
Date: 04-10-2019

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PART-A

LAND RESOURCE INVENTORY

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EXECUTIVE SUMMARY

The land resource inventory of Talak-2 Microwatershed was conducted using village cadastral maps and IRS satellite imagery on 1:7920 scale. The false colour composites of IRS imagery were interpreted for physiography and the physiographic delineations were used as base for mapping soils. The soils were studied in several transects and a soil map was prepared with phases of soil series as mapping units. Random checks were made all over the area outside the transects to confirm and validate the soil map unit boundaries. The soil map shows the geographic distribution and extent, characteristics, classification, behavior and use potentials of the soils in the microwatershed.

The present study covers an area of 572 ha in Yadgir taluk & district, Karnataka. The climate is semiarid and categorized as drought-prone with an average annual rainfall of 866 mm, of which about 652 mm is received during south-west monsoon, 138 mm during north-east and the remaining 76 mm during the rest of the year. An area of 530 ha in the microwatershed is covered by soils, 21 ha is covered by rock outcrops and 21 ha by others (habitation and water body). The salient findings from the land resource inventory are summarized briefly below.

- *The soils belong to 10 soil series and 17 soil phases (management units) and 5 land management units.*
- *The length of crop growing period is about 120-150 days starting from 1st week of June to 4th week of October.*
- *From the master soil map, several interpretative and thematic maps like land capability, soil depth, surface soil texture, soil gravelliness, available water capacity, soil slope and soil erosion were generated.*
- *Soil fertility status maps for macro and micronutrients were generated based on the surface soil samples collected at every 320 m grid interval.*
- *Land suitability for growing 29 major agricultural and horticultural crops was assessed and maps showing the degree of suitability along with constraints were generated.*
- *Entire area in the microwatershed is suitable for agriculture.*
- *About 26 per cent of area is shallow (25-50 cm), 1 per cent of area of the microwatershed has soils that are moderately shallow (50-75 cm), 36 per cent of area of the microwatershed has soils that are moderately deep (75-100 cm), 6 per cent of area is deep (100 - 150 cm) and 24 per cent of area is very deep (>150 cm).*
- *About 16 per cent area in the microwatershed has sandy soils, 24 per cent loamy soils and 53 per cent clayey soils at the surface.*
- *About 87 per cent area in the microwatershed is non gravelly (<15%) and 6 per cent is gravelly (15-35%).*

- *About 30 per cent area of the microwatershed is very high (>200 mm/m) in available water capacity, 36 per cent is medium (101-150mm/m) and 27 per cent area is very low (<50 mm/m).*
- *Entire area in the microwatershed is under very gently sloping (1-3% slope) lands.*
- *Maximum area of about 92 per cent is moderately (e2) eroded and <1 per cent area is slightly eroded (e1) soils.*
- *Entire area of the microwatershed is neutral (pH 6.5-7.3) in soil reaction.*
- *The Electrical Conductivity (EC) of entire soils of the microwatershed is <2 dsm^{-1} indicating that the soils are non-saline.*
- *About 59 per cent area is medium (0.5-0.75%), 9 per cent area is high (0.75%) and 25 per cent is low (<0.5%) in organic carbon content of the soil.*
- *About 83 per cent of area is medium (23-57 kg/ha) in available phosphorus content of the soil, 8 per cent of area is low (<23 kg/ha) and 2 per cent of area is high (>57 kg/ha) in the microwatershed.*
- *Available potassium content is medium (145-337 kg/ha) in 83 per cent area and high (>337 kg/ha) in 10 per cent of area in the microwatershed.*
- *Available sulphur is low (<10 ppm) in an area of about 41 per cent, medium (10 -20 ppm) in 50 per cent of area and high (>20 ppm) in 2 per cent of area in the microwatershed.*
- *Available boron is low (<0.5 ppm) in an area of 29 per cent and medium (0.5-0.1 ppm) in an area of 63 per cent in the microwatershed.*
- *Available iron is sufficient (>4.5 ppm) in 91 per cent area and deficient (<0.4 ppm) in 2 per cent area in the microwatershed.*
- *Available manganese and copper are sufficient in all the soils of the microwatershed.*
- *Available zinc is deficient (<0.6 ppm) in an area of 64 per cent and sufficient (>0.6 ppm) in an area of 28 per cent of the microwatershed.*
- *The land suitability for 29 major crops grown in the microwatershed were assessed and the areas that are highly suitable (S1) and moderately suitable (S2) are given below. It is however to be noted that a given soil may be suitable for various crops but what specific crop to be grown may be decided by the farmer looking to his capacity to invest on various inputs, marketing infrastructure, market price and finally the demand and supply position.*

Land suitability for various crops in the Microwatershed

Crop	Suitability Area in ha (%)			Crop	Suitability Area in ha (%)	
	Highly suitable (S1)	Moderately suitable (S2)			Highly suitable (S1)	Moderately suitable (S2)
Sorghum	-	*53 (9)*		*Guava*	-	-
Maize	-	*53 (9)*		*Sapota*	-	-
Bajra	-	*53 (9)*		*Pomegranate*	-	*8 (1)*
Groundnut	-	-		*Musambi*	-	*8 (1)*
Sunflower	-	*8 (1)*		*Lime*	-	*8 (1)*
Redgram	-	*53 (9)*		*Amla*	-	-
Bengal gram	-	*8 (1)*		*Cashew*	-	-
Cotton	-	*8 (1)*		*Jackfruit*	-	-
Chilli	-	*8 (1)*		*Jamun*	-	-
Tomato	-	-		*Custard apple*	-	*8 (1)*
Brinjal	-	-		*Tamarind*	-	-
Onion	-	-		*Mulberry*	-	-
Bhendi	-	*8 (1)*		*Marigold*	-	*8 (1)*
Drumstick	-	-		*Chrysanthemum*	-	*8 (1)*
Mango	-	-				

- *Apart from the individual crop suitability, a proposed crop plan has been prepared for the identified LMUs by considering only the highly and moderately suitable lands for different crops and cropping systems with food, fodder, fibre and other horticulture crops.*
- *Maintaining soil-health is vital for crop production and conserve soil and land resource base for maintaining ecological balance and to mitigate climate change. For this, several ameliorative measures have been suggested 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. This would help in not only supplementing the farm income but also provide fodder and fuel and generate lot of biomass which would help in maintaining an ecological balance and also contribute to mitigating the climate change.*

Chapter 1

INTRODUCTION

Soil being a vital natural resource on whose proper use depends the life supporting systems of a country and the socioeconomic development of its people. Soils provide food, fodder, fibre and fuel for meeting the basic human and animal needs. With the ever increasing growth in human and animal population, the demand on soil for more food and fodder production is on the increase. 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. The soils have been degrading at an estimated rate of one million hectares per year and ground water levels have been receding at an alarming rate resulting in decline in the ground water resource. Further, land degradation has emerged as a serious problem which has already affected about 38 lakh ha of cultivated area in the State. Soil erosion alone has degraded about 35 lakh ha. Almost all the uncultivated areas are facing various degrees of degradation, particularly soil erosion; salinity and alkalinity has emerged as a major problem in more than 3.5 lakh ha in the irrigated areas of the State. Nutrient depletion and declining factor productivity is common in both rainfed and irrigated areas. The degradation is continuing at an alarming rate and there appears to be no systematic effort among the stakeholders to contain this process. In recent times, an aberration of weather due to climate change phenomenon has added another dimension leading to unpredictable situation 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 use 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 has already been made to upscale the soil resource information from 1:250000 and 1:50000 scale to the LEU map in Goa and in some other states.

The land resource inventory aims to provide site-specific database for Talak-2 microwatershed in Yadgir Taluk and Yadgir District, Karnataka State for the Karnataka Watershed Development Department. The database was generated by using cadastral map of the village as a base along with high resolution IRS LISS IV and Cartosat-1 merged satellite imagery. Later, an attempt will be made to uplink this LRI data generated at 1:7920 scale under Sujala-III Project to the proposed Landscape Ecological Units (LEUs) map.

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

Chapter 2

GEOGRAPHICAL SETTING

2.1 Location and Extent

The Talak-2 microwatershed is located in the northern part of Karnataka in Yadgir Taluk & District, Karnataka State (Fig.2.1). It comprises parts of Hedagimadra, Talaka and Arakera. K villages. It lies between 16^0 50' and 16^0 48' North latitudes and 76^0 59' and 77^0 1' East longitudes covering an area of about 572 ha. It is about 20 km southeast of Yadgir town and is surrounded by Thalaka on the west, Hedagimadra on the south, southeast and Arakera. K on the north, northwest and eastern side.

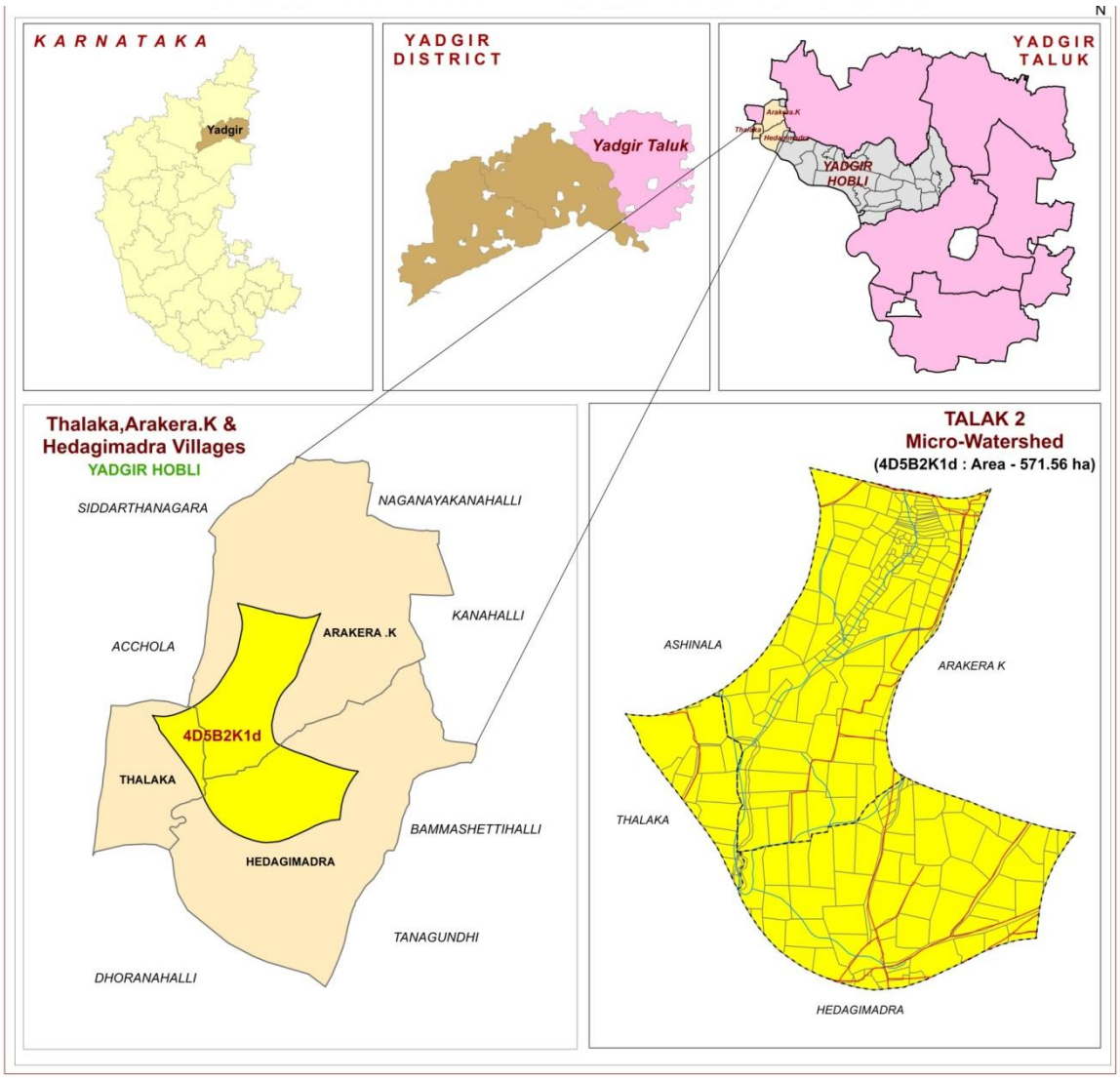


Fig.2.1 Location map of Talak-2 Microwatershed

2.2 Geology

Major rock formations observed in the microwatershed are granite gneiss (Figs.2.2). They 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 Talak-2 microwatershed.

Fig.2.2 Granite and granite gneiss rocks

2.3 Physiography

Physiographically, the area has been identified as granite gneiss landscape based on geology. The area has been further subdivided into five landforms, *viz;* mounds/ridges, summits, side slopes and very gently sloping uplands, plains and valleys based on slope and its relief features. The elevation ranges from 373-427 m above MSL. The mounds and ridges are mostly covered by rock outcrops.

2.4 Drainage

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

2.5 Climate

The Yadgir district lies in the northern plains of Karnataka and falls under semiarid tract of the state and is categorized as drought- prone with total annual rainfall of 866 mm (Table 2.1). Of the total rainfall, maximum of 652 mm is received during the south–west monsoon period from June to September, the north-east monsoon from October to early December contributes about 138 mm and the remaining 76 mm during the rest of the year. The summer season starts during the middle of February and

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

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

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

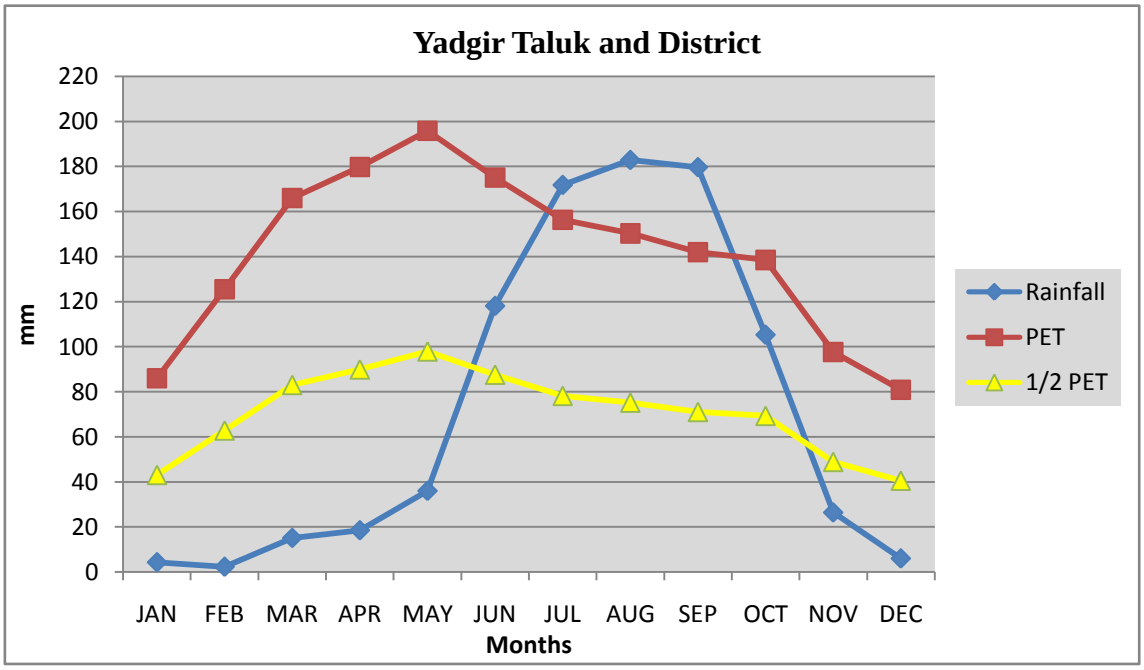


Fig 2.3 Rainfall distribution in Yadgir Taluk, Yadgir District

2.6 Natural Vegetation

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

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

Fig 2.4 Natural vegetation of Talak-2 microwatershed

2.7 Land Utilization

About 72 per cent area (Table 2.2) in Yadgir district is cultivated at present. An area of about 2 per cent is permanently under pasture, 20 per cent under current fallows and 6 per cent under non-agricultural land, and 5 per cent under currently barren. Forests occupy an area of about 7 per cent and the tree cover is in a very poor state. Most of the mounds, ridges and bouldery areas have very poor vegetative cover. Major crops grown in the area are sorghum, maize, cotton, sunflower, groundnut, Bengal gram, red gram and paddy. The cropping intensity is 120 per cent in the taluk. 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 Talak-2 microwatershed is presented in Fig.2.5. The different crops and cropping systems adopted in the

microwatershed is presented in the Figures 2.6. Location of wells in Talak-2 microwatershed is presented in the figure 2.7.

Table 2.2 Land Utilization in Yadgir District

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

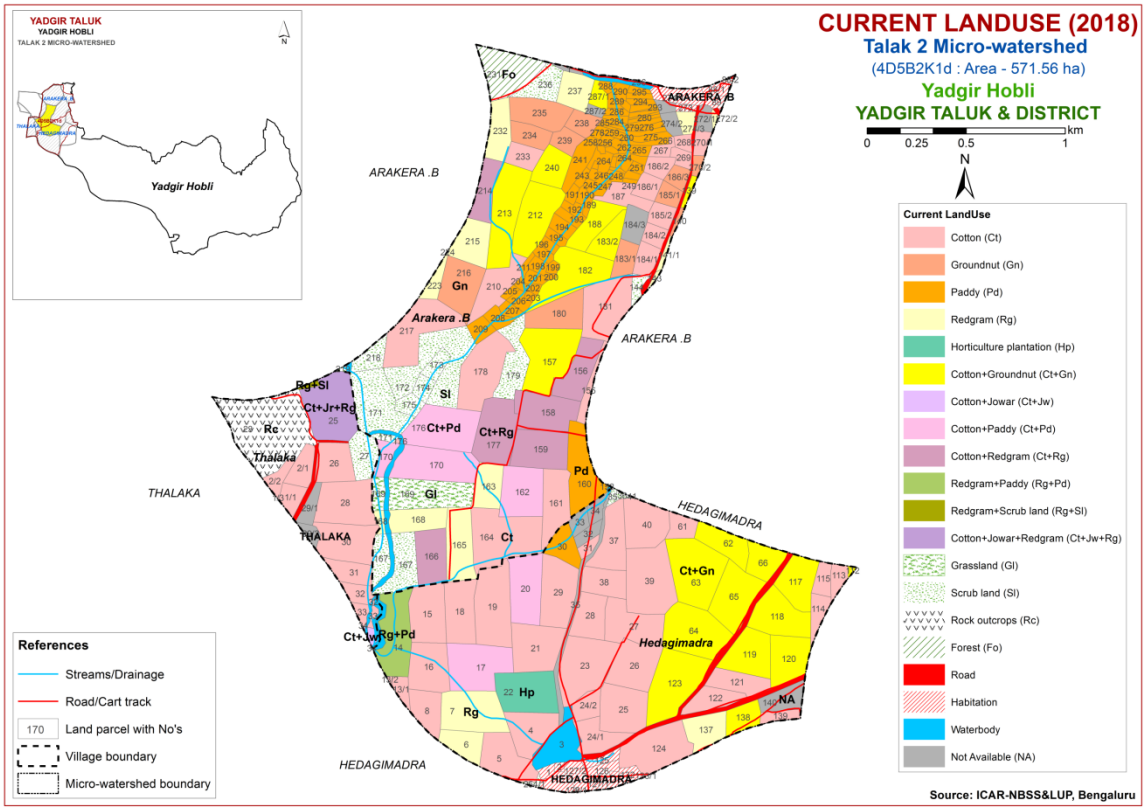


Fig.2.5 Current Land Use map of Talak-2 Microwatershed

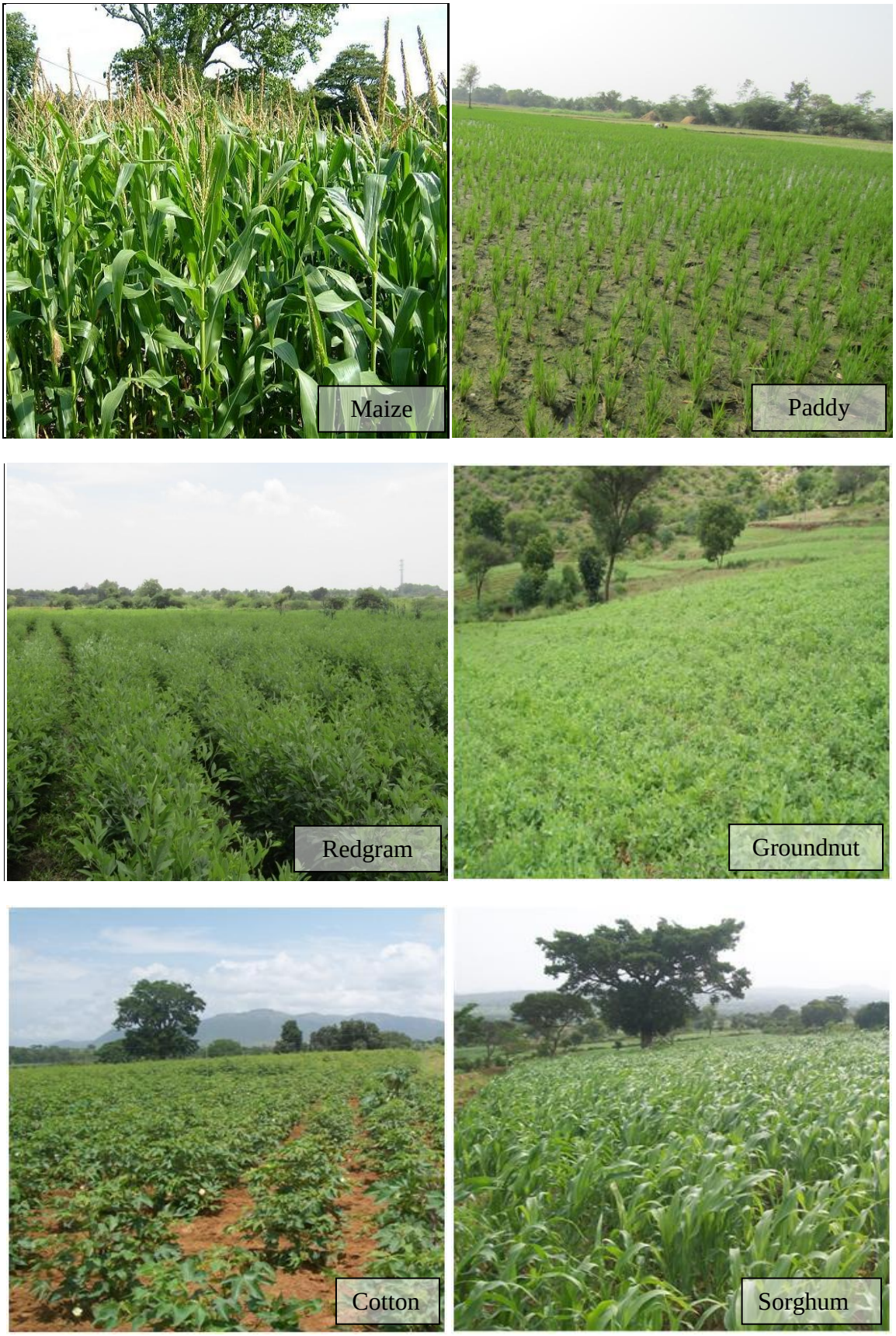


Fig 2.6 Different Crops and Cropping Systems in Talak-2 Microwatershed

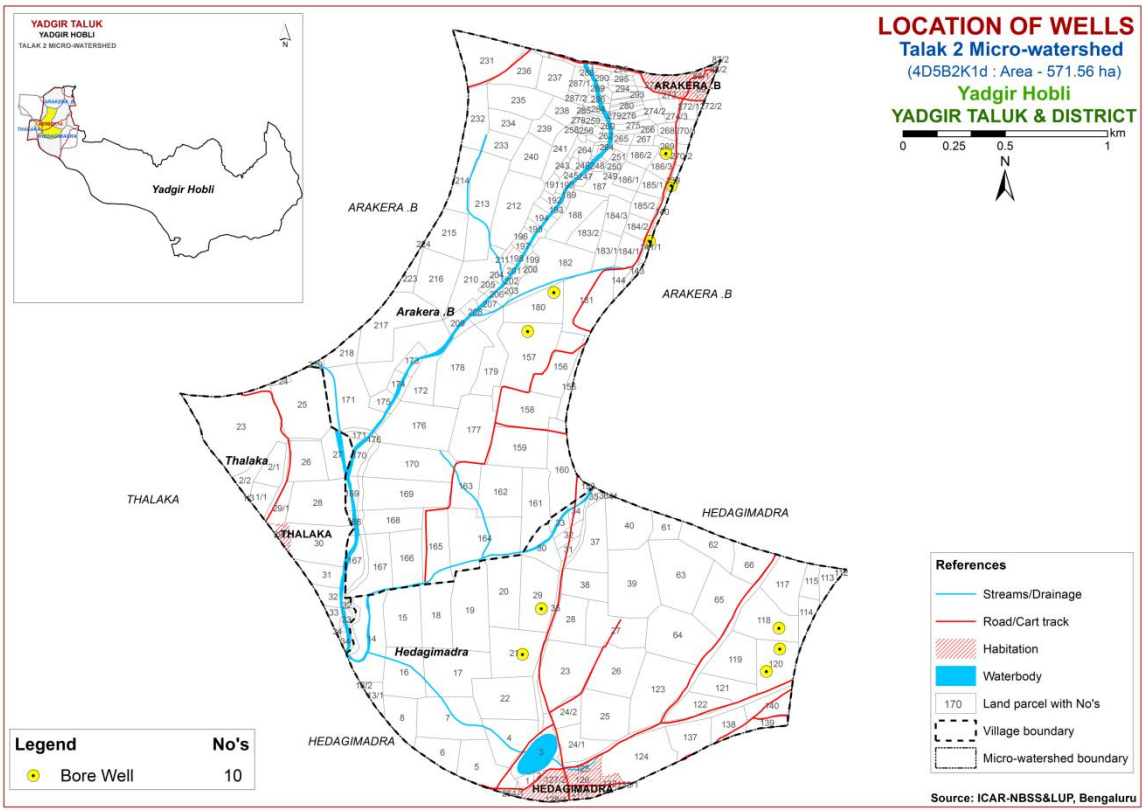


Fig 2.7 Location of wells in Talak-2 Microwatershed

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 Talak-2 microwatershed by the detailed study of all the soil characteristics (depth, texture, colour, structure, consistence, coarse fragments, porosity, soil reaction, soil horizons etc.) and site characteristics (slope of the land, erosion, drainage, occurrence of rock fragments etc.) followed by grouping of similar areas based on soil-site characteristics into homogeneous (management units) units, and showing the area extent and their geographic distribution on the microwatershed cadastral map. The detailed survey at 1:7920 scale was carried out in an area of 572 ha. The methodology followed for carrying out land resource inventory was as per the guidelines given in Soil Survey Manual (IARI, 1971; Soil Survey Staff, 2006; Natarajan *et al.,* 2015) which is briefly described below.

3.1 Base Maps

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

3.2 Image Interpretation for Physiography

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

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

Image Interpretation Legend for Physiography

G- Granite Gneiss Landscape

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

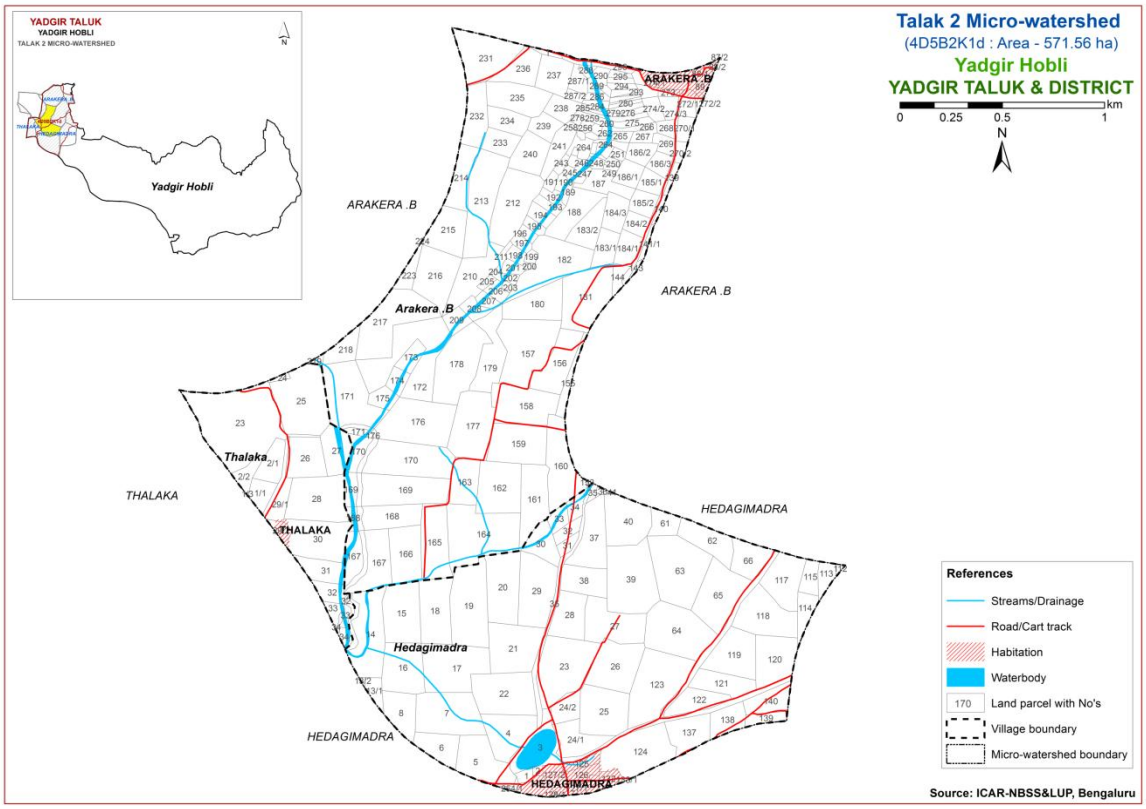


Fig 3.1 Scanned and Digitized Cadastral map of Talak-2 Microwatershed

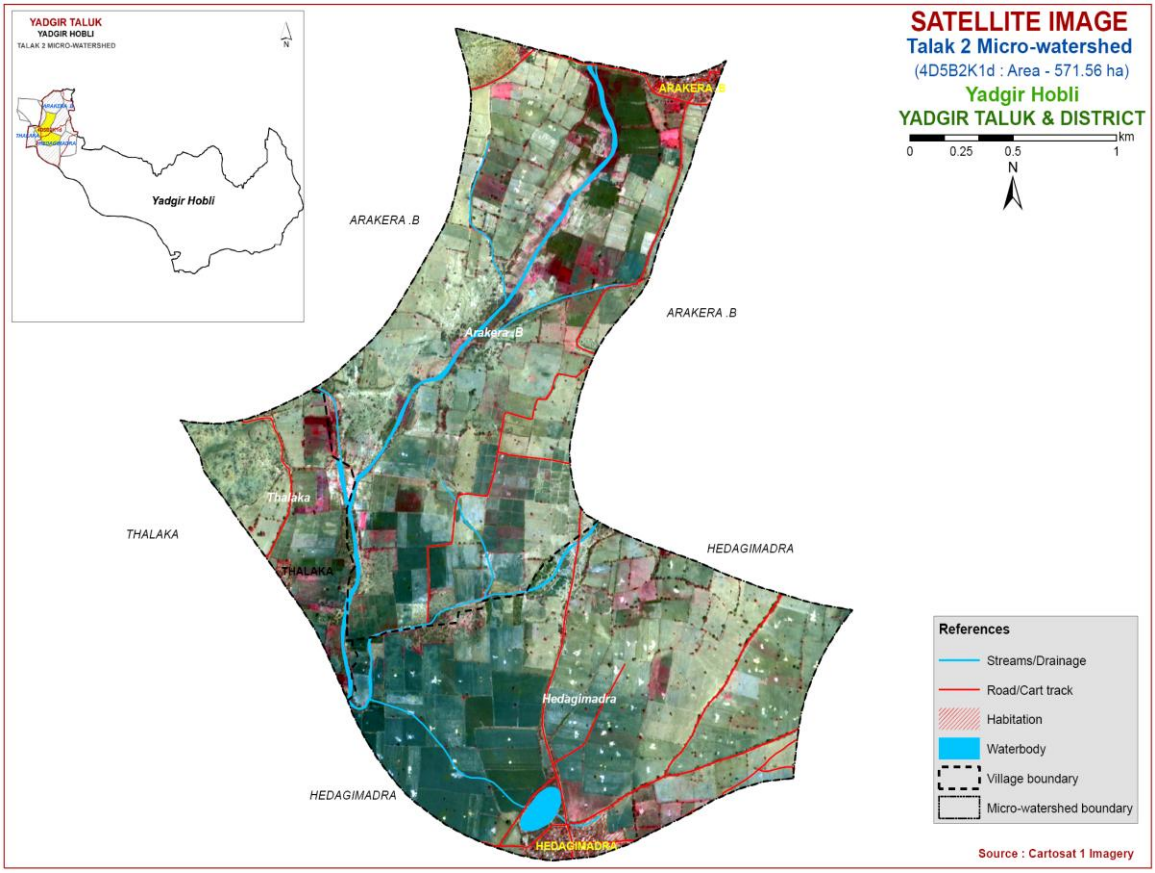


Fig.3.2 Satellite Image of Talak-2 Microwatershed

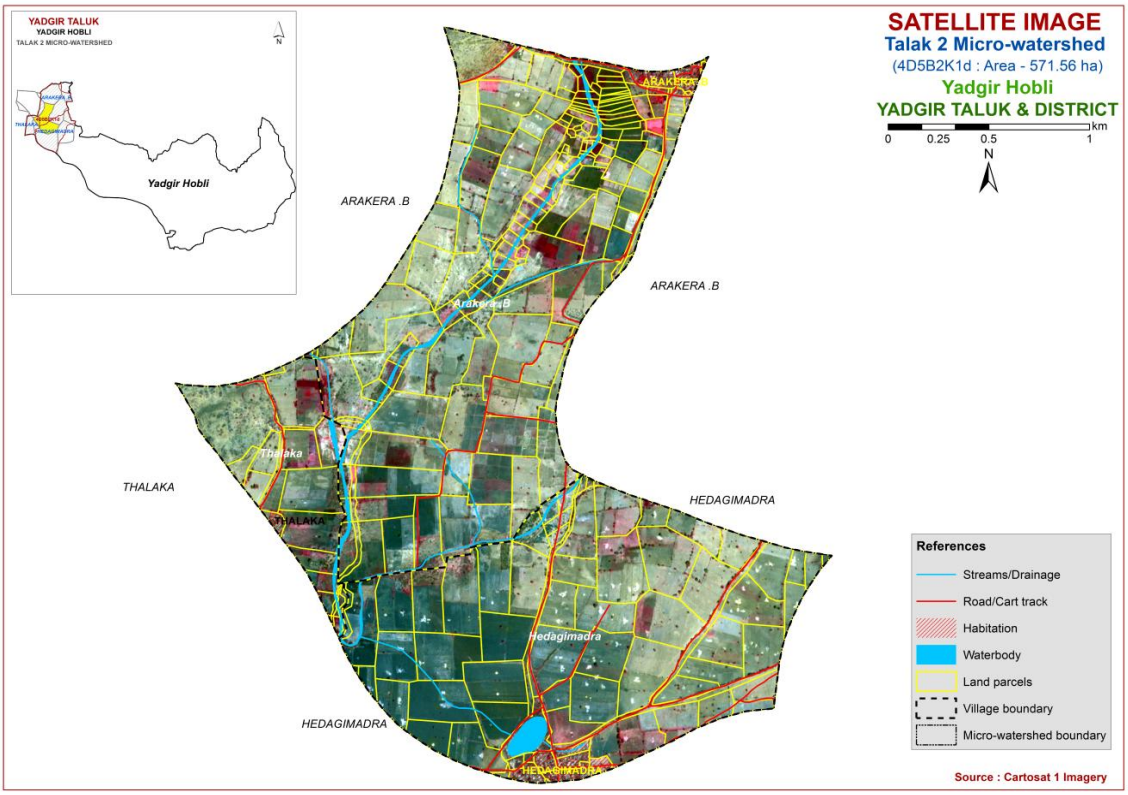


Fig.3.3 Cadastral map overlaid on IRS PAN+LISS IV merged imagery of Talak-2 Microwatershed

3.3 Field Investigation

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

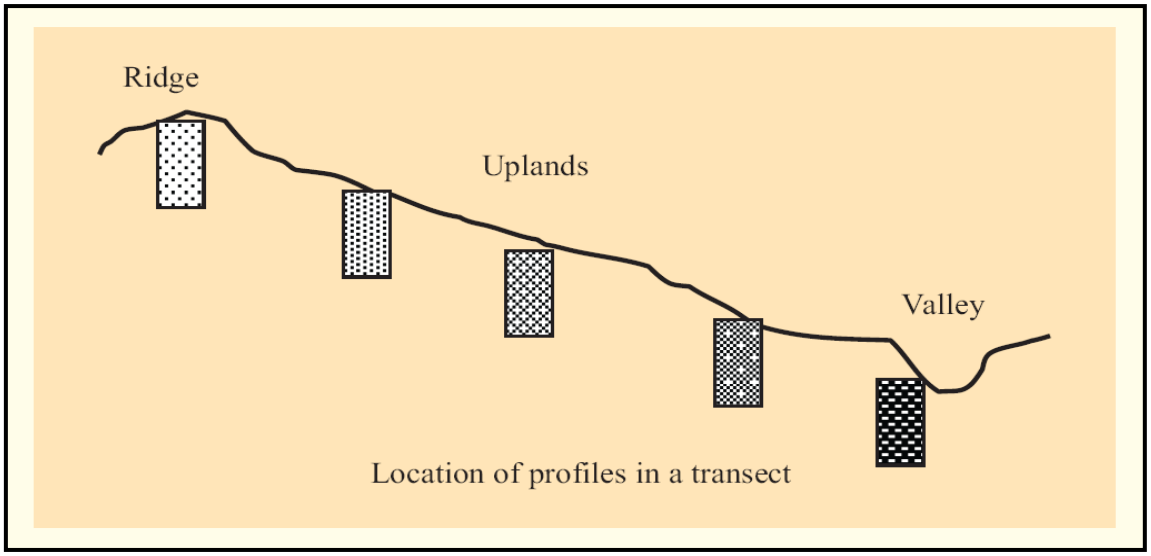


Fig: 3.4. Location of profiles in a transect

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

Based on the soil characteristics, the soils were grouped into different soil series. Soil series is the most homogeneous unit having similar horizons and properties and behaves similarly for a given level of management. Soil depth, texture, colour, kind of horizon and horizon sequence, calcareousness, amount and nature of gravel present, nature of substratum etc, were used as the major differentiating characteristics for identifying soil series occurring in the area. The differentiating characteristics used for identifying the soil series are given in Table 3.1. Based on the above characteristics, 10 soil series were identified in the Talak-2 microwatershed.

Table 3.1 Differentiating Characteristics used for identifying Soil Series

(Characteristics are of Series Control Section)

Soils of Granite gneiss Landscape							
Sl. no	**Soil Series**	**Depth (cm)**	**Colour (moist)**	**Texture**	**Gravel (%)**	**Horizon sequence**	**Calcare-ousness**
1	VNK (Vanakanahalli)	25-50	2.5YR 3/4	sc	-	Ap-Bt-Cr	-
2	BDL (Badiyala)	25-50	7.5YR 2.5/3,2.5/2,3/3 10YR 3/4,4/3	sl	-	Ap-Bw	e
3	SBR	50-75	10YR 7/1	ls	-	Ap-AC	-

	(Sambra)		7.5YR 7/4				
4	GWD (Gowdagera)	75-100	10YR 3/1,3/2,4/2	scl	-	Ap-Bw	es
5	NGP (Nagalapur)	100-150	10YR3/2,3/1,2/1	c	-	Ap-Bss	es
6	ANR (Anur)	100-150	10YR 4/3,4/1	c	-	Ap-Bw	es
7	VKS (Vanakasambar)	100-150	10YR5/3,4/2,2/1,2/2,3/2,4/3	c	-	Ap-Bw	es
8	TMK (Thumakur)	>150	10YR 3/1,3/2,3/3,4/3	c	-	Ap-Bw	e
9	BMN (Bhimanahalli)	>150	10YR 3/1	c	-	Ap-Bss	es
10	MDR (Madhwara)	>150	10YR 3/1,3/2,2/1,2/2	scl	-	Ap-Bw	e

3.4 Soil Mapping

The area under each soil series was further separated into soil phases and their boundaries delineated on the cadastral map based on the variations observed in the texture of the surface soil, slope, erosion, presence of gravel, stoniness etc. A soil phase is a subdivision of soil series based mostly on surface features that affect its use and management. The soil mapping units are shown on the map (Fig.3.5) in the form of symbols. During the survey many 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 of 17 mapping units representing 10 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 17 soil phases mapped in the microwatershed. Each mapping unit (soil phase) delineated on the map has similar soil and site characteristics. In other words, all the farms or survey numbers included in one soil phase will have similar management needs and have to be treated accordingly.

3.5 Land Management Units (LMU's)

The 17 soil phases identified and mapped in the microwatershed were grouped into 5 Land Management Units (LMU's) for the purpose of preparing a Proposed Crop Plan for sustained development of the microwatershed. The database (soil phases) generated under LRI was utilized for identifying Land Management Units (LMU's) based on the management needs. One or more than one soil site characteristic having influence on the management have been chosen for identification and delineation of LMUs. For Talak-2 microwatershed, five soil and site characteristics, namely soil depth, soil texture, slope, erosion and gravel content have been considered for defining LMUs. The Land Management Units are expected to behave similarly for a given level of management.

3.6 Laboratory Characterization

Soil samples for each soil 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 from farmer's fields for fertility status (major and micronutrients) at 320 m grid interval in the year 2018 were analyzed in the laboratory (Katyal and Rattan, 2003). By linking the soil fertility data to the survey numbers through GIS, soil fertility maps were generated by using Kriging method for the microwatershed.

Table 3.2 Soil map unit description of Talak-2 Microwatershed

Soil map unit No.	Soil Series	Soil Phase	Mapping Unit Description	Area in ha(%)
Soils of Granite and Granite Gneiss Landscape				
	VNK	Vanakanahalli soils are shallow (25-50 cm), well drained, have dark reddish brown, sandy clay red soils occurring on very gently to moderately sloping uplands under cultivation		**59(10.28)**
8		VNKbB2g1	Loamy sand surface, slope 1-3%, moderate erosion, gravelly (15-35%)	30 (5.25)
9		VNKcB2	Sandy loam surface, slope 1-3%, moderate erosion	26 (4.52)
109		VNKmB2g1	Clay surface, slope 1-3%, moderate erosion, gravelly (15-35%)	3 (0.51)
	BDL	Badiyala soils are shallow (25-50 cm), well drained, have dark brown to very dark brown and dark yellowish brown, slightly calcareous sandy loam soils occurring on very gently to gently sloping uplands under cultivation		**88(15.41)**
2		BDLbB2	Loamy sand surface, slope 1-3%, moderate erosion	61 (10.65)
4		BDLhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	27 (4.76)
	SBR	Sambara soils are moderately shallow (50-75 cm), somewhat excessively drained, have light gray to pink, loamy sand soils occurring on very gently to gently sloping uplands under cultivation		**6 (1.05)**
125		SBRhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	6 (1.05)
	GWD	Gowdagera soils are moderately deep (75-100 cm), moderately well drained, have dark grayish brown to very dark grayish brown, calcareous sodic sandy clay loam soils occurring on very gently sloping uplands under cultivation		**204(35.71)**
34		GWDcB2	Sandy loam surface, slope 1-3%, moderate erosion	38 (6.65)
35		GWDiB2	Sandy clay surface, slope 1-3%, moderate erosion	89 (15.54)
127		GWDmB2	Clay surface, slope 1-3%, moderate erosion	77 (13.52)
	NGP	Nagalapur soils are deep (100-150 cm), moderately well		**8 (1.38)**

Soil map unit No.	Soil Series	Soil Phase	Mapping Unit Description	Area in ha(%)
		drained, have very dark gray to very dark grayish brown, black calcareous cracking clay soils occurring on very gently sloping uplands under cultivation		
49		NGPmB2	Clay surface, slope 1-3%, moderate erosion	8 (1.38)
	ANR	Anur soils are deep (100-150 cm), moderately well drained, have dark gray to brown, calcareous sodic cracking clay soils occurring on very gently sloping uplands under cultivation		**27 (4.68)**
53		ANRhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	27 (4.68)
	VKS	Vankasambar soils are deep (100-150 cm), well drained, very dark brown to brown, sodic calcareous sandy clay loam soils occurring on very gently to gently sloping lowlands under cultivation		**2 (0.33)**
100		VKSmB1	Clay surface, slope 1-3%,slight erosion	2 (0.33)
	TMK	Thumakur soils are very deep (>150 cm), moderately well drained, have brown to very dark grayish brown, sodic slightly calcareous clay black soils occurring on nearly level to very gently sloping lowlands under cultivation		**91 (16.0)**
104		TMKiB2	Sandy clay surface, slope 1-3%, moderate erosion	91 (16.0)
	BMN	Bhimanahalli soils are very deep (>150 cm), moderately well drained, have very dark gray, calcareous cracking clay black soils occurring on nearly level to very gently sloping uplands under cultivation		**0.0016 (0.0003)**
63		BMNmB2g1	Clay surface, slope 1-3%, moderate erosion, gravelly (15-35%)	0.0016 (0.0003)
	MDR	Madhwara soils are very deep (>150 cm), well drained, have very dark gray to very dark brown, slightly calcareous sandy clay loam soils occurring on nearly level to very gently sloping uplands under cultivation		**46(7.81)**
132		MDRhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	12 (2.17)
133		MDRiB2	Sandy clay surface, slope 1-3%, moderate erosion	17 (2.95)
61		MDRmB2	Clay surface, slope 1-3%, moderate erosion	15 (2.69)
999		Rock outcrops	Rock lands, both massive and bouldery with little or no soil	**21 (3.68)**
1000		Others	Habitation and water body	**21 (3.68)**

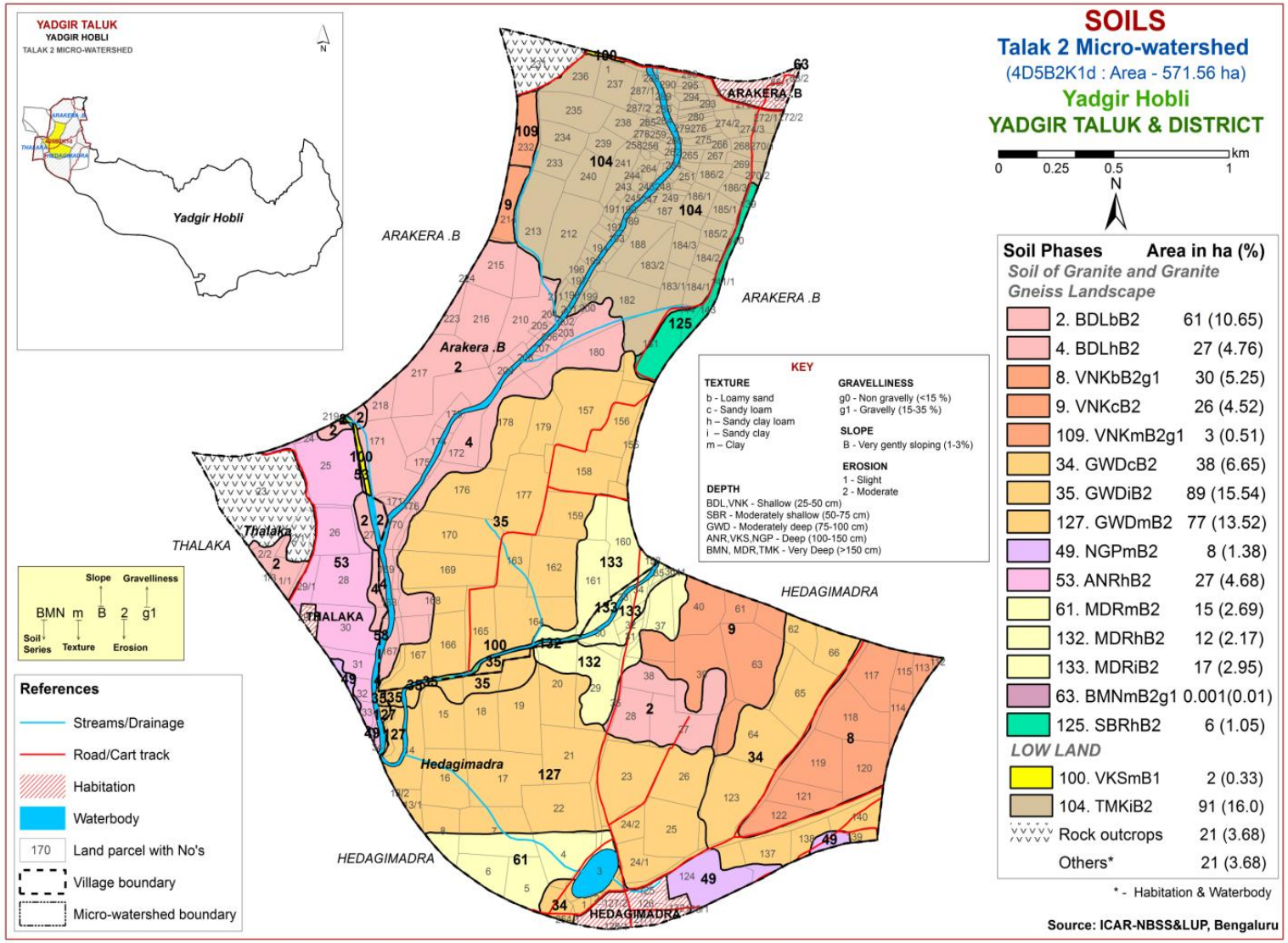


Fig 3.5 Soil Phase or Management Units - Talak-2 Microwatershed

Chapter 4

THE SOILS

Detailed information pertaining to the nature, extent and their distribution of different kinds of soils occurring in Talak-2 microwatershed is provided in this chapter. The microwatershed area has been identified as granite gneiss landscape based on geology. In all, 10 soil series are identified. Soil formation is the result of the combined effect of environmental and terrain factors that are reflected in soil morphology. In the granite gneiss landscape, it is by parent material, relief and climate.

A brief description of each of the 10 soil series identified followed by 17 soil phases (management units) mapped are furnished below. The physical and chemical characteristics of soil series identified in Talak-2 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, 10 soil series are identified and mapped. Of these, GWD series occupies a maximum area of 204 ha (36%) followed by TMK 91 ha (16%), BDL 88 ha (15%), VNK 59 ha (10%), MDR 46 ha (8%), ANR 27 ha (5%), NGP 8 (1%), SBR 6 ha (1%), VKS 2 ha (<1%) and BMN 0.0016 ha (<1). Brief description of each series identified and number of soil phases mapped is given below.

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

The thickness of the solum ranges from 25 to 49 cm. The thickness of A horizon ranges from 7 to 16 cm. Its colour is in 2.5 YR and 5 YR with value 3 and chroma 2 to 4. The texture is sandy loam to sandy clay loam and sandy clay. The thickness of B horizon ranges from 20 to 40 cm. Its colour is in 2.5 YR and 5 YR hue with value 3 to 4 and chroma 3 to 4. Its texture is sandy clay. The available water capacity is very low (<50 mm/m). Three phases were identified and mapped.

Landscape and Soil Profile characteristics of Vanakanahalli (VNK) Series

4.1.2 Badiyala (BDL) Series: Badiyala soils are shallow (25-50 cm), well drained, have very dark brown to dark yellow brown and dark brown, slightly calcareous sandy loam soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands under cultivation. The Badiyala series has been classified as a member of the coarse-loamy, mixed, isohyperthermic family of Fluventic Haplustepts.

The thickness of the solum ranges from 28 to 50 cm. The thickness of A horizon ranges from 4 to 12 cm. Its colour is in 10YR hue with value 3 to 4 and chroma 3 to 4. The texture is loamy sand, sandy clay loam and sandy clay. The thickness of B horizon ranges from 27 to 45 cm. Its colour is in 10 YR and 7.5 YR hue with value 2 to 4 and chroma 3 to 4. Its texture is sandy loam to sandy clay loam and is slightly calcareous. The available water capacity is very low (<50mm/m). Two phases were identified and mapped.

Landscape and Soil Profile characteristics of Badiyala (BDL) Series

4.1.3 Sambara (SBR) Series: Sambara soils are moderately shallow (50-75 cm), somewhat excessively drained, have light grey to reddish yellow, loamy sand soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands under cultivation. The Sambara series has been classified as a member of the mixed, isohyperthermic family of Typic Ustipsamments.

The thickness of the soil ranges from 52-75 cm. Thickness of A horizon ranges from 8 to 23 cm. Its colour is in hue 10 YR and 7.5 YR with value 3 and chroma 1 to 4. The texture varies from loamy sand to sandy loam. The thickness of subsurface horizons ranges from 41 to 66 cm. Its colour is in 10 YR and 7.5 YR hue with value 3 to 5 and chroma 1 to 4. The texture is loamy sand. The available water capacity is very low (<50 mm/m). Only one phase was identified and mapped.

Landscape and Soil Profile characteristics of Sambara (SBR) Series

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

The thickness of the solum ranges from 76 to 100 cm. The thickness of A horizon ranges from 8 to 16 cm. Its colour is in hue 10 YR with value 3 to 4 and chroma 2 to 4. Its texture varies from sandy loam to sandy clay loam. The thickness of B horizon ranges from 61 to 91 cm. Its colour is in hue 10 YR with value 2 to 4 and chroma 1 to 4. Its texture is sandy clay loam to sandy clay and is calcareous sodic soils. The available water capacity is medium (101-150 mm/m). Three phases were identified and mapped.

Landscape and Soil Profile characteristics of Gowdagera (GWD) Series

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

The thickness of the solum ranges from 110 to 150 cm. The thickness of A horizon ranges from 6 to 25 cm. Its colour is in 10 YR hue with value 3 to 5 and chroma 1 to 3. The texture varies from sandy loam to sandy clay and clay. The thickness of B horizon ranges from 110 to 141 cm. Its colour is in 10 YR hue with value 2 to 3 and chroma 1 to 2. Texture is clay and is calcareous. The available water capacity is very high (>200 mm/m). Only one phase was identified and mapped.

Landscape and Soil Profile characteristics of Naglapur (NGP) Series

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

The thickness of the solum ranges from 102 to 148 cm. The thickness of A-horizon ranges from 9 to 17 cm. Its colour is in 10 YR hue with value 3 to 4 and chroma 2 to 4. The texture ranges from loamy sand to sandy clay loam and sandy clay and are calcareous. The thickness of B horizon ranges from 102 to 135 cm. Its colour is in 10 YR hue with value 3 to 5 and chroma 1 to 6. Texture is sandy clay loam to sandy clay and clay and is calcareous sodic soils. The available water capacity is very high (>200 mm/m). Only one phase was identified and mapped.

Landscape and Soil Profile characteristics of Anur (ANR) Series

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

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

Landscape and Soil Profile characteristics of Vankasambaar (VKS) Series

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

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


Landscape and Soil Profile characteristics of Thumakur (TMK) Series

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

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

Landscape and Soil Profile characteristics of Bhimanahalli (BMN) Series

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

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

Landscape and Soil Profile characteristics of Madhwara (MDR) Series

Table: 4.1 Physical and Chemical Characteristics of Soil Series identified in Talak-2 microwatershed

Soil Series: Vanakanahalli (VNK) **Pedon:** R-15

Location: $16^0$43'49.5"N $77^0$17'17.9"E, Yaleri village, Balichakra hobli, Yadgiri taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Clayey, mixed isohyperthermic (Paralithic) Haplustalfs

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-18	Ap	82.61	8.09	9.30	6.77	8.59	21.13	34.58	11.53	-	ls	8.85	3.53
18-50	Bt	54.51	8.73	36.77	4.93	6.18	14.15	20.75	8.49	-	sc	18.88	11.63

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-18	5.37	-	-	0.11	0.60	0.00	2.96	1.45	0.13	0.14	4.68	6.27	0.67	75	2.22
18-50	4.71	-	-	0.05	0.81	0.00	5.56	2.24	0.10	0.05	7.95	13.31	0.36	60	0.38

Contd…

Soil Series: Badiyala **(**BDL) **Pedon:** R-5

Location: $16^0$37'10.0"N $77^0$20'21.5", Gudalagunta village, Balichakra hobli, Yadgir taluk and district

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

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-12	Ap	87.13	7.04	5.83	10.03	24.32	23.61	23.51	5.67	<15	ls	6.27	2.44
12-28	Bw1	64.63	13.30	22.07	6.74	13.07	22.30	17.01	5.50	<15	scl	16.34	7.83
28-50	BC	73.11	12.02	14.87	3.93	16.03	26.89	18.41	7.86	<15	sl	12.94	5.47

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-12	6.20	-	-	0.074	1.00	0.00	2.80	0.98	0.14	0.01	3.92	4.20	0.72	93	0.20
12-28	9.04	-	-	0.253	0.80	3.20	-	-	0.16	0.69	-	16.90	0.77	100	4.09
28-50	9.41	-	-	0.364	1.10	3.60	-	-	0.16	1.39	-	11.10	0.75	100	12.52

Contd…

Soil Series: Sambara (SBR) **Pedon:** R-10

Location: $16^0$42'04.5"N $77^0$14'35.3"E, Jinatera village, Balichakra hobli, Yadgir taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Mixed, isohyperthermic Typic Ustipsamments

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-9	Ap	81.90	8.22	9.88	23.76	14.05	23.76	10.62	9.71	-	ls	9.45	2.69
9-17	C1	84.08	6.59	9.33	21.30	20.69	17.65	17.65	6.80	-	ls	7.84	2.65
17-60	C2	86.86	6.17	6.98	11.53	21.54	25.08	23.46	5.26	-	ls	5.48	2.62
60-78	C3	87.27	6.92	5.81	15.05	20.91	26.36	19.29	5.66	-	ls	5.19	2.81

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-9	8.24	-	-	0.145	0.61	0.91	-	-	0.12	0.09	-	7.50	0.76	100	1.15
9-17	8.21	-	-	0.068	0.57	0.39	-	-	0.06	0.12	-	6.70	0.72	100	1.82
17-60	8.47	-	-	0.080	0.38	0.48	-	-	0.03	0.17	-	2.70	0.39	100	6.34
60-78	8.50	-	-	0.081	0.30	0.52	-	-	0.03	0.17	-	2.70	0.46	100	6.43

Contd…

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

Location: $16^0$38'24.4"N $77^0$21'24.0"E, Madhawara village, Balichakara hobli, Yadgir taluk and district

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

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-18	Ap	79.61	13.94	6.45	14.17	17.53	23.65	17.02	7.24	-	ls	11.36	3.86
18-42	BW1	69.09	10.58	21.06	10.54	16.58	22.01	14.43	5.53	-	scl	31.62	12.30
42-81	Bw2	51.37	13.51	35.60	7.59	10.55	16.24	11.60	5.38	-	sc	67.57	26.89

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-18	9.89	-	-	0.74	0.66	1.20	-	-	0.18	3.63	-	8.35	1.29	100	17.40
18-42	10.82	-	-	1.60	0.27	5.76	-	-	0.19	19.23	-	15.84	0.75	100	40.17
42-81	10.83	-	-	2.30	0.27	7.80	-	-	0.40	26.71	-	26.54	0.75	100	40.27

Contd…

Soil Series: Naglapur (NGP) **Pedon:** R-8

Location: $16^0$52'84.1"N $77^0$22'99.4"E, Gurumitkal village, Gurumitkal hobli, Yadgir taluk and district

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

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-10	Ap	7.53	19.88	72.59	1.00	0.78	0.89	2.10	2.77	-	c	44.31	32.79
10-35	Bss1	6.55	18.76	74.68	0.80	0.92	0.80	1.72	2.30	-	c	43.09	31.62
35-60	Bss2	6.58	21.05	72.37	0.69	0.46	1.04	1.50	2.89	-	c	46.52	32.52
60-102	Bss3	7.48	19.74	72.78	1.61	1.38	0.69	1.61	2.19	-	c	51.12	35.62

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	7.42	-	-	0.24	0.84	1.30	-	-	0.84	0.15	-	67.10	0.92	100	0.22
10-35	8.52	-	-	0.291	0.64	2.86	-	-	0.17	0.29	-	65.20	0.87	100	0.45
35-60	7.89	-	-	0.134	0.62	4.55	-	-	0.15	0.20	-	65.00	0.90	100	0.30
60-102	8.68	-	-	0.213	0.54	8.32	-	-	0.17	0.15	-	64.10	0.88	100	0.24

Contd…

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

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

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

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-18	Ap	64.60	13.44	21.96	7.33	10.42	18.68	20.12	8.05	<15	scl	16.59	7.96
18-49	Bw1	56.66	12.19	31.15	4.73	9.80	18.66	17.02	6.45	-	scl	33.38	13.51
49-95	Bw2	39.94	17.81	42.25	3.09	3.30	15.44	10.65	7.45	<15	c	44.68	25.23
95-123	Bw3	30.65	17.58	51.77	1.50	5.57	10.18	9.65	3.75	<15	c	54.94	32.07

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-18	10.17	-	-	0.365	0.48	6.11	-	-	0.25	3.52	-	19.90	0.91	100	7.08
18-49	10.32	-	-	1.38	0.30	6.76	-	-	0.21	16.03	-	24.60	0.79	100	26.07
49-95	10.08	-	-	2.55	0.17	6.11	-	-	0.33	21.49	-	32.60	0.77	100	26.36
95-123	9.92	-	-	2.56	0.12	7.93	-	-	0.51	26.03	-	36.00	0.70	100	28.92

Contd…

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

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

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

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-14	Ap	61.32	10.31	28.37	7.14	12.07	16.04	19.03	7.05	-	scl	20.65	11.25
14-37	Bw1	62.63	8.72	28.65	9.88	14.50	16.19	15.57	6.49	-	scl	24.37	11.33
37-80	Bw2	61.43	9.14	29.43	4.84	15.45	18.01	16.73	6.40	-	scl	41.96	13.39
80-108	Bw3	55.39	11.75	32.86	4.06	5.99	23.87	15.39	6.08	-	scl	45.20	15.45

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-14	9.1	-	-	0.586	0.96	5.72	-	-	0.54	1.74	-	17.57	0.62	100	3.97
14-37	10.35	-	-	0.595	0.52	7.80	-	-	0.50	4.24	-	16.65	0.58	100	10.19
37-80	10.39	-	-	2.14	0.28	12.35	-	-	0.64	15.89	-	13.45	0.46	100	47.24
80-108	11.15	-	-	3	0.32	11.70	-	-	0.74	20.69	-	22.58	0.69	100	36.656

Contd…

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

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

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

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

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

Contd…

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

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

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

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

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

Contd…

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

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

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

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-11	Ap	58.94	20.74	20.32	5.41	7.28	13.31	20.89	12.06	-	scl	16.47	8.85
11-30	Bw1	55.52	19.32	25.16	5.00	7.19	13.12	19.69	10.52	-	scl	18.25	10.18
30-58	Bw2	53.95	19.15	26.90	4.68	7.48	12.58	19.65	9.56	-	scl	26.99	14.02
58-117	Bw3	52.68	19.51	27.81	2.84	5.47	14.72	20.82	8.83	-	scl	37.86	17.40
117-160	Bw4	49.95	17.27	32.79	2.11	5.07	14.15	20.49	8.13	-	scl	44.15	20.38

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-11	8.31	-	-	0.33	0.46	2.76	-	-	0.45	0.47	-	20.57	1.01	100	0.90
11-30	9.25	-	-	0.20	0.31	4.20	-	-	0.19	1.40	-	23.98	0.95	100	2.34
30-58	9.78	-	-	0.40	0.19	5.76	-	-	0.16	1.53	-	24.53	0.91	100	2.49
58-117	9.94	-	-	0.88	0.23	4.80	-	-	0.18	9.09	-	24.31	0.87	100	14.96
117-160	9.98	-	-	0.93	0.15	3.00	-	-	0.24	11.09	-	28.27	0.86	100	15.69

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 interpretative and thematic maps generated are described below.

5.1 Land Capability Classification

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

Soil Characteristics: Depth, texture, gravelliness, calcareousness.

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

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

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

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

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

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

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

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

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

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

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

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

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

The 17 soil map units identified in Talak-2 microwatershed are grouped under 3 land capability classes and 4 land capability subclasses. An area of about 530 ha (93%) in the microwatershed is suitable for agriculture. About 21 ha (4%) area is covered by others and 21 ha (4%) is covered by rock outcrops (Fig. 5.1).

Good lands (Class II) cover an area of about 9 per cent and are distributed in the southern, southwestern, western and central part of the microwatershed with minor problems of soil and erosion. Moderately good lands (Class III) cover an area of about 26 per cent and are distributed in the southwestern, western, northern and central part of the microwatershed with moderate problems of soil and erosion. Fairly good (Class IV) lands occur in an area of about 58 per cent of the microwatershed and are distributed in the major part of the microwatershed with very severe problems of soil and erosion.

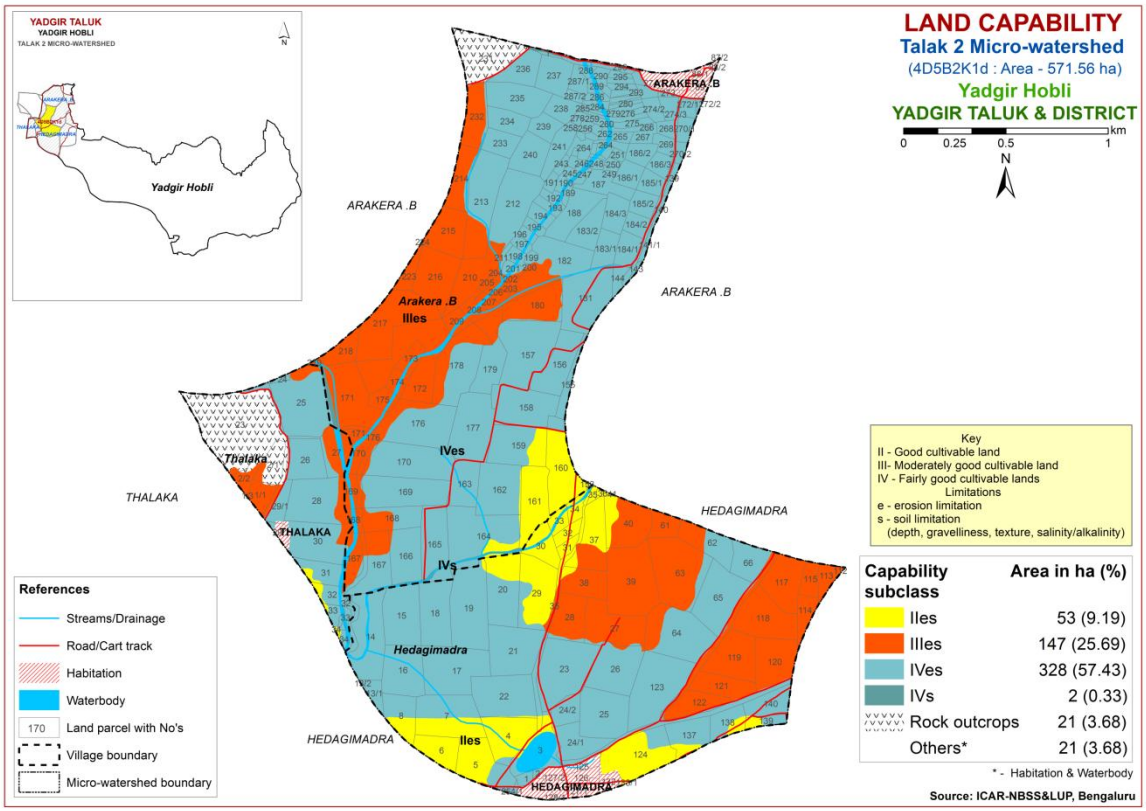


Fig. 5.1 Land Capability map of Talak-2 Microwatershed

5.2 Soil Depth

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

Shallow (25-50 cm) soils occur in an area of 147 ha (26%) and are distributed in the central, western, southwestern and northern part of the microwatershed. Moderately shallow (50-75 cm) soils occur in an area of 6 ha (1%) and are distributed in the northern part of the microwatershed. Moderately deep (75-100 cm) soils occur in an area of 204 ha (36%) and are distributed in the southern, central and southwestern part of the microwatershed. Deep (100-150 cm) soils cover an area of 37 ha (6%) and are distributed in the western and southwestern part of the microwatershed. Very deep (>150 cm) soils cover an area of 136 ha (24%) and are distributed in the northern, southern and central part of the microwatershed.

The most productive lands covering 173 ha (30%) with respect to soil rooting depth where all climatically adapted annual and perennial crops can be grown are deep to very deep (100- >150 cm depth) soils. The problem soils occupy an area of 147 ha (26%) where only short duration crops can be grown occasionally and the probability of crop failure is very high.

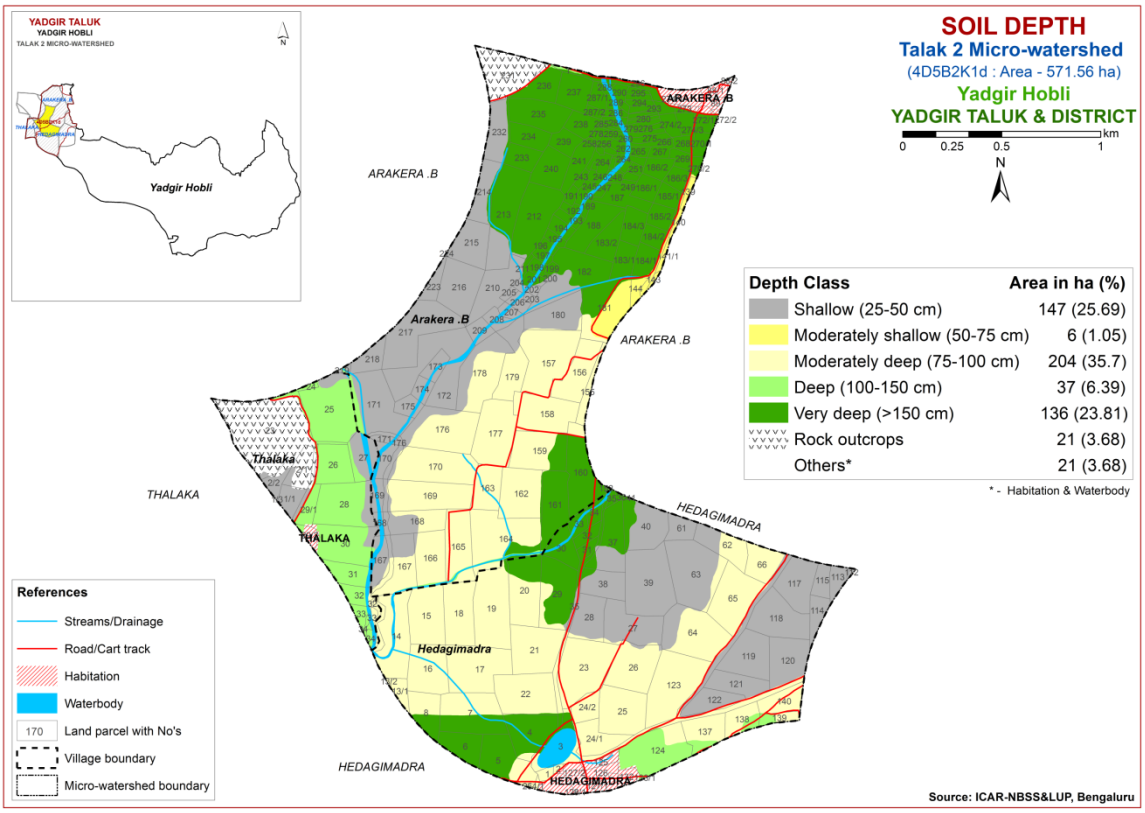


Fig. 5.2 Soil Depth map of Talak-2 Microwatershed

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 was generated. The area extent and their geographical distribution in the microwatershed is shown in Figure 5.3.

An area of 91 ha (16%) of the microwatershed has sandy soils at the surface and are distributed in the southwestern, northern and western part. An area of 136 ha (24%) of the microwatershed has loamy soils at the surface and are distributed in the southwestern, central, western and northern part. An area of about 302 ha (53%) of the microwatershed has soils that are clayey and are distributed in the major part. Both loamy and clay soils

have high potential for soil-water retention and availability, and nutrient retention and availability, but clayey soils have more problems of drainage, infiltration, workability and other physical problems. Problem soils have limitations of moisture and nutrient availability but are suited for root or tuber crops.

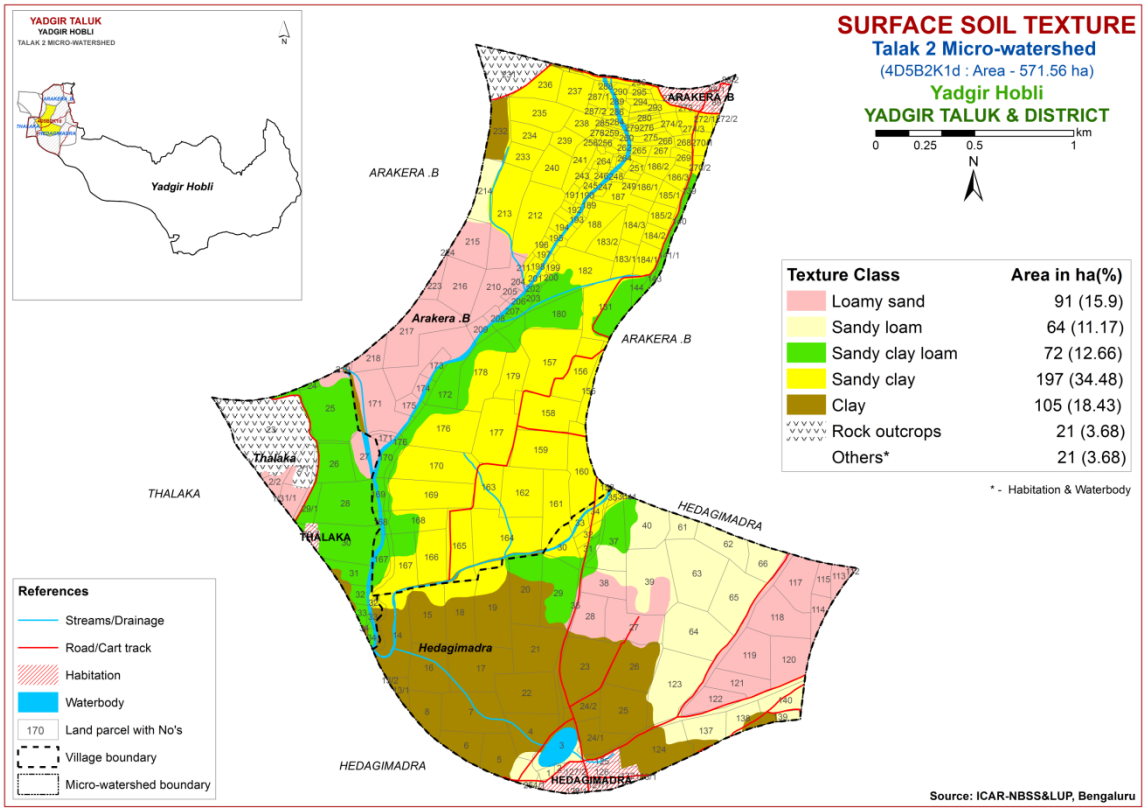


Fig. 5.3 Surface Soil Texture map of Talak-2 Microwatershed

5.4 Soil Gravelliness

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

Non gravelly (<15%) soils cover an area of 497 ha (87%) and are distributed in the major part of the microwatershed. These are the most productive soils, where all climatically adapted short and long duration crops can be grown. Gravelly (15-35%) soils occur in an area of 33 ha (6%) and distributed in the northern and southeastern part of the microwatershed. These lands are low in moisture holding capacity and hence growing of short duration crops is ideal with best management practice.

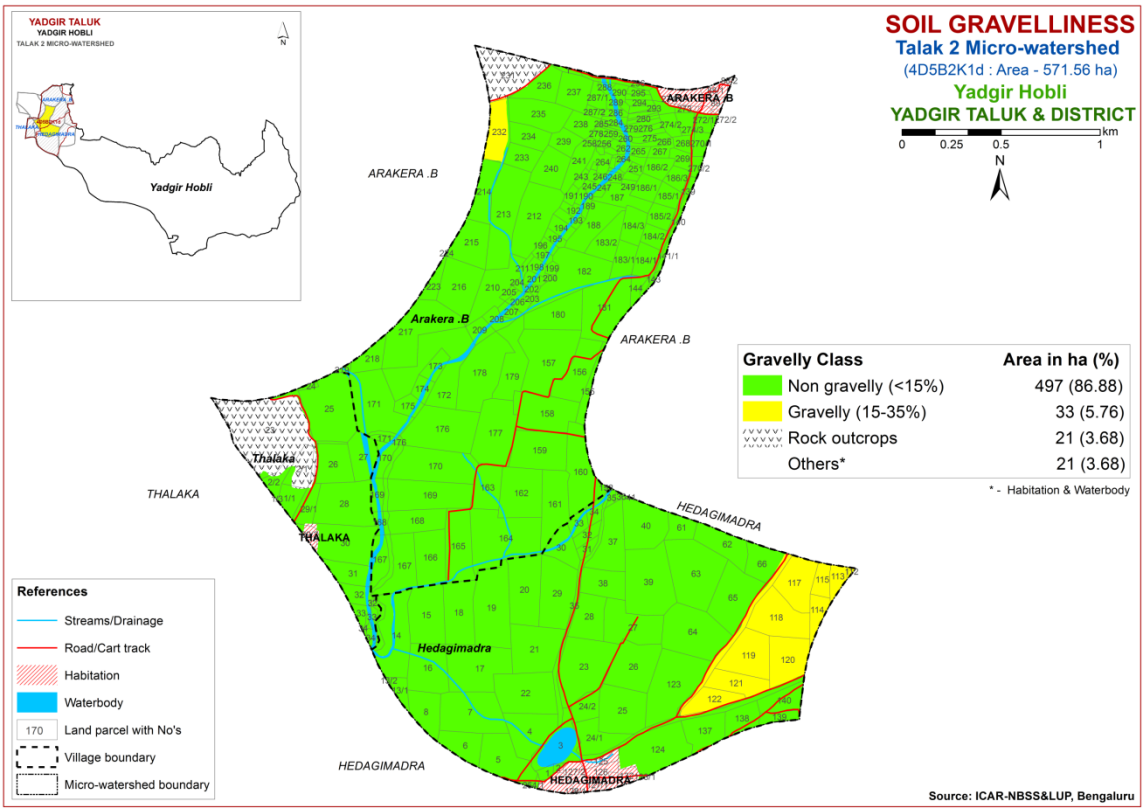


Fig. 5.4 Soil Gravelliness map of Talak-2 Microwatershed

5.5 Available Water Capacity

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

An area of about 153 ha (27%) in the microwatershed has soils that are very low (<50 mm/m) in available water capacity and is distributed in the western, central and southeastern part of the microwatershed. An area of about 204 ha (36%) is medium (101-150 mm/m) in available water capacity and are distributed in the central and southern part of the microwatershed. Very high (>200 mm/m) in 173 ha (30%) and are distributed in the central, western, southern, southeastern and northern part of the microwatershed.

An area of about 153 ha (27%) in the microwatershed has soils that are problematic with regard to available water capacity. Here, only short duration crops can be grown and probability of the crop failure is very high. These areas are best put to other alternative uses. An area of 173 ha (30%) are potential areas with regard to AWC where all climatically adapted annual and perennial crops can be grown.

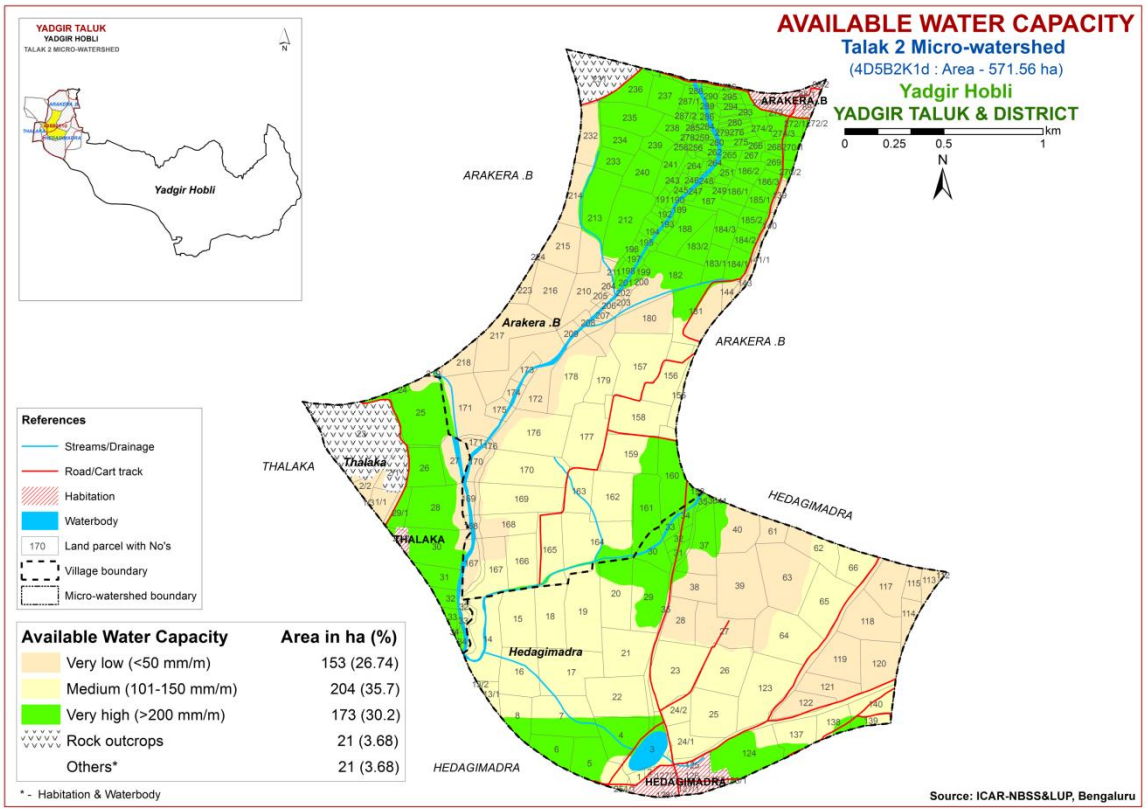


Fig. 5.5 Soil Available Water Capacity map of Talak-2 Microwatershed

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

Entire area in the microwatershed is under very gently sloping (1-3% slope) lands. In these areas, all climatically adapted annual and perennial crops can be grown without much soil and water conservation and other land development measures.

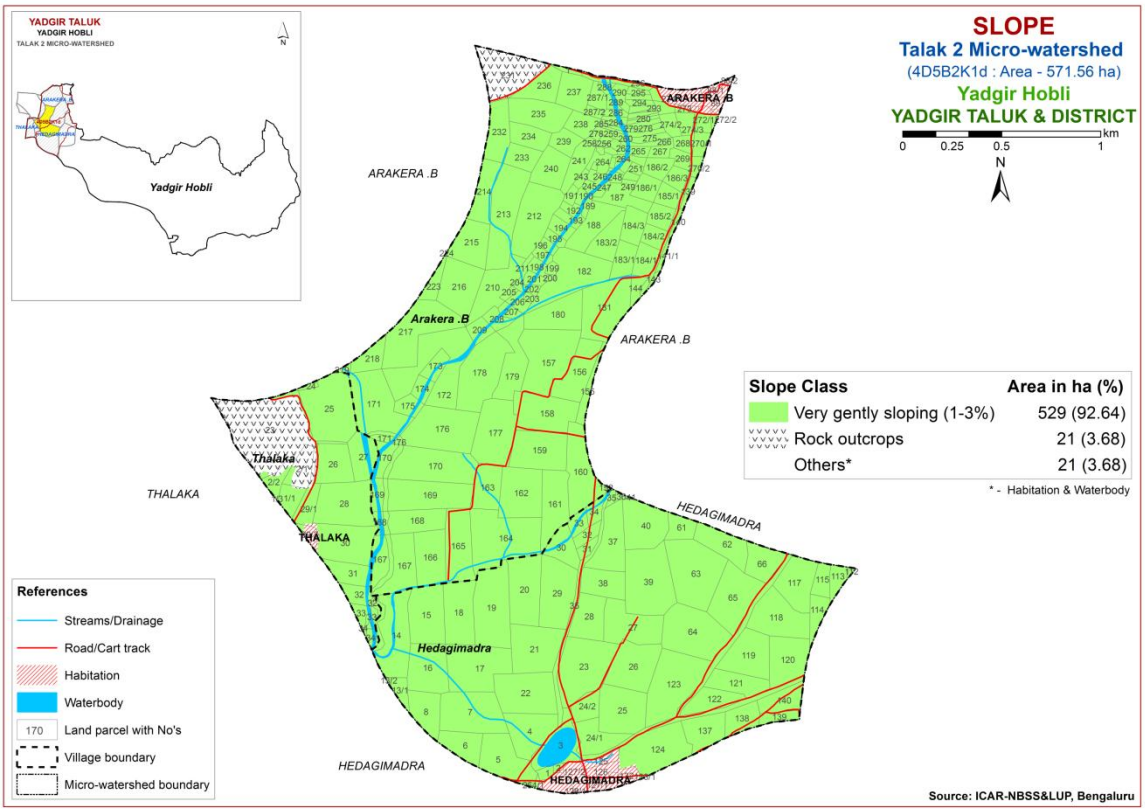


Fig. 5.6 Soil Slope map of Talak-2 Microwatershed

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.

Moderately eroded (e2 class) soils cover a maximum area of 528 ha (92%) and are distributed in the major part of the microwatershed. Slightly eroded (e1) soils cover an area of 2 ha (<1%) and are distributed in the western part of the microwatershed.

An area of about 528 ha (92%) of the microwatershed is problematic because of moderate erosion. For these areas, taking up of soil and water conservation and other land development measures are needed.

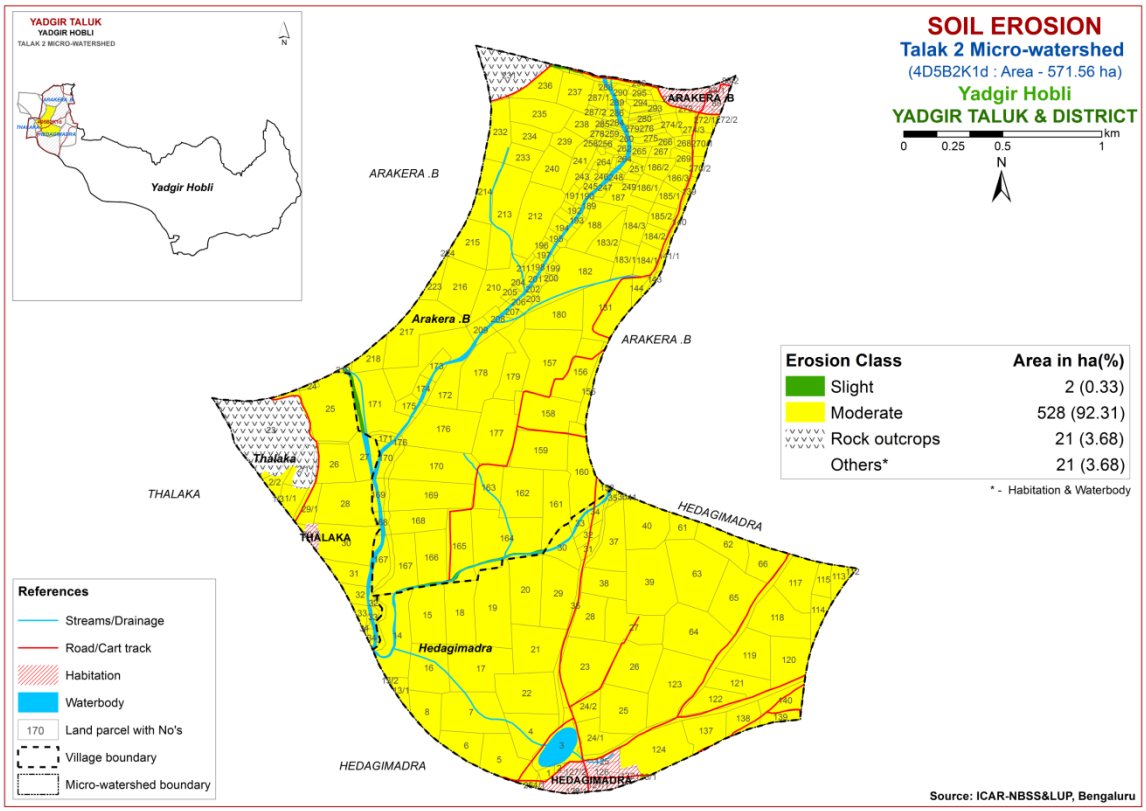


Fig. 5.7 Soil Erosion map of Talak-2 Microwatershed

Chapter 6

FERTILITY STATUS

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

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

6.1 Soil Reaction (pH)

The soil analysis of the Talak-2 microwatershed for soil reaction (pH) showed that entire microwatershed area is neutral (pH 6.5-7.3) and are distributed in all parts of the microwatershed (Fig. 6.1). Thus, all the soils are neutral in reaction.

6.2 Electrical Conductivity (EC)

The Electrical Conductivity in the entire area of the microwatershed is <2 dS/m (Fig. 6.2) and as such the soils are non saline.

6.3 Organic Carbon

The soil organic carbon content (an index of available Nitrogen) is high (>0.75%) in an area of about 51 ha (9%) and are distributed in the western and southern part. Medium (0.5-0.75%) in an area of 335 ha (59%) and are distributed in the major part of the microwatershed and low (<0.5%) in an area of 143 ha (25%) and is distributed in the southeastern, southern and central part of the microwatershed (Fig. 6.3).

6.4 Available Phosphorus

Available phosphorus content is medium (23-57 kg/ha) in an area of 472 ha (83%) and distributed in the major part of the microwatershed. High (>57 kg/ha) in an area of 10 ha (2%) and are distributed in the southeastern part and low (<23 kg/ha) in an area of 47 ha (8%) and are distributed in the central and northern part of the microwatershed (Fig. 6.4).

6.5 Available Potassium

Available potassium content is medium (145-337 kg/ha) in an area of 472 ha (83%) and are distributed in the major part of the microwatershed and high (>337 kg/ha) in an area of 58 ha (10%) and are distributed in the western and southern part of the microwatershed (Fig. 6.5)

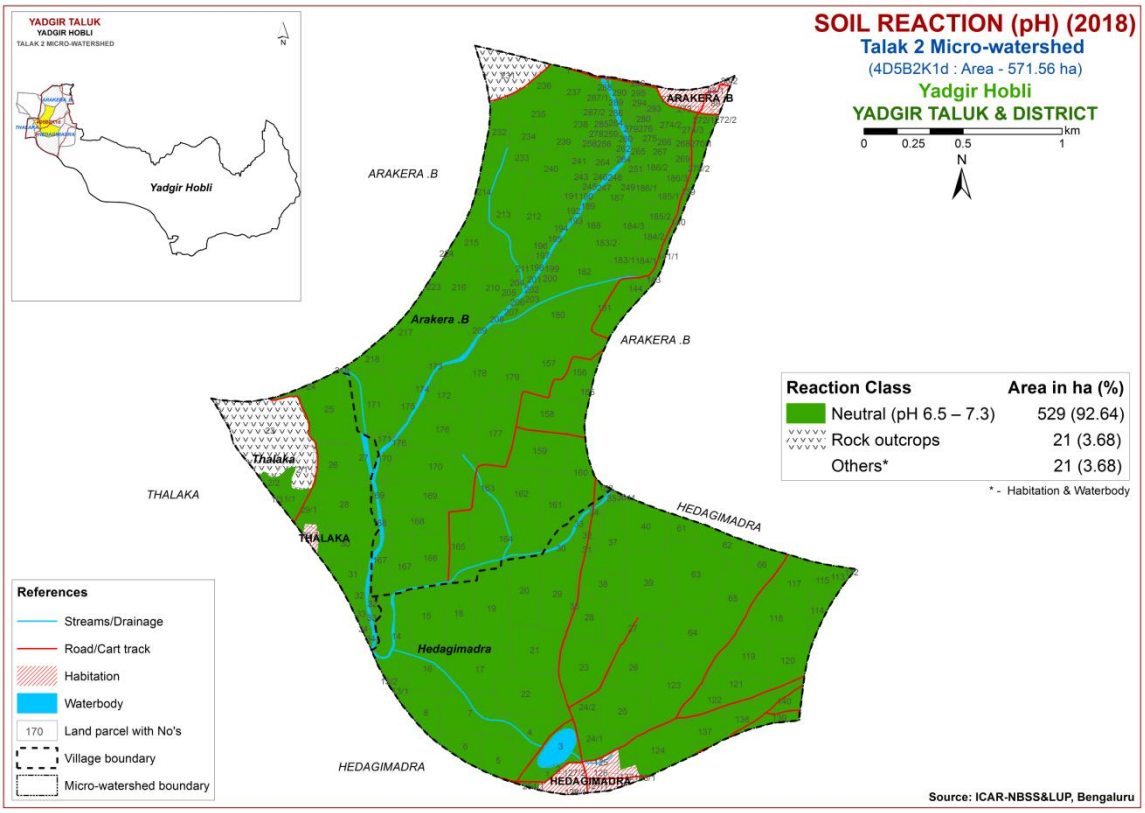


Fig.6.1 Soil Reaction (pH) map of Talak-2 Microwatershed

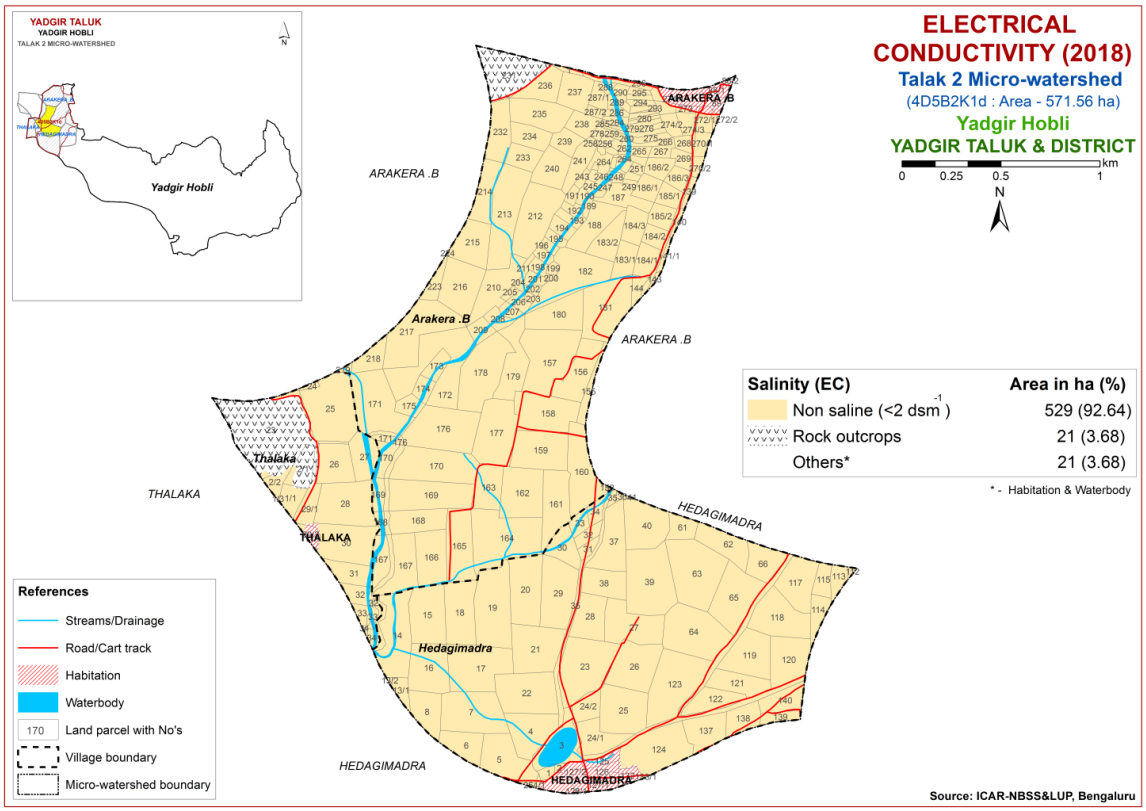


Fig.6.2 Electrical Conductivity (EC) map of Talak-2 Microwatershed

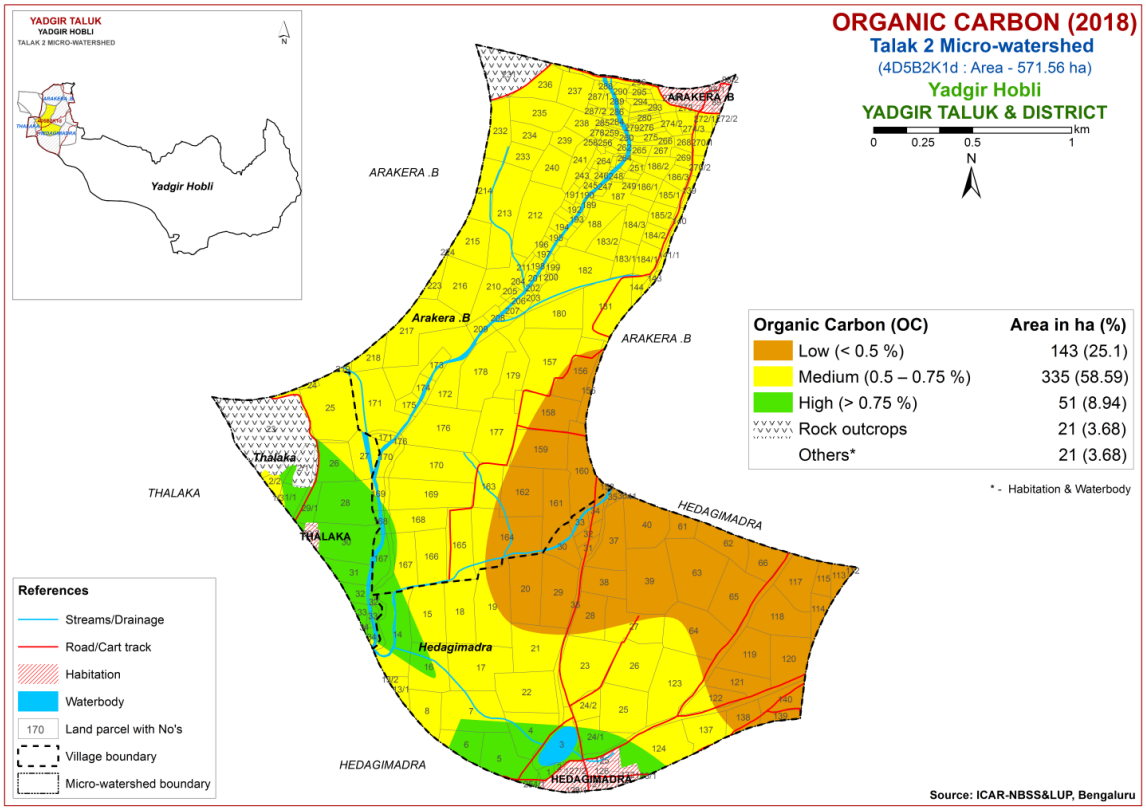


Fig.6.3 Soil Organic Carbon map of Talak-2 Microwatershed

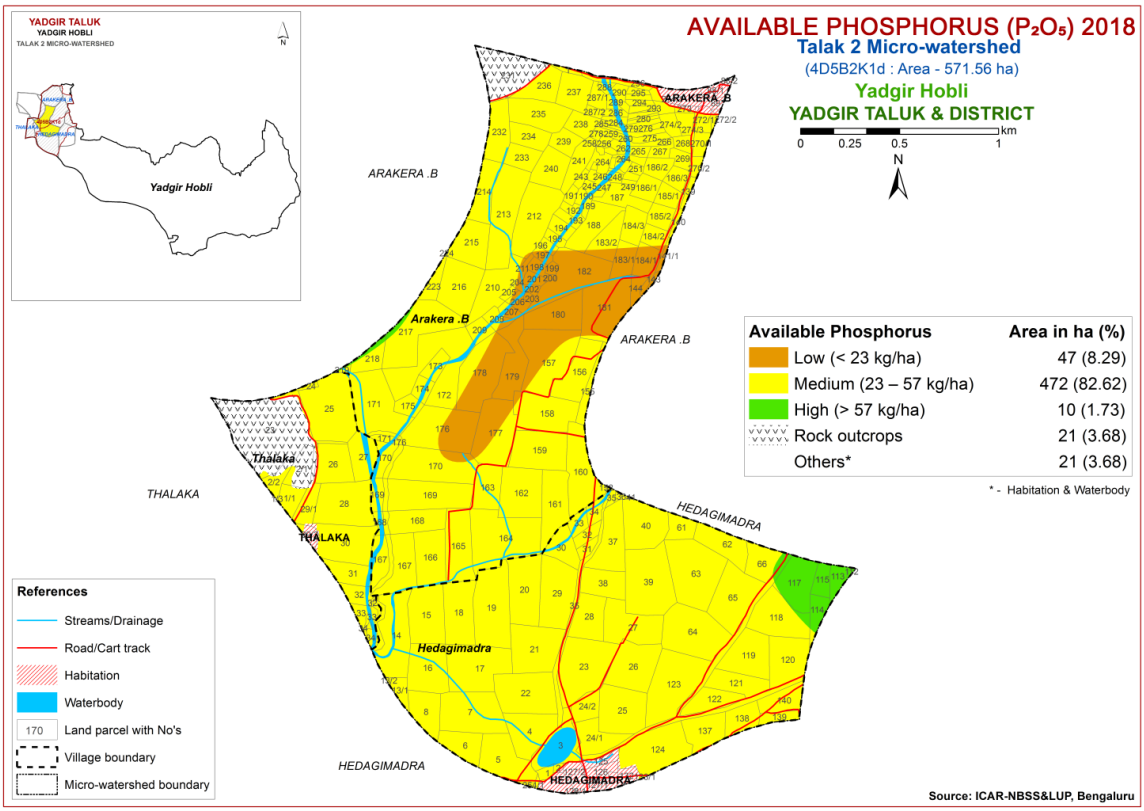


Fig.6.4 Soil Available Phosphorus map of Talak-2 Microwatershed

6.6 Available Sulphur

An area of about 235 ha (41%) is low (<10 ppm) in available sulphur content and are distributed in the southern, northern, southeastern and western part of the microwatershed. Medium (10-20 ppm) in an area of about 283 ha (50%) and is distributed in the major part of the microwatershed and high (>20 ppm) in an area of 12 ha (2%) and are distributed in the central part of the microwatershed (Fig. 6.6).

6.7 Available Boron

Available boron content is low (<0.5 ppm) in an area of 167 ha (29%) and are distributed in the central, northern, southern and southeastern part of the microwatershed and medium (0.5-1.0 ppm) in an area of 362 ha (63%) and are distributed in the major part of the microwatershed (Fig. 6.7).

6.8 Available Iron

Available iron content is sufficient (>4.5 ppm) in an area of 520 ha (91%) and are distributed in the major part and deficient (<4.5 ppm) in an area of 9 ha (2%) and are distributed in the western part of the microwatershed (Fig 6.8).

6.9 Available Manganese

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

6.10 Available Copper

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

6.11 Available Zinc

Available zinc content is deficient (<0.6 ppm) in a maximum area of 368 ha (64%) and are distributed in the major part and sufficient (>0.6 ppm) in an area of 162 ha (28%) and are distributed in the southern and southeastern part of the microwatershed (Fig 6.11).

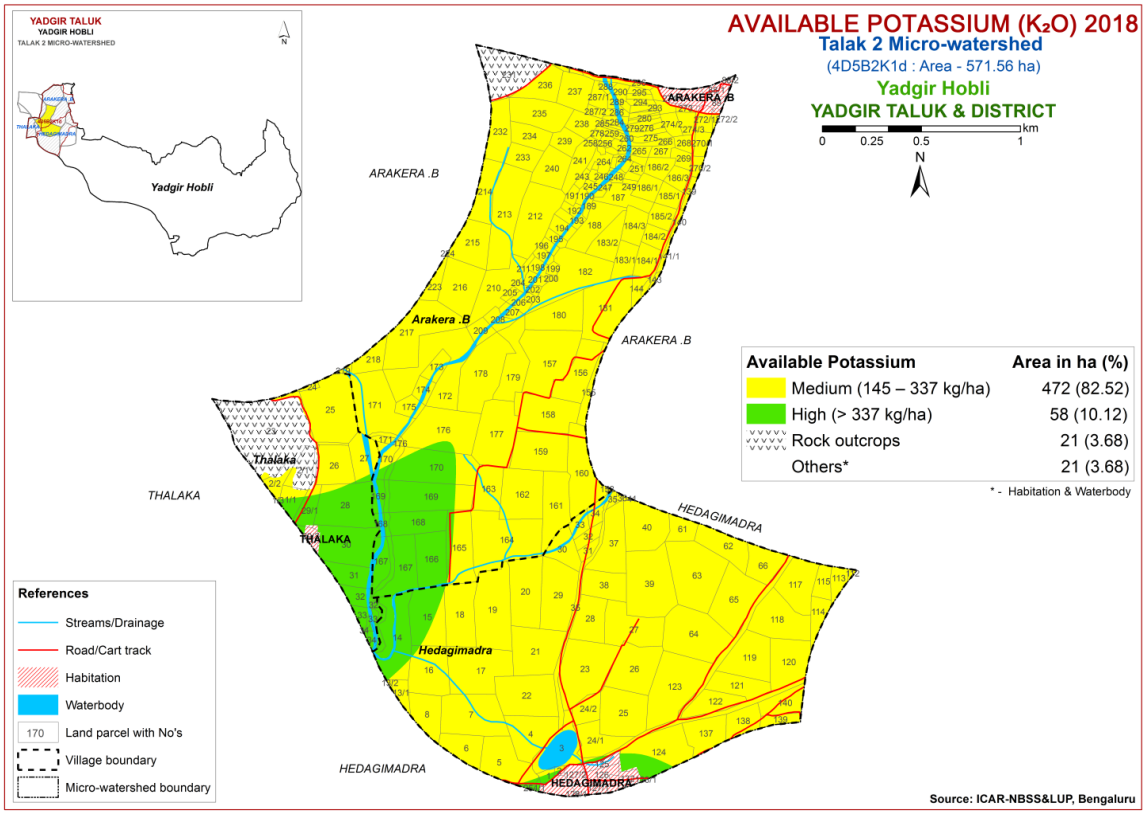


Fig.6.5 Soil Available Potassium map of Talak-2 Microwatershed

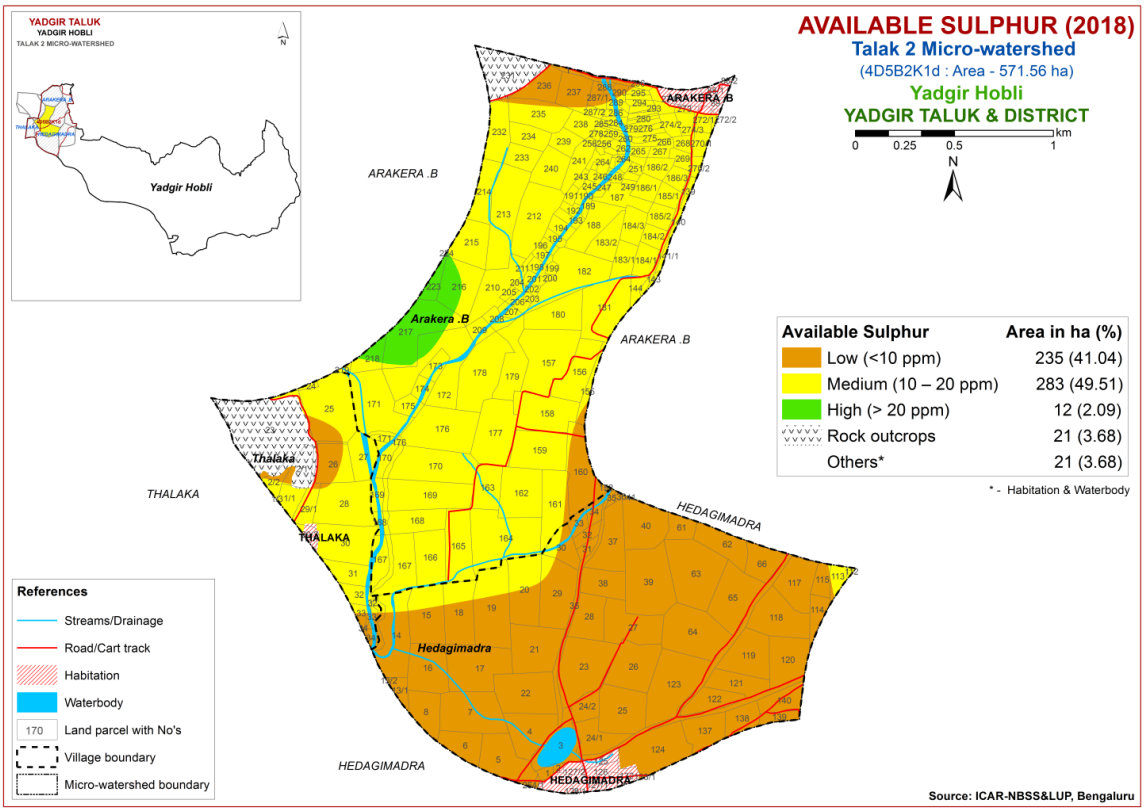


Fig.6.6 Soil Available Sulphur map of Talak-2 Microwatershed

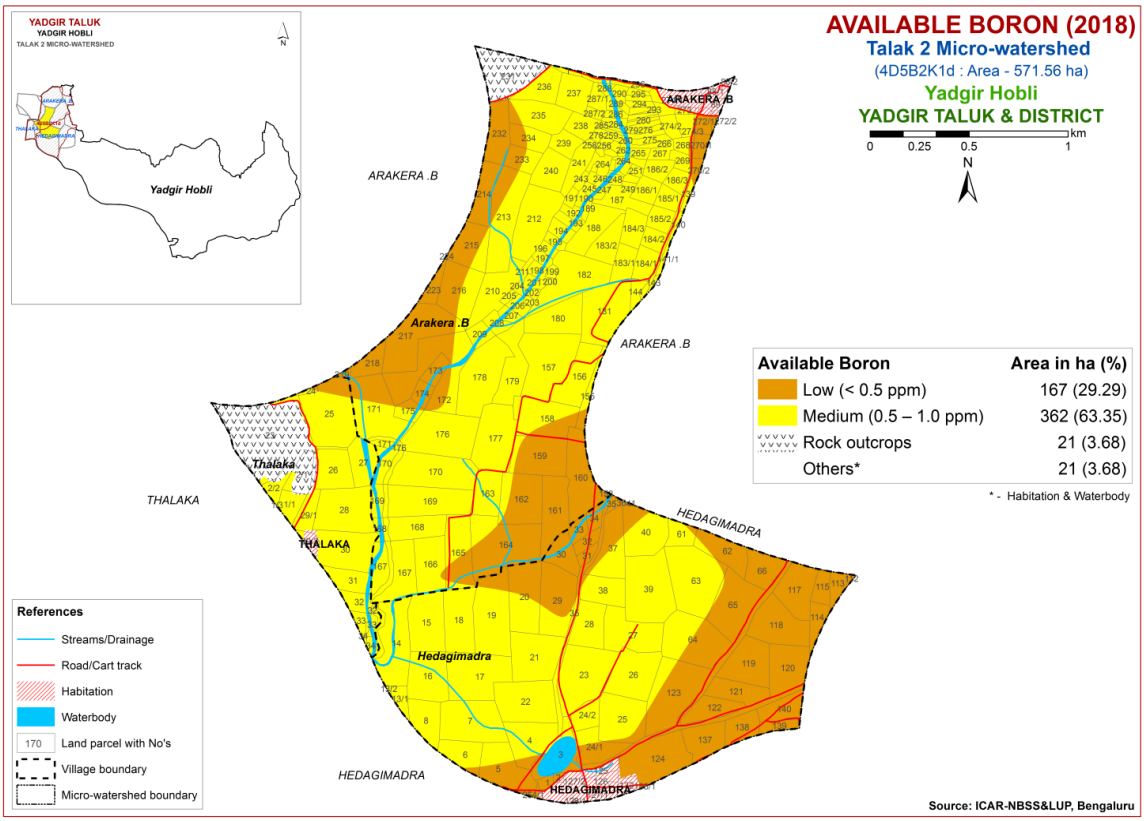


Fig.6.7 Soil Available Boron map of Talak-2 Microwatershed

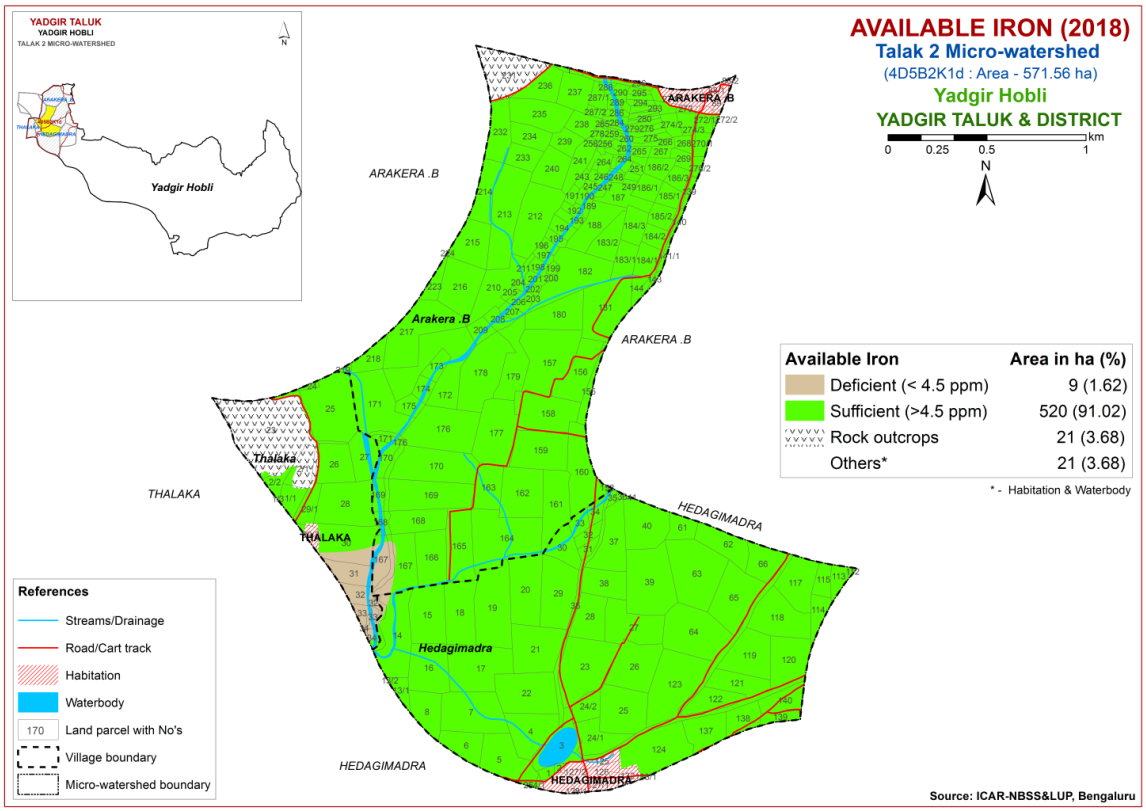


Fig.6.8 Soil Available Iron map of Talak-2 Microwatershed

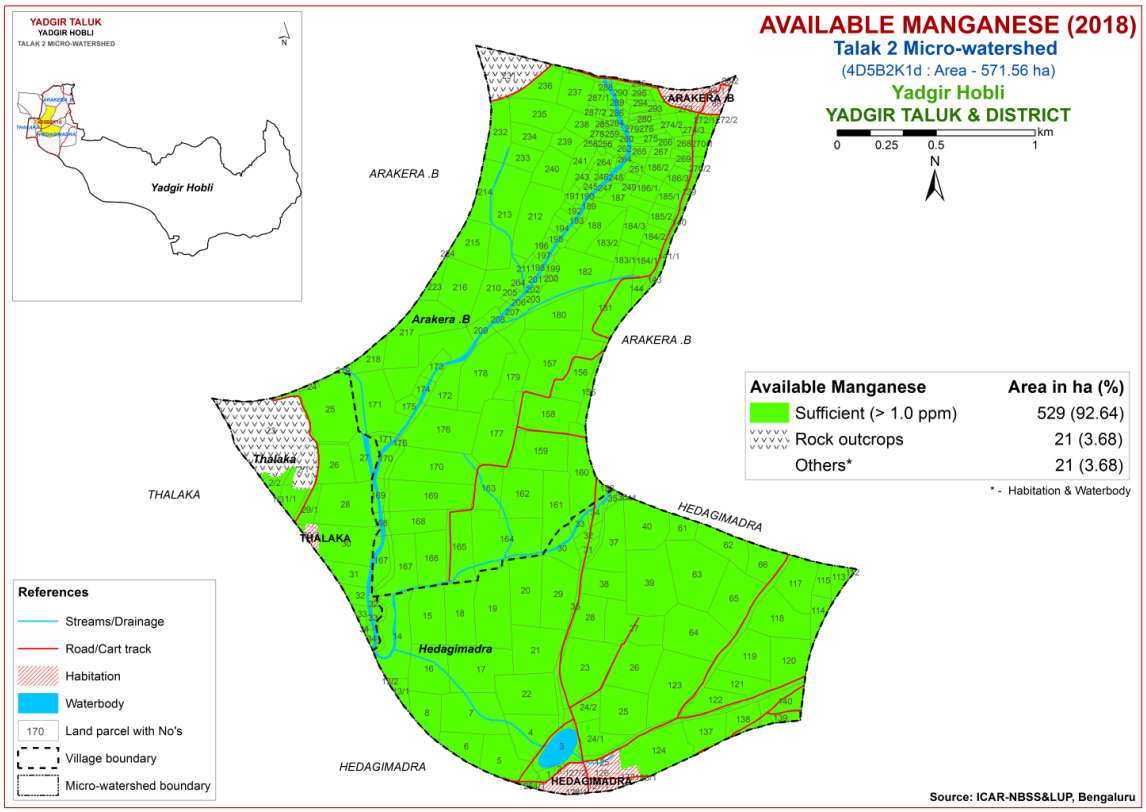


Fig.6.9 Soil Available Manganese map of Talak-2 Microwatershed

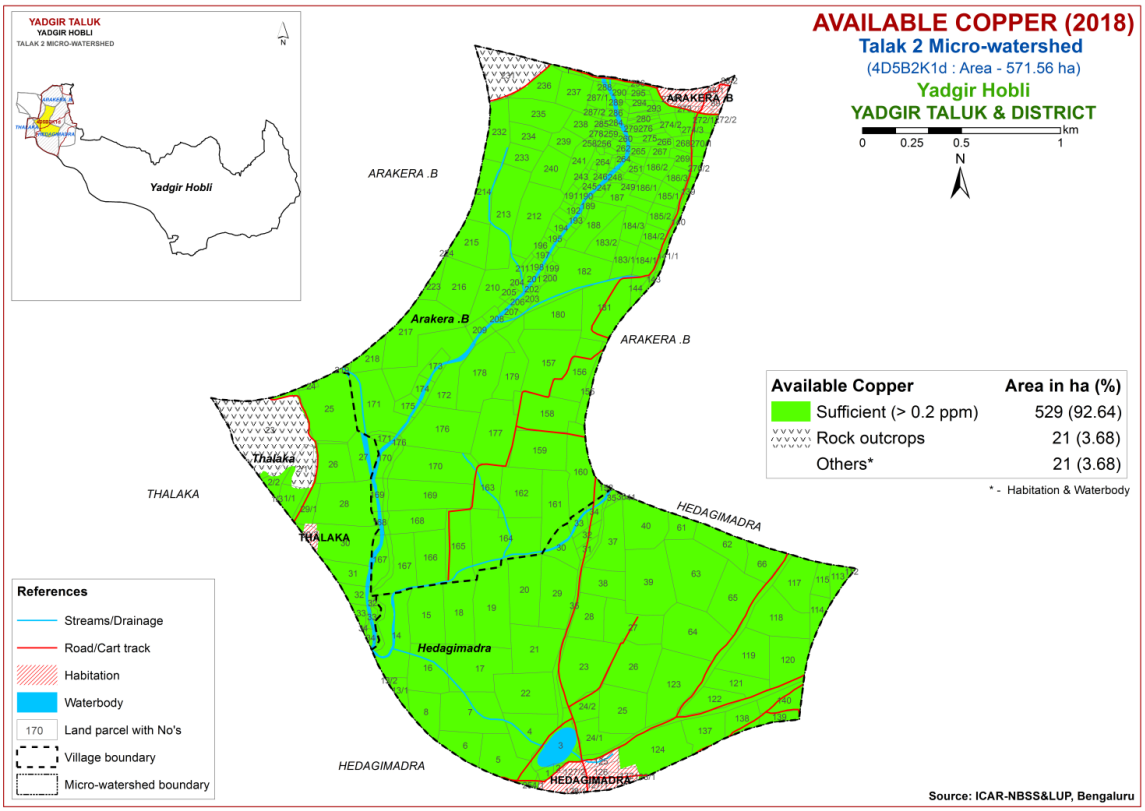


Fig.6.10 Soil Available Copper map of Talak-2 Microwatershed

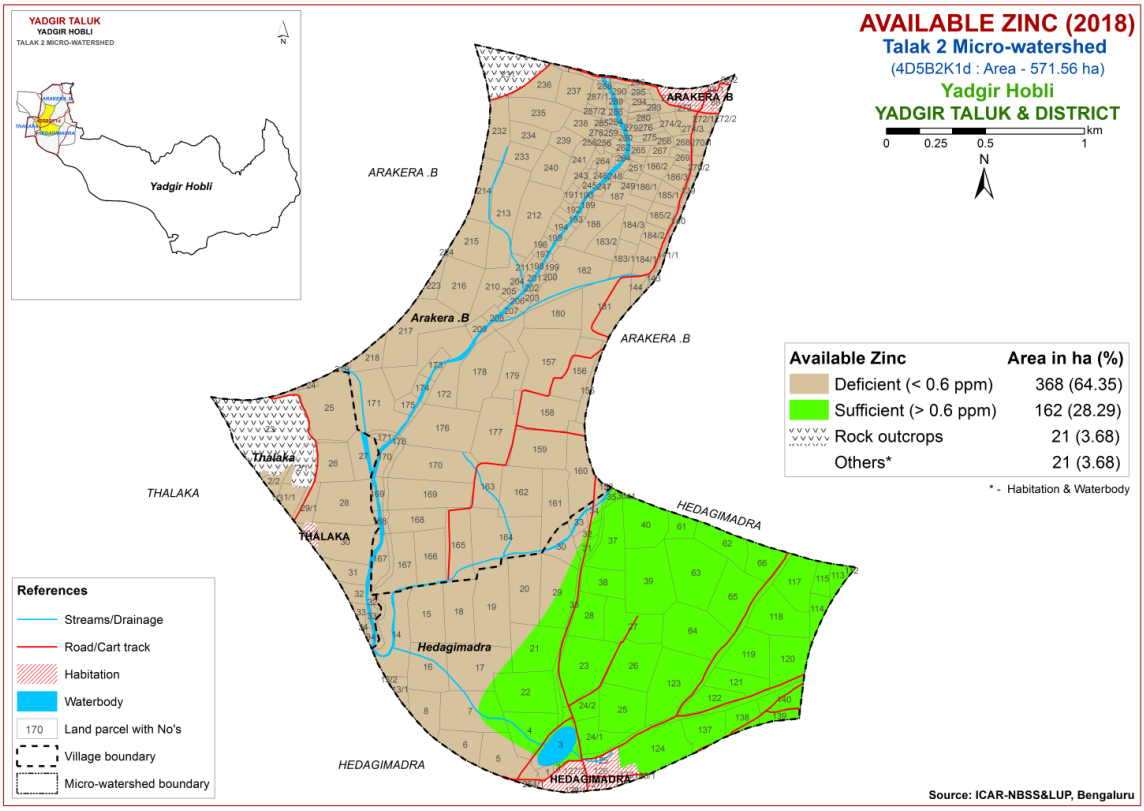


Fig.6.11 Soil Available Zinc map of Talak-2 Microwatershed

Chapter 7

LAND SUITABILITY FOR MAJOR CROPS

The soil and land resource units (soil phases) of Talak-2 microwatershed were assessed for their suitability for growing food, fodder, fibre and other horticulture crops by following the procedure as outlined in FAO, 1976 and 1983. Crop requirements were developed for each of the crop from the available research data and also by referring to Naidu *et. al.* (2006) and Natarajan *et. al* (2015). The soil and land characteristics were matched with the crop requirement to arrive at the crop suitability. The soil and land characteristics (Table 7.1) table and crop requirement tables (Tables 7.2 to 7.30) are given at the end of the chapter. In FAO land suitability classification, two orders are recognized. Order S-Suitable and Order N-Not suitable. The orders have classes, subclasses and units. Order-S has three classes, Class S1-Highly Suitable, Class S2-Moderately Suitable and Class S3- Marginally Suitable. Order N has two classes, N1-Currently not Suitable and N2- Permanently not Suitable. There are no subclasses within the Class S1 as they will have very minor or no limitations for crop growth. Classes S2, S3, 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, 'w' for drainage, 's' for sodium and 'z' for calcareousness. These limitations are indicated as lower case letters to the Class symbol. For example, moderately suitable lands with the limitations of soil depth and erosion are designated as S2re. For the microwatershed, the soil mapping units were evaluated and classified up to subclass level.

Using the above criteria, the soil map units of the microwatershed were evaluated and land suitability maps for 29 major 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 Tumakuru districts. The crop requirements for growing sorghum (Table 7.2) were matched with the soil-site characteristics (Table 7.1) of the soils of the microwatershed and a land suitability map for growing sorghum was generated. The area extent and their geographic distribution of different suitability subclasses in the microwatershed are given in Figure 7.1.

An area of about 53 ha (9%) is moderately suitable (Class S2) for growing sorghum and is distributed in the central and southern part of the microwatershed with minor limitations of texture, nutrient availability and calcareousness. An area of about

477 ha (83%) is marginally suitable (Class S3) for growing sorghum and is distributed in the major part of the microwatershed with moderate limitations rooting depth, texture, calcareousness and nutrient availability.

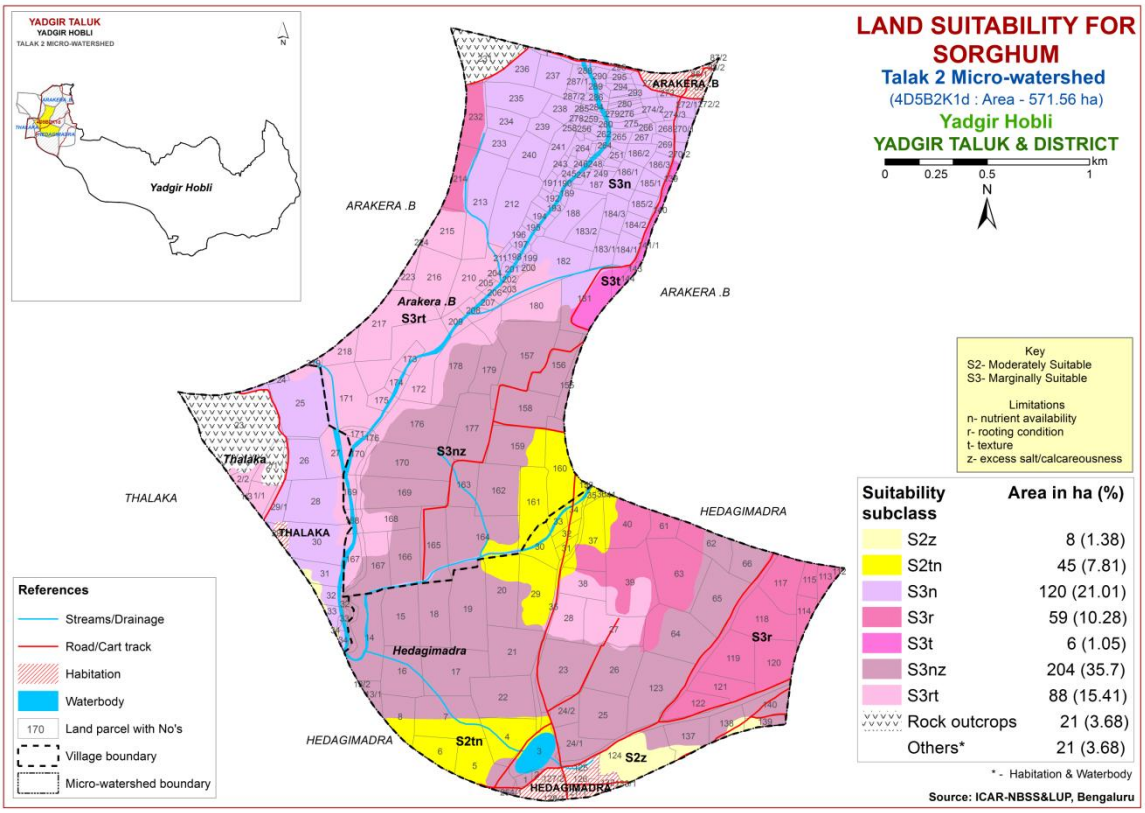


Fig. 7.1 Land Suitability map of Sorghum

7.2 Land Suitability for Maize (*Zea mays*)

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

An area of about 53 ha (9%) is moderately suitable (Class S2) for growing maize and is distributed in the central and southern part of the microwatershed with minor limitations of texture, nutrient availability and calcareousness. An area of about 477 ha (83%) is marginally suitable (Class S3) for growing maize and is distributed in the major part of the microwatershed with moderate limitations rooting depth, texture, calcareousness and nutrient availability.

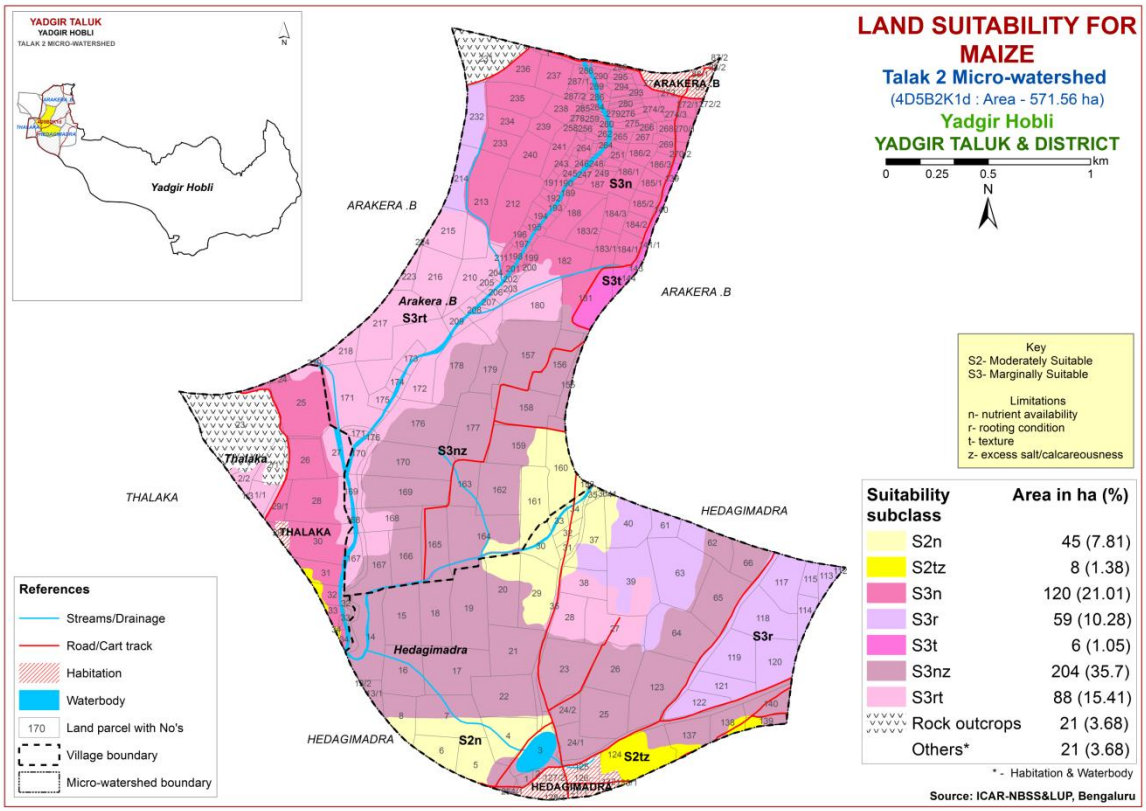


Fig. 7.2 Land Suitability map of Maize

7.3 Land Suitability for Bajra (*Pennisetum glaucum)*

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

An area of about 53 ha (9%) is moderately suitable (Class S2) for growing bajra and is distributed in the central and southern part of the microwatershed with minor limitations of texture, nutrient availability and calcareousness. An area of about 477 ha (83%) is marginally suitable (Class S3) for growing bajra and is distributed in the major part of the microwatershed with moderate limitations rooting depth, texture, calcareousness and nutrient availability.

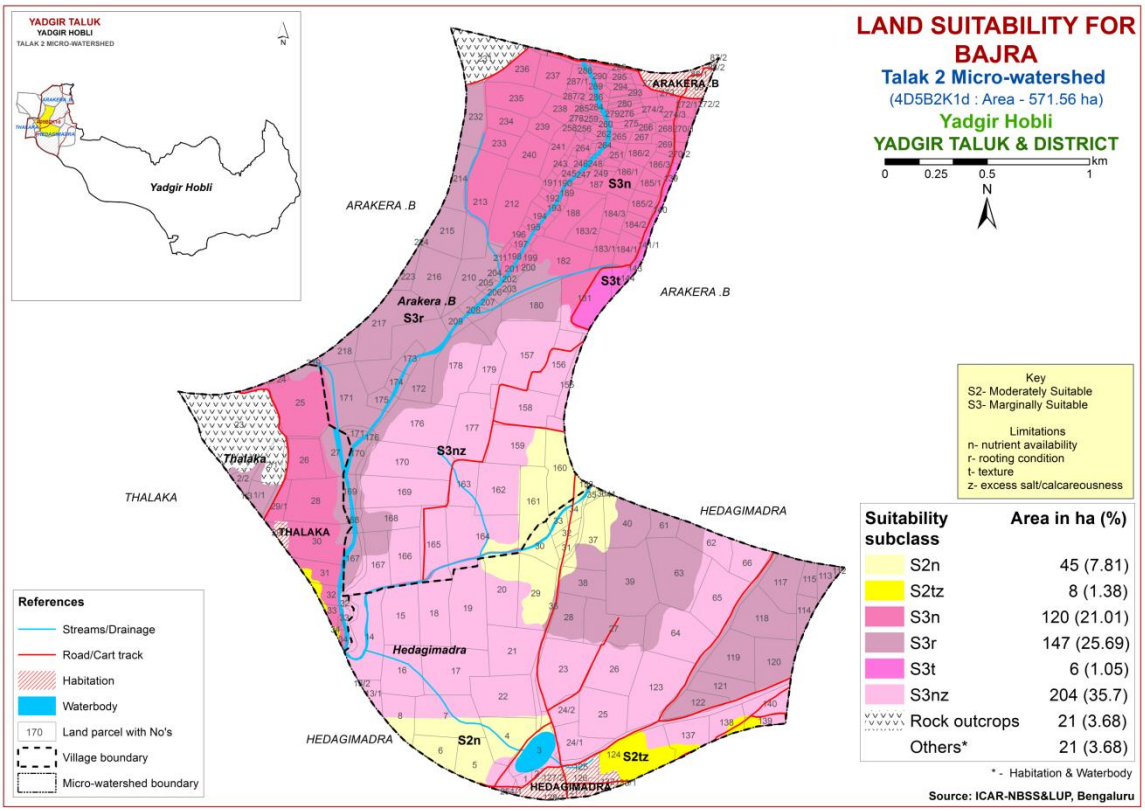


Fig. 7.3 Land Suitability map of Bajra

7.4 Land Suitability for Groundnut (*Arachis hypogaea*)

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

An area of about 206 ha (36%) is marginally suitable (Class S3) for growing groundnut and is distributed in the southern, northern, western, central and southeastern part of the microwatershed with moderate limitations rooting depth, calcareousness, nutrient availability and texture. Currently not suitable (Class N1) lands occur in an area of 324 ha (57%) and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

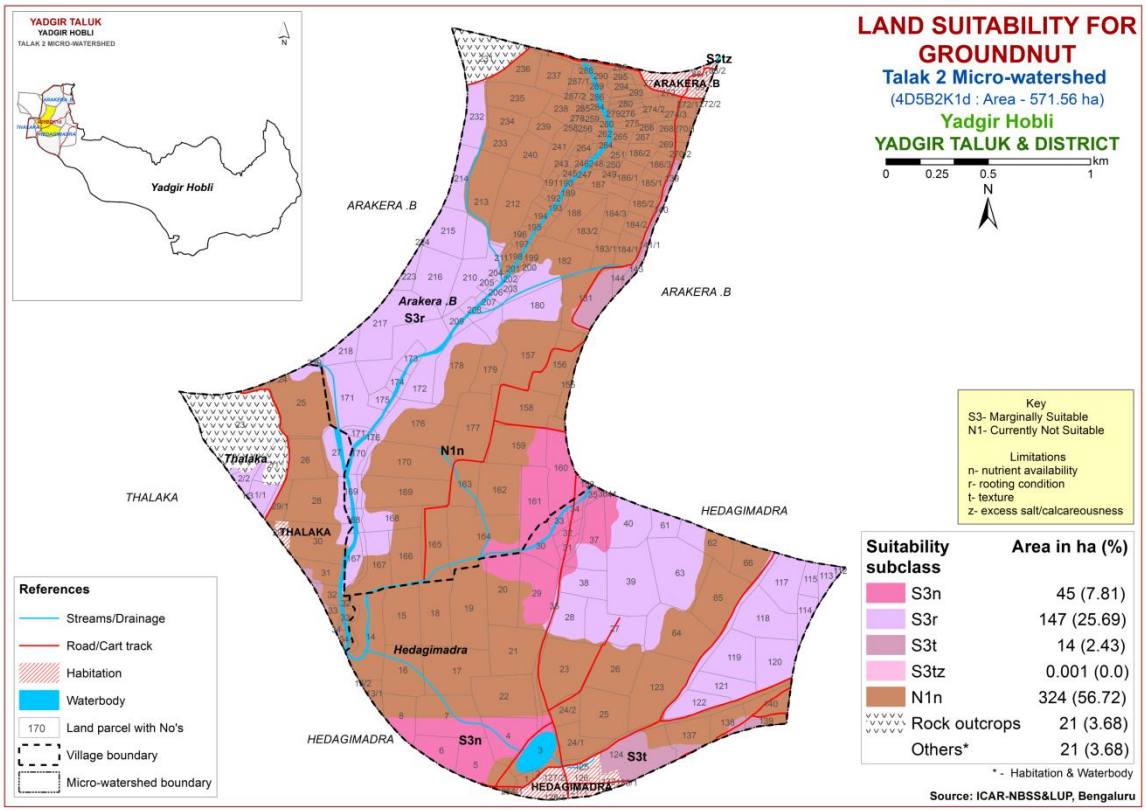


Fig. 7.4 Land Suitability map of Groundnut

7.5 Land Suitability for Sunflower (*Helianthus annus*)

Sunflower is one of the most important oilseed crop grown in an area of 4.1 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 8 ha (1%) is moderately suitable (Class S2) for growing sunflower and is distributed in the southern and western part of the microwatershed with minor limitation of calcareousness. An area of about 51 ha (9%) is marginally suitable (Class S3) and is distributed in the central, southern and northern part of the microwatershed with moderate limitations of rooting depth, texture and nutrient availability. Currently not suitable (Class N1) lands occur in an area of 471 ha (82%) and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

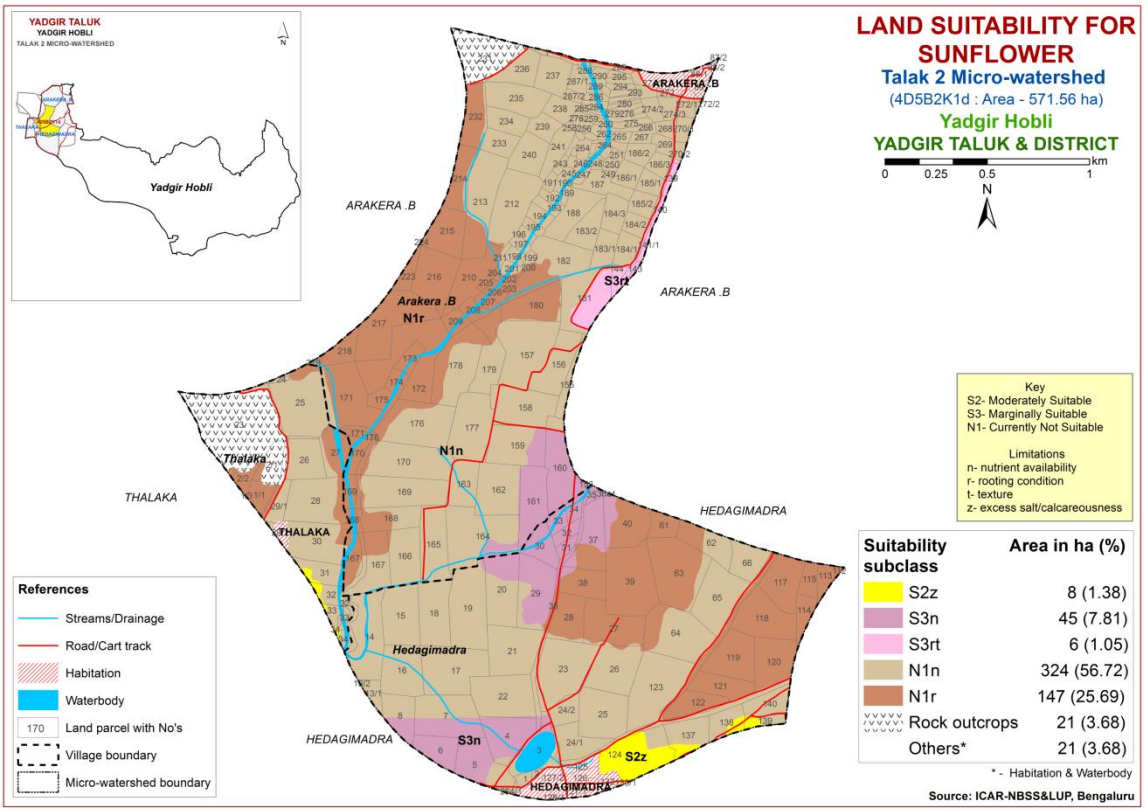


Fig. 7.5 Land Suitability map of Sunflower

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

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

An area of about 53 ha (9%) is moderately suitable (Class S2) for growing redgram and is distributed in the southern, central and southeastern part of the microwatershed with minor limitations of texture, calcareousness and nutrient availability. An area of about 330 ha (57%) is marginally suitable (Class S3) and is distributed in the major part of the microwatershed with moderate limitations of rooting depth, texture, calcareousness and nutrient availability. Currently not suitable (Class N1) lands occur in an area of 147 ha (26%) and are distributed in the central, southern, western and southeastern part of the microwatershed with severe limitation of rooting depth.

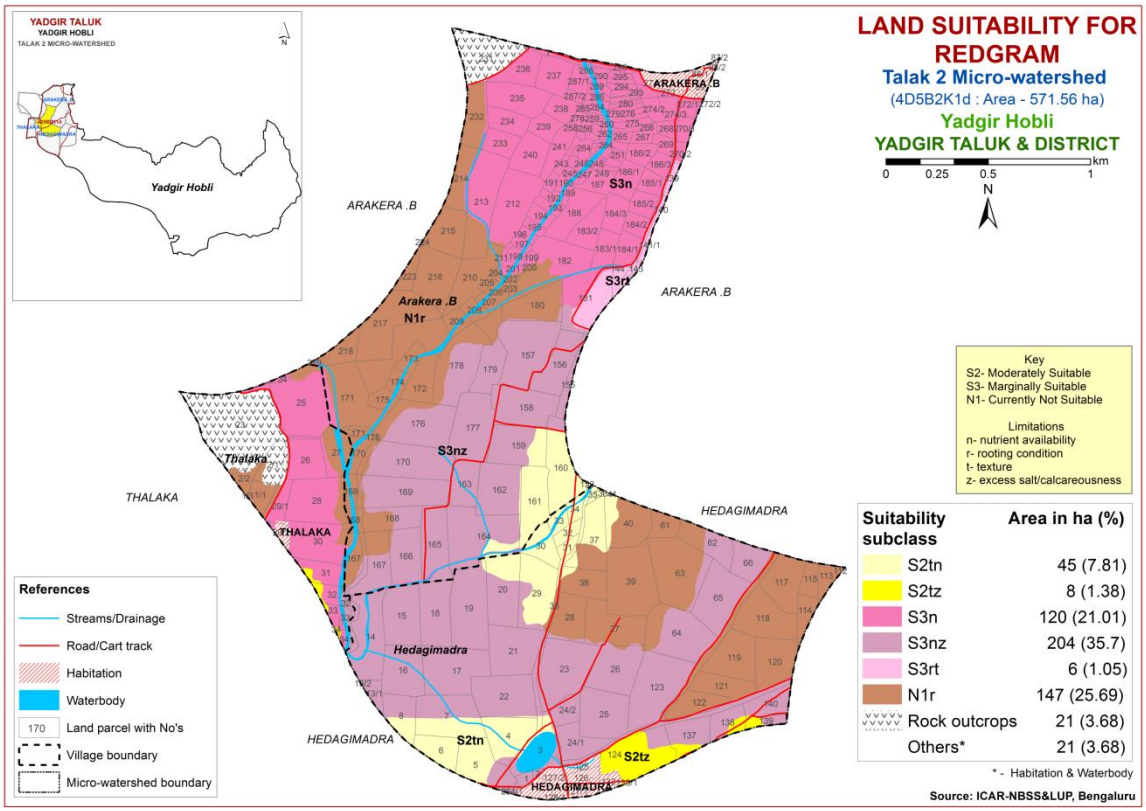


Fig. 7.6 Land Suitability map of Redgram

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

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

An area of about 8 ha (1%) is moderately suitable (Class S2) for growing bengalgram and is distributed in the southeastern and western part of the microwatershed with minor limitation of calcareousness. An area of about 426 ha (75%) is marginally suitable (Class S3) and is distributed in the major part of the microwatershed with moderate limitations of rooting depth, calcareousness, texture and nutrient availability. Currently not suitable (Class N1) lands occur in an area of 94 ha (16%) and are distributed in the central, southern, northern and western part of the microwatershed with severe limitation of texture.

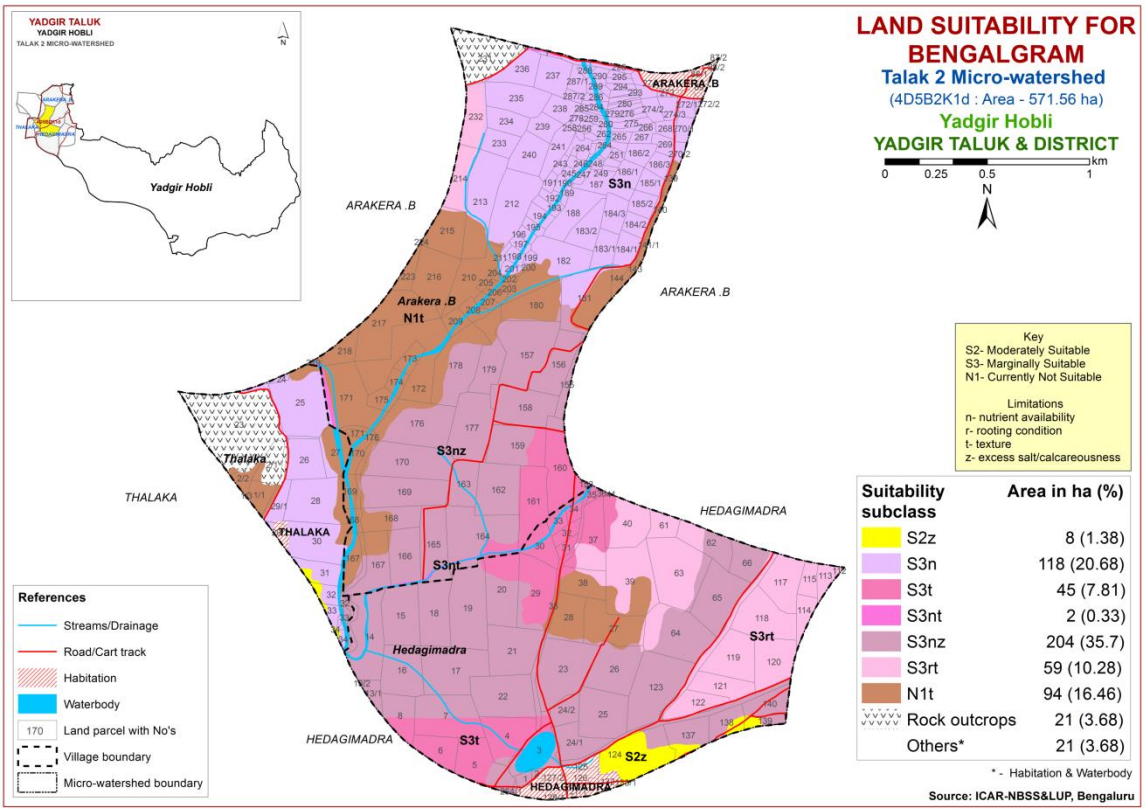


Fig. 7.7 Land Suitability map of Bengal gram

7.8 Land Suitability for Cotton (*Gossypium hirsutum*)

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

An area of about 8 ha (1%) is moderately suitable (Class S2) for growing cotton and is distributed in the southeastern and western part of the microwatershed with minor limitation of calcareousness. An area of about 426 ha (75%) is marginally suitable (Class S3) and is distributed in the major part of the microwatershed with moderate limitations of rooting depth, calcareousness, texture and nutrient availability. Currently not suitable (Class N1) lands occur in an area of 94 ha (16%) and are distributed in the central, southern, northern and western part of the microwatershed with severe limitation of texture.

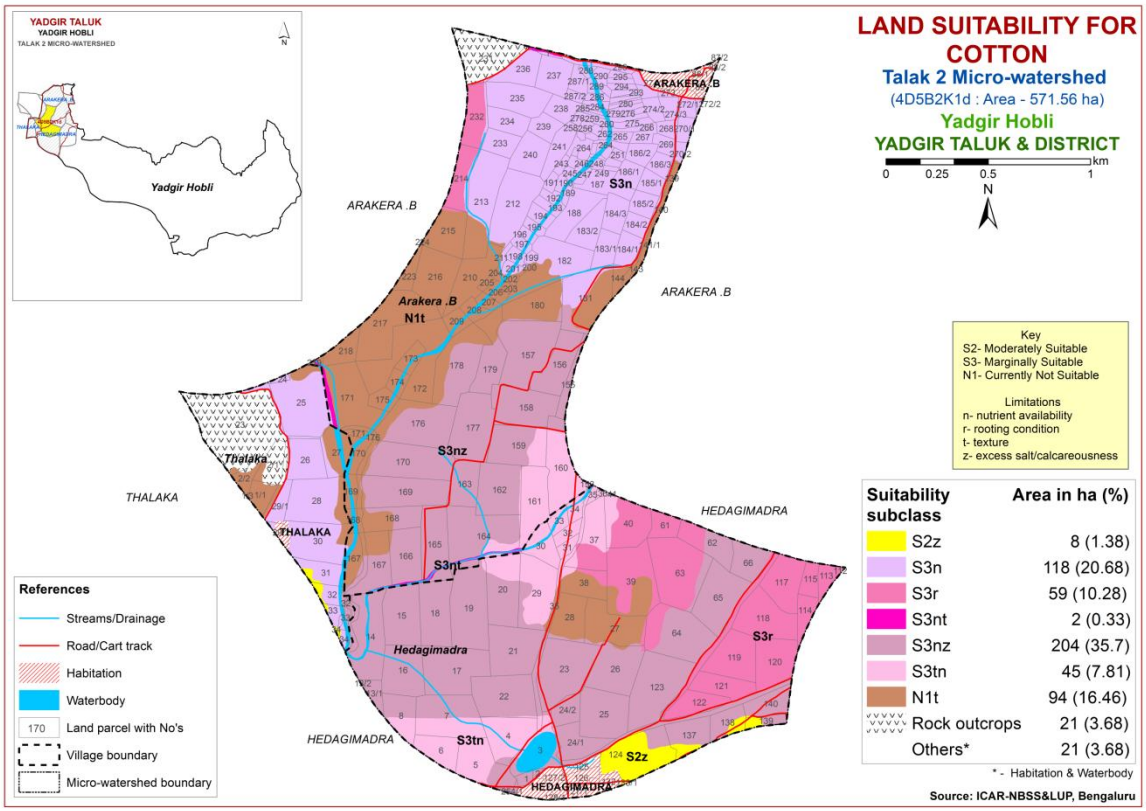


Fig. 7.8 Land Suitability map of Cotton

7.9 Land Suitability for Chilli (*Capsicum annuum)*

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

An area of about 8 ha (1%) is moderately suitable (Class S2) for growing chilli and is distributed in the southeastern and western part of the microwatershed with minor limitations of calcareousness and texture. Marginally suitable lands (Class S3) for growing chilli occupy an area of about 198 ha (35%) and are distributed in the central, northern, southern, western and southeastern part of the microwatershed with moderate limitations of nutrient availability, texture and rooting depth. Currently not suitable (Class N1) lands occur in an area of 324 ha (57%) and are distributed in the major part of the microwatershed with severe limitation of nutrient availability.

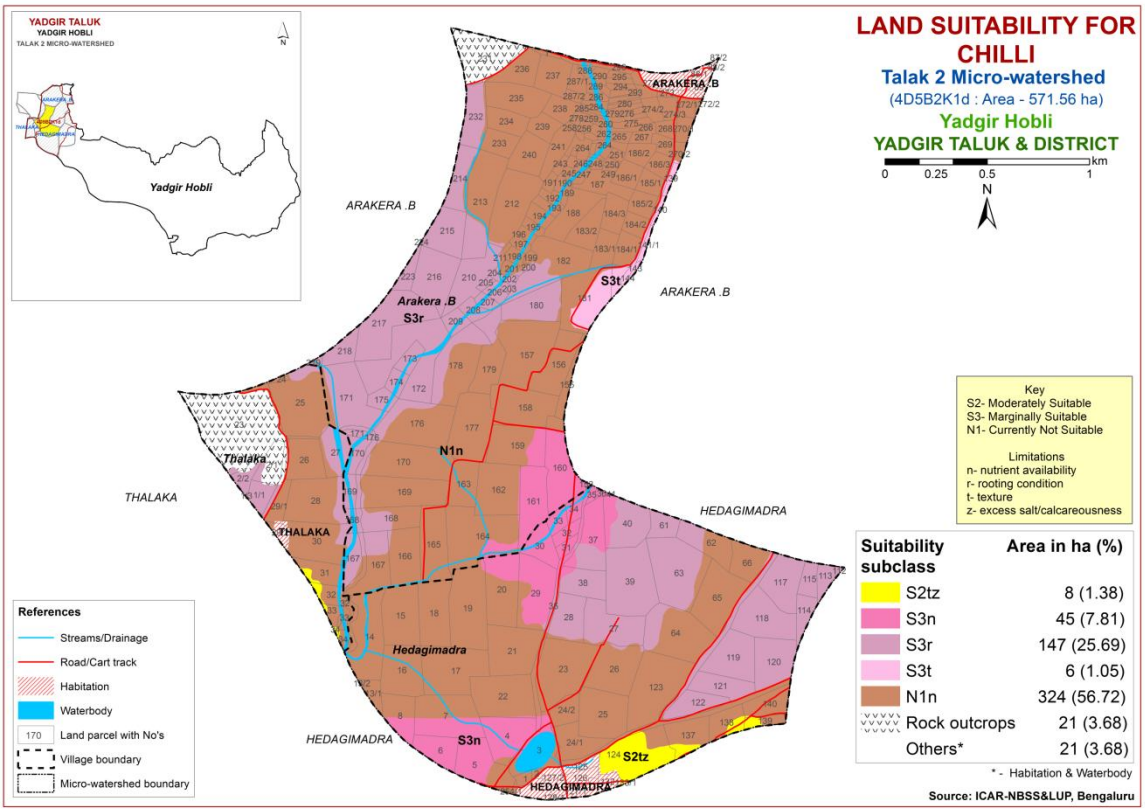


Fig 7.9 Land Suitability map of Chilli

7.10 Land Suitability for Tomato *(Lycopersicon esculentum)*

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

Marginally suitable lands (Class S3) for growing tomato occupy an area of about 206 ha (36%) and are distributed in the central, northern, southern, western and southeastern part of the microwatershed with moderate limitations of nutrient availability, texture and rooting depth. Currently not suitable (Class N1) lands occur in an area of 324 ha (57%) and are distributed in the major part of the microwatershed with severe limitation of nutrient availability.

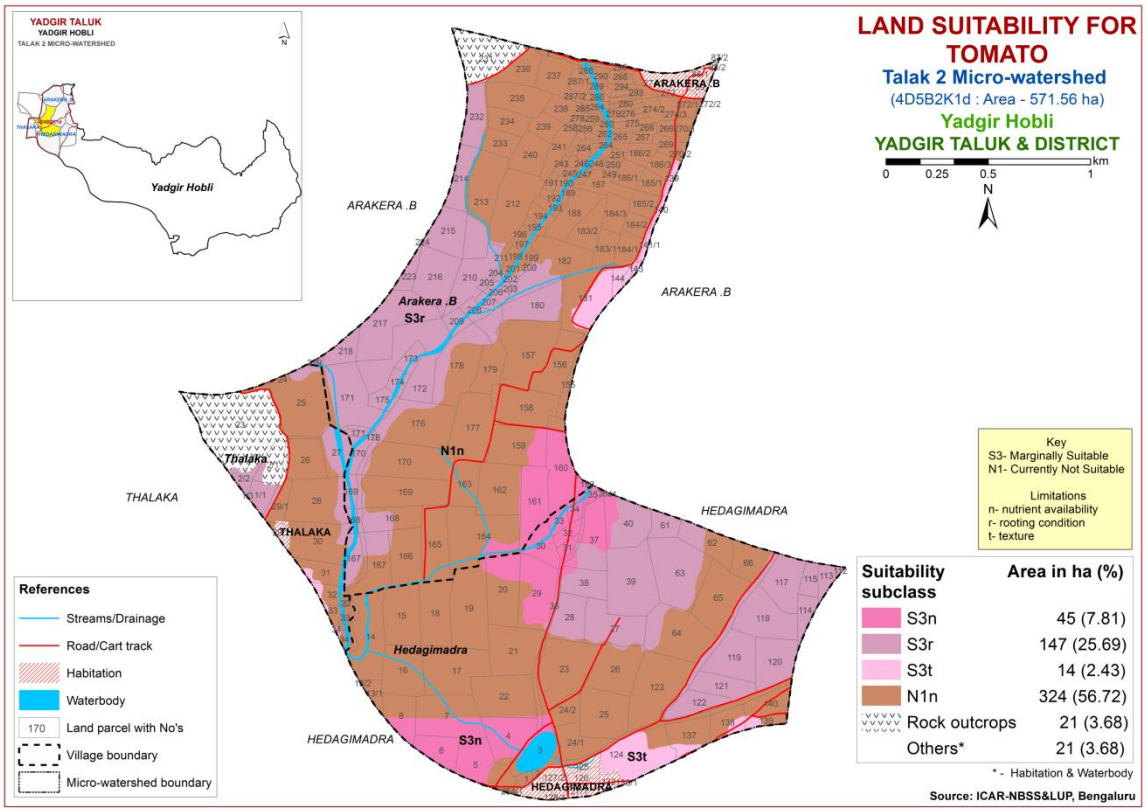


Fig 7.10 Land Suitability map of Tomato

7.11 Land Suitability for Brinjal (*Solanum melongena*)

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

Marginally suitable lands (Class S3) for growing brinjal occupy an area of about 206 ha (36%) and are distributed in the central, northern, southern, western and southeastern part of the microwatershed with moderate limitations of nutrient availability, texture and rooting depth. Currently not suitable (Class N1) lands occur in an area of 324 ha (57%) and are distributed in the major part of the microwatershed with severe limitation of nutrient availability.

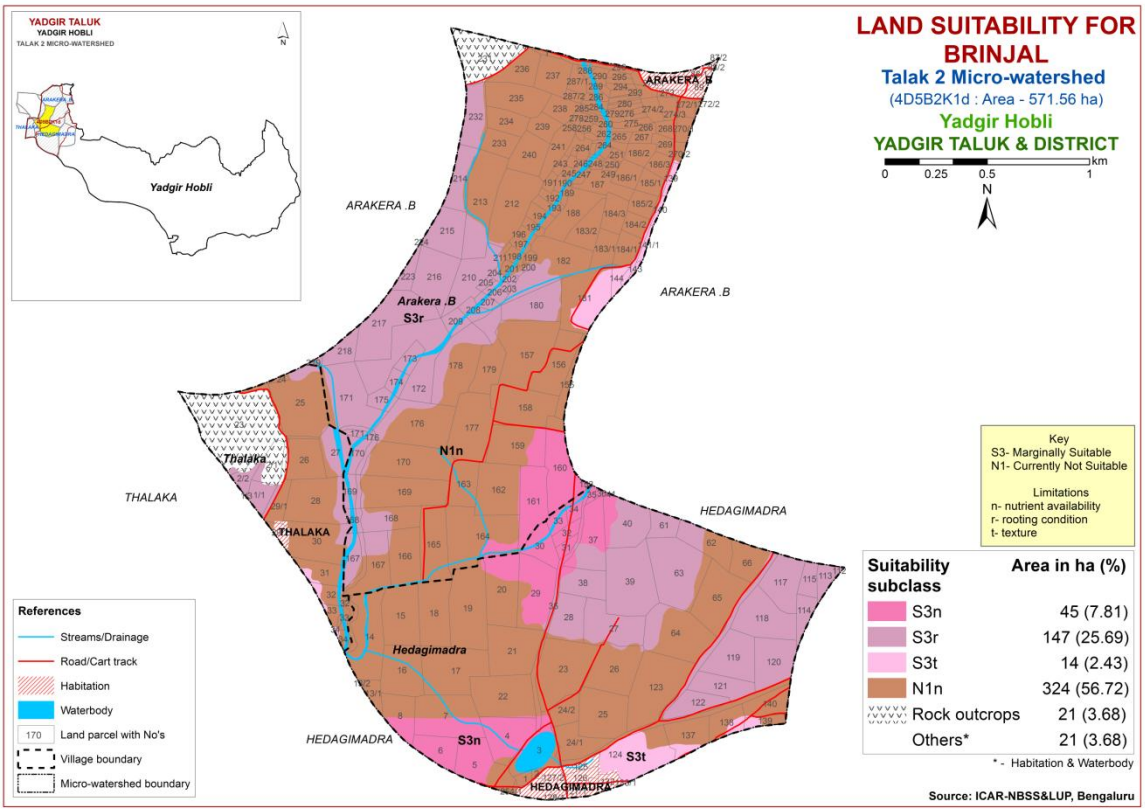


Fig 7.11 Land Suitability map of Brinjal

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

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

Marginally suitable lands (Class S3) for growing onion occupy an area of about 206 ha (36%) and are distributed in the central, northern, southern, western and southeastern part of the microwatershed with moderate limitations of calcareousness, texture and rooting depth. Currently not suitable (Class N1) lands occur in an area of 324 ha (57%) and are distributed in the major part of the microwatershed with severe limitation of nutrient availability.

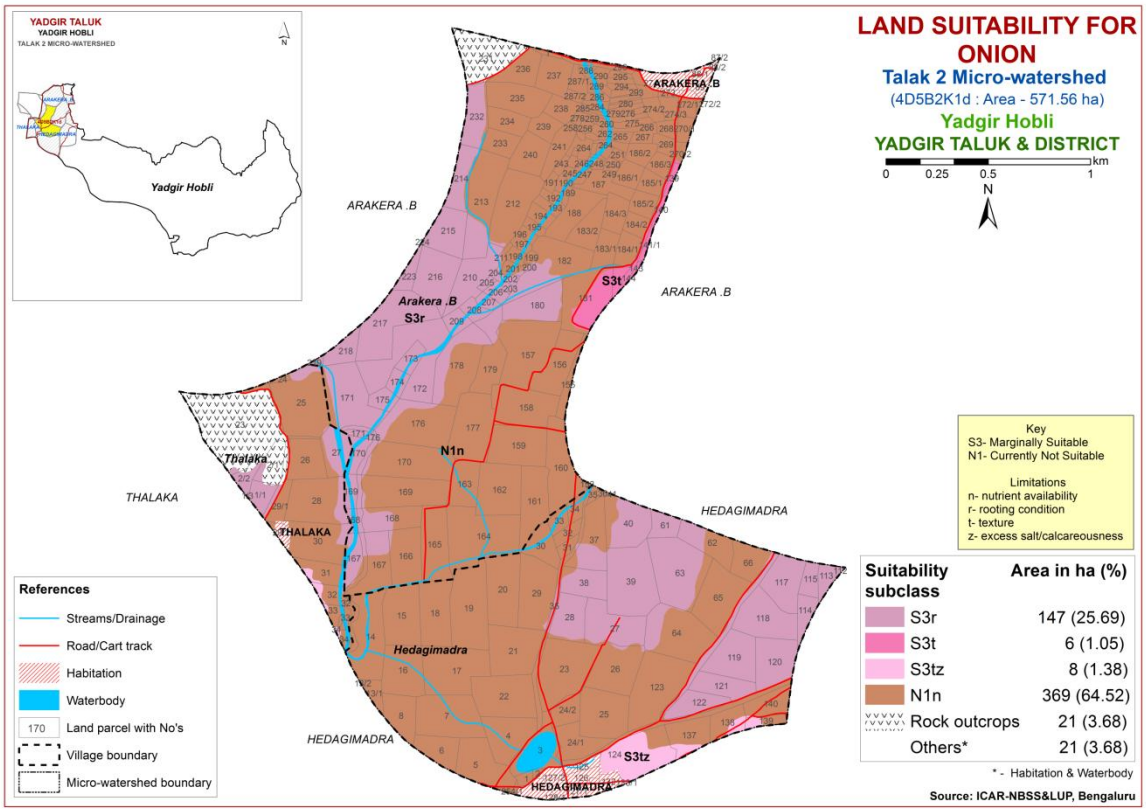


Fig 7.12 Land Suitability map of Onion

7.13 Land Suitability for Bhendi (*Abelmoschus esculentus*)

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

An area of about 8 ha (1%) is moderately suitable (Class S2) for growing bhendi and is distributed in the southeastern and western part of the microwatershed with minor limitations of calcareousness and texture. Marginally suitable lands (Class S3) for growing bhendi occupy an area of about 198 ha (35%) and are distributed in the central, northern, southern, western and southeastern part of the microwatershed with moderate limitations of nutrient availability, texture and rooting depth. Currently not suitable (Class N1) lands occur in an area of 324 ha (57%) and are distributed in the major part of the microwatershed with severe limitation of nutrient availability.

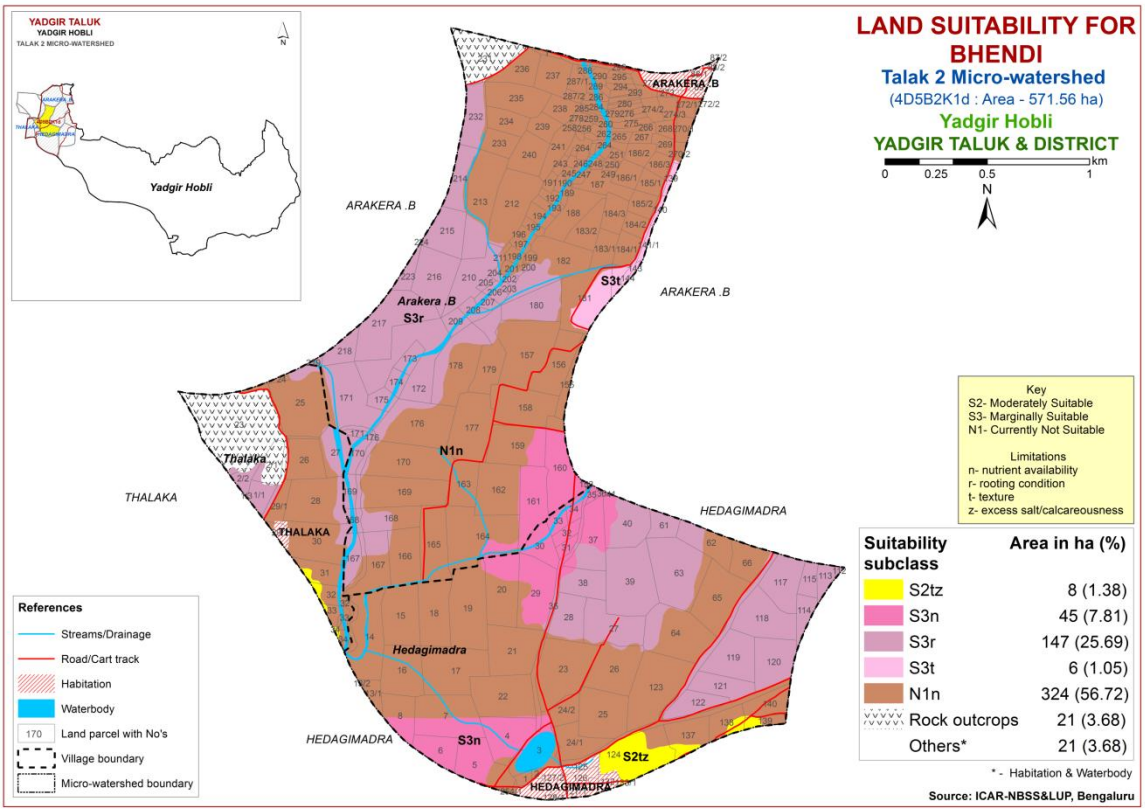


Fig 7.13 Land Suitability map of Bhendi

7.14 Land Suitability for Drumstick (*Moringa oleifera*)

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

An area of about 14 ha (2%) is marginally suitable (Class S3) and is distributed in the northern and southern part of the microwatershed with moderate limitations of rooting depth, texture and calcareousness. Currently not suitable (Class N1) lands occur in an area of 516 ha (90%) and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

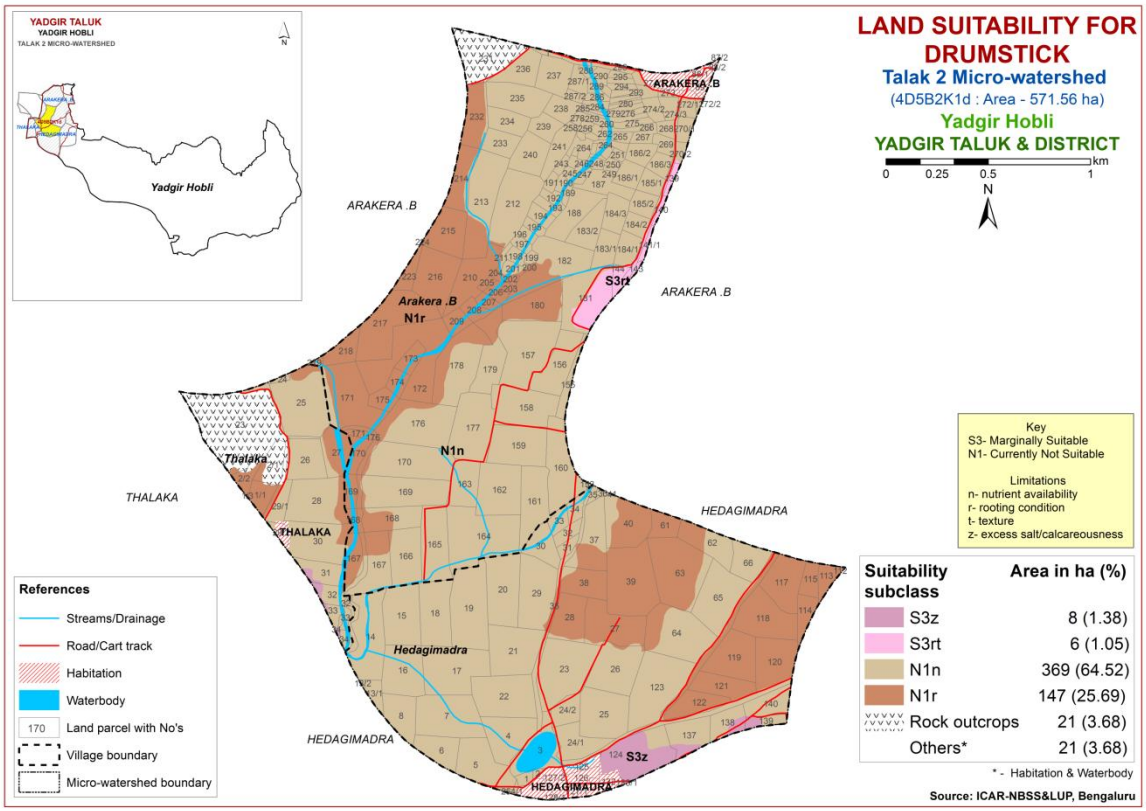


Fig 7.14 Land Suitability map of Drumstick

7.15 Land Suitability for Mango (*Mangifera indica*)

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

An area of about 53 ha (9%) is marginally suitable (Class S3) and is distributed in the southern and central part of the microwatershed with moderate limitations of nutrient availability and texture. Currently not suitable (Class N1) lands occur in an area of 477 ha (83%) and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

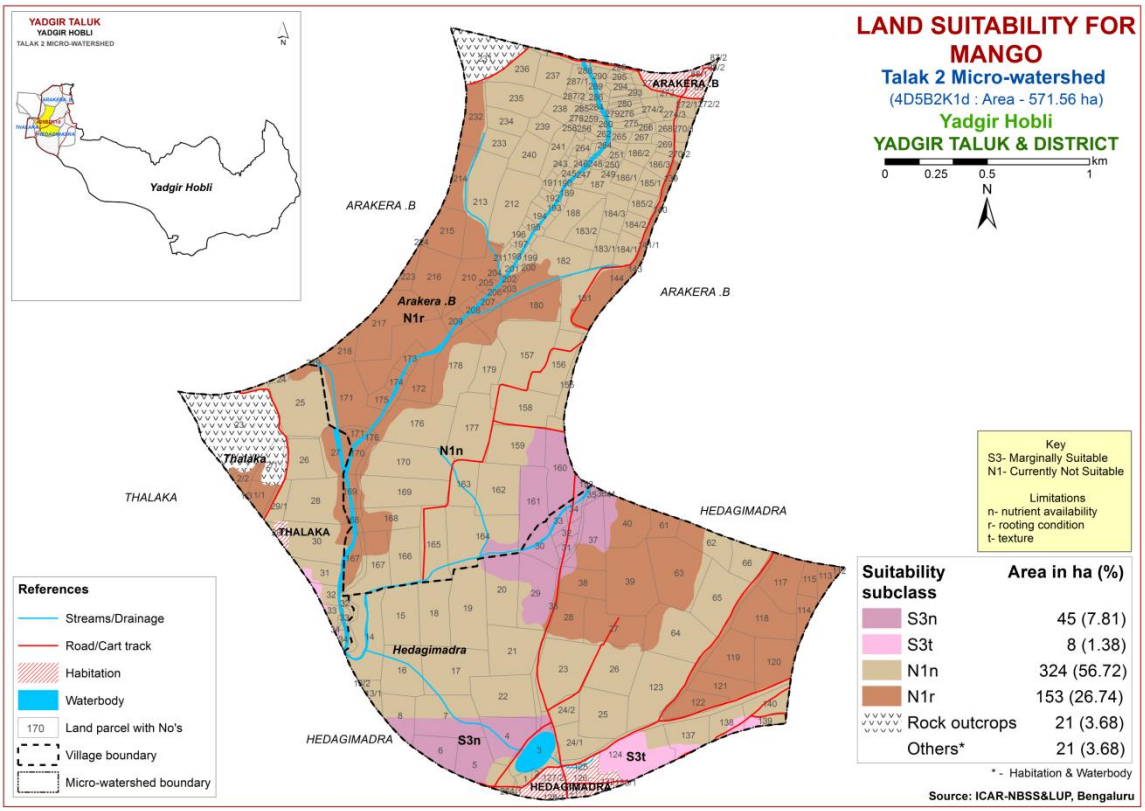


Fig. 7.15 Land Suitability map of Mango

7.16 Land Suitability for Guava (*Psidium guajava*)

Guava is one of the most important fruit crop grown in an area of 6558 ha in almost all the districts of the State. The crop requirements (Table 7.17) for growing guava were matched with the soil-site characteristics (7.1) and a land suitability map for growing guava was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.16.

An area of about 14 ha (2%) is marginally suitable (Class S3) and is distributed in the northern and southern part of the microwatershed with moderate limitations of rooting depth, texture and calcareousness. Currently not suitable (Class N1) lands occur in an area of 516 ha (90%) and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

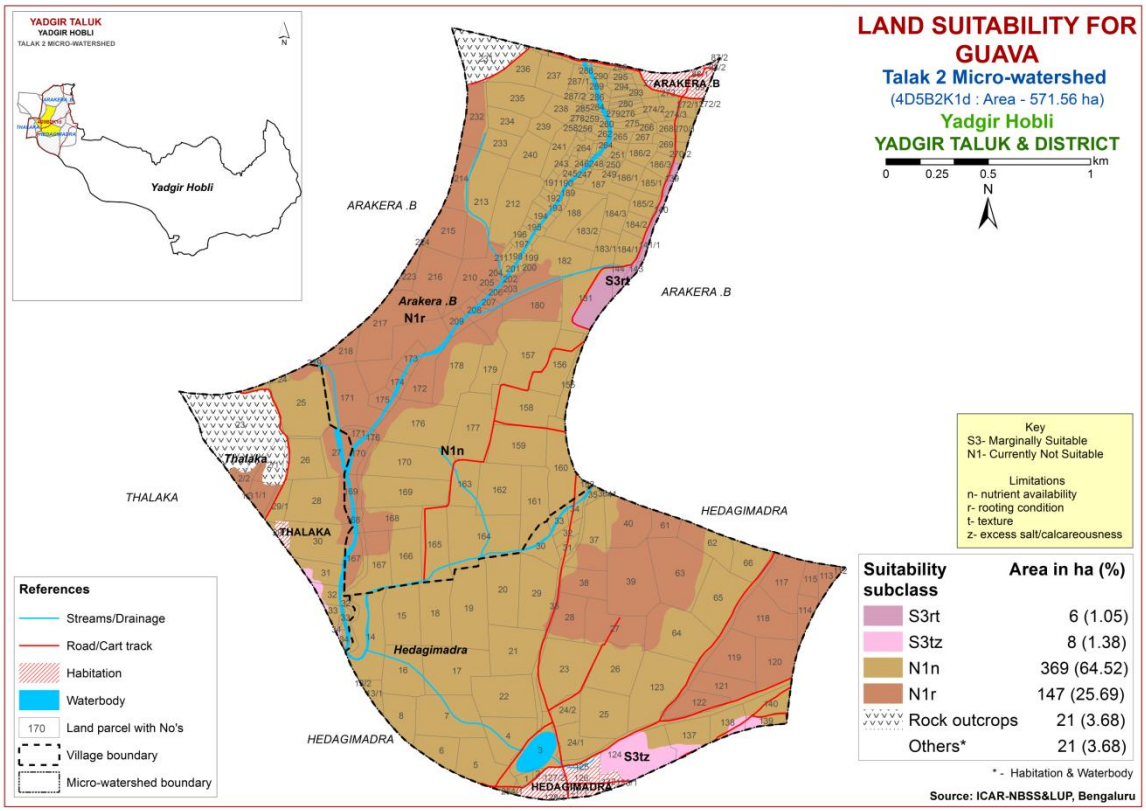


Fig. 7.16 Land Suitability map of Guava

7.17 Land Suitability for Sapota (*Manilkara zapota*)

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

An area of about 59 ha (10%) is marginally suitable (Class S3) and is distributed in the northern, central, southern and southeastern part of the microwatershed with moderate limitations of rooting depth, texture and nutrient availability. Currently not suitable (Class N1) lands occur in an area of 471 ha (82%) and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

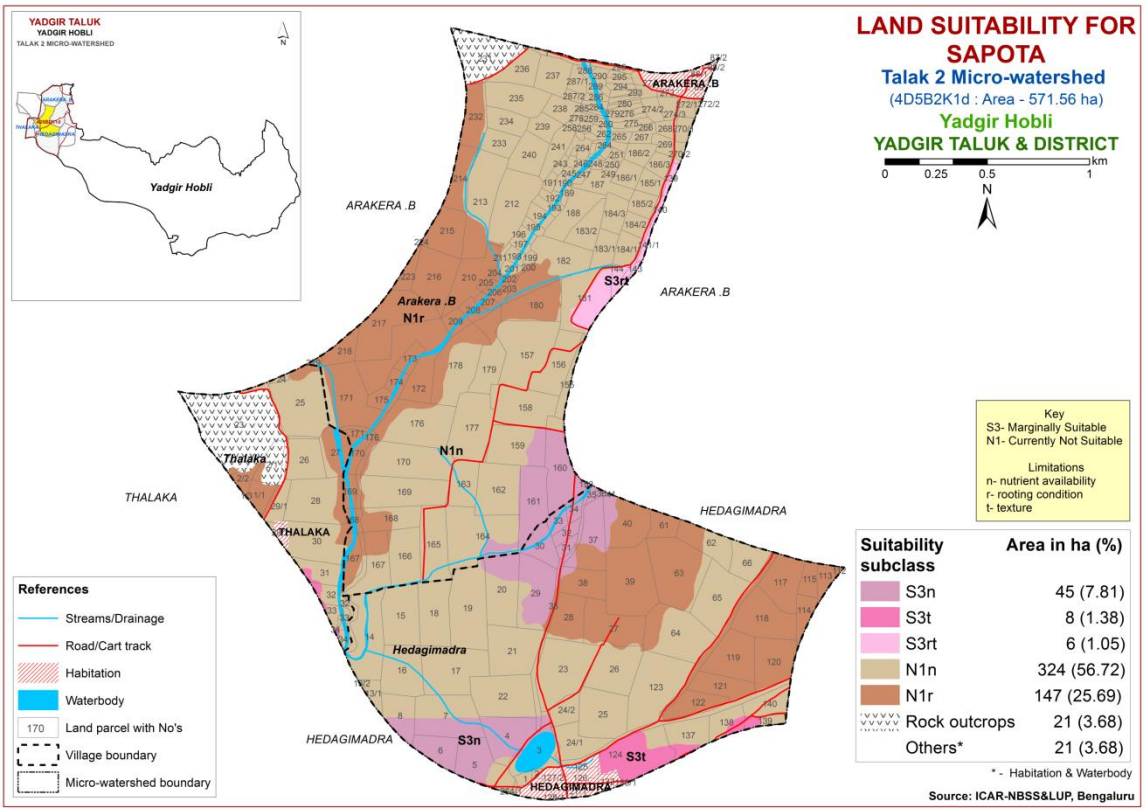


Fig. 7.17 Land Suitability map of Sapota

7.18 Land Suitability for Pomegranate (*Punica granatum*)

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

An area of about 8 ha (1%) is moderately suitable (Class S2) for growing pomegranate and is distributed in the southern and western part of the microwatershed with minor limitations of calcareousness and texture. An area of about 51 ha (9%) is marginally suitable (Class S3) and is distributed in the central, southern and northern part of the microwatershed with moderate limitations of rooting depth, texture and nutrient availability. Currently not suitable (Class N1) lands occur in an area of 471 ha (82%) and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

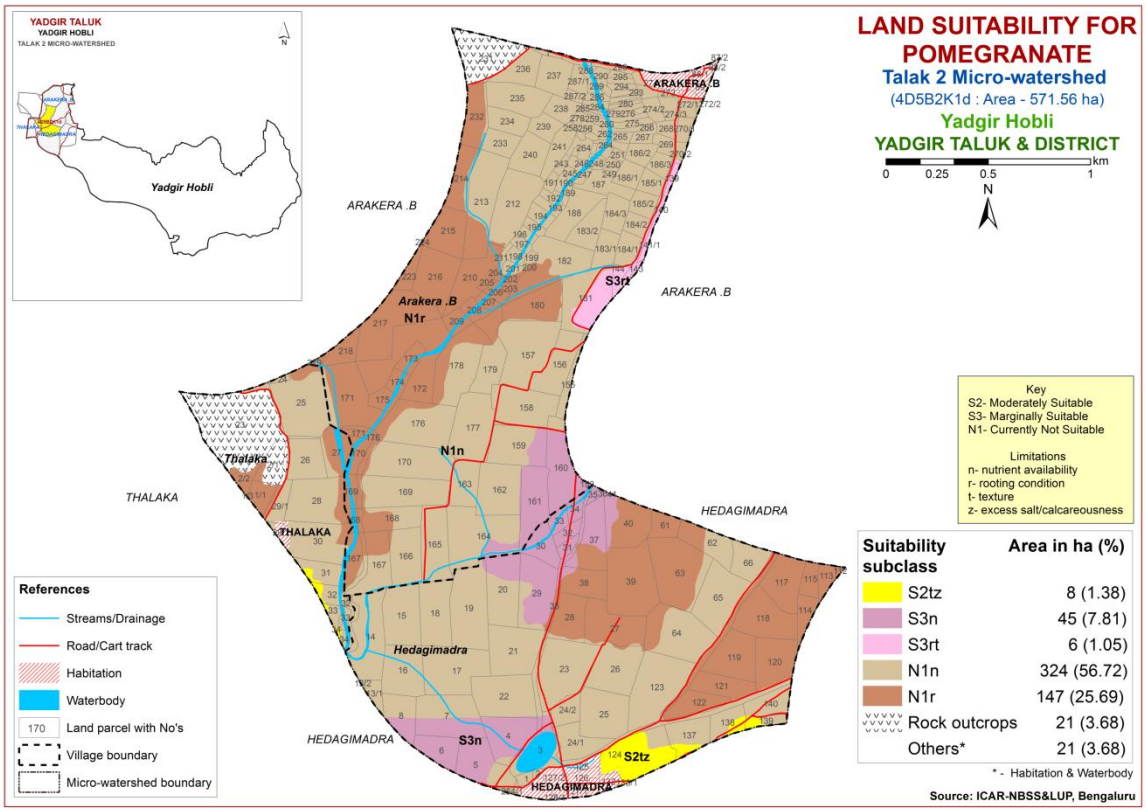


Fig 7.18 Land Suitability map of Pomegranate

7.19 Land Suitability for Musambi (*Citrus limetta*)

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

An area of about 8 ha (1%) is moderately suitable (Class S2) for growing musambi and is distributed in the southern and western part of the microwatershed with minor limitation of calcareousness. An area of about 51 ha (9%) is marginally suitable (Class S3) and is distributed in the central, southern and northern part of the microwatershed with moderate limitations of rooting depth, texture and nutrient availability. Currently not suitable (Class N1) lands occur in an area of 471 ha (82%) and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

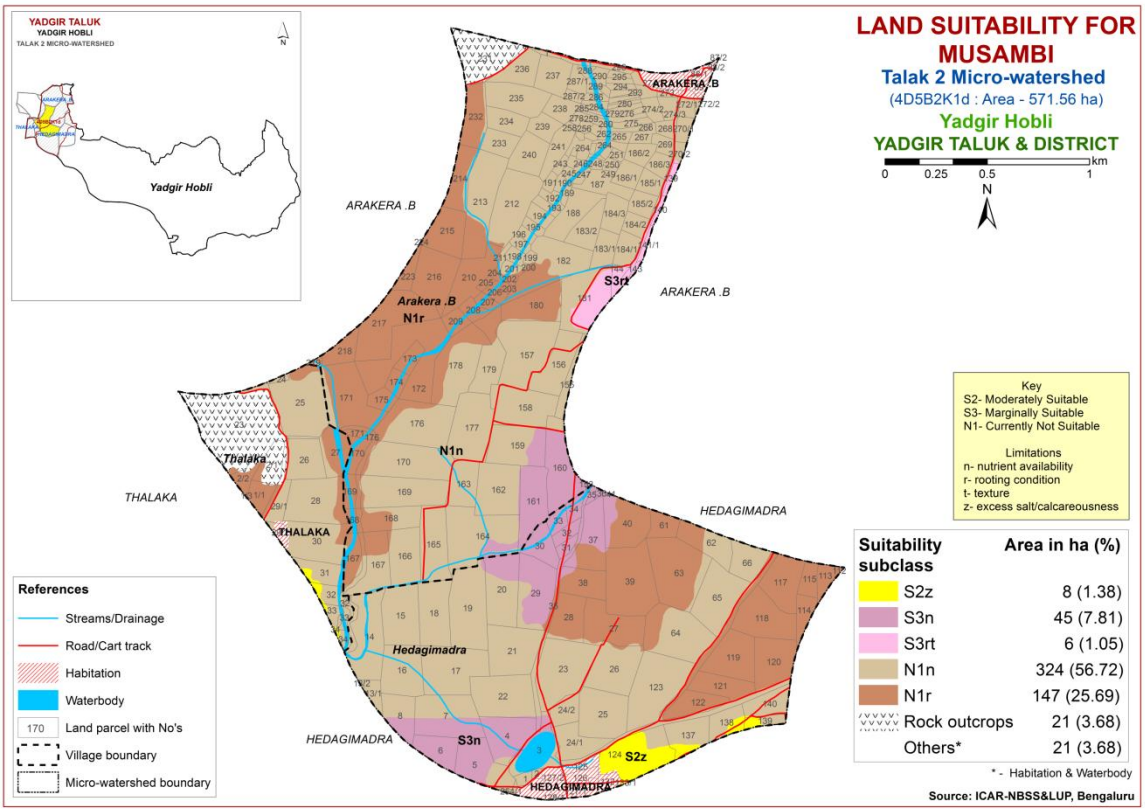


Fig. 7.19 Land Suitability map of Musambi

7.20 Land Suitability for Lime (*Citrus sp*)

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

An area of about 8 ha (1%) is moderately suitable (Class S2) for growing lime and is distributed in the southern and western part of the microwatershed with minor limitation of calcareousness. An area of about 51 ha (9%) is marginally suitable (Class S3) and is distributed in the central, southern and northern part of the microwatershed with moderate limitations of rooting depth, texture and nutrient availability. Currently not suitable (Class N1) lands occur in an area of 471 ha (82%) and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

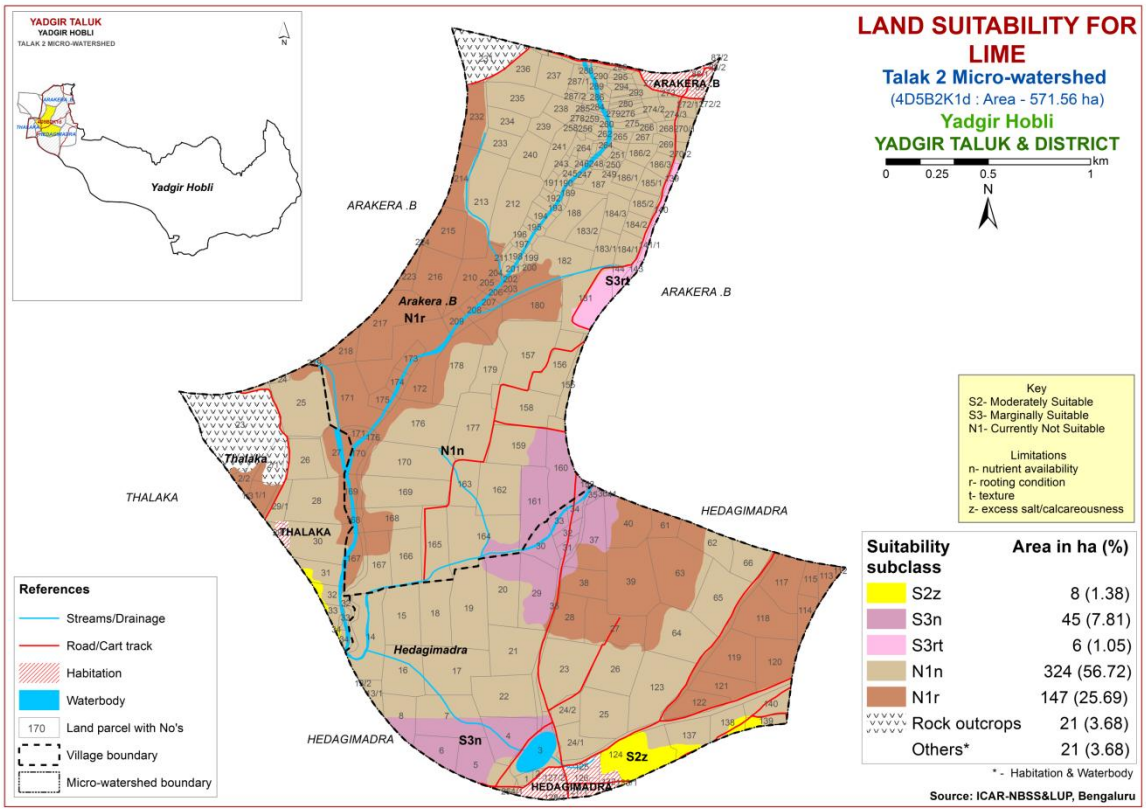


Fig. 7.20 Land Suitability map of Lime

7.21 Land Suitability for Amla (*Phyllanthus emblica*)

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

Marginally suitable lands (Class S3) for growing amla occupy an area of about 161 ha (28%) and are distributed in the northern, western, central and southeastern part of the microwatershed with moderate limitations of calcareousness, texture and rooting depth. Currently not suitable (Class N1) lands occur in an area of 369 ha (65%) and are distributed in the major part of the microwatershed with severe limitation of nutrient availability.

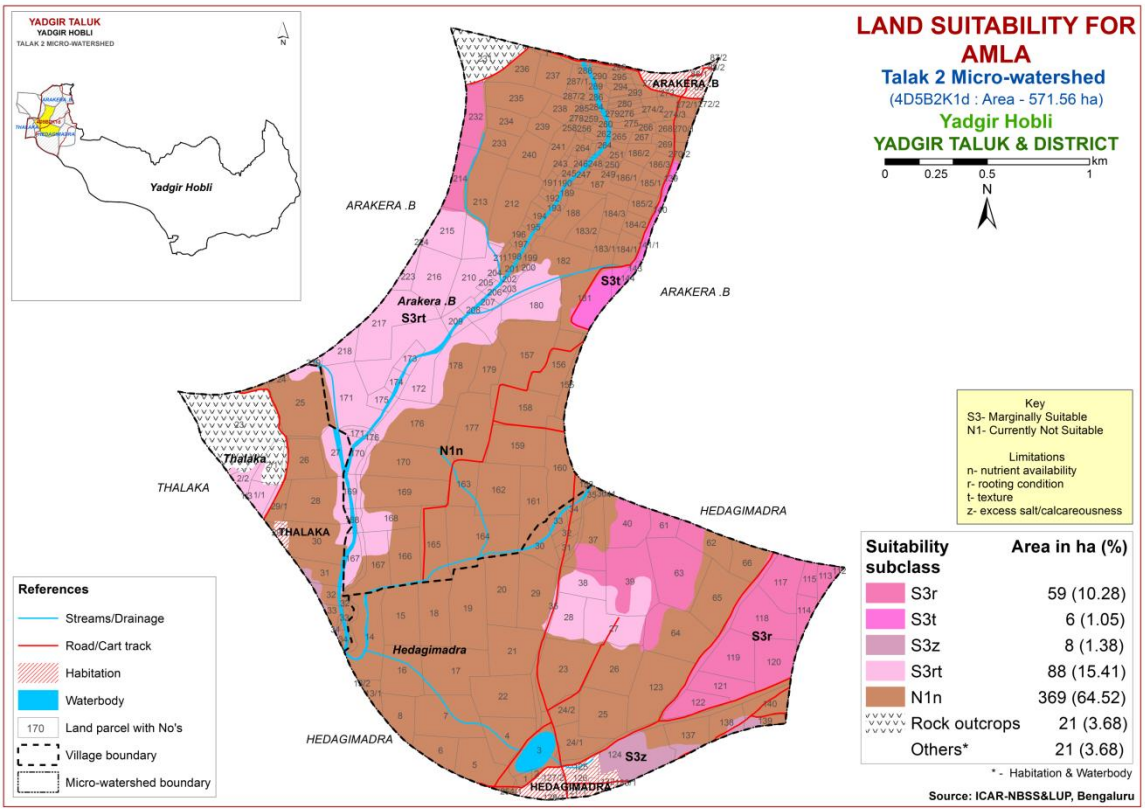


Fig. 7.21 Land Suitability map of Amla

7.22 Land Suitability for Cashew (*Anacardium occidentale)*

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

Currently not suitable (Class N1) lands occur in an entire cultivated area of 530 ha (93%) and are distributed in the major part of the microwatershed with severe limitations of rooting depth, texture and nutrient availability.

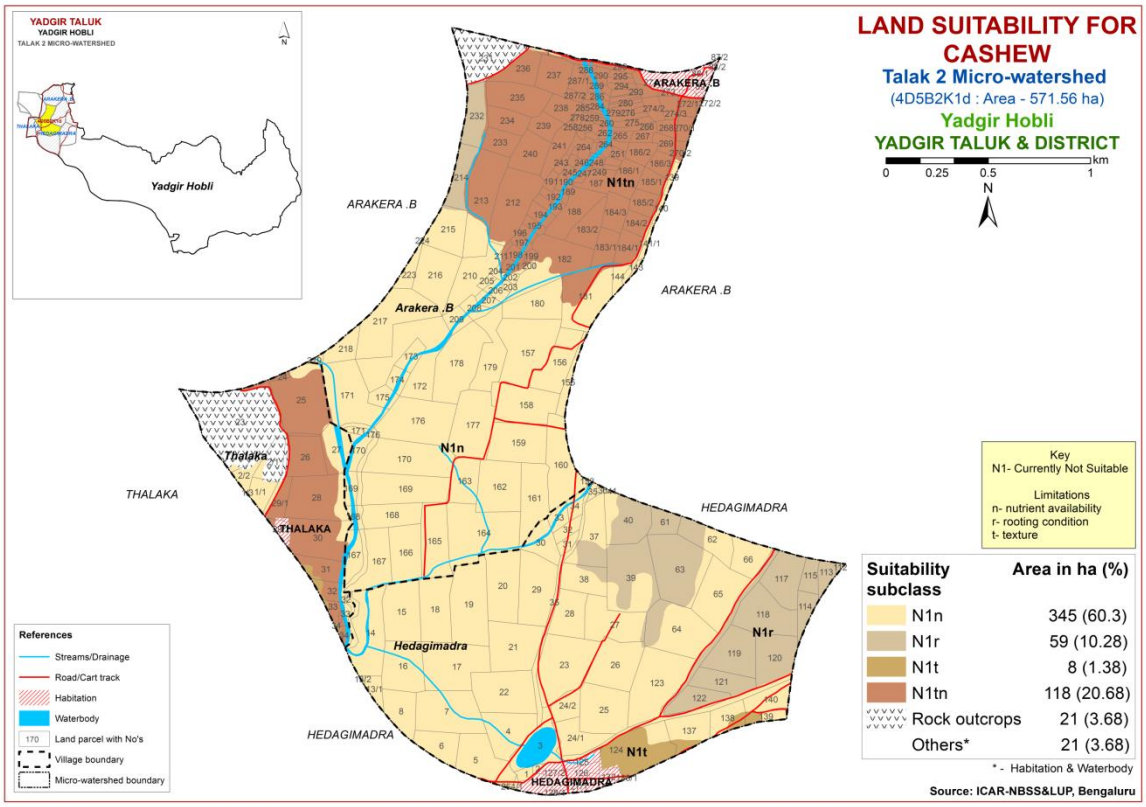


Fig. 7.22 Land Suitability map of Cashew

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

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

An area of about 14 ha (2%) is marginally suitable (Class S3) and is distributed in the northern and southern part of the microwatershed with moderate limitations of rooting depth, texture and calcareousness. Currently not suitable (Class N1) lands occur in an area of 516 ha (90%) and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

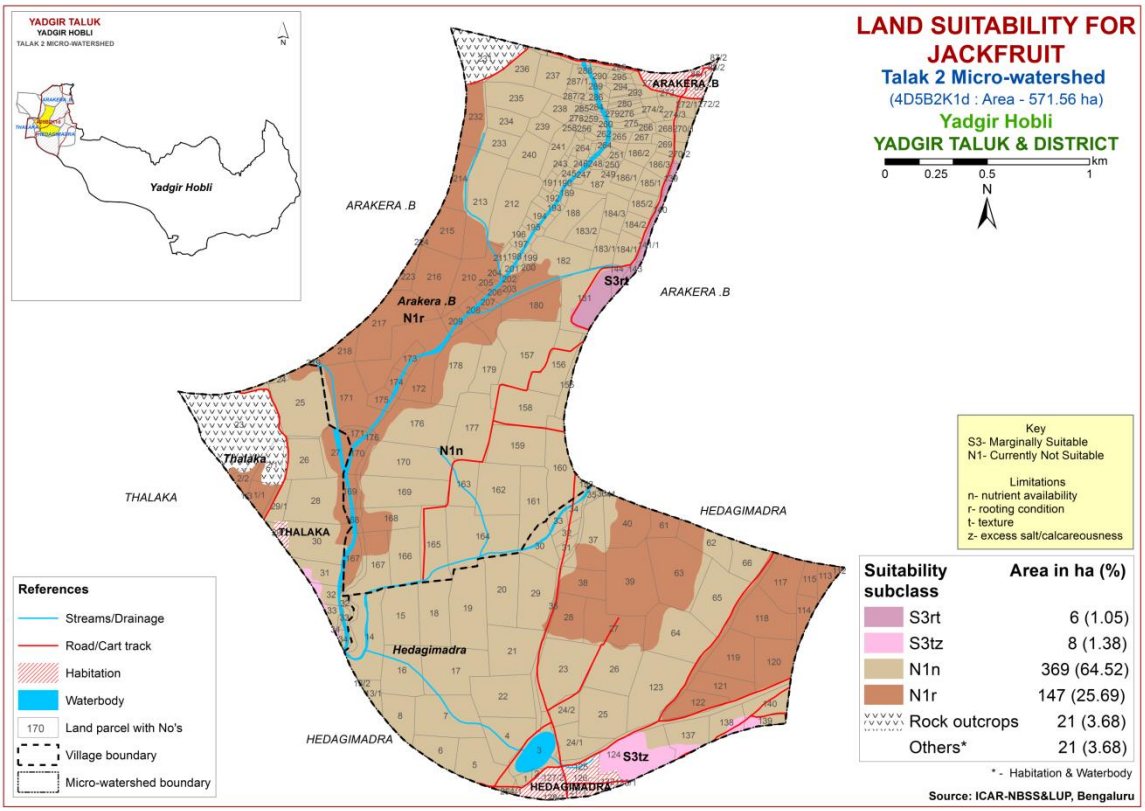


Fig. 7.23 Land Suitability map of Jackfruit

7.24 Land Suitability for Jamun (*Syzygium cumini*)

Jamun is an important fruit crop grown in almost all the districts of the State. The crop requirements for growing jamun (Table 25) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing jamun was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.24.

An area of about 14 ha (2%) is marginally suitable (Class S3) and is distributed in the northern and southern part of the microwatershed with moderate limitations of rooting depth, texture and calcareousness. Currently not suitable (Class N1) lands occur in an area of 516 ha (90%) and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

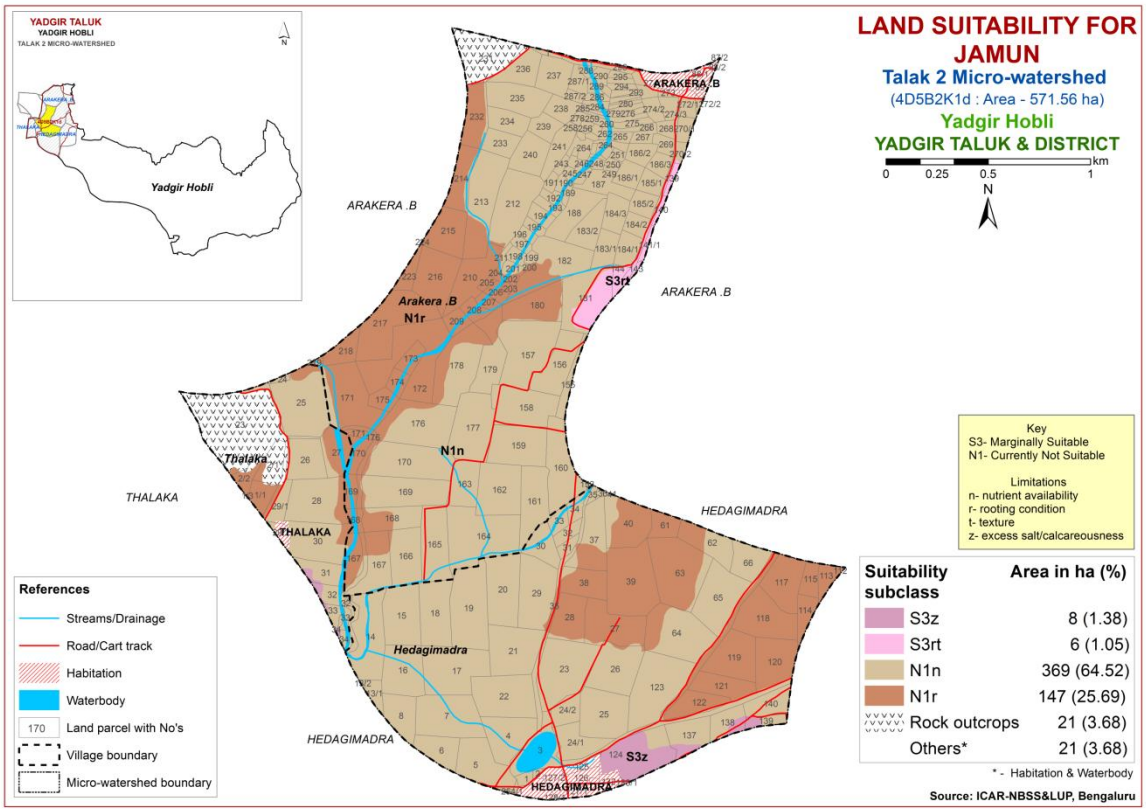


Fig. 7.24 Land Suitability map of Jamun

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

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

An area of about 8 ha (1%) is moderately suitable (Class S2) for growing custard apple and is distributed in the southeastern and western part of the microwatershed with minor limitation of calcareousness. Marginally suitable lands (Class S3) for growing custard apple occupy an area of about 198 ha (35%) and are distributed in the central, northern, southern, western and southeastern part of the microwatershed with moderate limitations of nutrient availability, texture and rooting depth. Currently not suitable (Class N1) lands occur in an area of 324 ha (57%) and are distributed in the major part of the microwatershed with severe limitation of nutrient availability.

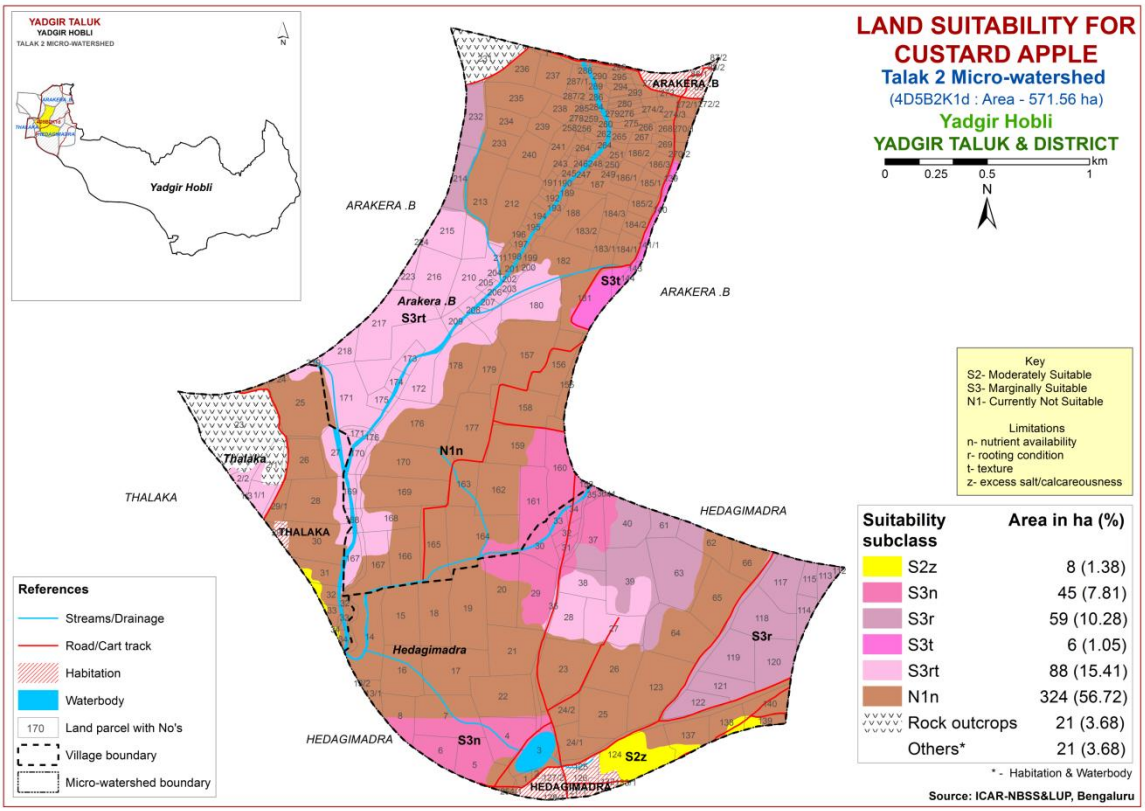


Fig. 7.25 Land Suitability map of Custard Apple

7.26 Land Suitability for Tamarind (*Tamarindus indica*)

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

An area of about 8 ha (1%) is marginally suitable (Class S3) and is distributed in the southern part of the microwatershed with moderate limitation of calcareousness. Currently not suitable (Class N1) lands occur in an area of 522 ha (91%) and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

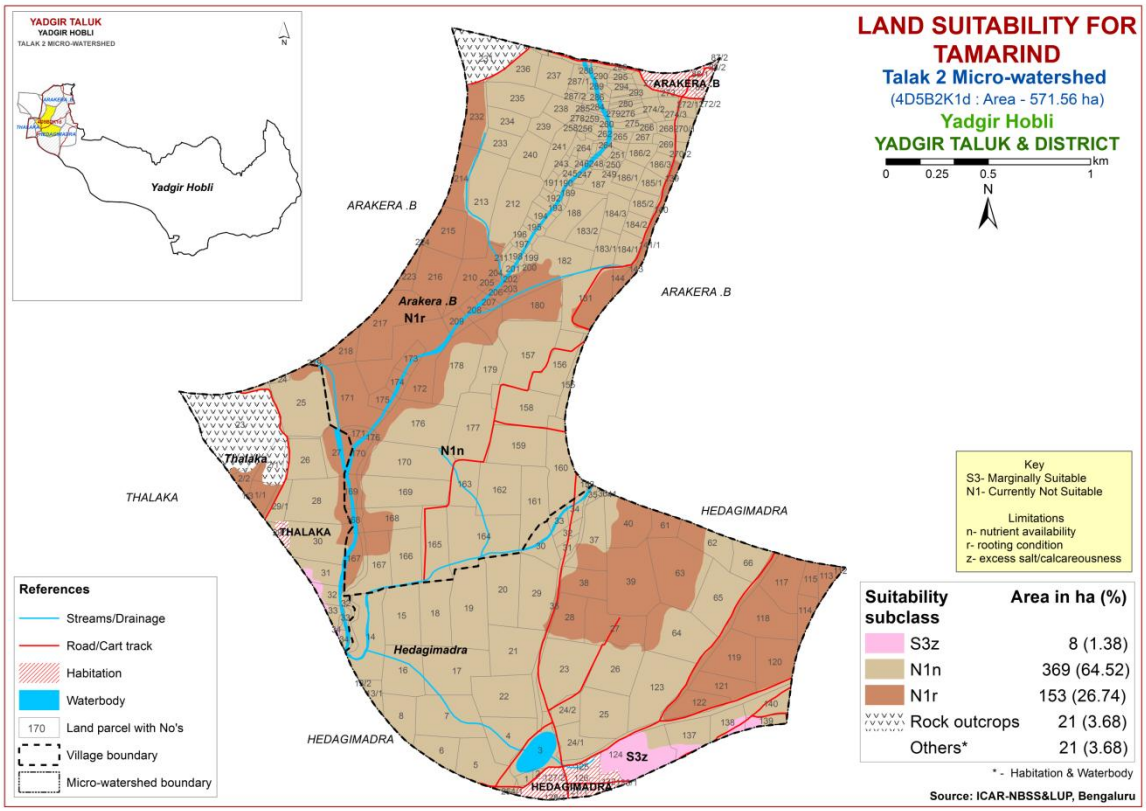


Fig. 7.26 Land Suitability map of Tamarind

7.27 Land Suitability for Mulberry (*Morus nigra*)

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

An area of about 14 ha (2%) is marginally suitable (Class S3) and is distributed in the major part of the microwatershed with moderate limitations of rooting depth, texture and calcareousness. Currently not suitable (Class N1) lands occur in an area of 516 ha (90%) and are distributed in the major part of the microwatershed with severe limitations of rooting depth and nutrient availability.

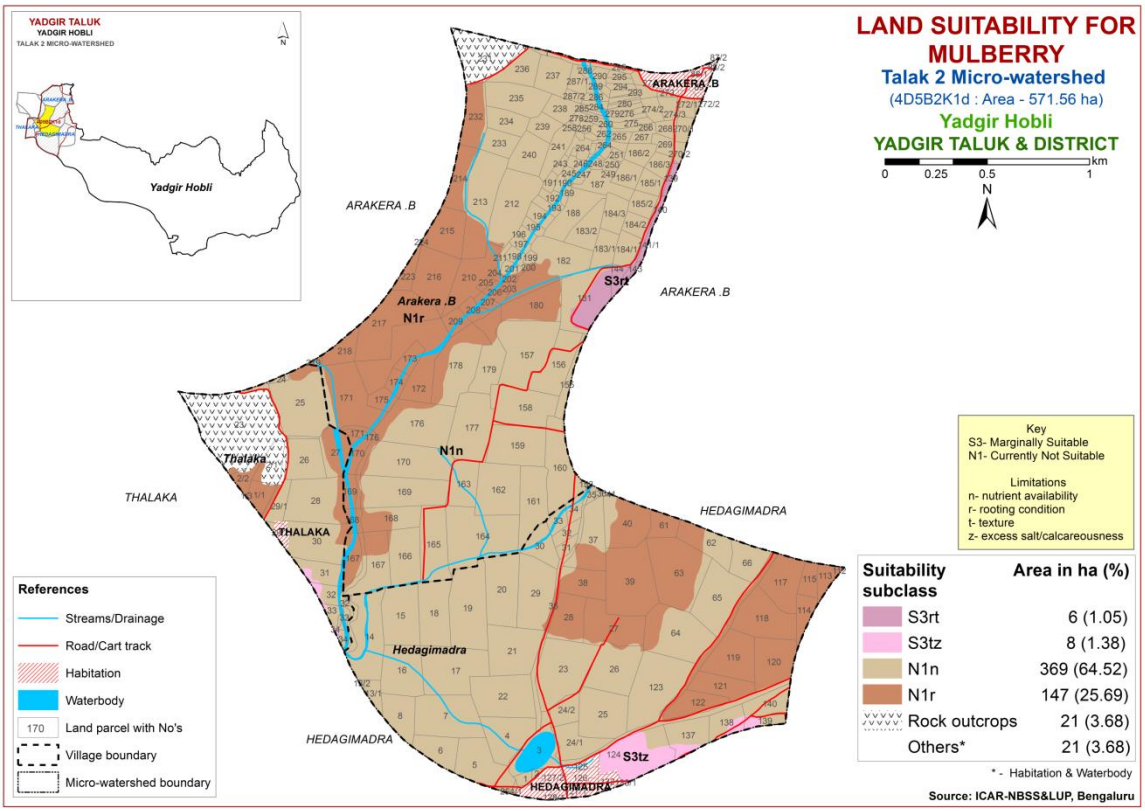


Fig 7.27 Land Suitability map of Mulberry

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

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

An area of about 8 ha (1%) is moderately suitable (Class S2) for growing marigold and is distributed in the southeastern and western part of the microwatershed with minor limitations of calcareousness and texture. Marginally suitable lands (Class S3) for growing marigold occupy an area of about 198 ha (35%) and are distributed in the central, northern, southern, western and southeastern part of the microwatershed with moderate limitations of nutrient availability, texture and rooting depth. Currently not suitable (Class N1) lands occur in an area of 324 ha (57%) and are distributed in the major part of the microwatershed with severe limitation of nutrient availability.

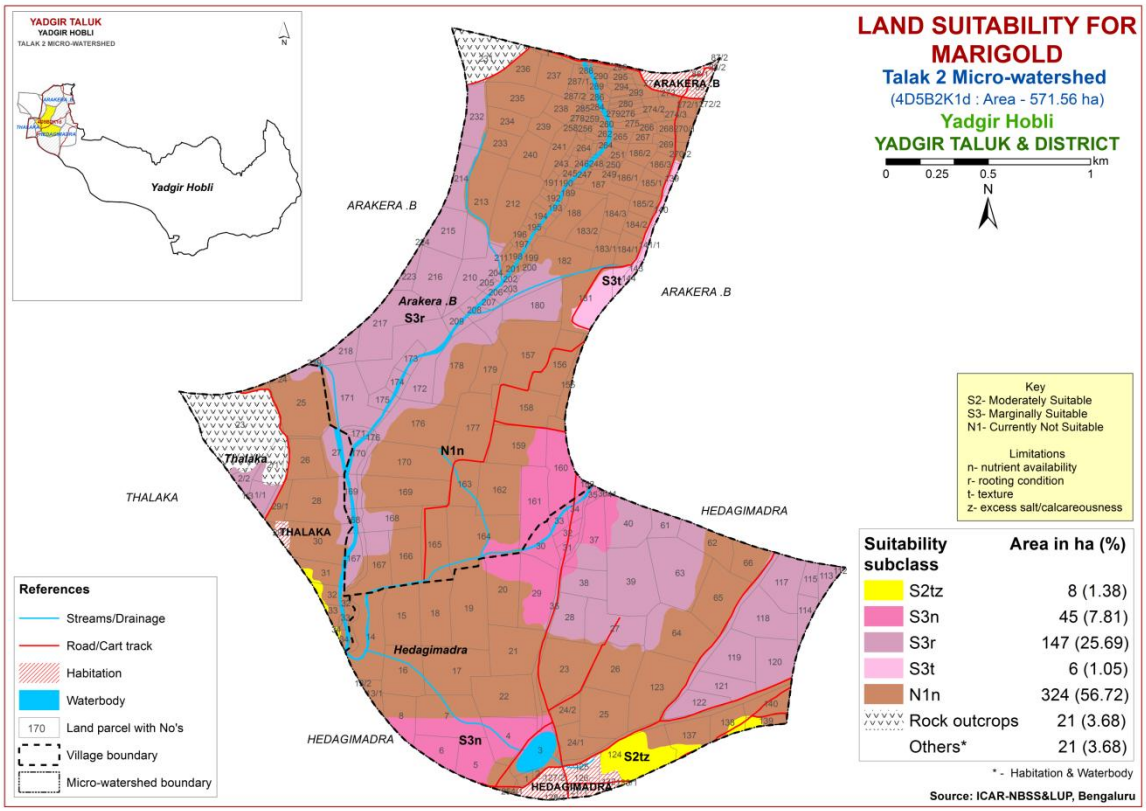


Fig. 7.28 Land Suitability map of Marigold

7.29 Land Suitability for Chrysanthemum (*Dendranthema grandiflora*)

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

An area of about 8 ha (1%) is moderately suitable (Class S2) for growing chrysanthemum and is distributed in the southeastern and western part of the microwatershed with minor limitations of calcareousness and calcareousness. Marginally suitable lands (Class S3) for growing chrysanthemum occupy an area of about 198 ha (35%) and are distributed in the central, northern, southern, western and southeastern part of the microwatershed with moderate limitations of nutrient availability, texture and rooting depth. Currently not suitable (Class N1) lands occur in an area of 324 ha (57%) and are distributed in the major part of the microwatershed with severe limitation of nutrient availability.

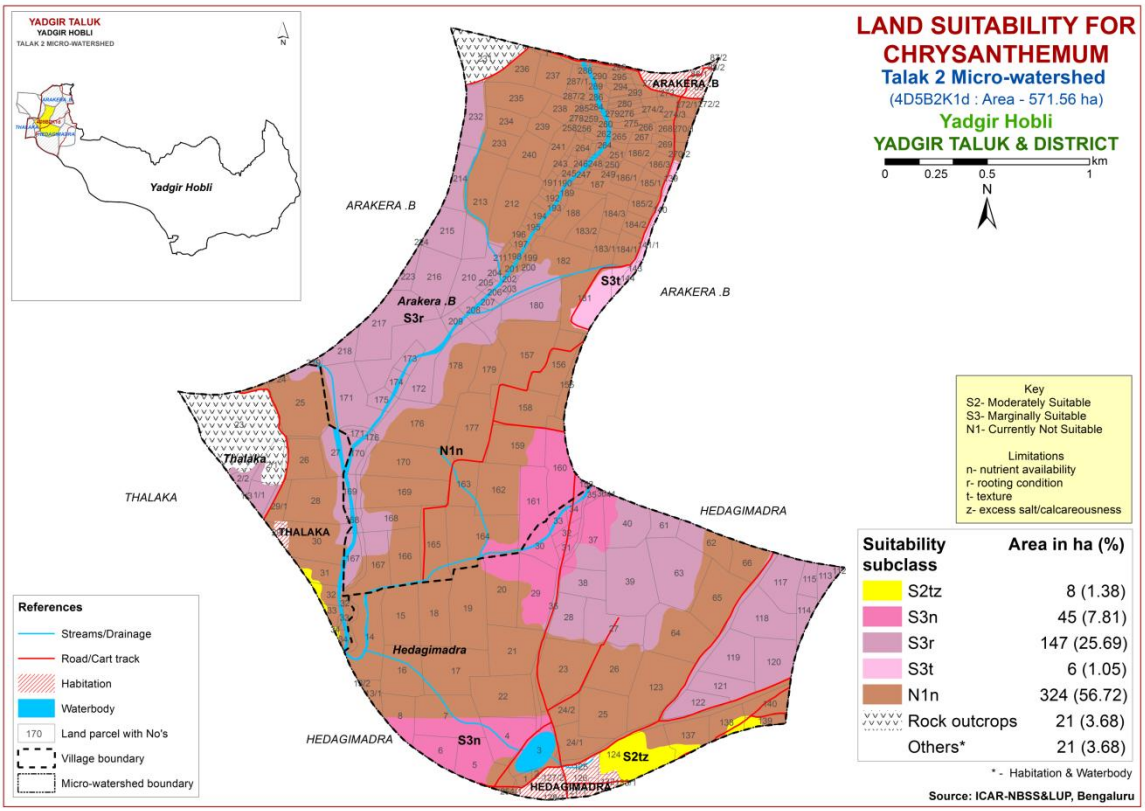


Fig. 7.29 Land Suitability map of Chrysanthemum

Table 7.1 Soil-Site Characteristics of Talak-2 Microwatershed

Soil Map Units	Climate (P) (mm)	Growing period (Days)	Drain-age Class	Soil depth (cm)	Soil texture		Gravelliness		AWC (mm/m)	Slope (%)	Erosion	pH	EC (dSm^{-1})	ESP (%)	CEC [Cmol (p^{+})kg^{-1}]	BS (%)
					Sur-face	Sub-surface	Surface (%)	Sub-surface (%)								
VNKbB2g1	866	150	WD	25-50	ls	sc	15-35	<15	<50	1-3	moderate	5.37	0.11	2.22	6.27	75
VNKcB2	866	150	WD	25-50	sl	sc	<15	<15	<50	1-3	moderate	5.37	0.11	2.22	6.27	75
VNKmB2g1	866	150	WD	25-50	m	sc	15-35	<15	<50	1-3	moderate	5.37	0.11	2.22	6.27	75
BDLbB2	866	150	WD	25-50	ls	sl	<15	<15	<50	1-3	moderate	6.20	0.074	0.20	4.20	93
BDLhB2	866	150	WD	25-50	scl	sl	<15	<15	<50	1-3	moderate	6.20	0.074	0.20	4.20	93
SBRhB2	866	150	Sed	50-75	scl	ls	<15	<15	<50	1-3	moderate	8.24	0.145	1.15	7.50	100
GWDcB2	866	150	MW	75-100	sl	scl	<15	<15	101-150	1-3	moderate	9.89	0.74	17.40	8.35	100
GWDmB2	866	150	MW	75-100	c	scl	<15	<15	101-150	1-3	moderate	9.89	0.74	17.40	8.35	100
GWDiB2	866	150	MW	75-100	sc	scl	<15	<15	101-150	1-3	moderate	9.89	0.74	17.40	8.35	100
NGPmB2	866	150	MW	100-150	c	c	<15	<15	>200	1-3	moderate	7.42	0.24	0.22	67.10	100
ANRhB2	866	150	MW	100-150	scl	c	<15	<15	>200	1-3	moderate	10.17	0.365	7.08	19.90	100
VKSmB1	866	150	WD	100-150	c	scl	<15	<15	>200	1-3	slight	9.1	0.586	3.97	17.57	100
TMKiB2	866	150	MW	>150	sc	c	<15	<15	>200	1-3	moderate	9.60	0.35	6.63	21.83	100
BMNmB2g1	866	150	MW	>150	c	c	15-35	<15	>200	1-3	moderate	8.2	0.284	0.65	52.70	100
MDRmB2	866	150	WD	>150	m	scl	<15	<15	>200	1-3	moderate	8.31	0.33	0.90	20.57	100
MDRhB2	866	150	WD	>150	scl	scl	<15	<15	>200	1-3	moderate	8.31	0.33	0.90	20.57	100
MDRiB2	866	150	WD	>150	sc	scl	<15	<15	>200	1-3	moderate	8.31	0.33	0.90	20.57	100

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

Table 7.2 Land suitability criteria for Sorghum

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

Table 7.3 Land suitability criteria for Maize

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

Table 7.4 Land suitability criteria for Bajra

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

Table 7.5 Land suitability criteria for Groundnut

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

Table 7.6 Land suitability criteria for Sunflower

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

Table 7.7 Land suitability criteria for Redgram

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

Table 7.8 Land suitability criteria for Bengal gram

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

Table 7.9 Land suitability criteria for Cotton

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

Table 7.10 Land suitability criteria for Chilli

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

Table 7.11 Land suitability criteria for Tomato

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

Table 7.12 Land suitability criteria for Brinjal

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

Table 7.13 Land suitability criteria for Onion

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

Table 7.14 Land suitability criteria for Bhendi

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

Table 7.15 Land suitability criteria for Drumstick

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

Table 7.16 Land suitability criteria for Mango

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

Table 7.17 Land suitability criteria for Guava

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

Table 7.18 Land suitability criteria for Sapota

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

Table 7.19 Land suitability criteria for Pomegranate

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

Table 7.20 Land suitability criteria for Musambi

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

Table 7.21 Land suitability criteria for Lime

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

Table 7.22 Land suitability criteria for Amla

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

Table 7.23 Land suitability criteria for Cashew

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

Table 7.24 Land suitability criteria for Jackfruit

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

Table 7.25 Land suitability criteria for Jamun

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

Table 7.26 Land suitability criteria for Custard apple

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

Table 7.27 Land suitability criteria for Tamarind

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

Table 7.28 Land suitability criteria for Mulberry

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

Table 7.29 Land suitability criteria for Marigold

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

Table 7.30 Land suitability criteria for Chrysanthemum

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

7.30 Land Management Units (LMUs)

The 17 soil map units identified in Talak-2 microwatershed have been grouped into 5 Land Management Units (LMU's) for the purpose of preparing a Proposed Crop Plan. Land Management Units are grouped based on the similarities in respect of the type of soil, the depth of the soil, the surface soil texture, gravel content, AWC, slope, erosion etc. and a Land Management Units map (Fig. 7.30) has been generated. These Land Management Units are expected to behave similarly for a given level of management.

The 17 map units that have been grouped into 5 Land Management Units along with brief description of soil and site characteristics are given below.

LMU	Soil map units	Soil and site characteristics
1	104.TMKiB2 53.ANRhB2 100.VKSmB1 34.GWDcB2 35.GWDiB2 127.GWDmB2	Moderately deep to very deep (75 to >150 cm), sodic soils, 1-3% slopes, non gravelly (<15%), slight to moderate erosion.
2	132.MDRhB2 133.MDRiB2 61.MDRmB2	Very deep (>150 cm), sandy clay loam soils, 1-3% slopes, non gravelly (15%), moderate erosion.
3	49.NGPmB2 63.BMNmB2g1	Deep to very deep (100 to >150 cm), black calcareous clay soils, 1-3% slopes, non gravelly to gravelly (<15-35%), moderate erosion.
4	125.SBRhB2	Moderately shallow (50 to 75 cm), loamy sand soils, 1-3% slopes, non gravelly (<15%), moderate erosion.
5	2.BDLbB2 4.BDLhB2 8.VNKbB2g1 9.VNKcB2	Shallow (25 to 50 cm) soils, 1-3% slopes, non gravelly to gravelly (<15-35%), moderate erosion.

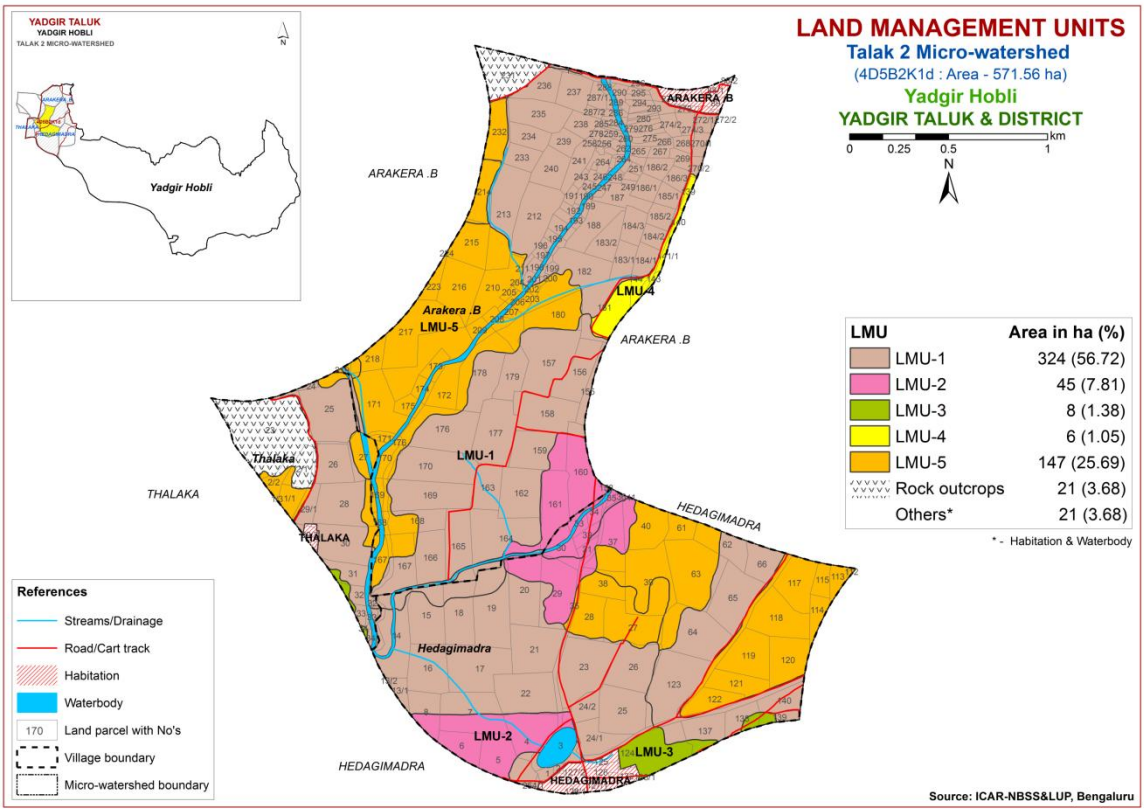


Fig. 7.30 Land Management Units Map- Talak-2 Microwatershed

7.31 Proposed Crop Plan for Talak-2 Microwatershed

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

Table 7.31 Proposed Crop Plan for Talak-2 Microwatershed

LMU	Soil Map Units	Survey Number	Field Crops/ Commercial crops	Horticulture Crops (Rainfed/Irrigated)	Suitable Interventions
1	104.TMKiB2 53.ANRhB2 100.VKSmB1 34.GWDcB2 35.GWDiB2 127.GWDmB2 (Moderately deep to very deep, sodic soils)	**Arakera .B:**1,155,156,157,158,159,162,163,164,165,166,168,169,170,176,177,178,179,182,183/1,183/2,184/1,184/2,184/3,185/1,185/2,186/1,186/2,186/3,187,188,189,190,191,192,193,194,195,196,197,198,199,201,211,212,213,233,234,235,236,237,238,239,240,241,242,243,244,245,246,247,248,249,250,251,252,253/1,253/2,254,255,256,257,258,259,260,261,262,263,264,265,266,267,268,269,270/1,270/2,272/1,272/2,273,274/1,274/2,274/3,275,276,277,278,279,280,281,282,283,284,285,286,287/1,287/2,288,289,290,291,292,293,294,295,296 **Hedagimadra:**1,2,7,8,13/1,13/2,14,15,16,17,18,19,20,21,22,23,24/1,24/2,25,26,35,62,64,65,66,123,137,138,139,140, 254/1 **Thalaka :** 24,25,26,28,29/1,30,31,32,33,34	-	**Agri-Silvi-Pasture** Ber, Aonla, Acacia sp. Dhaincha, Rhodes grass, Para grass, Bermuda grass	Application of gypsum, iron pyrites and elemental sulphur. Addition of farm yard manure, green manure and providing subsurface drainage
2	132.MDRhB2 133.MDRiB2 61.MDRmB2 (Very deep, sandy clay loam soils)	**Arakera .B :**153,160,161 **Hedagimadra:**4,29,30,31,32,33,34,36,37,41,45,56	Sunflower, Sorghum, Maize, Groundnut, Red gram, Bajra	**Fruit crops:** Mango, Musambi, Sapota, Tamarind, Pomegranate**,** Amla, Custard apple, Guava, Jackfruit, Jamun, Lime **Vegetables:** Tomato, Onion, Bhendi, Chilli, Brinjal, Drumstick, Coriander **Flowers:** Marigold, Chrysanthemum	Application of FYM, Biofertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices

LMU	Soil Map Units	Survey Number	Field Crops/ Commercial crops	Horticulture Crops (Rainfed/Irrigated)	Suitable Interventions
3	49.NGPmB2 63.BMNmB2g1 (Deep to very deep, black calcareous clay soils)	**Arakera .B :** 87/2 **Hedagimadra :**124,133/1	Maize, Sorghum, Sunflower, Cotton, Red gram, Bengalgram, Bajra	**Fruit crops:** Lime**,** Musambi, Custard apple, Pomegranate **Vegetables:** Chilli**,** Bhendi **Flowers:** Marigold, Chrysanthemum	Application of FYM, Biofertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices
4	125.SBRhB2 (Moderately shallow, loamy sand soils)	**Arakera .B :**139,140,141/1,143,144,181	-	**Agri-Silvi-Pasture:** Hybrid Napier, *Styloxanthes hamata, Styloxanthes scabra*	Application of FYM, Biofertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices
5	2.BDLbB2 4.BDLhB2 8.VNKbB2g1 9.VNKcB2 109.VNKmB2g1 (Shallow soils)	**Arakera .B :**167,171,172,173,174,175,180, 200,202,203,204,205,206,207,208,209,210,214,215,216,217 ,218,219,223,224,232 **Hedagimadra:**27,28,38,39,40,61,63,112,113, 114,115,117,118,119,120,121, 122 **Thalaka :**1/1,1/3,2/2,27	-	**Agri-Silvi-Pasture:** Hybrid Napier, *Styloxanthes hamata, Styloxanthes scabra*	Use of short duration varieties, sowing across the slope, drip irrigation is recommended

Chapter 8

SOIL HEALTH MANAGEMENT

8.1 Soil Health

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

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

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

The most important characteristics of a healthy soil are

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

Characteristics of Talak-2 Microwatershed

- The soil phases identified in the microwatershed belonged to the soil series of GWD series occupies a maximum area of 204 ha (36%) followed by TMK 91 ha (16%), BDL 88 ha (15%), VNK 59 ha (10%), MDR 46 ha (8%), ANR 27 ha (5%), NGP 8 (1%), SBR 6 ha (1%), VKS 2 ha (<1%) and BMN 0.0016 ha (<1).
- As per land capability classification entire area of the microwatershed falls under arable land category (Class II, III & IV). The major limitations identified in the arable lands were soil and erosion.
- On the basis of soil reaction, entire area of the microwatershed is neutral (pH 6.5-7.3).

❖ **Soil Health Management**

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

Acid soils

Acid soils do not occur in the microwatershed.

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

Liming materials:

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

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

Alkaline soils

Alkaline soils do not occur in the microwatershed.

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

Neutral soils

Neutral soils occur in the entire area of the microwatershed.

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

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

Soil Degradation

Soil erosion is one of the major factor affecting the soil health in the microwatershed. Out of total 572 ha area in the microwatershed, an area of about 2 ha

(<1%) is suffering from slight erosion and about 528 ha (92%) is suffering from moderate erosion. In areas of moderate erosion immediate soil and water conservation and, other land development and land husbandry practices are required for restoring soil health.

Dissemination of Information and Communication of Benefits

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

Inputs for Net Planning (Saturation Plan) and Interventions needed

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

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

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

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

- **Gravelliness:** More gravel content is favorable for run-off harvesting but poor in soil moisture storage and nutrient availability. It is a significant parameter that decides the kind of crop to be raised.
- **Land Capability Classification:** The land capability map shows the areas suitable and not suitable for agriculture and the major constraints in each of the plot/survey number. Hence, one can decide what kind of enterprise is possible in each of these units. In general, erosion and soil are the major constraints in Talak-2 microwatershed.
- **Organic Carbon:** The OC content (an index of available Nitrogen) is medium (0.5-0.75%) in an area of 335 ha (59%). Low (<0.5%) in an area of 143 ha (25%) and high (0.75%) in an area of 51 ha (9%) in the microwatershed. The areas that are medium and low in OC needs to be further improved by applying farmyard manure and crop rotation 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 where OC is medium and low (<0.5 - 0.75%). For example, for rainfed maize, recommended level is 50 kg N per ha and an additional 12 kg /ha needs to be applied for all the crops grown in these plots.
- **Available Phosphorus**: Available Phosphorus is medium (23-57 kg/ha) in an area of 472 ha (83%) in the microwatershed. Low (<23 kg/ha) in an area of 47 ha (8%) and high (>57 kg/ha) in an area of 10 ha (2%). In medium and low areas, for all the crops 25% additional P needs to be applied.
- **Available Potassium:** Available potassium is medium (145-337 kg/ha) in an area of 472 ha (83%) and high (>337 kg/ha) in an area of 58 ha (10%) in the microwatershed. All the plots, where available potassium is medium, for all the crops, additional 25% potassium may be applied.
- **Available Sulphur:** Available sulphur is a very critical nutrient for oilseed crops. It is medium in an area of 283 ha (50%). Low in an area of 235 ha (41%) and high (>20 ppm) in an area of 12 ha (2%) in the microwatershed. Low and medium areas need to be applied with magnesium sulphate or gypsum or Factamphos (p) fertilizer (13% sulphur) for 2-3 years for the deficiency to be corrected.
- **Available Boron:** An area of 167 ha (29%) is low (<0.5 ppm) in available boron and medium (0.5-1.0 ppm) in an area of 362 ha (63%). Application of sodium tetra borate @ 10 kg/ha as soil application or 0.2 % borax as foliar spray is recommended for low and medium areas.

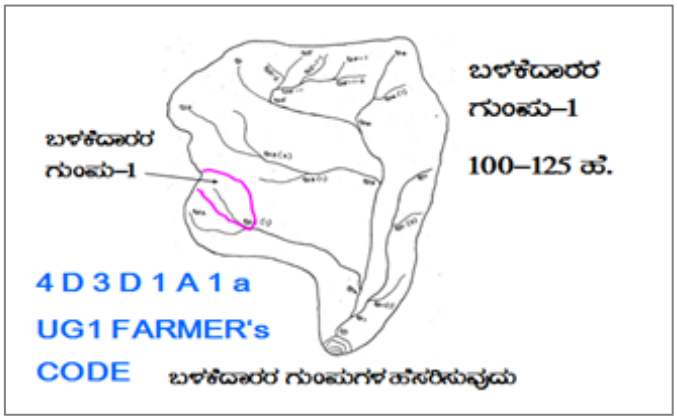
- **Available Iron:** Available iron content is sufficient (>4.5 ppm) in an area of 520 ha (91%) and deficient (<4.5 ppm) in an area of 9 ha (2%) in the microwatershed. Deficient areas need to be applied with iron sulphate @ 25 kg/ha for 2-3 years.
- **Available Manganese:** All the soils in the microwatershed are sufficient (>1.0 ppm) in available manganese.
- **Available Copper:** All the soils in the microwatershed are sufficient (>0.2 ppm) in available copper.
- **Available Zinc:** Maximum area of 368 ha (64%) is deficient (<0.6 ppm) in available zinc content of the microwatershed and 162 ha (28%) area is sufficient (>0.6 ppm). Application of zinc sulphate @25 kg/ha is recommended for zinc deficient areas.
- **Soil Alkalinity**: Alkaline soils are not occuring in the microwatershed. Alkaline soils 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, Acacia, 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 the water holding capacity of light textured soils, growing of green manure crops and application of organic manure is recommended.

Chapter 9

SOIL AND WATER CONSERVATION TREATMENT PLAN

For preparing soil and water conservation treatment plan for Talak-2 microwatershed, the land resource inventory database generated under Sujala-III project has been transformed as information through series of interpretative (thematic) maps using soil phase map as a base. The various thematic maps (1:7920 scale) generated were

- Soil depth
- Surface soil texture
- Available water capacity
- Soil slope
- Soil gravelliness
- Land capability
- Present land use and land cover
- Crop suitability
- Rainfall
- Hydrology
- Water Resources
- Socio-economic data



- Contour plan with existing features- network of waterways, pothissa boundaries, cut up/ minor terraces etc.
- Cadastral map (1:7920 scale)
- Satellite imagery (1:7920 scale)

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

Steps for Survey and Preparation of Treatment Plan

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

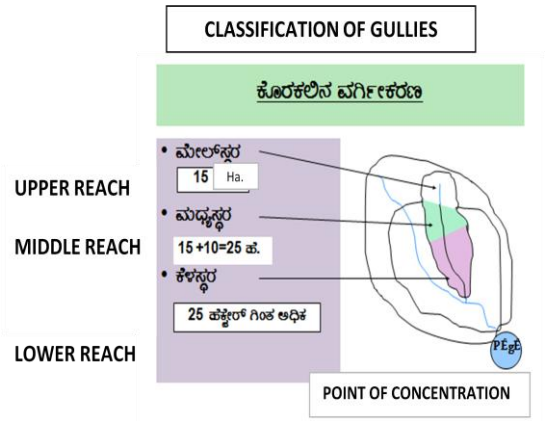
- Naming of user groups and farmers
- Identification of arable and non arable lands
- Identification of drainage lines and gullies
- Identification of non treatable areas
- Identification of priority areas in the arable lands
- Treatment plan for arable lands
- Location of water harvesting and recharge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

9.1 Treatment Plan

The treatment plan recommended for arable lands is briefly described below

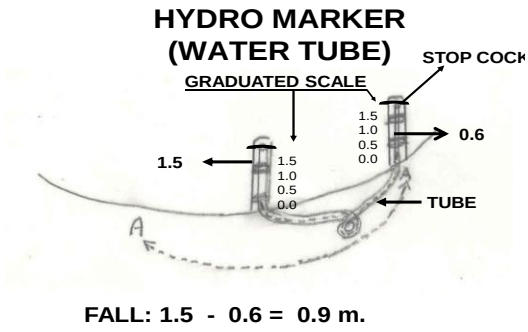
9.1.1 Arable Land Treatment

A. BUNDING

Steps for Survey and Preparation of Treatment Plan		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 ($bg_{0...}$ b=loamy sand, g_0 = <15% gravel). The recommended Sections for different soils are given below.

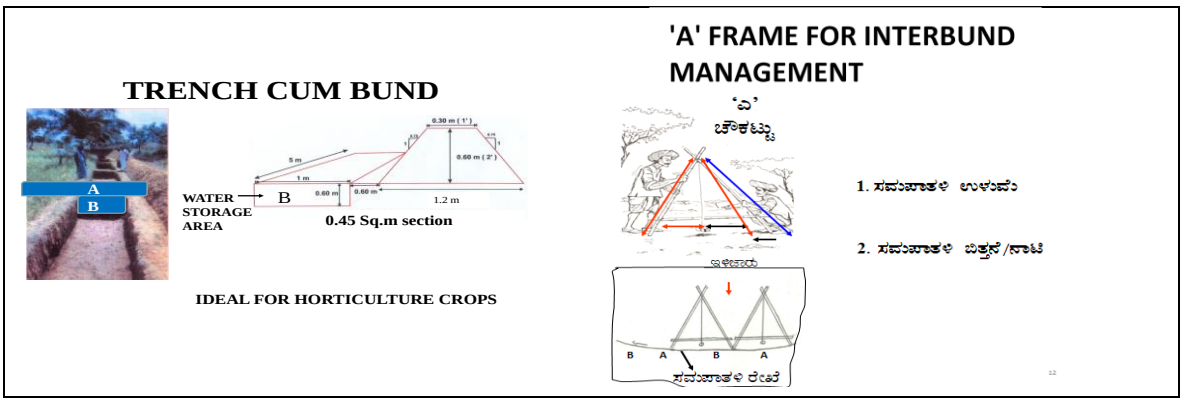
Recommended Bund Section

Top width (m)	Base width (m)	Height (m)	Side slope (Z:1;H:V)	Cross section (sq m)	Soil Texture	Remarks
0.3	0.9	0.3	01:01	0.18	Sandy loam	Vegetative bund
0.3	1.2	0.3	1.5:1	0.225	Sandy clay	
0.3	1.2	0.5	0.9:1	0.375	Red gravelly soils	
0.3	1.2	0.6	0.75:1	0.45		
0.3	1.5	0.6	01:01	0.54	Red sandy loam	
0.3	2.1	0.6	1.5:1	0.72	Very shallow black 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
m^2	m	m^3	L(m)	W(m)	D(m)	Quantity (m^3)	m	
0.375	6	2.25	5.85	0.85	0.45	2.24	0.15	Shallow
0.45	6	2.7	5.4	1.2	0.43	2.79	0.6	Shallow
0.45	6	2.7	5	0.85	0.65	2.76	1	Moderately Shallow
0.54	5.6	3.02	5.5	0.85	0.7	3.27	0.1	Moderately shallow
0.54	5.5	2.97	5	1.2	0.5	3	0.5	Shallow
0.72	6.2	4.46	6	1.2	0.7	5.04	0.2	Moderately shallow
0.72	5.2	3.74	5.1	0.85	0.9	3.9	0.1	Moderately deep

B. Water Ways

1. Existing waterways are marked on the cadastral map (1:7920 scale) and their dimensions are recorded.
2. Considering the contour plan of the MWS, additional waterways/ modernization of the existing ones can be thought of.
3. The design details are given in the Manual.

C. Farm Ponds

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

D. Diversion Channel

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

9.1.2 Non-Arable Land Treatment

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

9.1.3 Treatment of Natural Water Course/ Drainage Lines

a) The cadastral map has to be updated as regards the network of drainage lines (gullies/ *nalas/hallas*) and existing structures are marked to the scale and storage capacity of the existing water bodies are documented.
b) The drainage line will be demarcated into Upper Reach, Middle Reach and Lower Reach.
c) Considering the Catchment, *Nala* bed and bank conditions, suitable structures are decided.
d) Number of storage structures (Check dam/*Nala* bund/ Percolation tank) will be decided considering the commitments and available runoff from water budgeting and quality of water in the wells and site suitability.
e) Detailed 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 earthen 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 471 ha (82%) needs Graded Bunding and an area of 59 ha (10%) needs Trench cum Bunding in the microwatershed.

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.

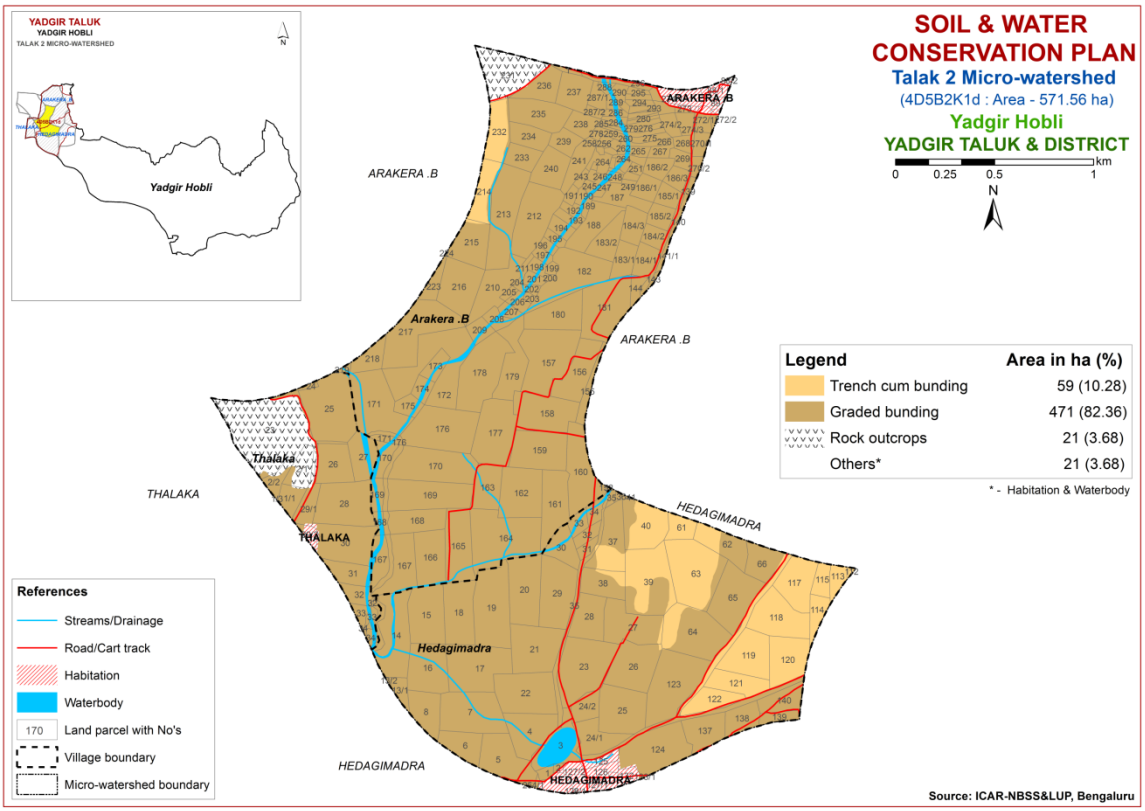


Fig. 9.1 Soil and Water Conservation Plan map of Talak-2 Microwatershed

9.3 Greening of Microwatershed

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

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

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

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

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Appendix I

Talak-2 (2K1d) Microwatershed

Soil Phase Information

Village	Survey Number	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
Hedagimadra	1	0.48	GWDcB2	LMU-1	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Habitation	Not Available	IVes	Graded bunding
Hedagimadra	2	0.23	GWDcB2	LMU-1	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Habitation	Not Available	IVes	Graded bunding
Hedagimadra	3	4.02	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody	Not Available	Others	Others
Hedagimadra	4	4.37	MDRmB2	LMU-2	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Hedagimadra	5	4.78	MDRmB2	LMU-2	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Hedagimadra	6	2.67	MDRmB2	LMU-2	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Hedagimadra	7	6.38	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Hedagimadra	8	2.98	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Hedagimadra	13/1	0.98	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Hedagimadra	13/2	0.08	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Hedagimadra	14	6.18	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Paddy (Rg+Pd)	Not Available	IVes	Graded bunding
Hedagimadra	15	5.16	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Hedagimadra	16	4.8	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Hedagimadra	17	6.74	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Paddy (Ct+Pd)	Not Available	IVes	Graded bunding
Hedagimadra	18	4.83	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Hedagimadra	19	7.13	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Hedagimadra	20	5.48	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Paddy (Ct+Pd)	Not Available	IVes	Graded bunding
Hedagimadra	21	5.67	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	1 Bore Well	IVes	Graded bunding
Hedagimadra	22	6.06	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Horticulture plantation (Hp)	Not Available	IVes	Graded bunding
Hedagimadra	23	7.32	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Hedagimadra	24/1	3.01	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Hedagimadra	24/2	1.77	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding

Village	Survey Number	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
Hedagimadra	25	5.33	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Hedagimadra	26	5.23	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Hedagimadra	27	5.11	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIIes	Graded bunding
Hedagimadra	28	3.5	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIIes	Graded bunding
Hedagimadra	29	5.79	MDRhB2	LMU-2	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	1 Bore Well	IIes	Graded bunding
Hedagimadra	30	2.33	MDRiB2	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Hedagimadra	31	0.63	MDRhB2	LMU-2	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Hedagimadra	32	0.9	MDRiB2	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Hedagimadra	33	0.97	MDRiB2	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Hedagimadra	34	0.93	MDRiB2	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Hedagimadra	35	2.67	GWDmB2	LMU-1	Moderately deep (75-100 cm)	Clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Hedagimadra	36	0.15	MDRiB2	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIes	Graded bunding
Hedagimadra	37	4.36	MDRhB2	LMU-2	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Hedagimadra	38	3.04	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIIes	Graded bunding
Hedagimadra	39	7.82	VNKcB2	LMU-5	Shallow (25-50 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIIes	Trench cum bunding
Hedagimadra	40	4.85	VNKcB2	LMU-5	Shallow (25-50 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIIes	Trench cum bunding
Hedagimadra	41	0.07	MDRiB2	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIes	Graded bunding
Hedagimadra	45	0.01	MDRhB2	LMU-2	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIes	Graded bunding
Hedagimadra	61	1.63	VNKcB2	LMU-5	Shallow (25-50 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIIes	Trench cum bunding
Hedagimadra	62	3.3	GWDcB2	LMU-1	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	Not Available	IVes	Graded bunding
Hedagimadra	63	7.85	VNKcB2	LMU-5	Shallow (25-50 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	Not Available	IIIes	Trench cum bunding
Hedagimadra	64	7.04	GWDcB2	LMU-1	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	Not Available	IVes	Graded bunding
Hedagimadra	65	5.78	GWDcB2	LMU-1	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	Not Available	IVes	Graded bunding
Hedagimadra	66	2.77	GWDcB2	LMU-1	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	Not Available	IVes	Graded bunding

Village	Survey Number	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
Hedagi madra	112	0.15	VNKbB2g1	LMU-5	Shallow (25-50 cm)	Loamy sand	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	Not Available	IIIes	Trench cum bunding
Hedagi madra	113	1.12	VNKbB2g1	LMU-5	Shallow (25-50 cm)	Loamy sand	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIIes	Trench cum bunding
Hedagi madra	114	1.52	VNKbB2g1	LMU-5	Shallow (25-50 cm)	Loamy sand	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIIes	Trench cum bunding
Hedagi madra	115	1.34	VNKbB2g1	LMU-5	Shallow (25-50 cm)	Loamy sand	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIIes	Trench cum bunding
Hedagi madra	117	4.14	VNKbB2g1	LMU-5	Shallow (25-50 cm)	Loamy sand	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	Not Available	IIIes	Trench cum bunding
Hedagi madra	118	5.29	VNKbB2g1	LMU-5	Shallow (25-50 cm)	Loamy sand	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	1 Bore Well	IIIes	Trench cum bunding
Hedagi madra	119	4.66	VNKbB2g1	LMU-5	Shallow (25-50 cm)	Loamy sand	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	Not Available	IIIes	Trench cum bunding
Hedagi madra	120	4.39	VNKbB2g1	LMU-5	Shallow (25-50 cm)	Loamy sand	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	2 Bore Well	IIIes	Trench cum bunding
Hedagi madra	121	2.93	VNKbB2g1	LMU-5	Shallow (25-50 cm)	Loamy sand	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIIes	Trench cum bunding
Hedagi madra	122	2.58	VNKbB2g1	LMU-5	Shallow (25-50 cm)	Loamy sand	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIIes	Trench cum bunding
Hedagi madra	123	7.65	GWDcB2	LMU-1	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	Not Available	IVes	Graded bunding
Hedagi madra	124	6.55	NGPmB2	LMU-3	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Hedagi madra	125	0.83	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Hedagi madra	126	1.04	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Hedagi madra	127/1	1.37	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Hedagi madra	127/2	0.97	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Hedagi madra	128/1	0.04	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Hedagi madra	132	0.82	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Hedagi madra	133/1	0.05	NGPmB2	LMU-3	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Hedagi madra	137	3.17	GWDcB2	LMU-1	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Hedagi madra	138	2.23	GWDcB2	LMU-1	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	Not Available	IVes	Graded bunding
Hedagi madra	139	1.02	GWDcB2	LMU-1	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Hedagi madra	140	2.39	GWDcB2	LMU-1	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Hedagi madra	254/1	0.24	GWDcB2	LMU-1	Moderately deep (75-100 cm)	Sandy loam	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding

Village	Survey Number	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
Thalaka	1/1	1.47	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIIes	Graded bunding
Thalaka	1/3	0.01	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIIes	Graded bunding
Thalaka	2/1	2.07	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Cotton (Ct)	Not Available	Rock outcrops	Rock outcrops
Thalaka	2/2	1.21	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIIes	Graded bunding
Thalaka	23	13.48	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops (Rc)	Not Available	Rock outcrops	Rock outcrops
Thalaka	24	0.22	ANRhB2	LMU-1	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Scrub land (Rg+Sl)	Not Available	IVes	Graded bunding
Thalaka	25	7.61	ANRhB2	LMU-1	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Jowar+Redgram (Ct+Jw+Rg)	Not Available	IVes	Graded bunding
Thalaka	26	3.55	ANRhB2	LMU-1	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Thalaka	27	2.85	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIIes	Graded bunding
Thalaka	28	6.07	ANRhB2	LMU-1	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Thalaka	29/1	1.41	ANRhB2	LMU-1	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Thalaka	29/2	0.72	Habitation	Others	Others	Others	Others	Others	Others	Others	Not Available (NA)	Not Available	Others	Others
Thalaka	30	5.38	ANRhB2	LMU-1	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Thalaka	31	2.24	ANRhB2	LMU-1	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Thalaka	32	1.33	ANRhB2	LMU-1	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Thalaka	33	0.94	ANRhB2	LMU-1	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Thalaka	34	0.34	ANRhB2	LMU-1	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Jowar (Ct+Jw)	Not Available	IVes	Graded bunding
Arakera .B	1	0.33	VKSmB1	LMU-1	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Slight	Not Available (NA)	Not Available	IVs	Graded bunding
Arakera .B	87/2	0	BMNmB2g1	LMU-3	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Habitation	Not Available	IIes	Graded bunding
Arakera .B	88/1	0.88	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Arakera .B	88/2	0.08	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Arakera .B	89	0.56	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Arakera .B	139	0.42	SBRhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	1 Bore Well	IVes	Graded bunding
Arakera .B	140	0.29	SBRhB2	LMU-4	Moderately shallow (50-75	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding

Village	Survey Number	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
					cm)									
Arakera.B	141/1	0.36	SBRhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	1 Bore Well	IVes	Graded bunding
Arakera.B	143	0.18	SBRhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Arakera.B	144	0.78	SBRhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Arakera.B	153	0.01	MDRiB2	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Arakera.B	155	1.2	GWDiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Arakera.B	156	4.19	GWDiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IVes	Graded bunding
Arakera.B	157	7.49	GWDiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	1 Bore Well	IVes	Graded bunding
Arakera.B	158	5.42	GWDiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IVes	Graded bunding
Arakera.B	159	5.28	GWDiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IVes	Graded bunding
Arakera.B	160	5.51	MDRiB2	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Arakera.B	161	4.48	MDRiB2	LMU-2	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Arakera.B	162	5.29	GWDiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Paddy (Ct+Pd)	Not Available	IVes	Graded bunding
Arakera.B	163	3.04	GWDiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Arakera.B	164	8.54	GWDiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Arakera.B	165	4.92	GWDiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Arakera.B	166	4.19	GWDiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IVes	Graded bunding
Arakera.B	167	5.78	BDLhB2	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIIes	Graded bunding
Arakera.B	168	3.72	GWDiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Arakera.B	169	7.06	GWDiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Grassland (Gl)	Not Available	IVes	Graded bunding
Arakera.B	170	8	GWDiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Paddy (Ct+Pd)	Not Available	IVes	Graded bunding
Arakera.B	171	7.12	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIIes	Graded bunding
Arakera.B	172	8.86	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIIes	Graded bunding

Village	Survey Number	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
Arakera.B	173	1.24	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIIes	Graded bunding
Arakera.B	174	1.01	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIIes	Graded bunding
Arakera.B	175	1.17	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIIes	Graded bunding
Arakera.B	176	7.15	GWDiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Paddy (Ct+Pd)	Not Available	IVes	Graded bunding
Arakera.B	177	6.21	GWDiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IVes	Graded bunding
Arakera.B	178	6.84	GWDiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Arakera.B	179	4.14	GWDiB2	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Arakera.B	180	4.14	BDLhB2	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	1 Bore Well	IIIes	Graded bunding
Arakera.B	181	6.37	SBRhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Arakera.B	182	6.26	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	Not Available	IVes	Graded bunding
Arakera.B	183/1	1.82	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Arakera.B	183/2	2.5	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	Not Available	IVes	Graded bunding
Arakera.B	184/1	1.68	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Arakera.B	184/2	1.14	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Arakera.B	184/3	1.93	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Arakera.B	185/1	1.21	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Arakera.B	185/2	1.4	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Arakera.B	186/1	1.44	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Arakera.B	186/2	1.33	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Arakera.B	186/3	1.07	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Arakera.B	187	2.2	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Arakera.B	188	3.31	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	Not Available	IVes	Graded bunding
Arakera.B	189	0.38	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	190	0.41	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding

Village	Survey Number	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
Arakera.B	191	0.47	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	192	0.68	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	193	0.61	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	194	0.97	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	195	0.57	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	196	0.47	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	197	0.57	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	198	0.66	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	199	0.33	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	200	0.14	BDLhB2	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIIes	Graded bunding
Arakera.B	201	0.64	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	202	0.34	BDLhB2	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIIes	Graded bunding
Arakera.B	203	0.22	BDLhB2	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIIes	Graded bunding
Arakera.B	204	0.18	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIIes	Graded bunding
Arakera.B	205	0.32	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIIes	Graded bunding
Arakera.B	206	0.78	BDLhB2	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIIes	Graded bunding
Arakera.B	207	0.67	BDLhB2	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIIes	Graded bunding
Arakera.B	208	1.01	BDLhB2	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIIes	Graded bunding
Arakera.B	209	1.16	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIIes	Graded bunding
Arakera.B	210	4.08	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIIes	Graded bunding
Arakera.B	211	0.42	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	212	6.04	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	Not Available	IVes	Graded bunding
Arakera.B	213	7.04	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	Not Available	IVes	Graded bunding
Arakera.B	214	2.98	VNKcB2	LMU-5	Shallow (25-50 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Redgram (Ct+Rg)	Not Available	IIIes	Trench cum bunding

Village	Survey Number	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
Arakera.B	215	3.68	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Arakera.B	216	4.89	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIIes	Graded bunding
Arakera.B	217	7.19	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIIes	Graded bunding
Arakera.B	218	1.82	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIIes	Graded bunding
Arakera.B	219	0.1	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIIes	Graded bunding
Arakera.B	223	1.22	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Arakera.B	224	0.02	BDLbB2	LMU-5	Shallow (25-50 cm)	Loamy sand	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Arakera.B	231	5.57	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Forest (Fo)	Not Available	Rock outcrops	Rock outcrops
Arakera.B	232	3.25	VNKmB2g1	LMU-5	Shallow (25-50 cm)	Clay	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Trench cum bunding
Arakera.B	233	1.86	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Arakera.B	234	2.13	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Arakera.B	235	4.03	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Arakera.B	236	2.77	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Arakera.B	237	2.78	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Arakera.B	238	1.61	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Arakera.B	239	1.52	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Arakera.B	240	2.92	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	Not Available	IVes	Graded bunding
Arakera.B	241	2.02	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	242	0.11	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	243	0.37	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	244	0.29	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	245	0.38	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	246	0.34	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera.B	247	0.32	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding

Village	Survey Number	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
Arakera .B	248	0.52	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	249	0.16	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	250	0.28	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	251	0.36	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	252	0.31	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	253/1	0.13	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	253/2	0.15	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	254	0.14	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	255	0.09	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	256	0.27	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	257	0.15	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	258	0.19	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	259	0.55	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	260	0.24	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	261	0.19	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	262	0.25	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	263	0.19	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	264	1.22	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	265	0.54	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	266	0.54	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	267	0.77	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Arakera .B	268	0.68	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Arakera .B	269	0.84	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	1 Bore Well	IVes	Graded bunding
Arakera .B	270/1	0.88	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding

Village	Survey Number	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
Arakera .B	270/2	0.49	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Arakera .B	272/1	0.96	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Arakera .B	272/2	0.21	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Arakera .B	273	0.39	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Habitation	Not Available	IVes	Graded bunding
Arakera .B	274/1	0.54	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Arakera .B	274/2	0.91	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Arakera .B	274/3	0.86	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Arakera .B	275	0.64	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	276	0.47	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	277	0.18	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	278	0.2	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	279	0.42	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	280	0.46	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	281	0.29	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	282	0.16	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	283	0.28	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	284	0.37	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	285	0.25	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	286	0.43	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	287/1	0.92	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton+Groundnut (Ct+Gn)	Not Available	IVes	Graded bunding
Arakera .B	287/2	0.43	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Arakera .B	288	0.38	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	289	0.43	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	290	0.57	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding

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Arakera .B	291	0.19	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	292	0.1	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	293	0.36	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	294	0.41	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	295	0.37	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Arakera .B	296	0.34	TMKiB2	LMU-1	Very deep (>150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding

Appendix II

Talak-2 (2K1d) Microwatershed

Soil Fertility Information

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Hedagimadra	1	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hedagimadra	2	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	3	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Hedagimadra	4	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	5	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hedagimadra	6	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hedagimadra	7	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hedagimadra	8	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hedagimadra	13/1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hedagimadra	13/2	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hedagimadra	14	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hedagimadra	15	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hedagimadra	16	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hedagimadra	17	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hedagimadra	18	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hedagimadra	19	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hedagimadra	20	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hedagimadra	21	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	22	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	23	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	24/1	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	24/2	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Hedagimadra	25	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	26	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	27	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	28	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	29	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	30	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hedagimadra	31	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	32	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	33	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hedagimadra	34	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Hedagimadra	35	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	36	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	37	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	38	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	39	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	40	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	41	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	45	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	61	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	62	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	63	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	64	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	65	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	66	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Hedagimadra	112	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	High (> 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	113	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	High (> 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	114	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	High (> 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	115	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	High (> 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	117	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	High (> 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	118	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	119	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	120	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	121	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	122	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	123	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	124	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	125	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Hedagimadra	126	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Hedagimadra	127/1	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Hedagimadra	127/2	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Hedagimadra	128/1	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Hedagimadra	132	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Hedagimadra	133/1	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	137	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	138	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	139	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	140	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Hedagimadra	254/1	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Thalaka	1/1	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Thalaka	1/3	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Thalaka	2/1	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops
Thalaka	2/2	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Thalaka	23	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops
Thalaka	24	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Thalaka	25	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Thalaka	26	Very strongly alkaline (pH > 9.0)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Thalaka	27	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Thalaka	28	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Thalaka	29/1	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Thalaka	29/2	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Thalaka	30	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Thalaka	31	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Thalaka	32	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Thalaka	33	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Deficient (< 4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Thalaka	34	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	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
Arakera .B	1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	87/2	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	88/1	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Arakera .B	88/2	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Arakera .B	89	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Arakera .B	139	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	140	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	141/1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	143	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	144	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	153	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	155	Slightly alkaline (pH 7.3 – 7.8)	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	156	Slightly alkaline (pH 7.3 – 7.8)	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	157	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	158	Slightly alkaline (pH 7.3 – 7.8)	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	159	Slightly alkaline (pH 7.3 – 7.8)	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	160	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Low (< 0.5 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	161	Slightly alkaline (pH 7.3 – 7.8)	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	162	Slightly alkaline (pH 7.3 – 7.8)	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	163	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	164	Slightly alkaline (pH 7.3 – 7.8)	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	165	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	166	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	167	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	170	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)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	171	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	172	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Arakera .B	173	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	174	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	175	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	176	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)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	177	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	178	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	179	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	180	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	181	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	182	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	183/1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	183/2	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	184/1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	184/2	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	184/3	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	185/1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	185/2	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	186/1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	186/2	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	186/3	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	187	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	188	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	189	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	190	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Arakera .B	191	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	192	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	193	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	194	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	195	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	196	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	197	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	198	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	199	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	200	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	201	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	202	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	203	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	204	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	205	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	206	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	207	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	208	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	209	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	210	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	211	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	212	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	213	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	214	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Arakera .B	215	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	216	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	217	Strongly alkaline (pH 8.4 – 9.0)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	218	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	219	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	223	Moderately alkaline (pH 7.8 – 8.4)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	224	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	High (> 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	231	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops
Arakera .B	232	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	233	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	234	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	235	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	236	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	237	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	238	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	239	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	240	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	241	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	242	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	243	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	244	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	245	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	246	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	247	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Arakera .B	248	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	249	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	250	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	251	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	252	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	253/1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	253/2	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	254	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	255	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	256	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	257	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	258	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	259	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	260	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	261	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	262	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	263	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	264	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	265	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	266	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	267	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	268	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	269	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	270/1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Arakera .B	270/2	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	272/1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	272/2	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	273	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	274/1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	274/2	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	274/3	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	275	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	276	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	277	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	278	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	279	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	280	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	281	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	282	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	283	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	284	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	285	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	286	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	287/1	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	287/2	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	288	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	289	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	290	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Arakera .B	291	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	292	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	293	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	294	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	295	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Arakera .B	296	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Appendix III

Talak-2 (2K1d) Microwatershed

Soil Suitability Information

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Hedagimadra	1	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	2	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	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
Hedagimadra	4	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Hedagimadra	5	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Hedagimadra	6	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Hedagimadra	7	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	8	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	13/1	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	13/2	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	14	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	15	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	16	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	17	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	18	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	19	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	20	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	21	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	22	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	23	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	24/1	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	24/2	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	25	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	26	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Hedagimadra	27	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Hedagimadra	28	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Hedagimadra	29	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Hedagimadra	30	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Hedagimadra	31	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Hedagimadra	32	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Hedagimadra	33	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Hedagimadra	34	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Hedagimadra	35	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	36	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Hedagimadra	37	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Hedagimadra	38	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Hedagimadra	39	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Hedagimadra	40	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Hedagimadra	41	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Hedagimadra	45	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Hedagimadra	61	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Hedagimadra	62	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	63	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Hedagimadra	64	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	65	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	66	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	112	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Hedagimadra	113	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Hedagimadra	114	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Hedagimadra	115	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Hedagimadra	117	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Hedagimadra	118	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Hedagimadra	119	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Hedagimadra	120	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Hedagimadra	121	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Hedagimadra	122	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Hedagimadra	123	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	124	S3t	S2tz	S3t	S2z	S3tz	S2z	S3z	S2z	S2z	S2z	S2tz	S3z	S3tz	S2z	N1t	S3z	S2z	S3t	S3tz	S2tz	S3t	S2tz	S2tz	S2tz	S2tz	S3t	S2tz	S3z	S3tz
Hedagimadra	125	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Hedagimadra	126	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Hedagimadra	127/1	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Hedagimadra	127/2	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Hedagimadra	128/1	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Hedagimadra	132	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Hedagimadra	133/1	S3t	S2tz	S3t	S2z	S3tz	S2z	S3z	S2z	S2z	S2z	S2tz	S3z	S3tz	S2z	N1t	S3z	S2z	S3t	S3tz	S2tz	S3t	S2tz	S2tz	S2tz	S2tz	S3t	S2tz	S3z	S3tz
Hedagimadra	137	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	138	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	139	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	140	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Hedagimadra	254/1	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Thalaka	1/1	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Thalaka	1/3	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Thalaka	2/1	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops
Thalaka	2/2	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Thalaka	23	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops
Thalaka	24	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Thalaka	25	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Thalaka	26	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Thalaka	27	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Thalaka	28	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Thalaka	29/1	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Thalaka	29/2	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Thalaka	30	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Thalaka	31	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Thalaka	32	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Thalaka	33	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Thalaka	34	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Arakera .B	1	N1n	S3n	N1n	S3n	N1n	S3nt	N1n	N1n	S3nt	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	87/2	S3t	S2tz	S3t	S2z	S3tz	S2z	S3z	S2z	S2z	S2z	S2tz	S3z	S3tz	S2z	N1t	S3z	S2z	S3tz	S3t	S2tz	S3t	S2tz	S2tz	S2tz	S2tz	S3t	S2tz	S3z	S3tz
Arakera .B	88/1	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Arakera .B	88/2	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Arakera .B	89	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Arakera .B	139	N1r	S3t	S3rt	S3t	S3rt	N1t	N1r	S3rt	N1t	S3rt	S3rt	S3t	S3rt	S3t	N1n	S3rt	S3rt	S3t	S3t	S3t	S3t	S3t	S3t	S3rt	S3t	S3t	S3t	S3rt	S3rt

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Arakera .B	140	N1r	S3t	S3rt	S3t	S3rt	N1t	N1r	S3rt	N1t	S3rt	S3rt	S3t	S3rt	S3t	N1n	S3rt	S3rt	S3t	S3t	S3t	S3t	S3t	S3t	S3rt	S3t	S3t	S3t	S3rt	S3rt
Arakera .B	141/1	N1r	S3t	S3rt	S3t	S3rt	N1t	N1r	S3rt	N1t	S3rt	S3rt	S3t	S3rt	S3t	N1n	S3rt	S3rt	S3t	S3t	S3t	S3t	S3t	S3t	S3rt	S3t	S3t	S3t	S3rt	S3rt
Arakera .B	143	N1r	S3t	S3rt	S3t	S3rt	N1t	N1r	S3rt	N1t	S3rt	S3rt	S3t	S3rt	S3t	N1n	S3rt	S3rt	S3t	S3t	S3t	S3t	S3t	S3t	S3rt	S3t	S3t	S3t	S3rt	S3rt
Arakera .B	144	N1r	S3t	S3rt	S3t	S3rt	N1t	N1r	S3rt	N1t	S3rt	S3rt	S3t	S3rt	S3t	N1n	S3rt	S3rt	S3t	S3t	S3t	S3t	S3t	S3t	S3rt	S3t	S3t	S3t	S3rt	S3rt
Arakera .B	153	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Arakera .B	155	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Arakera .B	156	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Arakera .B	157	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Arakera .B	158	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Arakera .B	159	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Arakera .B	160	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Arakera .B	161	S3n	S2n	S3n	S2tn	N1n	S3tn	N1n	S3n	S3t	S3n	S2tn	N1n	N1n	S3n	N1n	N1n	S3n	S3n	N1n	S3n	S3n	S3n	S3n	S3n	S2n	S3n	S3n	N1n	N1n
Arakera .B	162	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Arakera .B	163	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Arakera .B	164	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Arakera .B	165	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Arakera .B	166	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Arakera .B	167	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	168	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Arakera .B	169	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Arakera .B	170	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Arakera .B	171	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	172	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	173	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	174	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	175	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Arakera .B	176	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Arakera .B	177	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Arakera .B	178	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Arakera .B	179	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Arakera .B	180	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	181	N1r	S3t	S3rt	S3t	S3rt	N1t	N1r	S3rt	N1t	S3rt	S3rt	S3t	S3rt	S3t	N1n	S3rt	S3rt	S3t	S3t	S3t	S3t	S3t	S3t	S3rt	S3t	S3t	S3t	S3rt	S3rt
Arakera .B	182	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	183/1	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	183/2	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	184/1	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	184/2	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	184/3	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	185/1	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	185/2	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	186/1	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	186/2	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	186/3	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	187	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	188	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	189	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	190	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	191	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	192	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	193	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Arakera .B	194	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	195	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	196	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	197	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	198	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	199	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	200	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	201	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	202	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	203	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	204	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	205	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	206	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	207	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	208	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	209	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	210	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	211	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	212	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	213	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	214	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	215	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	216	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	217	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	218	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	219	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Arakera .B	223	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	224	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1n	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	231	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops	Rock outcrops
Arakera .B	232	N1r	S3r	N1r	S3r	N1r	S3r	N1r	N1r	S3rt	N1r	N1r	S3r	N1r	S3r	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3r	S3r	S3r	N1r	N1r
Arakera .B	233	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	234	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	235	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	236	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	237	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	238	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	239	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	240	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	241	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	242	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	243	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	244	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	245	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	246	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	247	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	248	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	249	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	250	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	251	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	252	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	253/1	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Arakera .B	253/2	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	254	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	255	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	256	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	257	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	258	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	259	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	260	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	261	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	262	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	263	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	264	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	265	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	266	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	267	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	268	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	269	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	270/1	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	270/2	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	272/1	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	272/2	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	273	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	274/1	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	274/2	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Arakera .B	274/3	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	275	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	276	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	277	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	278	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	279	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	280	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	281	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	282	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	283	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	284	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	285	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	286	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	287/1	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	287/2	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	288	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	289	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	290	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	291	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	292	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	293	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	294	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	295	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Arakera .B	296	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n

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 81 (57.45%) men and 60 (42.55%) women among the sampled households.*
- *The average family size of landless farmers' was 3.3, marginal farmers' was 3.7, small farmers' was 4.6, semi medium farmers' was 3.8 and medium farmers' was 4.3.*
- *The data indicated that, 17 (126%) people were in 0-15 years of age, 65 (46.1%) were in 16-35 years of age, 48 (344%) were in 36-60 years of age and 11 (7.8%) were above 61 years of age.*
- *The results indicated that Talak-2 had 32.62 per cent illiterates, 18.44 per cent of them had primary school, 14.89 per cent of them had middle school, 27.66 per cent of them had high school education, 4.96 per cent of them had PUC, and 0.71 per cent of them had degree education.*
- *The results indicate that, 54.29 per cent of household heads were practicing agriculture, 37.14 per cent of the household heads were agricultural laborers and 2.86 per cent of the household's heads were General Labour and trade and business.*
- *The results indicate that agriculture was the major occupation for 21.28 per cent of the household members, 53.9 per cent were agricultural laborers, 3.55 per cent were in general labour, 2.13 per cent were private service and children, 1.42 per cent were trade and business, 10.64 per cent were student and 4.96 per cent were housewives.*
- *The results show that, 100 per cent of the population in the micro watershed has not participated in any local institutions.*
- *The results indicate that 8.57 per cent of the households possess thatched, 71.43 per cent of the households possess katcha house. 17.14 per cent of the households possess pucca/RCC house and 2.86 per cent of the households possess semi pacca.*
- *The results show that 54.29 per cent of the households possess TV, 17.14 per cent of the households possess mixer/grinder, 2.86 per cent of the households possess bicycle, landline phone and computer /laptop, motor cycle per cent of the households possess 31.43, 5.71 per cent of the households possess Auto and 60 per cent of the households possess mobile phones.*
- *The results show that the average value of television was Rs. 6,026, mixer/grinder was Rs. 2,133, bicycle was Rs. 5,000, motor cycle was Rs. 57,818, landline phone was Rs. 5,000, mobile phone was Rs. 2,437 and computer/laptop was Rs. 40,000.*
- *About 5.71 per cent each of the households possess bullock cart, 40 per cent of the households possess plough, 2.86 per cent of the households possess seed/fertilizer drill and irrigation pump, 14.29 per cent of the households possess sprayer, 14.29*

per cent of the households possess weeder and 8.57 per cent of the households possess thresher.

- *The results show that the average value of bullock cart was Rs. 21,600, plough was Rs. 7,092, seed/ fertilizer drill was Rs. 7,000, irrigation pump was Rs. 10,000, sprayer was Rs. 3,100, Sprinkler was Rs. 3,750, weeder was Rs. 164 and the average value of chaff cutter was Rs. 145.*
- *The results indicate that, 28.57 per cent of the households possess bullocks, 17.14 per cent of the households possess local cow, 5.71 per cent of the households possess crossbreed and 2.86 per cent of the households possess Buffalo.*
- *The results indicate that, average own labour men available in the micro watershed was 1.53, average own labour (women) available was 1.38, average hired labour (men) available was 8.34 and average hired labour (women) available was 8.81.*
- *The results indicate that, 68.57 per cent of the households opined that the hired labour was adequate and 22.86 per cent of the households opined that the hired labour was inadequate.*
- *The results show that, 2.13 per cent of the population in the micro watershed has migrated.*
- *The results show that, average distance of migration was 500 kms and average duration of migration was 11 months.*
- *The results show that, 100 per cent of the population has migrated for the purpose of job/wage/work in micro-watershed.*
- *The results indicate that, households of the Talak-2 micro-watershed possess 50.94 ha (86.6%) of dry land and 13.4 ha (13.40%) of irrigated land. Marginal farmers possess 7.53 ha (100 %) of dry land. Small farmers possess 12.51 ha (100%) of dry land. Semi medium farmers possess 18.35 ha (100%) of dry land. Medium farmers possess 12.55 ha (61.41%) of dry land and 7.88 ha (38.59%).*
- *The results indicate that, the average value of dry land was Rs. 222,743.52 and the average value of irrigated land was Rs. 304,312.11. In case of marginal famers, the average land value was Rs. 544,169.80 for dry land. In case of small famers, the average land value was Rs. 211,828.48 for dry land. In case of semi medium famers, the average land value was Rs. 163,395.81 for dry land. In case of medium farmers, the average land value was Rs. 127,483.87 for dry land and the average value of irrigated land was Rs. 304,312.11.*
- *The results indicate that, there were 2 de-functioning bore wells in the micro watershed.*
- *The results indicate that, farmers have grown cotton (8.5 ha), red gram (44.43 ha), groundnut (5.34 ha), sorghum (3.8 ha), green gram (22 ha), cotton (1.21 ha), paddy (11 ha) and black gram (0.97 ha). Marginal farmers have grown red gram, groundnut and black gram. Small farmers have grown red gram, groundnut and*

cotton. Semi medium farmers have grown red gram, groundnut, sorghum, green gram and paddy. Medium farmers have grown red gram.

- *The results indicate that, the cropping intensity in Talak-2 micro-watershed was found to be 94.5 per cent.*
- *The results indicate that, 85.71 per cent of the households have bank account and 65.71 per cent of the households have savings.*
- *The results indicate that, 222.86 per cent of the households have availed credit from different sources.*
- *The results indicate that, 21.74 per cent of the households have borrowed from commercial bank, 4.35 per cent of the households have borrowed from cooperative bank, 8.70 per cent of the households have borrowed from friends / relatives, grameena bank and 4.35 per cent of the households have borrowed from money lender.*
- *The results indicate that, the average credit amount borrowed by households in micro-watershed was Rs, 36,173.91.*
- *The results indicate that, 100 per cent of the households borrowed from institutional sources for the purpose of agricultural production.*
- *The results indicated that 83.33 per cent of the households not paid their loan borrowed from institutional sources.*
- *The results indicate that, 83.33 per cent opined that the loan amount borrowed from helped to perform timely agricultural operations.*
- *The results indicate that, the total cost of cultivation for Cotton was Rs. 32651.19. The gross income realized by the farmers was Rs. 81689.26. The net income from Cotton cultivation was Rs. 490387. Thus the benefit cost ratio was found to be 1:2.5.*
- *The total cost of cultivation for groundnut was Rs. 32092.84. The gross income realized by the farmers was Rs. 48090.90. The net income from groundnut cultivation was Rs. 159986. Thus the benefit cost ratio was found to be 1:1.5.*
- *The total cost of cultivation for Red gram was Rs. 30058.50. The gross income realized by the farmers was Rs. 49221.51. The net income from Red gram cultivation was Rs. 191631. Thus the benefit cost ratio was found to be 1:1.64.*
- *The total cost of cultivation for Sorghum was Rs. 11389.23. The gross income realized by the farmers was Rs. 215255. The net income from Sorghum cultivation was Rs. 10135.83. Thus the benefit cost ratio was found to be 1:1.89.*
- *The total cost of cultivation for Green gram was Rs. 26600.81. The gross income realized by the farmers was Rs. 480354. The net income from Green gram cultivation was Rs. 21434.24. Thus the benefit cost ratio was found to be 1:1.81.*
- *The total cost of cultivation for Maize was Rs. 492983. The gross income realized by the farmers was Rs. 22328.80. The net income from Maize cultivation was Rs. -26969.23. Thus the benefit cost ratio was found to be 1:0.45.*

- *The results indicate that, 14.29 per cent of the households opined that dry fodder was adequate and 8.57 per cent of the households opined that green fodder was adequate.*
- *The results indicate that the annual gross income was Rs. 19,666.67 for landless farmers, for marginal farmers it was Rs. 81,318.18, for small farmers it was Rs. 136,440.63, semi medium farmers it was Rs. 170,285.71 and medium farmers it was Rs. 105,133.33.*
- *The results indicate that the average annual expenditure is Rs. 7,087.57. For landless households it was Rs. 2,833.33, for marginal farmers it was Rs. 2,857.85, for small farmers it was Rs. 12,602.68, for semi medium farmers it was Rs. 9,265.31 and medium farmers it was Rs. 7,075.*
- *The results indicate that, households have planted 66 neem, 2 acacia and 3banyan trees in their field.*
- *The results indicated that, households have an average investment capacity of Rs. 4,942.86 for land development and households have an average investment capacity of Rs. 428.57 for improved crop production.*
- *The results indicated that own funds was the source of additional investment for 8.57 per cent for land development and improved crop production. Soft loan was the source of additional investment for 34.29 per cent for land development.*
- *The results indicated that, cotton was sold to the extent of 100 per cent, green gram was sold to the extent of 69.54 per cent, groundnut was sold to the extent of 75 per cent, maize was sold to the extent of 94.29 per cent, Red gram was sold to the extent of 92.95 per cent and sorghum was sold to the extent of 94.44 per cent.*
- *The results indicated that, about 8.57 per cent of the farmers sold their produce to local/village merchant, 71.43 per cent of the farmers sold their produce to regulated markets and 11.43 per cent of the farmers sold their produce to cooperative marketing society.*
- *The results indicated that, 88.57 per cent of the households have used tractor and 2.86 per cent of the households have used truck as a mode of transportation.*
- *The results indicated that, 42.86 per cent of the households have experienced soil and water erosion problems in the farm.*
- *The results indicated that, 71.43 per cent have shown interest in soil test. The results indicated that, 2.86 per cent have adopted graded bund and Summer Ploughing.*
- *The results indicated that, 97.14 per cent of the households used firewood and 2.86 per cent of the households used dung cake as a source of fuel.*
- *The results indicated that, piped supply was the major source of drinking water for 82.86 per cent of the households in the micro watershed and bore well was the source of drinking water for 14.29 per cent of the households in the micro watershed.*

- *Electricity was the major source of light for 100 per cent of the households in micro watershed.*
- *The results indicated that, 65.71 per cent of the households possess sanitary toilet facility.*
- *The results indicated that, 100 per cent of the sampled households possessed BPL cards.*
- *The results indicated that, 88.57 per cent of the households participated in NREGA programme.*
- *The results indicated that, cereals were adequate for 94.29 per cent of the households, pulses were adequate for 88.57 per cent, oilseed and vegetables were adequate for 51.43 per cent, fruits were adequate for 45.71 per cent, milk were adequate for 57.14 per cent, egg and meat were adequate for 54.29 per cent.*
- *The results indicated that, oilseeds, milk, egg and meat were inadequate for 2.86 per cent of the households, vegetables were inadequate for 5.71 per cent, fruits and fruits were inadequate for 77.78 per cent of the households.*
- *The results indicated that, lower fertility status of the was the constraint experienced by 91.43 per cent of the households, wild animal menace on farm field (57.14%), frequent incidence of pest and diseases (82.86%), Inadequacy of irrigation water (62.86%), high cost of fertilizer and plant protection chemicals (80%), high rate of interest on credit (57.14%), low price for the agricultural commodities (74.29%), lack of marketing facilities in the area (62.86%), inadequacy extension service (48.57%), Lack of transport for safe transport of the Agril produce to the market (25.71%), less rainfall (8.57%) and Source of Agri-technology information(5.71%)*

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

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

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

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

Description of the micro watershed

Talak-2 micro-watershed in Hadagimudra sub-watershed (Yadgir taluk and district) is located in between 77^0 1’44.315’’ to $77^0$0’2.47’’North latitudes and 77^0 1’44.315’’ to $77^0$0’2.47’’East longitudes, covering an area of about 571.41 ha, bounded by Thalaka, Arekera.B and Hedagimadra 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 35 households located in the micro-watershed were interviewed for the survey.

Chapter 3

SALIENT FEATURES OF THE SURVEY

Households sampled for socio-economic survey: The data on households sampled for socio economic survey in Talak-2 micro-watershed is presented in Table 1 and it indicated that 35 farmers were sampled in Talak-2 micro-watershed among them 3 (8.57%) were landless, 11 (31.43%) were marginal farmers, 8 (22.86%) were small farmers, 7 (20%) were medium farmers and 6 (17.14%) were medium farmers.

Table 1: Households sampled for socio economic survey in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Farmers	3	8.57	11	31.43	8	22.86	7	20	6	17.14	35	100

Population characteristics: The population characteristics of households sampled for socio-economic survey in Talak-2 micro-watershed is presented in Table 2. The data indicated that there were 81 (57.45%) men and 60 (42.55%) women among the sampled households. The average family size of landless farmers' was 3.3, marginal farmers' was 3.7, small farmers' was 4.6, semi medium farmers' was 3.8 and medium farmers' was 4.3.

Table 2: Population characteristics of Talak-2 micro-watershed

Sl.No.	Particulars	LL (10)		MF (41)		SF (37)		SMF (27)		MDF (26)		All (141)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Men	7	70	23	56.10	23	62.16	13	48.15	15	57.69	81	57.45
2	Women	3	30	18	43.90	14	37.84	14	51.85	11	42.31	60	42.55
Total		10	100	41	100	37	100	27	100	26	100	141	100
Average		3.3		3.7		4.6		3.8		4.3		42	

Age wise classification of population: The age wise classification of household members in Talak-2 micro-watershed is presented in Table 3. The data indicated that, 17 (126%) people were in 0-15 years of age, 65 (46.1%) were in 16-35 years of age, 48 (344%) were in 36-60 years of age and 11 (7.8%) were above 61 years of age.

Table 3: Age wise classification of household members in Talak-2 micro-watershed

Sl. No.	Particulars	LL (10)		MF (41)		SF (37)		SMF (27)		MDF (26)		All (141)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	0-15 years of age	3	30	5	12.20	4	10.81	3	11.11	2	7.69	17	126
2	16-35 years of age	3	30	22	53.66	18	48.65	14	51.85	8	30.77	65	46.10
3	36-60 years of age	3	30	13	31.71	11	29.73	9	33.33	12	46.15	48	344
4	> 61 years	1	10	1	2.44	4	10.81	1	3.70	4	15.38	11	7.80
Total		10	100	41	100	37	100	27	100	26	100	141	100

Education level of household members: Education level of household members in Talak-2 micro-watershed is presented in Table 4. The results indicated that Talak-2 had 32.62 per cent illiterates, 18.44 per cent of them had primary school, 14.89 per cent of

them had middle school, 27.66 per cent of them had high school education, 4.96 per cent of them had PUC, and 0.71 per cent of them had degree education.

Table 4. Education level of household members in Talak-2 micro-watershed

Sl.No.	Particulars	LL (10)		MF (41)		SF (37)		SMF (27)		MDF (26)		All (141)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Illiterate	2	20	11	26.83	22	59.46	9	33.33	2	7.69	46	32.62
2	Primary School	5	50	9	21.95	5	13.51	4	14.81	3	11.54	26	18.44
3	Middle School	1	10	6	14.63	5	13.51	6	22.22	3	11.54	21	14.89
4	High School	2	20	14	34.15	2	5.41	6	22.22	15	57.69	39	27.66
5	PUC	0	0	0	0	3	8.11	1	3.70	3	11.54	7	4.96
6	Degree	0	0	0	0	0	0	1	3.70	0	0	1	0.71
7	Others	0	0	1	2.44	0	0	0	0	0	0	1	0.71
Total		10	100	41	100	37	100	27	100	26	100	141	100

Occupation of household heads: The data regarding the occupation of the household heads in Talak-2 micro-watershed is presented in Table 5. The results indicate that, 54.29 per cent of household heads were practicing agriculture, 37.14 per cent of the household heads were agricultural laborers and 2.86 per cent of the household's heads were General Labour and trade and business.

Table 5: Occupation of household heads in Talak-2 micro-watershed

Sl. No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Agriculture	0	0	7	63.64	4	50	4	57.14	4	66.67	19	54.29
2	Agricultural Labour	1	33.33	4	36.36	4	50	2	28.57	2	33.33	13	37.14
3	General Labour	1	33.33	0	0	0	0	0	0	0	0	1	2.86
4	Trade & Business	0	0	0	0	0	0	1	14.29	0	0	1	2.86
Total		2	100	11	100	8	100	7	100	6	100	34	100

Occupation of the household members: The data regarding the occupation of the household members in Talak-2 micro-watershed is presented in Table 6. The results indicate that agriculture was the major occupation for 21.28 per cent of the household members, 53.9 per cent were agricultural laborers, 3.55 per cent were in general labour, 2.13 per cent were private service and children, 1.42 per cent were trade and business, 10.64 per cent were student and 4.96 per cent were housewives.

Table 6: Occupation of family members in Talak-2 micro-watershed

Sl. No.	Particulars	LL (10)		MF (41)		SF (37)		SMF (27)		MDF (26)		All (141)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Agriculture	0	0	8	19.51	5	13.51	7	25.93	10	38.46	30	21.28
2	Agricultural Labour	3	30	25	60.98	22	59.46	16	59.26	10	38.46	76	53.90
3	General Labour	2	20	0	0	2	5.41	1	3.70	0	0	5	3.55
7	Private Service	1	10	1	2.44	0	0	0	0	1	3.85	3	2.13
8	Trade & Business	0	0	0	0	0	0	1	3.70	1	3.85	2	1.42
9	Student	2	20	3	7.32	7	18.92	1	3.70	2	7.69	15	10.64
10	Housewife	1	10	2	4.88	1	2.70	1	3.70	2	7.69	7	4.96
11	Children	1	10	2	4.88	0	0	0	0	0	0	3	2.13
Total		10	100	41	100	37	100	27	100	26	100	141	100

Institutional participation of the household members: The data regarding the institutional participation of the household members in Talak-2 micro-watershed is presented in Table 7. The results show that, 100 per cent of the population in the micro watershed has not participated in any local institutions.

Table 7. Institutional Participation of household members in Talak-2 micro-watershed

Sl. No.	Particulars	LL (10)		MF (41)		SF (37)		SMF (27)		MDF (26)		All (141)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	No Participation	10	100	41	100	37	100	27	100	26	100	141	100
Total		10	100	41	100	37	100	27	100	26	100	141	100

Type of house owned: The data regarding the type of house owned by the households in Talak-2 micro-watershed is presented in Table 8. The results indicate that 8.57 per cent of the households possess thatched, 71.43 per cent of the households possess katcha house. 17.14 per cent of the households possess pucca/RCC house and 2.86 per cent of the households possess semi pacca.

Table 8. Type of house owned by households in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Thatched	0	0	2	18.18	0	0	1	14.29	0	0	3	8.57
2	Katcha	1	33.33	7	63.64	5	62.50	6	85.71	6	100	25	71.43
3	Pucca/RCC	1	33.33	2	18.18	3	37.50	0	0	0	0	6	17.14
4	Semi pacca	1	33.33	0	0	0	0	0	0	0	0	1	2.86
Total		3	100	11	100	8	100	7	100	6	100	35	100

Durable Assets owned by the households: The data regarding the Durable Assets owned by the households in Talak-2 micro-watershed is presented in Table 9. The results show that 54.29 per cent of the households possess TV, 17.14 per cent of the households possess mixer/grinder, 2.86 per cent of the households possess bicycle, landline phone and computer /laptop, motor cycle per cent of the households possess 31.43, 5.71 per cent of the households possess Auto and 60 per cent of the households possess mobile phones.

Table 9. Durable Assets owned by households in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Television	2	66.67	6	54.55	3	37.50	4	57.14	4	66.67	19	54.29
2	Mixer/Grinder	0	0	1	99	1	12.50	2	28.57	2	33.33	6	17.14
3	Bicycle	0	0	0	0	1	12.50	0	0	0	0	1	2.86
4	Motor Cycle	1	33.33	1	99	2	25	4	57.14	3	50	11	31.43
5	Auto	0	0	1	99	1	12.50	0	0	0	0	2	5.71
6	Landline Phone	0	0	0	0	1	12.50	0	0	0	0	1	2.86
7	Mobile Phone	3	100	6	54.55	5	62.50	4	57.14	3	50	21	60
8	Computer/Laptop	0	0	0	0	1	12.50	0	0	0	0	1	2.86
9	Blank	0	0	0	0	1	12.50	0	0	0	0	1	2.86

Average value of durable assets: The data regarding the average value of durable assets owned by the households in Talak-2 micro-watershed is presented in Table 10. The results show that the average value of television was Rs. 6,026, mixer/grinder was Rs. 2,133, bicycle was Rs. 5,000, motor cycle was Rs. 57,818, landline phone was Rs. 5,000, mobile phone was Rs. 2,437 and computer/laptop was Rs. 40,000.

Table 10. Average value of durable assets owned by households in Talak-2 micro-watershed **Average value (Rs.)**

Sl.No.	Particulars	LL (3)	MF (11)	SF (8)	SMF (7)	MDF (6)	All (35)
1	Television	10,000	7,000	4,666	5,125	4,500	6,026
2	Mixer/Grinder	0	2,000	1,800	2,000	2,500	2,133
3	Bicycle	0	0	5,000	0	0	5,000
4	Motor Cycle	50,000	40,000	62,500	62,750	56,666	57,818
5	Landline Phone	0	0	5,000	0	0	5,000
6	Mobile Phone	1,375	2,457	2,860	2,600	2,833	2,437
7	Computer/Laptop	0	0	40,000	0	0	40,000

Farm Implements owned: The data regarding the farm implements owned by the households in Talak-2 micro-watershed is presented in Table 11. About 5.71 per cent each of the households possess bullock cart, 40 per cent of the households possess plough, 2.86 per cent of the households possess seed/fertilizer drill and irrigation pump, 14.29 per cent of the households possess sprayer, 14.29 per cent of the households possess weeder and 8.57 per cent of the households possess thresher.

Table 11. Farm Implements owned by households in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Bullock Cart	0	0	0	0	2	25	0	0	0	0	2	5.71
2	Plough	0	0	2	18.18	5	62.50	4	57.14	3	50	14	40
3	Seed/Fertilizer Drill	0	0	0	0	1	12.50	0	0	0	0	1	2.86
4	Irrigation Pump	0	0	0	0	1	12.50	0	0	0	0	1	2.86
5	Sprayer	0	0	1	99	3	37.50	1	14.29	0	0	5	14.29
6	Sprinkler	0	0	1	99	3	37.50	0	0	0	0	4	11.43
7	Weeder	0	0	1	99	1	12.50	2	28.57	1	16.67	5	14.29
8	Thresher	0	0	0	0	0	0	2	28.57	1	16.67	3	8.57
9	Blank	1	33.33	2	18.18	3	37.50	2	28.57	0	0	8	22.86

Table 12. Average value of farm implements owned by households in Talak-2 micro-watershed **Average Value (Rs.)**

Sl.No.	Particulars	LL (3)	MF (11)	SF (8)	SMF (7)	MDF (6)	All (35)
1	Bullock Cart	0	0	21,000	0	0	21,000
2	Plough	0	35,000	3,000	1,825	2,333	7,092
3	Seed/Fertilizer Drill	0	0	7,000	0	0	7,000
4	Irrigation Pump	0	0	10,000	0	0	10,000
5	Sprayer	0	4,000	3,666	500	0	3,100
6	Sprinkler	0	4,000	3,666	0	0	3,750
7	Weeder	0	400	150	150	90	164
8	Thresher	0	0	0	190	100	145

Average value of farm implements: The data regarding the average value of farm Implements owned by the households in Talak-2 micro-watershed is presented in Table 12. The results show that the average value of bullock cart was Rs. 21,600, plough was Rs. 7,092, seed/ fertilizer drill was Rs. 7,000, irrigation pump was Rs. 10,000, sprayer was Rs. 3,100, Sprinkler was Rs. 3,750, weeder was Rs. 164 and the average value of chaff cutter was Rs. 145.

Livestock possession by the households: The data regarding the Livestock possession by the households in Talak-2 micro-watershed is presented in Table 13. The results indicate that, 28.57 per cent of the households possess bullocks, 17.14 per cent of the households possess local cow, 5.71 per cent of the households possess crossbreed and 2.86 per cent of the households possess Buffalo.

Table 13. Livestock possession by households in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Bullock	0	0	1	99	2	25	2	28.57	5	83.33	10	28.57
2	Local cow	0	0	1	99	2	25	1	14.29	2	33.33	6	17.14
3	Crossbred cow	0	0	0	0	0	0	0	0	2	33.33	2	5.71
4	Buffalo	0	0	0	0	0	0	1	14.29	0	0	1	2.86
9	blank	1	33.33	2	18.18	5	62.50	3	42.86	1	16.67	12	34.29

Average Labour availability: The data regarding the average labour availability in Talak-2 micro-watershed is presented in Table 14. The results indicate that, average own labour men available in the micro watershed was 1.53, average own labour (women) available was 1.38, average hired labour (men) available was 8.34 and average hired labour (women) available was 8.81.

In case of marginal farmers, average own labour men available was 1.45, average own labour (women) was 1.55, average hired labour (men) was 8.1 and average hired labour (women) available was 8.4. In case of small farmers, average own labour men available and average own labour (women) was 1.13, average hired labour (men) was 7 and average hired labour (women) available was 8. In case of semi medium farmers, average own labour men available and average own labour (women) was 1.43, average hired labour (men) was 10.14 and average hired labour (women) available was 11. In case of medium farmers, average own labour men available was 2.50, average own labour (women) was 1.50, average hired labour (men) was 9.33 and average hired labour (women) available was 9.17.

Table 14. Average Labour availability in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)	MF (11)	SF (8)	SMF (7)	MDF (6)	All (35)
1	Hired labour Female	0	8.40	8	11	9.17	8.81
2	Own Labour Female	0	1.55	1.13	1.43	1.50	1.38
3	Own labour Male	0	1.45	1.13	1.43	2.50	1.53
4	Hired labour Male	0	8.10	7	10.14	9.33	8.34

Adequacy of Hired Labour: The data regarding the adequacy of hired labour in Talak-2 micro-watershed is presented in Table 15. The results indicate that, 68.57 per cent of the households opined that the hired labour was adequate and 22.86 per cent of the households opined that the hired labour was inadequate.

Table 15. Adequacy of Hired Labour in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Adequate	2	66.67	8	72.73	3	37.50	5	71.43	6	100	24	68.57
2	Inadequate	0	0	2	18.18	4	50	2	28.57	0	0	8	22.86

Migration among the households: The data regarding the migration among the household members in Talak-2 micro-watershed is presented in Table 16. The results show that, 2.13 per cent of the population in the micro watershed has migrated.

Table 16. Migration among the households in Talak-2 micro-watershed

Sl.No.	Particulars	LL (10)		MF (41)		SF (37)		SMF (27)		MDF (26)		All (141)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Migration	0	0	1	2.44	2	5.41	0	0	0	0	3	2.13

Average distance and duration of migration: The data regarding the average distance and duration of migration of household members in Talak-2 micro-watershed is presented in Table 17. The results show that, average distance of migration was 500 kms and average duration of migration was 11 months.

Table 17. Average distance and duration of migration of households in Talak-2 micro-watershed

Sl.No.	Particulars	LL (10)	MF (41)	SF (37)	SMF (27)	MDF (26)	All (141)
1	Avg. Distance (kms)	0	500	500	0	0	500
2	Avg. Duration (months)	0	10	12	0	0	11

Purpose of migration by household members: The data regarding the average distance and duration of migration of household members in Talak-2 micro-watershed is presented in Table 18. The results show that, 100 per cent of the population has migrated for the purpose of job/wage/work in micro-watershed.

Table 18. purpose of migration of households in Talak-2 micro-watershed

Sl.No.	Particulars	MF (1)		SF (2)		All (3)	
		N	%	N	%	N	%
1	Job/wage/work	1	100	2	100	3	100
Total		1	100	2	100	3	100

Distribution of land (ha): The data regarding the distribution of land (ha) in Talak-2 micro-watershed is presented in Table 19. The results indicate that, households of the Talak-2 micro-watershed possess 50.94 ha (86.6%) of dry land and 13.4 ha (13.40%) of irrigated land.. Marginal farmers possess 7.53 ha (100 %) of dry land. Small farmers possess 12.51 ha (100%) of dry land. Semi medium farmers possess 18.35 ha (100%) of dry land. Medium farmers possess 12.55 ha (61.41%) of dry land and 7.88 ha (38.59%).

Table 19. Distribution of land (Ha) in Talak-2 micro-watershed

Sl.No.	Particulars	MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		ha	%	ha	%	ha	%	ha	%	ha	%
1	Dry	7.53	100	12.51	100	18.35	100	12.55	61.41	50.94	86.60
2	Irrigated	0	0	0	0	0	0	7.88	38.59	7.88	13.40
Total		7.53	100	12.51	100	18.35	100	20.43	100	58.82	100

Average land value (Rs./ha): The data regarding the average land value (Rs./ha) in Talak-2 micro-watershed is presented in Table 20. The results indicate that, the average value of dry land was Rs. 222,743.52 and the average value of irrigated land was Rs. 304,312.11. In case of marginal famers, the average land value was Rs. 544,169.80 for dry land. In case of small famers, the average land value was Rs. 211,828.48 for dry land. In case of semi medium famers, the average land value was Rs. 163,395.81 for dry land. In case of medium farmers, the average land value was Rs. 127,483.87 for dry land and the average value of irrigated land was Rs. 304,312.11.

Table 20. Average land value (Rs./ha) in Talak-2 micro-watershed

Sl.No.	Particulars	MF (11)	SF (8)	SMF (7)	MDF (6)	All (35)
1	Dry	544,169.80	211,828.48	163,395.81	127,483.87	222,743.52
2	Irrigated	0	0	0	304,312.11	304,312.11

Status of bore wells: The data regarding the status of bore wells in Talak-2 micro-watershed is presented in Table 21. The results indicate that, there were 2 functioning bore wells in the micro watershed.

Table 21. Status of bore wells in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)	MF (11)	SF (8)	SMF (7)	MDF (6)	All (35)
1	De-functioning	0	0	2	0	0	2

Cropping pattern: The data regarding the cropping pattern in Talak-2 micro-watershed is presented in Table 22. The results indicate that, farmers have grown ctton (8.5 ha), red gram (44.43 ha), groundnut (5.34 ha), sorghum (3.8 ha), green gram (22 ha), cotton (1.21 ha), paddy (11 ha) and black gram (0.97 ha). Marginal farmers have grown red gram, groundnut and black gram. Small farmers have grown red gram, groundnut and cotton. Semi medium farmers have grown red gram, groundnut, sorghum, green gram and paddy. Medium farmers have grown red gram.

Table 22. Cropping pattern in Talak-2 micro-watershed (Area in ha)

Sl.No.	Particulars	LL (3)	MF (11)	SF (8)	SMF (7)	MDF (6)	All
1	Kharif - Cotton	0	3.27	5.43	11.74	8.5	28.94
2	Kharif - Red gram	0	1.72	4.56	3.64	6.07	15.99
3	Kharif – Green gram	0	0.83	3.33	0	0	4.15
4	Kharif - Groundnut	0	0	0.81	0	2.02	2.83
5	Kharif - Maize	0	0	0	2.02	0	2.02
6	Kharif - Sorghum	0	1.72	0	0	0	1.72
Total		0	7.54	14.13	17.41	16.6	55.67

Cropping intensity: The data regarding the cropping intensity in Talak-2 micro-watershed is presented in Table 23. The results indicate that, the cropping intensity in Talak-2 micro-watershed was found to be 94.5 per cent.

Table 23. Cropping intensity (%) in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)	MF (11)	SF (8)	SMF (7)	MDF (6)	All (35)
1	Cropping Intensity	0	100	100	100	83.67	94.50

Possession of Bank account and savings: The data regarding the possession of bank account and saving in Talak-2 micro-watershed is presented in Table 24. The results indicate that, 85.71 per cent of the households have bank account and 65.71 per cent of the households have savings.

Table 24. Possession of bank account and savings in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Account	2	66.67	10	90.91	8	100	7	100	3	50	30	85.71
2	Savings	2	66.67	9	81.82	5	62.50	5	71.43	2	33.33	23	65.71

Borrowing status: The data regarding the borrowing status in Talak-2 micro-watershed is presented in Table 25. The results indicate that, 222.86 per cent of the households have availed credit from different sources.

Table 25. Borrowing status in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Credit Availed	2	66.67	1	99	2	25	1	14.29	2	33.33	8	22.86

Source of credit availed by households: The data regarding the source of credit availed by households in Talak-2 micro-watershed is presented in Table 26. The results indicate that, 21.74 per cent of the households have borrowed from commercial bank, 4.35 per cent of the households have borrowed from cooperative bank, 8.70 per cent of the households have borrowed from friends / relatives, grameena bank and 4.35 per cent of the households have borrowed from money lender

Table 26. Source of credit availed by households in Talak-2 micro-watershed

Sl.No.	Particulars	LL (2)		MF (9)		SF (5)		SMF (5)		MDF (2)		All (23)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Commercial Bank	0	0	0	0	1	20	1	20	3	150	5	21.74
2	Cooperative Bank	0	0	0	0	0	0	1	20	0	0	1	4.35
3	Friends/Relatives	0	0	0	0	1	20	1	20	0	0	2	8.70
6	Money Lender	0	0	0	0	1	20	0	0	0	0	1	4.35

Avg. Credit amount: The data regarding the avg. Credit amount in Talak-2 micro-watershed is presented in Table 27. The results indicate that, the average credit amount borrowed by households in micro-watershed was Rs, 36,173.91.

Table 27. Avg. credit amount by household in Talak-2 micro-watershed

Sl.No.	Particulars	LL (2)	MF (9)	SF (5)	SMF (5)	MDF (2)	All (23)
1	Average Credit	0	0	44,000	50,400	180,000	36,173.91

Purpose of credit borrowed - Institutional Credit: The data regarding the purpose of credit borrowed - Institutional Credit in Talak-2 micro-watershed is presented in Table 28. The results indicate that, 100 per cent of the households borrowed from institutional sources for the purpose of agricultural production

Table 28. Purpose of credit borrowed - Institutional Credit by household in Talak-2 micro-watershed

Sl.No.	Particulars	SF (1)		SMF (2)		MDF (3)		All (6)	
		N	%	N	%	N	%	N	%
1	Agriculture production	1	100	2	100	3	100	6	100

Repayment status of households – Institutional: The data regarding the repayment status of credit borrowed from institutional sources by households in Talak-2 micro watershed is presented in Table 29. The results indicated that 83.33 per cent of the households not paid their loan borrowed from institutional sources.

Table 29. Repayment status of households – Institutional Credit in Talak-2 micro-watershed

Sl.No.	Particulars	SF (1)		SMF (2)		MDF (3)		All (6)	
		N	%	N	%	N	%	N	%
1	Un paid	1	100	1	50	3	100	5	83.33

Opinion on institutional sources of credit: The data regarding the opinion on institutional sources of credit in Talak-2 micro watershed is presented in Table 30. The results indicate that, 83.33 per cent opined that the loan amount borrowed from helped to perform timely agricultural operations.

Table 30. Opinion on institutional sources of credit in Talak-2 micro watershed

Sl.No.	Particulars	SF (1)		SMF (2)		MDF (3)		All (6)	
		N	%	N	%	N	%	N	%
1	Helped to perform timely agricultural operations	0	0	2	100	3	100	5	83.33
2	Higher rate of interest	1	100	0	0	0	0	1	16.67

Cost of cultivation of Cotton: The data regarding the cost of cultivation of Cotton in Talak-2 micro-watershed is presented in Table 31. The results indicate that, the total cost of cultivation for Cotton was Rs. 32651.19. The gross income realized by the farmers was Rs. 81689.26. The net income from Cotton cultivation was Rs. 490387. Thus the benefit cost ratio was found to be 1:2.5.

Table 31. Cost of Cultivation of Cotton in Talak-2 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	23.54	5344.50	16.37
2	Bullock		Pairs/day	17	726.50	2.23
3	Tractor		Hours	0.68	410.52	1.26
4	Machinery		Hours	0.16	0	0
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	9.94	7767.47	23.79
6	Seed Inter Crop		Kgs.	0	0	0
7	FYM		Quintal	2.13	2636.54	87
8	Fertilizer + micronutrients		Quintal	3.86	32739	102
9	Pesticides (PPC)		Kgs / liters	1.66	2182.23	6.68
10	Irrigation		Number	0	0	0
11	Repairs			0	266.67	0.82
12	Msc. Charges (Marketing costs etc)			0	300	0.92
13	Depreciation charges			0	177.18	0.54
14	Land revenue and Taxes			0	0	0
II	**Cost B1**					
16	Interest on working capital				19108	5.85
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				24994.78	76.55
III	**Cost B2**					
18	Rental Value of Land				133.33	0.41
19	**Cost B2 = (Cost B1 + Rental value)**				25128.11	76.96
IV	**Cost C1**					
20	Family Human Labour			18.91	4496.79	13.77
21	**Cost C1 = (Cost B2 + Family Labour)**				29624.90	90.73
V	**Cost C2**					
22	Risk Premium				58	0.18
23	**Cost C2 = (Cost C1 + Risk Premium)**				29682.90	90.91
VI	**Cost C3**					
24	Managerial Cost				2968.29	99
25	**Cost C3 = (Cost C2 + Managerial Cost)**				32651.19	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		19.73	81689.26	
		b) Main Crop Sales Price (Rs.)			4140	
b.	Gross Income (Rs.)				81689.26	
c.	Net Income (Rs.)				490387	
d.	Cost per Quintal (Rs./q.)				1654.76	
e.	Benefit Cost Ratio (BC Ratio)				1:2.5	

Cost of cultivation of Groundnut: The data regarding the cost of cultivation of groundnut in Talak-2 micro-watershed is presented in Table 32. The results indicate that, the total cost of cultivation for groundnut was Rs. 32092.84. The gross income realized by the farmers was Rs. 48090.90. The net income from groundnut cultivation was Rs. 159986. Thus the benefit cost ratio was found to be 1:1.5.

Table 32. Cost of Cultivation of Groundnut in Talak-2 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	10.99	2445.30	7.62
2	Bullock		Pairs/day	0	0	0
3	Tractor		Hours	2.47	0	0
4	Machinery		Hours	1.24	0	0
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	14.33	8200.40	25.55
6	Seed Inter Crop		Kgs.	0	0	0
7	FYM		Quintal	48	4890.60	15.24
8	Fertilizer + micronutrients		Quintal	7.41	5584.67	17.40
9	Pesticides (PPC)		Kgs / liters	2.96	1877.20	5.85
10	Irrigation		Number	0	0	0
11	Repairs			0	250	0.78
12	Msc. Charges (Marketing costs etc)			0	250	0.78
13	Depreciation charges			0	166.73	0.52
14	Land revenue and Taxes			0	0	0
II	**Cost B1**					
16	Interest on working capital				2472.94	7.71
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				26137.84	81.44
III	**Cost B2**					
18	Rental Value of Land				166.67	0.52
19	**Cost B2 = (Cost B1 + Rental value)**				26304.51	81.96
IV	**Cost C1**					
20	Family Human Labour			13.59	2815.80	8.77
21	**Cost C1 = (Cost B2 + Family Labour)**				29120.31	90.74
V	**Cost C2**					
22	Risk Premium				55	0.17
23	**Cost C2 = (Cost C1 + Risk Premium)**				29175.31	90.91
VI	**Cost C3**					
24	Managerial Cost				2917.53	99
25	**Cost C3 = (Cost C2 + Managerial Cost)**				32092.84	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		8.15	48090.90	
		b) Main Crop Sales Price (Rs.)			5900	
b.	Gross Income (Rs.)				48090.90	
c.	Net Income (Rs.)				159986	
d.	Cost per Quintal (Rs./q.)				3937.29	
e.	Benefit Cost Ratio (BC Ratio)				1:1.5	

Cost of cultivation of Red gram: The data regarding the cost of cultivation of Red gram in Talak-2 micro-watershed is presented in Table 33. The results indicate that, the total cost of cultivation for Red gram was Rs. 30058.50. The gross income realized by the farmers was Rs. 49221.51. The net income from Red gram cultivation was Rs. 191631. Thus the benefit cost ratio was found to be 1:1.64.

Table 33. Cost of Cultivation of Red gram in Talak-2 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	22.14	5227.88	17.39
2	Bullock		Pairs/day	0.93	586.63	1.95
3	Tractor		Hours	1.49	1000.43	3.33
4	Machinery		Hours	0.19	104.98	0.35
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	16.68	6126.90	20.38
7	FYM		Quintal	2.70	2804.72	9.33
8	Fertilizer + micronutrients		Quintal	3.93	2978.16	9.91
9	Pesticides (PPC)		Kgs / liters	1.91	21746	7.23
10	Irrigation		Number	0	0	0
11	Repairs			0	170	0.57
12	Msc. Charges (Marketing costs etc)			0	300	1
13	Depreciation charges			0	487	0.16
14	Land revenue and Taxes			0	0	0
II	**Cost B1**					
16	Interest on working capital				1696.66	5.64
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				23218.48	77.24
III	**Cost B2**					
18	Rental Value of Land				133.33	0.44
19	**Cost B2 = (Cost B1 + Rental value)**				23351.82	77.69
IV	**Cost C1**					
20	Family Human Labour			16.15	3919.10	134
21	**Cost C1 = (Cost B2 + Family Labour)**				27270.91	90.73
V	**Cost C2**					
22	Risk Premium				55	0.18
23	**Cost C2 = (Cost C1 + Risk Premium)**				27325.91	90.91
VI	**Cost C3**					
24	Managerial Cost				2732.59	99
25	**Cost C3 = (Cost C2 + Managerial Cost)**				30058.50	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		11.33	49211.63	
		b) Main Crop Sales Price (Rs.)			4345	
	By Product	e) Main Product (q)		0.25	9.88	
		f) Main Crop Sales Price (Rs.)			40	
b.	Gross Income (Rs.)				49221.51	
c.	Net Income (Rs.)				191631	
d.	Cost per Quintal (Rs./q.)				2653.93	
e.	Benefit Cost Ratio (BC Ratio)				1:1.64	

Cost of Cultivation of Sorghum: The data regarding the cost of cultivation of Sorghum in Talak-2 micro-watershed is presented in Table 34. The results indicate that, the total cost of cultivation for Sorghum was Rs. 11389.23. The gross income realized by the farmers was Rs. 215255. The net income from Sorghum cultivation was Rs. 10135.83. Thus the benefit cost ratio was found to be 1:1.89.

Table 34. Cost of Cultivation of Sorghum in Talak-2 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	38.83	8730.27	19.32
2	Bullock		Pairs/day	1.65	1482	3.28
3	Tractor		Hours	0	0	0
4	Machinery		Hours	0	0	0
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	8.55	5128.19	11.35
6	Seed Inter Crop		Kgs.	0	0	0
7	FYM		Quintal	3.78	5033.44	11.14
8	Fertilizer + micronutrients		Quintal	4.19	34533	7.64
9	Pesticides (PPC)		Kgs / liters	2.30	2760.13	6.11
10	Irrigation		Number	0	0	0
11	Repairs			0	500	1.11
12	Msc. Charges (Marketing costs etc)			0	700	1.55
13	Depreciation charges			0	19.76	04
14	Land revenue and Taxes			0	0	0
II	**Cost B1**					
16	Interest on working capital				1976.98	4.38
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				29783.80	65.93
III	**Cost B2**					
18	Rental Value of Land				0	0
19	**Cost B2 = (Cost B1 + Rental value)**				29783.80	65.93
IV	**Cost C1**					
20	Family Human Labour			493	11185.57	24.76
21	**Cost C1 = (Cost B2 + Family Labour)**				40969.37	90.69
V	**Cost C2**					
22	Risk Premium				100	0.22
23	**Cost C2 = (Cost C1 + Risk Premium)**				41069.37	90.91
VI	**Cost C3**					
24	Managerial Cost				4106.94	99
25	**Cost C3 = (Cost C2 + Managerial Cost)**				45176.31	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		9.85	28904.66	
		b) Main Crop Sales Price (Rs.)			2933.33	
b.	Gross Income (Rs.)				28904.66	
c.	Net Income (Rs.)				-16271.65	
d.	Cost per Quintal (Rs./q.)				4584.63	
e.	Benefit Cost Ratio (BC Ratio)				1:0.64	

Cost of cultivation of Green gram: The data regarding the cost of cultivation of Green gram in Talak-2 micro-watershed is presented in Table 35. The results indicate that, the total cost of cultivation for Green gram was Rs. 26600.81. The gross income realized by the farmers was Rs. 480354. The net income from Green gram cultivation was Rs. 21434.24. Thus the benefit cost ratio was found to be 1:1.81.

Table 35. Cost of Cultivation of Green gram in Talak-2 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	28.14	7074.69	26.60
2	Bullock		Pairs/day	2.41	1605.84	64
3	Tractor		Hours	0.80	600.97	2.26
4	Machinery		Hours	0	0	0
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	12.44	6252.77	23.51
6	Seed Inter Crop		Kgs.	0	0	0
7	FYM		Quintal	0	0	0
8	Fertilizer + micronutrients		Quintal	2.61	2760.94	10.38
9	Pesticides (PPC)		Kgs / liters	1	1103.26	4.15
10	Irrigation		Number	0.60	0	0
11	Repairs			0	0	0
12	Msc. Charges (Marketing costs etc)			0	0	0
13	Depreciation charges			0	398.88	1.50
14	Land revenue and Taxes			0	0	0
II	**Cost B1**					
16	Interest on working capital				1215.24	4.57
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				21012.58	78.99
III	**Cost B2**					
18	Rental Value of Land				333.33	1.25
19	**Cost B2 = (Cost B1 + Rental value)**				21345.92	80.25
IV	**Cost C1**					
20	Family Human Labour			10.86	2826.64	10.63
21	**Cost C1 = (Cost B2 + Family Labour)**				24172.55	90.87
V	**Cost C2**					
22	Risk Premium				10	04
23	**Cost C2 = (Cost C1 + Risk Premium)**				24182.55	90.91
VI	**Cost C3**					
24	Managerial Cost				2418.26	99
25	**Cost C3 = (Cost C2 + Managerial Cost)**				26600.81	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		9.64	480354	
		b) Main Crop Sales Price (Rs.)			4983.33	
b.	Gross Income (Rs.)				480354	
c.	Net Income (Rs.)				21434.24	
d.	Cost per Quintal (Rs./q.)				2759.67	
e.	Benefit Cost Ratio (BC Ratio)				1:1.81	

Cost of cultivation of Maize: The data regarding the cost of cultivation of Maize in Talak-2 micro-watershed is presented in Table 36. The results indicate that, the total cost of cultivation for Maize was Rs. 492983. The gross income realized by the farmers was Rs. 22328.80. The net income from Maize cultivation was Rs. -26969.23. Thus the benefit cost ratio was found to be 1:0.45.

Table 36. Cost of Cultivation of Maize in Talak-2 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	7.90	1141.14	2.31
2	Bullock		Pairs/day	0	0	0
3	Tractor		Hours	2.47	1729	3.51
4	Machinery		Hours	0.49	345.80	0.70
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	24.70	29640	60.12
7	FYM		Quintal	2.47	2964	61
8	Fertilizer + micronutrients		Quintal	2.47	2050.10	4.16
9	Pesticides (PPC)		Kgs / liters	2.47	1235	2.51
10	Irrigation		Number	0	0	0
11	Repairs			0	0	0
12	Msc. Charges (Marketing costs etc)			0	0	0
13	Depreciation charges			0	22.72	05
14	Land revenue and Taxes			0	0	0
II	**Cost B1**					
16	Interest on working capital				4307.89	8.74
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				43435.66	88.11
III	**Cost B2**					
18	Rental Value of Land				333.33	0.68
19	**Cost B2 = (Cost B1 + Rental value)**				43768.99	88.78
IV	**Cost C1**					
20	Family Human Labour			5.43	1037.40	2.10
21	**Cost C1 = (Cost B2 + Family Labour)**				44806.39	90.89
V	**Cost C2**					
22	Risk Premium				10	02
23	**Cost C2 = (Cost C1 + Risk Premium)**				44816.39	90.91
VI	**Cost C3**					
24	Managerial Cost				4481.64	99
25	**Cost C3 = (Cost C2 + Managerial Cost)**				492983	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		17.29	20748	
		b) Main Crop Sales Price (Rs.)			1200	
	By Product	e) Main Product (q)		3.95	1580.80	
		f) Main Crop Sales Price (Rs.)			400	
b.	Gross Income (Rs.)				22328.80	
c.	Net Income (Rs.)				-26969.23	
d.	Cost per Quintal (Rs./q.)				2851.25	
e.	Benefit Cost Ratio (BC Ratio)				1:0.45	

Adequacy of fodder: The data regarding the adequacy of fodder in Talak-2 micro-watershed is presented in Table 37. The results indicate that, 14.29 per cent of the households opined that dry fodder was adequate and 8.57 per cent of the households opined that green fodder was adequate

Table 37. Adequacy of fodder in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Adequate-Dry Fodder	0	0	1	99	1	12.50	1	14.29	2	33.33	5	14.29
2	Adequate-Green Fodder	0	0	0	0	0	0	1	14.29	2	33.33	3	8.57

Annual gross income: The data regarding the annual gross income in Talak-2 micro-watershed is presented in Table 38. The results indicate that the annual gross income was Rs. 19,666.67 for landless farmers, for marginal farmers it was Rs. 81,318.18, for small farmers it was Rs. 136,440.63, semi medium farmers it was Rs. 170,285.71 and medium farmers it was Rs. 105,133.33.

Table 38. Annual gross income in Talak-2 micro-watershed

(Avg value in Rs.)

Sl.No.	Particulars	LL (3)	MF (11)	SF (8)	SMF (7)	MDF (6)	All (35)
1	Wage	19,666.67	35,454.55	42,500	34,571.43	11,333.33	31,400
2	Agriculture	0	45,863.64	92,956.25	135,714.29	93,800	78,884.29
3	Dairy Farm	0	0	984.38	0	0	225
Income(Rs.)		19,666.67	81,318.18	136,440.63	170,285.71	105,133.33	110,509.29

Average annual expenditure: The data regarding the average annual expenditure in Talak-2 micro-watershed is presented in Table 39. The results indicate that the average annual expenditure is Rs. 7,087.57. For landless households it was Rs. 2,833.33, for marginal farmers it was Rs. 2,857.85, for small farmers it was Rs. 12,602.68, for semi medium farmers it was Rs. 9,265.31 and medium farmers it was Rs. 7,075.

Table 39. Average annual expenditure in Talak-2 micro-watershed

(Avg value in Rs.)

Sl.No.	Particulars	LL (3)	MF (11)	SF (8)	SMF (7)	MDF (6)	All (35)
3	Wage	8,500	14,800	19,571.43	14,142.86	3,250	11,828.57
4	Agriculture	0	16,636.36	36,250	50,714.29	39,200	29,257.14
7	Dairy Farm	0	0	45,000	0	0	1,285.71
8	Goat Farming	0	0	0	0	0	0
Total		8,500	31,436.36	100,821.43	64,857.14	42,450	248,064.94
Average		2,833.33	2,857.85	12,602.68	9,265.31	7,075	7,087.57

Table 43: Forest species grown in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		F	B	F	B	F	B	F	B	F	B	F	B
4	Neem	0	0	13	1	36	0	13	0	4	2	66	3
7	Acacia	0	0	0	0	0	0	0	0	2	0	2	0
8	Banyan	0	0	2	0	1	0	0	0	0	0	3	0

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

Forest species grown: The data regarding forest species grown in Talak-2 micro-watershed is presented in Table 40. The results indicate that, households have planted 66 neem, 2 acacia and 3banyan trees in their field.

Average Additional investment capacity: The data regarding average additional investment capacity in Talak-2 micro-watershed is presented in Table 41. The results indicated that, households have an average investment capacity of Rs. 4,942.86 for land development and households have an average investment capacity of Rs. 428.57 for improved crop production.

Table 41: Source of funds for additional investment capacity in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)	MF (11)	SF (8)	SMF (7)	MDF (6)	All (35)
1	Land development	0	6,000	3,375	5,142.86	7,333.33	4,942.86
2	Improved crop production	0	0	625	1,428.57	0	428.57

Source of additional investment: The data regarding source of funds for additional investment in Talak-2 micro-watershed is presented in Table 42. The results indicated that own funds was the source of additional investment for 8.57 per cent for land development and improved crop production. Soft loan was the source of additional investment for 34.29 per cent for land development.

Table 42: Source of funds for additional investment capacity in Talak-2 micro – watershed

Sl.No	Item	Land development		Improved crop production	
		N	%	N	%
1	Own funds	3	8.57	3	8.57
2	Soft loan	12	34.29	0	0

Marketing of the agricultural produce: The data regarding marketing of the agricultural produce in Talak-2 micro-watershed is presented in Table 43. The results indicated that, cotton was sold to the extent of 100 per cent, green gram was sold to the extent of 69.54 per cent, groundnut was sold to the extent of 75 per cent, maize was sold to the extent of 94.29 per cent, Red gram was sold to the extent of 92.95 per cent and sorghum was sold to the extent of 94.44 per cent..

Table 43. Marketing of the agricultural produce in Talak-2 micro-watershed

Sl.No	Crops	Output obtained (q)	Output retained (q)	Output sold (q)	Output sold (%)	Avg. Price obtained (Rs/q)
1	Cotton	473	144.5	328.5	100	4435.71
2	Greengram	40	0	40	69.45	4983.33
3	Groundnut	24	6	18	75	11800
4	Maize	35	2	33	94.29	1200
5	Redgram	156	11	145	92.95	4345
6	Sorghum	18	1	17	94.44	2933.33

Marketing Channels used for sale of agricultural produce: The data regarding marketing channels used for sale of agricultural produce in Talak-2 micro-watershed is presented in Table 44. The results indicated that, about 8.57 per cent of the farmers sold their produce to local/village merchant, 71.43 per cent of the farmers sold their produce to regulated markets and 11.43 per cent of the farmers sold their produce to cooperative marketing society.

Table 44. Marketing Channels used for sale of agricultural produce in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Local/village Merchant	0	0	1	99	0	0	2	28.57	0	0	3	8.57
2	Regulated Market	0	0	10	90.91	7	87.50	3	42.86	5	83.33	25	71.43
3	Cooperative marketing Society	0	0	0	0	1	12.50	2	28.57	1	16.67	4	11.43

Mode of transport of agricultural produce: The data regarding mode of transport of agricultural produce in Talak-2 micro-watershed is presented in Table 45. The results indicated that, 88.57 per cent of the households have used tractor and 2.86 per cent of the households have used truck as a mode of transportation.

Table 45. Mode of transport of agricultural produce in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Tractor	0	0	11	100	8	100	6	85.71	6	100	31	88.57
2	Truck	0	0	0	0	0	0	1	14.29	0	0	1	2.86

Incidence of soil and water erosion problems: The data regarding incidence of soil and water erosion problems in Talak-2 micro-watershed is presented in Table 46. The results indicated that, 42.86 per cent of the households have experienced soil and water erosion problems in the farm.

Table 46. Incidence of soil and water erosion problems in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Soil and water erosion problems in the farm	0	0	3	27.27	7	87.50	4	57.14	1	16.67	15	42.86

Interest shown towards soil testing: The data regarding Interest shown towards soil testing in Talak-2 micro-watershed is presented in Table 47. The results indicated that, 71.43 per cent have shown interest in soil test.

Table 47. Interest shown towards soil testing in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Interest in soil test	0	0	7	63.64	7	87.50	7	100	4	66.67	25	71.43

Soil and water conservation practices and structures adopted: The data regarding incidence of soil and water conservation practices in Balachakra-1 micro-watershed is presented in Table 48. The results indicated that, 2.86 per cent have adopted graded bund and Summer Ploughing.

Table 48. Soil and water conservation practices and structures adopted in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF(11)		SF (8)		SMF(7)		MDF(6)		All(35)	
		N	%	N	%	N	%	N	%	N	%	N	%
3	Graded Bund	0	0	1	99	0	0	0	0	0	0	1	2.86
9	Summer Ploughing	0	0	1	99	0	0	0	0	0	0	1	2.86

Usage pattern of fuel for domestic use: The data regarding usage pattern of fuel for domestic use in Talak-2 micro-watershed is presented in Table 49. The results indicated that, 97.14 per cent of the households used firewood and 2.86 per cent of the households used dung cake as a source of fuel.

Table 49. Usage pattern of fuel for domestic use in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Dung Cake	0	0	0	0	0	0	0	0	1	16.67	1	2.86
2	Fire Wood	3	100	11	100	8	100	7	100	5	83.33	34	97.14

Source of drinking water: The data regarding source of drinking water in Talak-2 micro-watershed is presented in Table 50. The results indicated that, piped supply was the major source of drinking water for 82.86 per cent of the households in the micro watershed and bore well was the source of drinking water for 14.29 per cent of the households in the micro watershed.

Table 50. Source of drinking water in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Piped supply	3	100	9	81.82	5	62.50	6	85.71	6	100	29	82.86
2	Bore Well	0	0	2	18.18	3	37.50	0	0	0	0	5	14.29

Source of light: The data regarding source of light in Talak-2 micro-watershed is presented in Table 51. The results indicated that, Electricity was the major source of light for 100 per cent of the households in micro watershed.

Table 51. Source of light in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Electricity	3	100	11	100	8	100	7	100	6	100	35	100

Existence of Sanitary toilet facility: The data regarding existence of sanitary toilet facilit**y** in Talak-2 micro-watershed is presented in Table 52. The results indicated that, 65.71 per cent of the households possess sanitary toilet facility.

Table 52. Existence of Sanitary toilet facility in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Sanitary toilet facility	1	33.33	1	99	8	100	7	100	6	100	23	65.71

Possession of PDS card: The data regarding possession of PDS card in Talak-2 micro-watershed is presented in Table 53. The results indicated that, 100 per cent of the sampled households possessed BPL cards.

Table 53. Possession of PDS card in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	BPL	3	100	11	100	8	100	7	100	6	100	35	100

Participation in NREGA program: The data regarding participation in NREGA programme in Talak-2 micro-watershed is presented in Table 54. The results indicated that, 88.57 per cent of the households participated in NREGA programme.

Table 54. Participation in NREGA programme in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF(7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Participation in NREGA programme	2	66.67	10	90.91	8	100	5	71.43	6	100	31	88.57

Adequacy of food items: The data regarding adequacy of food items in Talak-2 micro-watershed is presented in Table 55. The results indicated that, cereals were adequate for 94.29 per cent of the households, pulses were adequate for 88.57 per cent, oilseed and vegetables were adequate for 51.43 per cent, fruits were adequate for 45.71 per cent, milk were adequate for 57.14 per cent, egg and meat were adequate for 54.29 per cent.

Table 55. Adequacy of food items in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Cereals	0	0	12	1099	8	100	7	100	6	100	33	94.29
2	Pulses	1	33.33	10	90.91	8	100	6	85.71	6	100	31	88.57
3	Oilseed	0	0	7	63.64	3	37.50	4	57.14	4	66.67	18	51.43
4	Vegetables	0	0	8	72.73	1	12.50	3	42.86	6	100	18	51.43
5	Fruits	1	33.33	6	54.55	1	12.50	4	57.14	4	66.67	16	45.71
6	Milk	0	0	8	72.73	4	50	3	42.86	5	83.33	20	57.14
7	Egg	0	0	7	63.64	3	37.50	4	57.14	5	83.33	19	54.29
8	Meat	0	0	6	54.55	3	37.50	4	57.14	6	100	19	54.29

Response on Inadequacy of food items: The data regarding inadequacy of food items in Talak-2 micro-watershed is presented in Table 56. The results indicated that, oilseeds, milk, egg and meat were inadequate for 2.86 per cent of the households, vegetables were inadequate for 5.71 per cent, fruits and fruits were inadequate for 77.78 per cent of the households.

Table 56. Response on Inadequacy of food items in Talak-2 micro-watershed

Sl.No.	Particulars	LL (3)		MF (11)		SF (8)		SMF (7)		MDF (6)		All (35)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Oilseed	0	0	0	0	1	12.50	0	0	0	0	1	2.86
2	Vegetables	0	0	0	0	1	12.50	1	14.29	0	0	2	5.71
3	Fruits	0	0	1	99	1	12.50	1	14.29	0	0	3	8.57
4	Milk	0	0	0	0	0	0	1	14.29	0	0	1	2.86
5	Egg	0	0	1	99	0	0	0	0	0	0	1	2.86
6	Meat	0	0	0	0	0	0	1	14.29	0	0	1	2.86

Farming constraints: The data regarding farming constraints experienced by households in Talak-2 micro-watershed is presented in Table 57. The results indicated that, lower fertility status of the was the constraint experienced by 91.43 per cent of the households, wild animal menace on farm field (57.14%), frequent incidence of pest and diseases (82.86%), Inadequacy of irrigation water (62.86%), high cost of fertilizer and plant protection chemicals (80%), high rate of interest on credit (57.14%), low price for the agricultural commodities (74.29%), lack of marketing facilities in the area (62.86%), inadequacy extension service (48.57%), Lack of transport for safe transport of the Agril produce to the market (25.71%), less rainfall (8.57%) and Source of Agri-technology information(5.71%)

Table 57. Farming constraints Experienced in Talak-2 micro-watershed

Sl.No.	Particulars	MF (11)		SF (8)		SMF(7)		MDF(6)		All (35)	
		N	%	N	%	N	%	N	%	N	%
1	Lower fertility status of the soil	11	100	8	100	7	100	6	100	32	91.43
2	Wild animal menace on farm field	5	45.45	7	87.50	6	85.71	2	33.33	20	57.14
3	Frequent incidence of pest and diseases	9	81.82	8	100	6	85.71	6	100	29	82.86
4	Inadequacy of irrigation water	8	72.73	3	37.50	5	71.43	6	100	22	62.86
5	High cost of Fertilizers and plant protection chemicals	11	100	6	75	5	71.43	6	100	28	80
6	High rate of interest on credit	7	63.64	4	50	4	57.14	5	83.33	20	57.14
7	Low price for the agricultural commodities	9	81.82	6	75	5	71.43	6	100	26	74.29
8	Lack of marketing facilities in the area	8	72.73	3	37.50	5	71.43	6	100	22	62.86
9	Inadequate extension services	5	45.45	4	50	4	57.14	4	66.67	17	48.57
10	Lack of transport for safe transport of the Agril produce to the market.	1	99	4	50	3	42.86	1	16.67	9	25.71
11	Less rainfall	1	99	1	12.50	1	14.29	0	0	3	8.57
12	Source of Agri-technology information	1	99	1	12.50	0	0	0	0	2	5.71

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

The data indicated that there were 81 (57.45%) men and 60 (42.55%) women among the sampled households. The average family size of landless farmers' was 3.3, marginal farmers' was 3.7, small farmers' was 4.6, semi medium farmers' was 3.8 and medium farmers' was 4.3. The data indicated that, 17 (126%) people were in 0-15 years of age, 65 (46.1%) were in 16-35 years of age, 48 (344%) were in 36-60 years of age and 11 (7.8%) were above 61 years of age.

The results indicated that Talak-2 had 32.62 per cent illiterates, 18.44 per cent of them had primary school, 14.89 per cent of them had middle school, 27.66 per cent of them had high school education, 4.96 per cent of them had PUC, and 0.71 per cent of them had degree education. The results indicate that, 54.29 per cent of household heads were practicing agriculture, 37.14 per cent of the household heads were agricultural laborers and 2.86 per cent of the household's heads were General Labour and trade and business.

The results indicate that agriculture was the major occupation for 21.28 per cent of the household members, 53.9 per cent were agricultural laborers, 3.55 per cent were in general labour, 2.13 per cent were private service and children, 1.42 per cent were trade and business, 10.64 per cent were student and 4.96 per cent were housewives.

The results show that, 100 per cent of the population in the micro watershed has not participated in any local institutions. The results indicate that 8.57 per cent of the households possess thatched, 71.43 per cent of the households possess katcha house. 17.14 per cent of the households possess pucca/RCC house and 2.86 per cent of the households possess semi pacca.

The results show that 54.29 per cent of the households possess TV, 17.14 per cent of the households possess mixer/grinder, 2.86 per cent of the households possess bicycle, landline phone and computer /laptop, motor cycle per cent of the households possess 31.43, 5.71 per cent of the households possess Auto and 60 per cent of the households possess mobile phones. The results show that the average value of television was Rs. 6,026, mixer/grinder was Rs. 2,133, bicycle was Rs. 5,000, motor cycle was Rs. 57,818,

landline phone was Rs. 5,000, mobile phone was Rs. 2,437 and computer/laptop was Rs. 40,000.

About 5.71 per cent each of the households possess bullock cart, 40 per cent of the households possess plough, 2.86 per cent of the households possess seed/fertilizer drill and irrigation pump, 14.29 per cent of the households possess sprayer, 14.29 per cent of the households possess weeder and 8.57 per cent of the households possess thresher. The results show that the average value of bullock cart was Rs. 21,600, plough was Rs. 7,092, seed/ fertilizer drill was Rs. 7,000, irrigation pump was Rs. 10,000, sprayer was Rs. 3,100, Sprinkler was Rs. 3,750, weeder was Rs. 164 and the average value of chaff cutter was Rs. 145.

The results indicate that, 28.57 per cent of the households possess bullocks, 17.14 per cent of the households possess local cow, 5.71 per cent of the households possess crossbreed and 2.86 per cent of the households possess Buffalo.

The results indicate that, average own labour men available in the micro watershed was 1.53, average own labour (women) available was 1.38, average hired labour (men) available was 8.34 and average hired labour (women) available was 8.81. The results indicate that, 68.57 per cent of the households opined that the hired labour was adequate and 22.86 per cent of the households opined that the hired labour was inadequate.

The results show that, 2.13 per cent of the population in the micro watershed has migrated. The results show that, average distance of migration was 500 kms and average duration of migration was 11 months. The results show that, 100 per cent of the population has migrated for the purpose of job/wage/work in micro-watershed.

The results indicate that, households of the Talak-2 micro-watershed possess 50.94 ha (86.6%) of dry land and 13.4 ha (13.40%) of irrigated land.. Marginal farmers possess 7.53 ha (100 %) of dry land. Small farmers possess 12.51 ha (100%) of dry land. Semi medium farmers possess 18.35 ha (100%) of dry land. Medium farmers possess 12.55 ha (61.41%) of dry land and 7.88 ha (38.59%).

The results indicate that, the average value of dry land was Rs. 222,743.52 and the average value of irrigated land was Rs. 304,312.11. In case of marginal famers, the average land value was Rs. 544,169.80 for dry land. In case of small famers, the average land value was Rs. 211,828.48 for dry land. In case of semi medium famers, the average land value was Rs. 163,395.81 for dry land. In case of medium farmers, the average land value was Rs. 127,483.87 for dry land and the average value of irrigated land was Rs. 304,312.11.

The results indicate that, there were 2 de-functioning bore wells in the micro watershed.

The results indicate that, farmers have grown ctton (8.5 ha), red gram (44.43 ha), groundnut (5.34 ha), sorghum (3.8 ha), green gram (22 ha), cotton (1.21 ha), paddy (11 ha) and black gram (0.97 ha). Marginal farmers have grown red gram, groundnut and black gram. Small farmers have grown red gram, groundnut and cotton. Semi medium farmers have grown red gram, groundnut, sorghum, green gram and paddy. Medium farmers have grown red gram. The results indicate that, the cropping intensity in Talak-2 micro-watershed was found to be 94.5 per cent.

The results indicate that, 85.71 per cent of the households have bank account and 65.71 per cent of the households have savings. The results indicate that, 222.86 per cent of the households have availed credit from different sources. The results indicate that, 21.74 per cent of the households have borrowed from commercial bank, 4.35 per cent of the households have borrowed from cooperative bank, 8.70 per cent of the households have borrowed from friends / relatives, grameena bank and 4.35 per cent of the households have borrowed from money lender. The results indicate that, the average credit amount borrowed by households in micro-watershed was Rs, 36,173.91. The results indicate that, 100 per cent of the households borrowed from institutional sources for the purpose of agricultural production. The results indicated that 83.33 per cent of the households not paid their loan borrowed from institutional sources. The results indicate that, 83.33 per cent opined that the loan amount borrowed from helped to perform timely agricultural operations.

The results indicate that, the total cost of cultivation for Cotton was Rs. 32651.19. The gross income realized by the farmers was Rs. 81689.26. The net income from Cotton cultivation was Rs. 490387. Thus the benefit cost ratio was found to be 1:2.5. The total cost of cultivation for groundnut was Rs. 32092.84. The gross income realized by the farmers was Rs. 48090.90. The net income from groundnut cultivation was Rs. 159986. Thus the benefit cost ratio was found to be 1:1.5. The total cost of cultivation for Red gram was Rs. 30058.50. The gross income realized by the farmers was Rs. 49221.51. The net income from Red gram cultivation was Rs. 191631. Thus the benefit cost ratio was found to be 1:1.64. The total cost of cultivation for Sorghum was Rs. 11389.23. The gross income realized by the farmers was Rs. 215255. The net income from Sorghum cultivation was Rs. 10135.83. Thus the benefit cost ratio was found to be 1:1.89. The total cost of cultivation for Green gram was Rs. 26600.81. The gross income realized by the farmers was Rs. 480354. The net income from Green gram cultivation was Rs. 21434.24. Thus the benefit cost ratio was found to be 1:1.81. The total cost of cultivation for Maize was Rs. 492983. The gross income realized by the farmers was Rs. 22328.80. The net income from Maize cultivation was Rs. -26969.23. Thus the benefit cost ratio was found to be 1:0.45.

The results indicate that, 14.29 per cent of the households opined that dry fodder was adequate and 8.57 per cent of the households opined that green fodder was adequate.

The results indicate that the annual gross income was Rs. 19,666.67 for landless farmers, for marginal farmers it was Rs. 81,318.18, for small farmers it was Rs. 136,440.63, semi medium farmers it was Rs. 170,285.71 and medium farmers it was Rs. 105,133.33. The results indicate that the average annual expenditure is Rs. 7,087.57. For landless households it was Rs. 2,833.33, for marginal farmers it was Rs. 2,857.85, for small farmers it was Rs. 12,602.68, for semi medium farmers it was Rs. 9,265.31 and medium farmers it was Rs. 7,075.

The results indicate that, households have planted 66 neem, 2 acacia and 3banyan trees in their field.

The results indicated that, households have an average investment capacity of Rs. 4,942.86 for land development and households have an average investment capacity of Rs. 428.57 for improved crop production. The results indicated that own funds was the source of additional investment for 8.57 per cent for land development and improved crop production. Soft loan was the source of additional investment for 34.29 per cent for land development.

The results indicated that, cotton was sold to the extent of 100 per cent, green gram was sold to the extent of 69.54 per cent, groundnut was sold to the extent of 75 per cent, maize was sold to the extent of 94.29 per cent, Red gram was sold to the extent of 92.95 per cent and sorghum was sold to the extent of 94.44 per cent.

The results indicated that, about 8.57 per cent of the farmers sold their produce to local/village merchant, 71.43 per cent of the farmers sold their produce to regulated markets and 11.43 per cent of the farmers sold their produce to cooperative marketing society. The results indicated that, 88.57 per cent of the households have used tractor and 2.86 per cent of the households have used truck as a mode of transportation.

The results indicated that, 42.86 per cent of the households have experienced soil and water erosion problems in the farm. The results indicated that, 71.43 per cent have shown interest in soil test. The results indicated that, 2.86 per cent have adopted graded bund and Summer Ploughing.

The results indicated that, 97.14 per cent of the households used firewood and 2.86 per cent of the households used dung cake as a source of fuel. The results indicated that, piped supply was the major source of drinking water for 82.86 per cent of the households in the micro watershed and bore well was the source of drinking water for 14.29 per cent of the households in the micro watershed.

Electricity was the major source of light for 100 per cent of the households in micro watershed. The results indicated that, 65.71 per cent of the households possess sanitary toilet facility. The results indicated that, 100 per cent of the sampled households possessed BPL cards. The results indicated that, 88.57 per cent of the households participated in NREGA programme.

The results indicated that, cereals were adequate for 94.29 per cent of the households, pulses were adequate for 88.57 per cent, oilseed and vegetables were adequate for 51.43 per cent, fruits were adequate for 45.71 per cent, milk were adequate for 57.14 per cent, egg and meat were adequate for 54.29 per cent. The results indicated that, oilseeds, milk, egg and meat were inadequate for 2.86 per cent of the households, vegetables were inadequate for 5.71 per cent, fruits and fruits were inadequate for 77.78 per cent of the households.

The results indicated that, lower fertility status of the was the constraint experienced by 91.43 per cent of the households, wild animal menace on farm field (57.14%), frequent incidence of pest and diseases (82.86%), Inadequacy of irrigation water (62.86%), high cost of fertilizer and plant protection chemicals (80%), high rate of interest on credit (57.14%), low price for the agricultural commodities (74.29%), lack of marketing facilities in the area (62.86%), inadequacy extension service (48.57%), Lack of transport for safe transport of the Agril produce to the market (25.71%), less rainfall (8.57%) and Source of Agri-technology information(5.71%)