ICAR-NBSS&LUP Sujala MWS Publ.346

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

NAGALAPUR-1 (4D5B1M1e) MICROWATERSHED

Balichakra Hobli, Yadgir Taluk and District, Karnataka

Karnataka Watershed Development Project – II

SUJALA – III

World Bank funded Project

The World Bank

ICAR – NATIONAL BUREAU OF SOIL SURVEY AND LAND USE PLANNING

ICAR - NBSS & LUP

WATERSHED DEVELOPMENT DEPARTMENT
GOVT. OF KARNATAKA, BANGALORE

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The 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 Nagalapur-1 Microwatershed, Yadgir Taluk and District, Karnataka" for integrated development was taken up in collaboration with the State Agricutural Universities, IISC, KSRSAC, KSNDMC as Consortia partners. The project provides detailed land resource information at cadastral level (1:7920 scale) for all the plots and socio-economic status of farm households covering thirty per cent farmers randomely selected representing landed and landless class of farmers in the micro-watershed. The project report with the accompanying maps for the Microwatershed will provide required detailed database for evolving effective land use plan, alternative land use options and conservation plans for the planners, administrators, agricutural extention personnel, KVK officials, developmental departments and other land users to manage the land resources in a sustainable manner.

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

Nagpur
Date: 04-09-2019

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PART-A

LAND RESOURCE INVENTORY

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EXECUTIVE SUMMARY

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

The present study covers an area of 677 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 598 ha in the microwatershed is covered by soils and about 78 ha by others (habitation and water bodies). The salient findings from the land resource inventory are summarized briefly below.

- *The soils belong to 15 soil series and 23 soil phases (management units) and 8 land management units.*
- *The length of crop growing period is about 120-150 days starting from 1st week of June to 4th week of October.*
- *From the master soil map, several interpretative and thematic maps like land capability, soil depth, surface soil texture, soil gravelliness, available water capacity, soil slope and soil erosion were generated.*
- *Soil fertility status maps for macro and micronutrients were generated based on the surface soil samples collected at every 320 m grid interval.*
- *Land suitability for growing 29 major agricultural and horticultural crops was assessed and maps showing the degree of suitability along with constraints were generated.*
- *Entire area in the microwatershed is suitable for agriculture.*
- *About 61 per cent area of the microwatershed has soils that are moderately deep to very deep (75 - >150 cm) and 26 per cent soils are very shallow to moderately shallow (<25-75 cm).*
- *About 1 per cent area in the microwatershed has sandy soils, 73 per cent has loamy soils and 14 per cent clayey soils.*
- *About of 86 per cent area of the microwatershed has non gravelly (<15%) soils and 3 per cent has gravelly (15-35%) soils.*

- *About 22 per cent area of the microwatershed is very high (>200 mm/m) in available water capacity, 4 per cent medium (101-150 mm/m), 47 per cent area low (51-100 mm/m) and 16 per cent area very low (<50 mm/m) in available water capacity.*
- *An area of 15 per cent has nearly level (0-1% slope) lands, 63 per cent has very gently sloping (1-3% slope) lands and 10 per cent has gently sloping (3-5% slope) lands of the microwatershed.*
- *An area of about 8 per cent is severely (e3) eroded, 65 per cent area is moderately (e2) eroded and 15 per cent area is slightly (e1) eroded.*
- *An area of about 34 per cent soils are neutral (pH 6.5-7.3) and 54 per cent are slightly alkaline (pH 7.3-7.8) in soil reaction.*
- *The Electrical Conductivity (EC) of the soils in the entire cultivated area of the microwatershed is dominantly <2 dsm^{-1} indicating that the soils are non-saline.*
- *An area of about 3 per cent of the microwatershed is high (>0.75%) and 85 per cent is medium (0.50-0.75%) in organic carbon content.*
- *About 33 per cent area is low (<23kg/ha), 50 per area is medium (23-57 kg/ha) and 5 per cent is high (> 57 kg/ha) in available phosphorus.*
- *An area 44 per cent is low (<145 kg/ha) and 45 per cent is medium (145-337 kg/ha) in available potassium of the microwatershed.*
- *Available sulphur is low (<10 ppm) in 3 per cent and medium (10-20 ppm) in 86 per cent of the microwatershed.*
- *Available boron is low (<0.5 ppm) in 31 per cent and medium (0.5-1.0 ppm) in 57 per cent area of the microwatershed.*
- *Available iron is sufficient (>4.5 ppm) in the entire cultivated area of the microwatershed.*
- *Available manganese and copper are sufficient in the entire cultivated area of the microwatershed.*
- *Available zinc is deficient (<0.6 ppm) in the entire cultivated area of the microwatershed.*
- *The land suitability for 29 major crops grown in the microwatershed were assessed and the areas that are highly suitable (S1) and moderately suitable (S2) are given below. It is however to be noted that a given soil may be suitable for various crops but what specific crop to be grown may be decided by the farmer looking to his capacity to invest on various inputs, marketing infrastructure, market price and finally the demand and supply position.*

Land suitability for various crops in the Microwatershed

Crop	Suitability Area in ha (%)			Crop	Suitability Area in ha (%)	
	Highly suitable (S1)	Moderately suitable (S2)			Highly suitable (S1)	Moderately suitable (S2)
Sorghum	*47(7)*	*143(21)*		*Guava*	-	*28(4)*
Maize	*23(3)*	*192(28)*		*Sapota*	-	*28(4)*
Bajra	*28(4)*	*162(24)*		*Pomegranate*	-	*55(8)*
Groundnut	*8(1)*	*32(5)*		*Musambi*	*27(4)*	*28 (4)*
Sunflower	*27(4)*	*28(4)*		*Lime*	*27(4)*	*28 (4)*
Redgram	-	*117(17)*		*Amla*	*28(4)*	*100(15)*
Bengal gram	*27(4)*	-		*Cashew*	-	*25(4)*
Cotton	*27(4)*	*25(4)*		*Jackfruit*	-	*28(4)*
Chilli	*23(3)*	*105(15)*		*Jamun*	-	*27(4)*
Tomato	*23(3)*	*78(12)*		*Custard apple*	*55(8)*	*73(11)*
Brinjal	*23(3)*	*78(12)*		*Tamarind*	-	*27(4)*
Onion	*23(3)*	*78(12)*		*Mulberry*	-	*28(4)*
Bhendi	*23(3)*	*105(16)*		*Marigold*	*23(3)*	*105(16)*
Drumstick	-	*55(8)*		*Chrysanthemum*	*23(3)*	*105(16)*
Mango	-	-				

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

Chapter 1

INTRODUCTION

Land is a scarce resource and basic unit for any material production. It can support the needs of the growing population, provided they use the land in a rational and judicious manner. But what is happening in many areas of the state is a cause for concern to everyone involved in the management of land resources at the grassroots level. The area available for agriculture is about 51 per cent of the total geographical area and more than 60 per cent of the people are still dependant on agriculture for their livelihood. The limited land area is under severe stress and strain due to increasing population pressure and competing demands of various land uses. Due to this, every year there is significant diversion of farm lands and water resources for non-agricultural purposes. Apart from this, due to lack of interest in farmers for farming, large tracts of cultivable lands are turning into fallows in many areas and this trend is continuing at an alarming rate.

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

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

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

economic conditions, infrastructure, marketing facilities and various schemes and developmental works of the government etc. From the data collected at farm level, the specific problems and potentials of the area can be identified and highlighted, conservation measures required for the area can be planned on a scientific footing, suitability of the area for various uses can be worked out and finally viable and sustainable land use options suitable for each and every land holding can be prescribed.

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

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

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

Chapter 2

GEOGRAPHICAL SETTING

2.1 Location and Extent

The Nagalapur-1 microwatershed is located in the northern part of Karnataka in Yadgir Taluk & District, Karnataka State (Fig.2.1). It comprises parts of Nagalapura, Balichakra and Jinatera villages. It lies between 16^0 42'- 16^0 40' North latitudes and 77^0 13'-77^0 16' East longitudes covering an area of about 676.63 ha. It is about 15 km northeast of Yadgir town and is surrounded by Risabadha Hosalli village on the northeast side, Halagera on the northwest and north, Jinatera on the southwest and Balichakra on the southeast and southern side.

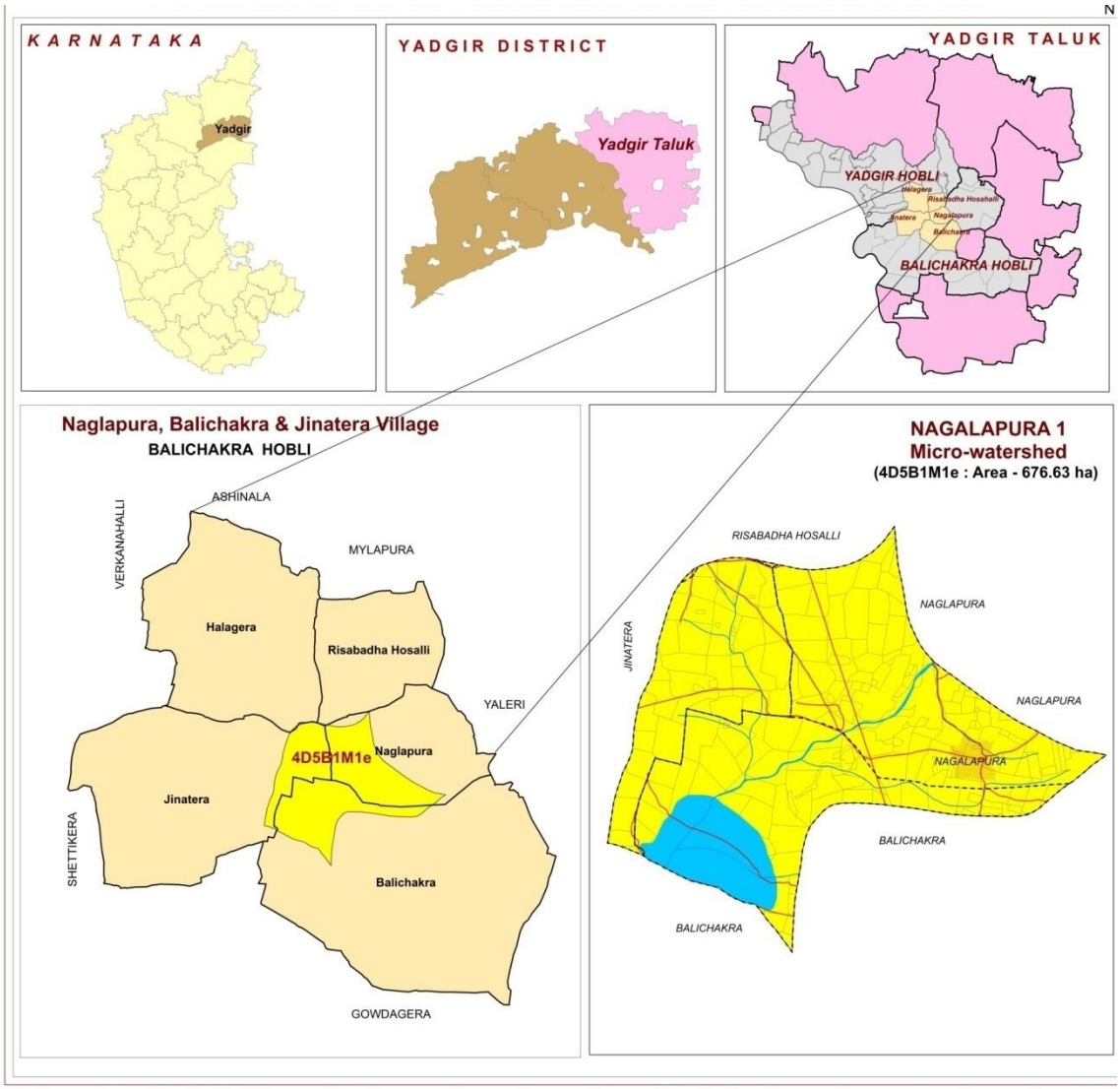

Fig.2.1 Location map of Nagalapur-1 Microwatershed

2.2 Geology

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

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

Fig.2.2 Granite and granite gneiss rocks

2.3 Physiography

Physiographically, the area has been identified as granite and gneiss landscape based on geology. The area has been further subdivided into five landforms, *viz;* mounds/ridges, summits, side slopes and very gently sloping uplands, plains and valleys based on slope and its relief features. The elevation ranges from 390-453 m above MSL. The mounds and ridges are mostly covered by rock outcrops.

2.4 Drainage

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

2.5 Climate

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

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

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

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

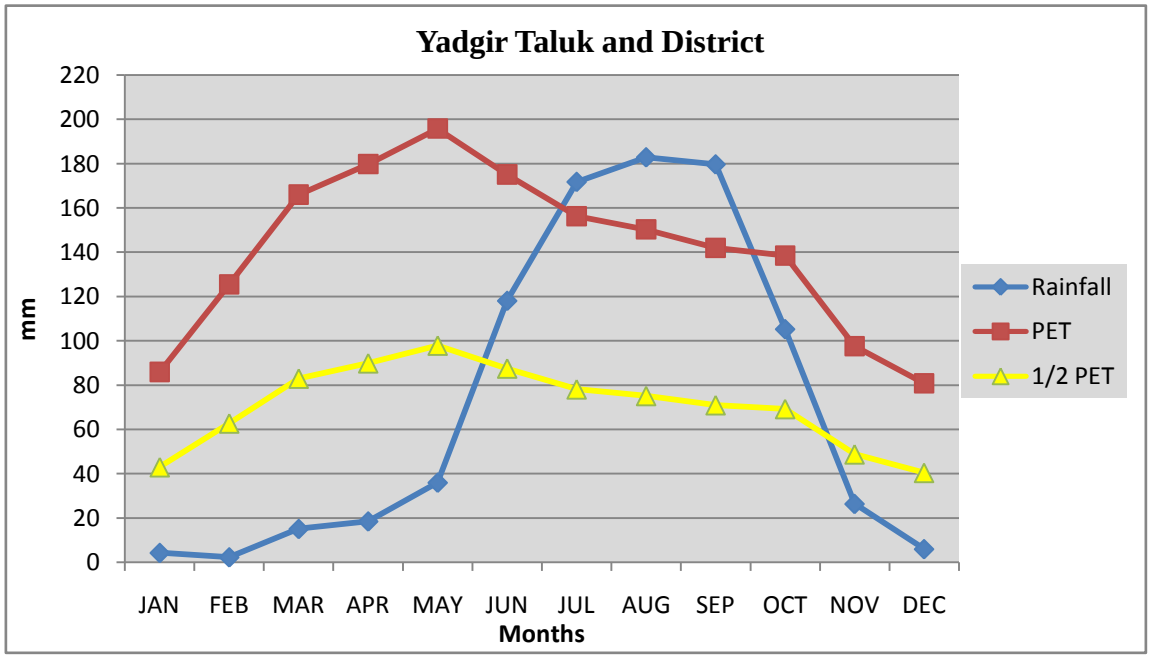

Fig 2.3 Rainfall distribution in Yadgir Taluk, Yadgir District

2.6 Natural Vegetation

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

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

Fig 2.4 Natural vegetation of Nagalapur-1 Microwatershed

2.7 Land Utilization

About 72 per cent area (Table 2.2) in Yadgir district is cultivated at present. An area of about 2 per cent is permanently under pasture, 20 per cent under current fallows and 6 per cent under non-agricultural land and 5 per cent under currently barren. Forests occupy an area of about 7 per cent and the tree cover is in a very poor state. Most of the mounds, ridges and bouldery areas have very poor vegetative cover. Major crops grown in the area are paddy, cotton, groundnut and red gram. While carrying out land resource inventory, the land use/land cover particulars are collected from all the survey numbers and a current land use map of the microwatershed is prepared. The current land use map prepared shows the arable and non-arable lands, other land uses and different types of crops grown in the area. The current land use map of Nagalapur-1 microwatershed is presented in Fig.2.5. The different crops and cropping systems adopted in the microwatershed is presented in the Figures 2.6.

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

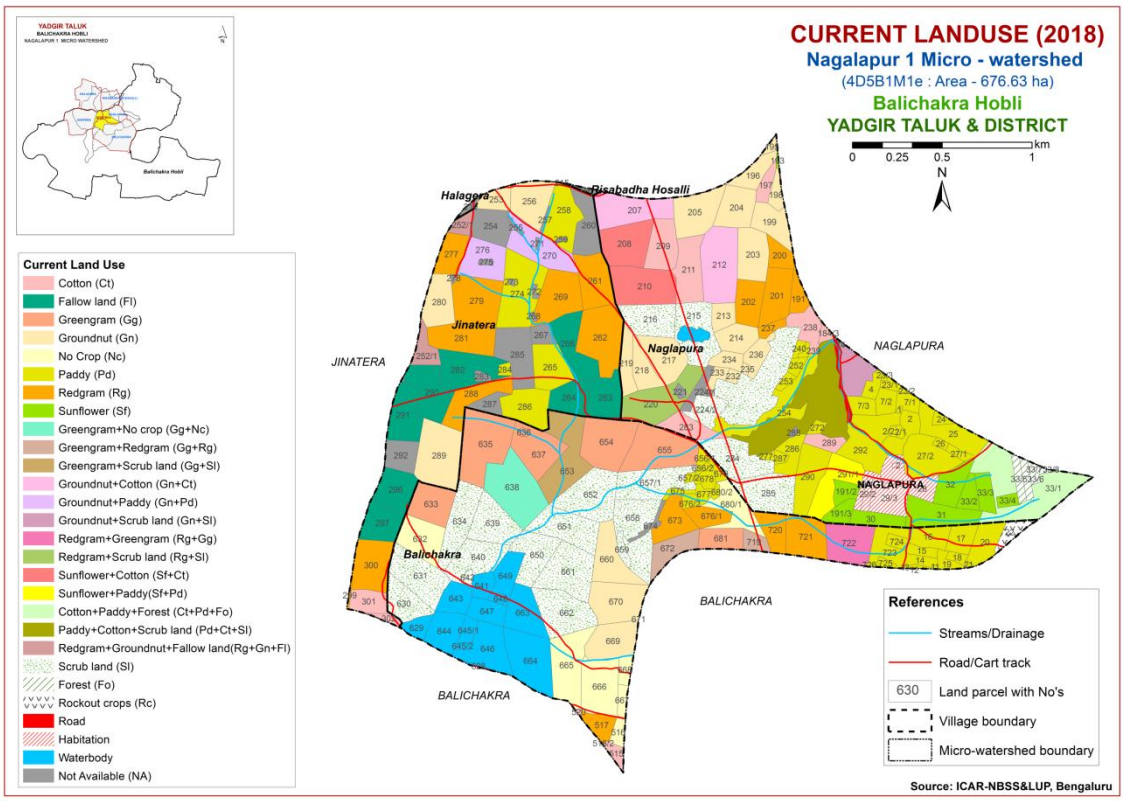

Fig.2.5 Current Land Use map of Nagalapur-1 Microwatershed

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

Chapter 3

SURVEY METHODOLOGY

The purpose of land resource inventory is to delineate similar areas (soil series and phases), which respond or expected to respond similarly to a given level of management. This was achieved in Nagalapur-1 microwatershed by the detailed study of all the soil characteristics (depth, texture, colour, structure, consistence, coarse fragments, porosity, soil reaction, soil horizons etc.) and site characteristics (slope of the land, erosion, drainage, occurrence of rock fragments etc.) followed by grouping of similar areas based on soil-site characteristics into homogeneous (management units) units, and showing the area extent and their geographic distribution on the microwatershed cadastral map. The detailed survey at 1:7920 scale was carried out in an area of 677 ha. The methodology followed for carrying out land resource inventory was as per the guidelines given in Soil Survey Manual (IARI, 1971; Soil Survey Staff, 2006; Natarajan *et al.*, 2015) which is briefly described below.

3.1 Base Maps

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

3.2 Image Interpretation for Physiography

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

Image Interpretation Legend for Physiography

G- Granite Gneiss Landscape

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

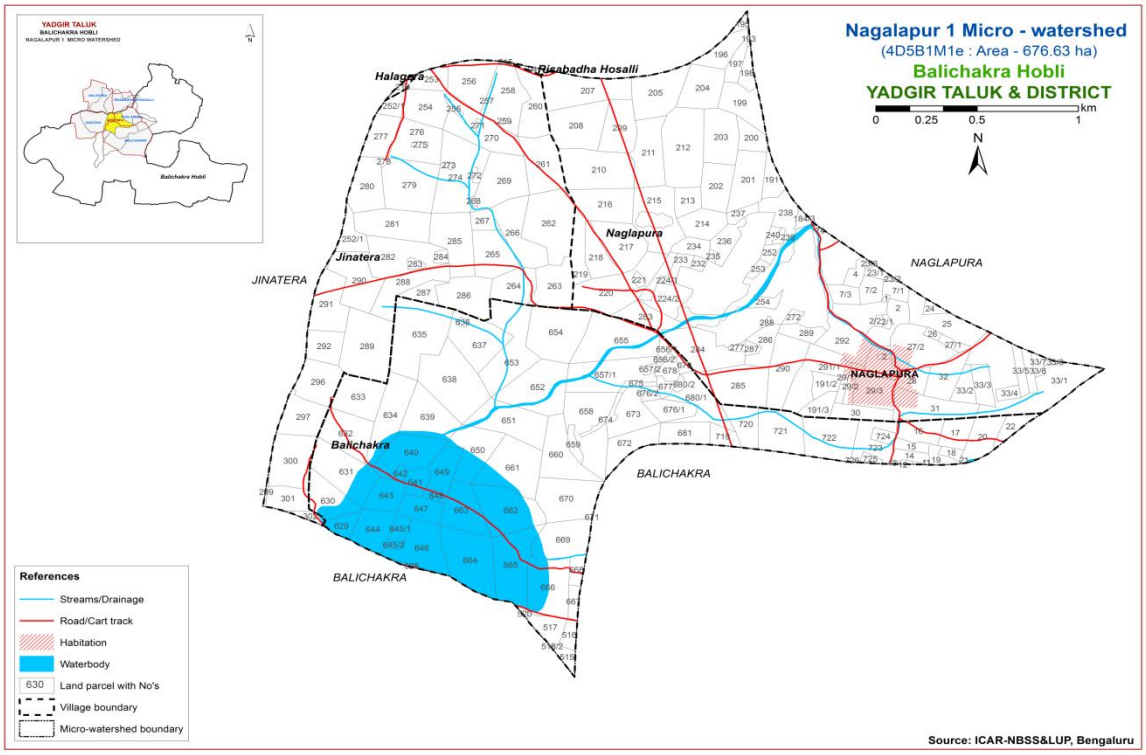

Fig 3.1 Scanned and Digitized Cadastral map of Nagalapur-1 Microwatershed

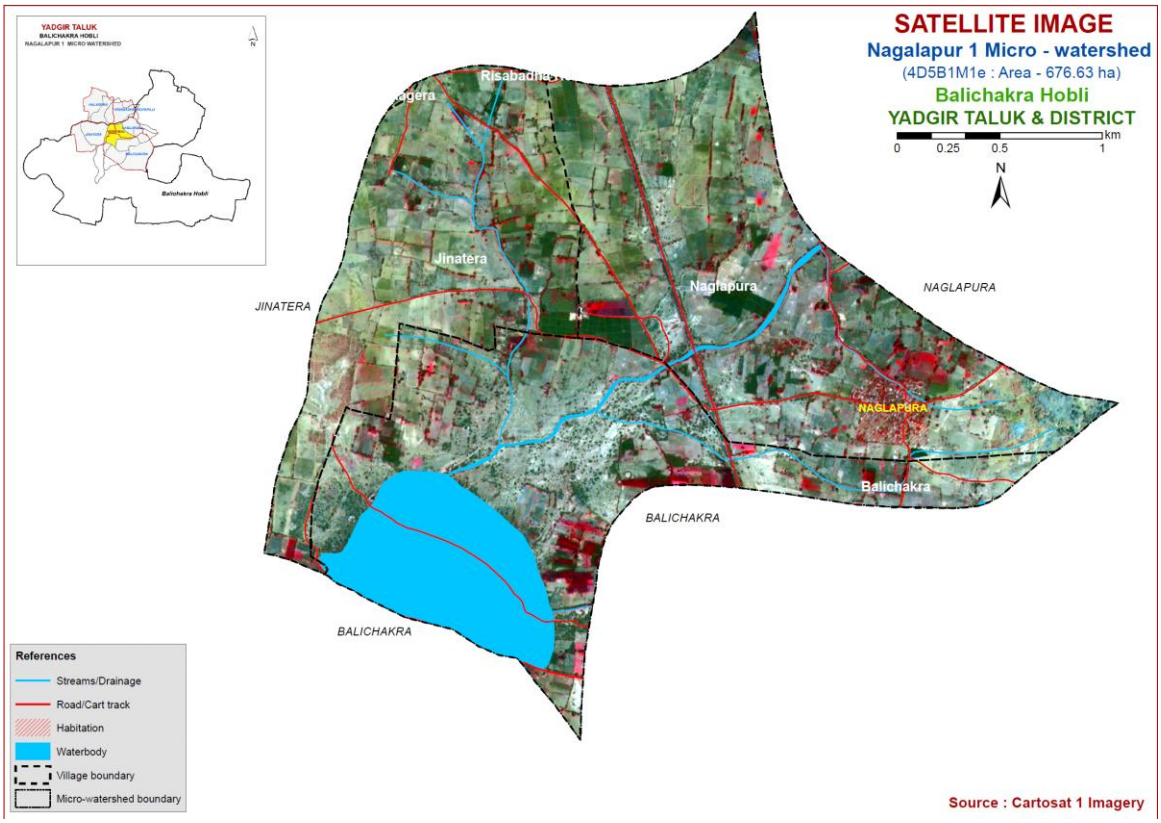

Fig.3.2 Satellite Image of Nagalapur-1 Microwatershed

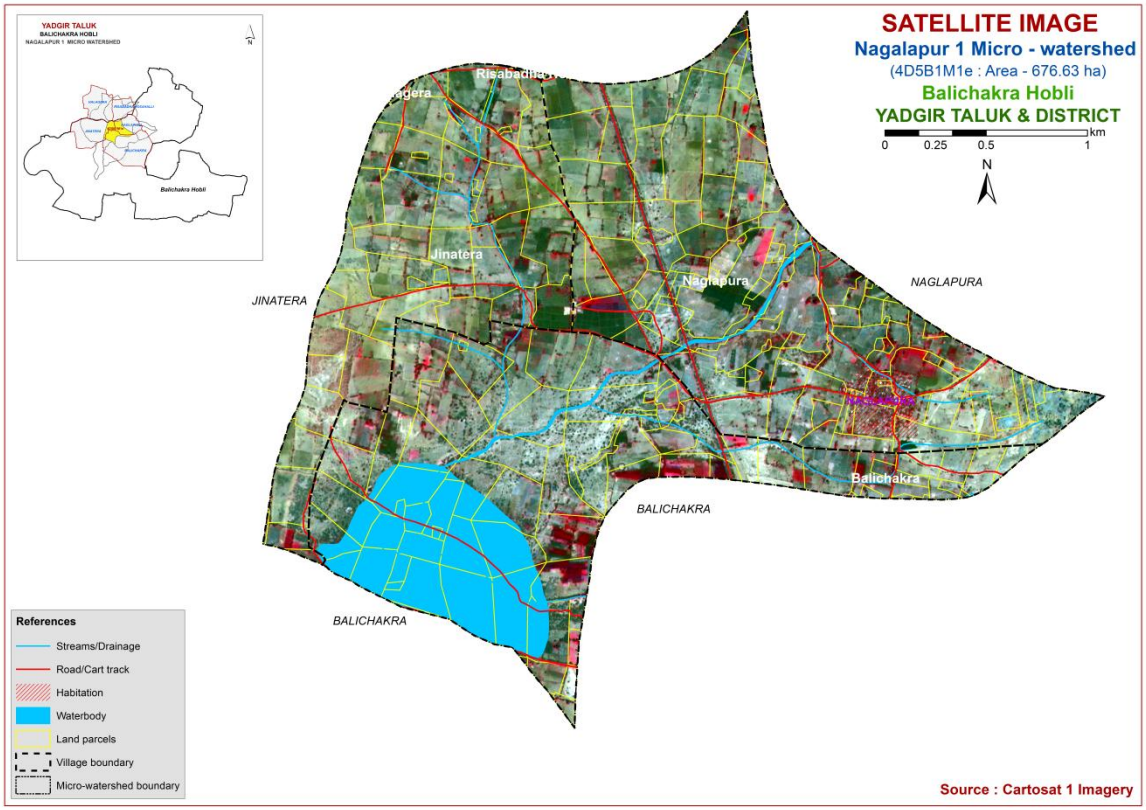

Fig.3.3 Cadastral map overlaid on IRS PAN+LISS IV merged imagery of Nagalapur-1 Microwatershed

3.3 Field Investigation

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

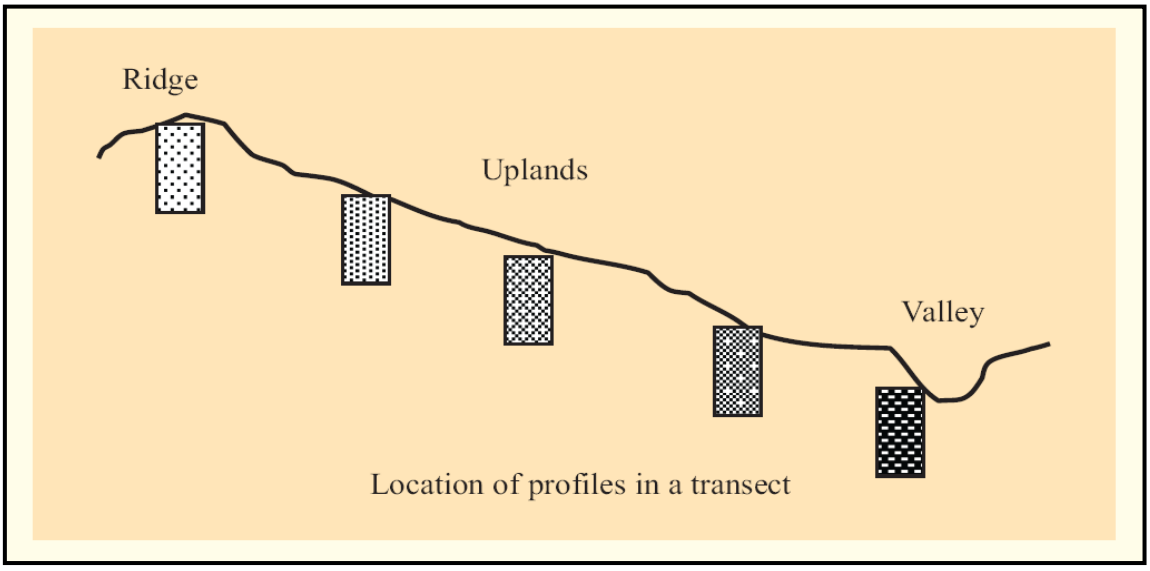

Fig: 3.4. Location of profiles in a transect

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

Based on the soil characteristics, the soils were grouped into different soil series. Soil series is the most homogeneous unit having similar horizons and properties and behaves similarly for a given level of management. Soil depth, texture, colour, kind of horizon and horizon sequence, calcareousness, amount and nature of gravel present, nature of substratum etc, were used as the major differentiating characteristics for

identifying soil series occurring in the area. The differentiating characteristics used for identifying the soil series are given in Table 3.1. Based on the above characteristics, 15 soil series were identified in the Nagalapur-1 microwatershed.

Table 3.1 Differentiating Characteristics used for identifying Soil Series

(Characteristics are of Series Control Section)

Soils of Granite gneiss Landscape							
Sl. no	**Soil Series**	**Depth (cm)**	**Colour (moist)**	**Texture**	**Gravel (%)**	**Horizon sequence**	**Calcareou-sness**
1	BDP (Baddeppalli)	<25	7.5YR 3/2,3/4 5YR 3/4	scl	-	Ap-Ac	es
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	HTK (Hattikuni)	25-50	10YR4/6,4/4 7.5YR4/4,3/3	sl	10-25	Ap-AC	-
4	YLR (Yalleri)	50-75	2.5YR 3/4,4/4 5YR3/4 7.5YR4/4	c	15-35	Ap-Bt	-
5	SBR (Sambra)	50-75	10YR 7/1 7.5YR 7/4	ls	-	Ap-AC	-
6	JNK (Jinkera)	50-75	10YR3/1,3/2 7.5YR3/4	scl	-	Ap-Bw	e
7	BLC (Balichakra)	75-100	2.5YR5/3,2.5/4 5YR4/3,3/3	scl	-	Ap-BA-Bt	-
8	SHT (Shettalli)	75-100	10YR 3/1	scl	15-35	Ap-Bw	e
9	Pogalapur (PGP)	75-100	5YR 4/6,3/3 7.5YR 4/4	sc	-	Ap-Bt	-
10	GWD (Gowdagera)	75-100	10YR 3/1,3/2,4/2	scl	-	Ap-Bw	es
11	BGD (Belagundi)	100-150	10YR 5/4,4/4 7.5YR4/4	c	-	Ap-AB-Bss	e
12	MDG (Mundargi)	100-150	10YR 4/4,3/3 7.5YR4/4	scl	-	Ap-Bw	-
13	ANR (Anur)	100-150	10YR 4/3,4/1	c	-	Ap-Bw	es
14	YDR (Yadgir)	100-150	10YR4/3,4/4 2.5YR4/3,5/3	sl	-	Ap-A2-Bw	-
15	KDP (Kondapur)	>150	7.5YR5/6 10YR 4/2,4/4,5/3	s	-	A-C	-

3.4 Soil Mapping

The area under each soil series was further separated into soil phases and their boundaries delineated on the cadastral map based on the variations observed in the texture of the surface soil, slope, erosion, presence of gravel, stoniness etc. A soil phase is a subdivision of soil series based mostly on surface features that affect its use and

management. The soil mapping units are shown on the map (Fig.3.5) in the form of symbols. During the survey many profile pits, few minipits and a few auger bores representing different landforms occurring in the microwatershed were studied. In addition to the profile study, spot observations in the form of minipits, road cuts, terrace cuts etc., were studied to validate the soil boundaries on the soil map.

The soil map shows the geographic distribution of 23 mapping units representing 15 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 23 soil phases mapped in the microwatershed. Each mapping unit (soil phase) delineated on the map has similar soil and site characteristics. In other words, all the farms or survey numbers included in one phase will have similar management needs and have to be treated accordingly.

3.5 Land Management Units

The 23 soil phases identified and mapped in the microwatershed were grouped into 8 Land Management Units (LMU's) for the purpose of preparing a Proposed Crop Plan for sustained development of the microwatershed. The database (soil phases) generated under LRI was utilized for identifying Land Management Units (LMU's) based on the management needs. One or more than one soil site characteristic having influence on the management have been chosen for identification and delineation of LMUs. For Nagalapur-1 microwatershed, five soil and site characteristics, namely soil depth, soil texture, slope, erosion and gravel content have been considered for defining LMUs. The Land Management Units are expected to behave similarly for a given level of management.

3.6 Laboratory Characterization

Soil samples were collected from representative master profiles for laboratory characterization by following the methods outlined in the Laboratory Manual (Sarma *et al*, 1987). Surface soil samples collected from farmer's fields (68 samples) for fertility status (major and micronutrients) at 320 m grid interval in the year 2018 were analyzed in the laboratory (Katyal and Rattan, 2003). By linking the soil fertility data to the survey numbers through GIS, soil fertility maps were generated by using Kriging method for the microwatershed.

Table 3.2 Soil map unit description of Nagalapur-1 Microwatershed

*Soil map unit No.	Soil Series	Soil Phase	Mapping Unit Description	Area in ha (%)
Soils of Granite and Granite Gneiss Landscape				
	BDP	Baddeppalli soils are very shallow (<25 cm), well drained, have dark brown to dark reddish brown, calcareous, sandy clay loam soils occurring on very gently sloping uplands under cultivation		**14 (2.14)**
120		BDPhB2	Sandy clay loam surface, slope 1-3%, moderate	14 (2.14)

*Soil map unit No.	Soil Series	Soil Phase	Mapping Unit Description	Area in ha (%)
			erosion	
	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		**1 (0.07)**
5		BDLiB2	Sandy clay surface, slope 1-3%, moderate erosion	1 (0.07)
	HTK	Hattikuni soils are shallow (25-50 cm), well drained, have dark yellowish brown sandy loam soils occurring on very gently sloping uplands under cultivation		**32 (4.78)**
113		HTKcC2g1	Sandy loam surface, slope 3-5%, moderate erosion, gravelly (15-35%)	14 (2.14)
165		HTKcB2	Sandy loam surface, slope 1-3%, moderate erosion	18 (2.64)
	YLR	Yalleri soils are moderately shallow (50-75 cm), well drained, have brown to reddish brown and dark reddish brown, clay red soils occurring on very gently to gently sloping uplands under cultivation		**61 (8.95)**
27		YLRbB2	Loamy sand surface, slope 1-3%, moderate erosion	5 (0.73)
30		YLRcC3	Sandy loam surface, slope 3-5%, severe erosion	56 (8.22)
	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		**58 (8.54)**
11		SBRcB2	Sandy loam surface, slope 1-3%, moderate erosion	58 (8.54)
	JNK	Jinkera soils are moderately shallow (50-75 cm), well drained, have dark brown to very dark grayish brown, slightly calcareous, sandy clay loam soils occurring on very gently sloping uplands under cultivation		**12 (1.83)**
20		JNKcB2	Sandy loam surface, slope 1-3%, moderate erosion	0.43 (0.06)
22		JNKiB2	Sandy clay surface, slope 1-3%, moderate erosion	12 (1.77)
	BLC	Balichakra soils are moderately deep (75-100 cm), well drained, have reddish brown to dark reddish brown, sandy clay loam red soils occurring on very gently sloping uplands under cultivation		**5 (0.74)**
155		BLCcB2g1	Sandy loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	5 (0.74)
	SHT	Shettalli soils are moderately deep (75-100 cm), well drained, have very dark gray, gravelly sandy clay loam soils occurring on very gently sloping uplands under cultivation		**3 (0.38)**
36		SHThB2	Sandy clay loam surface, slope 1-3%, moderate erosion	3 (0.38)
	PGP	Poglapur soils are moderately deep (75-100 cm), well drained, have brown to dark reddish brown and yellowish red, sandy clay soils occurring on very gently sloping uplands under cultivation		**20 (2.98)**
114		PGPhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	20 (2.98)

*Soil map unit No.	Soil Series	Soil Phase	Mapping Unit Description	Area in ha (%)
	GWD	Gowdagera soils are moderately deep (75-100 cm), moderately well drained, have dark grayish brown to very dark grayish brown, sodic sandy clay loam soils occurring on very gently sloping uplands under cultivation		**25 (3.75)**
35		GWDiB2	Sandy clay surface, slope 1-3%, moderate erosion	25 (3.75)
	BGD	Belagundi soils are deep (100-150 cm) well drained, have brown to dark yellowish brown, slightly calcareous, clayey soils occurring on very gently sloping uplands under cultivation		**27 (4.02)**
115		BGDmB2	Clay surface, slope 1-3%, moderate erosion	27 (4.02)
	MDG	Mundargi soils are deep (100-150 cm), moderately well drained, have brown to dark yellowish brown, sandy clay loam soils occurring on very gently sloping uplands under cultivation		**62 (9.17)**
57		MDGcB2	Sandy loam surface, slope 1-3%, moderate erosion	29 (4.33)
149		MDGhB2g1	Sandy clay loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	0.08 (0.01)
58		MDGiB2	Sandy clay surface, slope 1-3%, moderate erosion	33 (4.83)
	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		**60 (8.84)**
167		ANRcA1	Sandy loam surface, slope 0-1%, slight erosion	17 (2.45)
168		ANRcB2	Sandy loam surface, slope 1-3%, moderate erosion	43 (6.38)
55		ANRiB2	Sandy clay surface, slope 1-3%, moderate erosion	00.9 (0.01)
	YDR	Yadgir soils are deep (100-150 cm), well drained, have brown to dark yellowish brown and olive brown, sodic sandy loam soils occurring on very gently sloping uplands under cultivation		**128 (18.87)**
42		YDRcB2	Sandy loam surface, slope 1-3%, moderate erosion	128(18.87)
	KDP	Kondapur soils are very deep (>150 cm), somewhat excessively drained, have strong brown to dark grayish brown and brown sandy soils occurring on nearly level to gently sloping lowlands under cultivation.		**90 (13.39)**
179		KDPcA1	Sandy loam surface, slope 0-1%, slight erosion	84(12.49)
180		KDPhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	6 (0.9)
1000		Others	Habitation and water body	**78(11.55)**

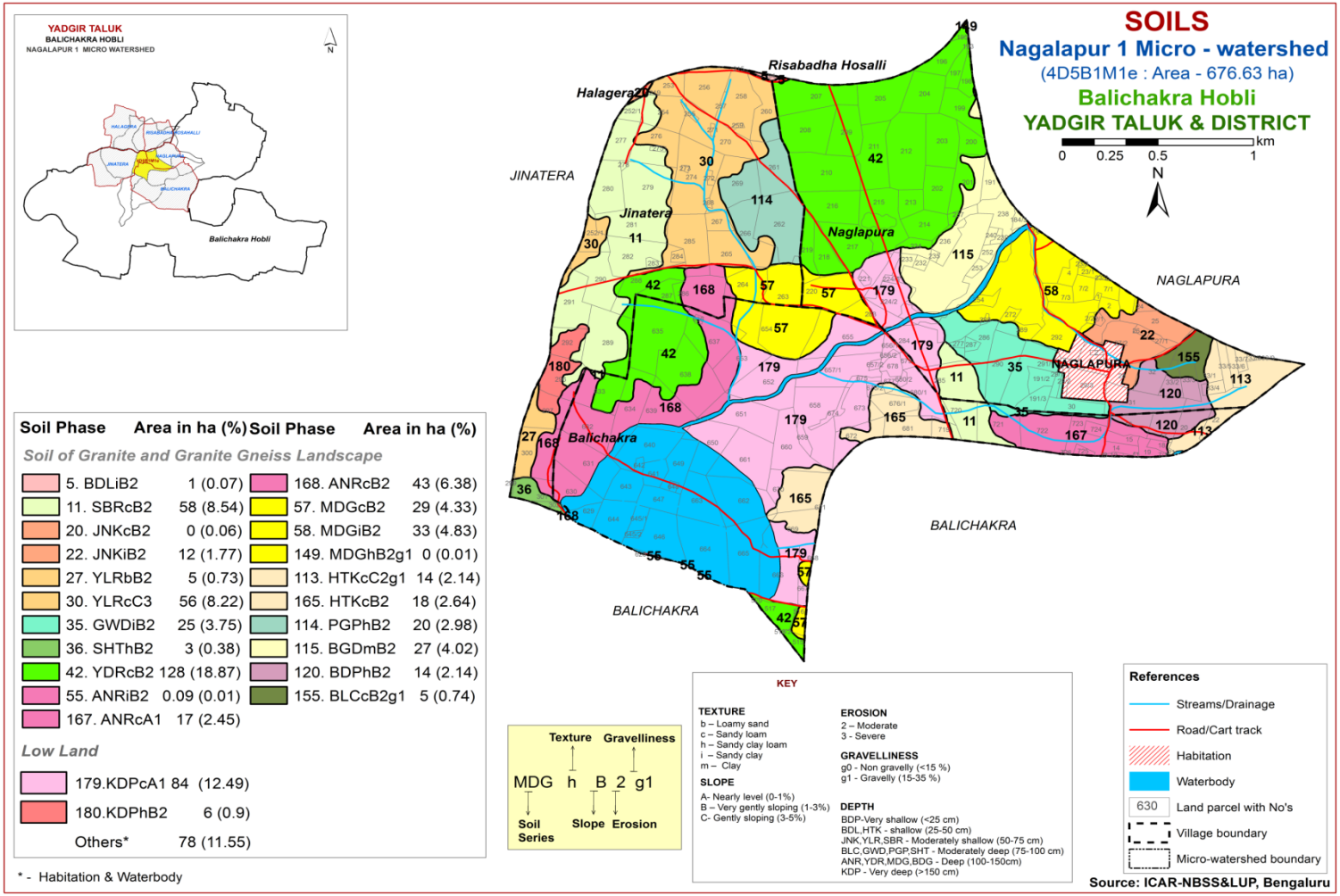

Fig 3.5 Soil Phase or Management Units - Nagalapur-1 Microwatershed

Chapter 4

THE SOILS

Detailed information pertaining to the nature, extent and their distribution of different kinds of soils occurring in Nagalapur-1 microwatershed is provided in this chapter. The microwatershed area has been identified as granite and gneiss landscape based on geology. In all, 15 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 15 soil series identified followed by 23 soil phases (management units) mapped under each series are furnished below. The physical and chemical characteristics of soil series identified in Nagalapur-1 microwatershed are given in Table 4.1 along with soil classification. The soils in any one map unit differ from place to place in their depth, texture, slope, gravelliness, erosion or any other site characteristic that affect management. The soil phase map can be used for identifying the suitability of areas for growing specific crops or for other alternative uses and also for deciding the type of conservation structures needed. The detailed information on soil and site-characteristics like soil depth, surface soil texture, slope, erosion, gravelliness, AWC, LCC etc, with respect to each of the soil phase identified is given village/survey number wise for the microwatershed in Appendix-I.

4.1 Soils of granite gneiss landscape

In this landscape, 15 soil series are identified and mapped. Of these, YDR series occupies maximum area of 128 ha (19%) followed by KDP 90 ha (13%), MDG 62 ha (9%), YLR 61 ha (9%), ANR 60 ha (9%) and SBR 58 ha (9%). The other series occupy minor area in the microwatershed. Brief description of each series identified and number of soil phases mapped is given below.

4.1.1 Baddeppalli (BDP) Series: Baddeppalli soils are very shallow (<25cm), well drained, have dark brown to dark reddish brown, calcareous, sandy clay loam soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands under cultivation. The Baddepalli series has been classified as a member of the loamy, mixed (calcareous), isohyperthermic family of Lithic Ustorthents.

The thickness of the soil is less than 25 cm. Its colour is in 7.5 YR and 5 YR hue with value 3 and chroma 2 to 4. The texture varies from sandy clay loam to sandy clay and is calcareous. The available water capacity is very low (<50 mm/m). Only one phase was identified and mapped.

Landscape and Soil Profile characteristics of Baddeppalli (BDP) Series

4.1.2 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). Only one phase was identified and mapped.

Landscape and Soil Profile characteristics of Badiyala (BDL) Series

4.1.3 Hattikuni (HTK) Series: Hattikuni soils are shallow (25-50 cm), well drained, have dark brown to dark yellowish brown sandy loam soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands under cultivation. The Hattikuni series has been classified as a member of the mixed, isohyperthermic family of Lithic Ustipsamments.

The thickness of the soil ranges from 36 to 50 cm. The thickness of A horizon ranges from 8 to 12 cm. Its colour is in 10YR and 7.5 YR hue with value 3 to 4 and chroma 4 to 6. The texture varies from loamy sand to sandy loam. The thickness of subsurface horizon ranges from 28 to 42 cm. Its colour is in 10 YR and 7.5 YR hue with value 3 to 4 and chroma 4 to 6. Its texture varies from loamy sand to sand and sandy loam. The available water capacity is very low (<50 mm/m). Two phases were identified and mapped.

Landscape and Soil Profile characteristics of Hattikuni (HTK) Series

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

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

Landscape and Soil Profile characteristics of Yalleri (YLR) Series

4.1.5 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

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

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

Landscape and Soil Profile characteristics of Jinkera (JNK) Series

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

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

Landscape and Soil Profile characteristics of Balichakra (BLC) Series

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

The thickness of the solum ranges from 78 to 100 cm. The thickness of A horizon ranges from 7 to 12 cm. Its colour is in hue 7.5 YR with value and chroma of 3 to 4. Its texture varies from sandy loam to sandy clay with 20 per cent gravel. The thickness of B horizon ranges from 68 to 92 cm. Its colour is in hue 7.5 YR with value 2 to 4 and chroma 1 to 3. Its texture is sandy clay loam to sandy clay with 15-35 per cent gravel and is slightly calcareous. The available water capacity is low (51-100 mm/m). Only one phase was identified and mapped.

Landscape and Soil Profile characteristics of Shettalli (SHT) Series

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

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

Landscape and Soil Profile characteristics of Poglapur (PGP) Series

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

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

Landscape and Soil Profile characteristics of Gowdagera (GWD) Series

4.1.11 Belagundi (BGD) Series: Belagundi soils are deep (100-150 cm), moderately well drained, have dark yellowish brown to yellowish brown and dark brown, slightly calcareous, cracking clay soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands under cultivation. The Belagundi 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 100 to 145 cm. The thickness of A horizon ranges from 5 to 12 cm. Its colour is in 10 YR and 5 YR hue with value 5 and chroma 2 to 4. The texture varies from sandy to loamy sand. The thickness of B horizon ranges from 95 to 135 cm. Its colour is in 10 YR and 7.5 YR hue with value 4 to 5 and chroma 4. Texture is sandy clay to clay and is slightly calcareous. The available water capacity is very high (>200 mm/m). Only one phase was identified and mapped.

Landscape and Soil Profile characteristics of Belagundi (BGD) Series

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

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

Landscape and Soil Profile characteristics of Mundargi (MDG) Series

4.1.13 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). Three phases were identified and mapped.

Landscape and Soil Profile characteristics of Anur (ANR) Series

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

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

Landscape and Soil Profile characteristics of Yadgir (YDR) Series

4.1.15 Kondapur (KDP) Series: Kondapur soils are very deep (>150 cm), somewhat excessively drained, have strong brown, dark grayish brown to brown sandy soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping lowlands under cultivation. The Kondapur series has been classified as a member of the mixed, isohyperthermic family of Typic Ustipsamments.

The thickness of the solum is more than 150 cm. The thickness of A horizon ranges from 9 to 18 cm. Its colour is in 10 YR hue with value 3 and chroma 2 to 3 with clay texture. The thickness of B horizon ranges from 159 to 162 cm. Its colour is in 10 YR and 7.5YR hue with value 4 to 5 and chroma 2 to 6. Its texture varies from sand to loamy sand and sandy loam and is stratified. The available water capacity is low (51-100 mm/m). Two phases were identified and mapped.

Landscape and Soil Profile characteristics of Kondapur (KDP) Series

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

Soil Series: Baddeppalli **(**BDP) **Pedon:** R-11

Location: $16^0$43'84.4"N $77^0$14'06.4"E, Halagera village, Yadgir hobli, Yadgir taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Loamy, mixed (calcareous), isohyperthermic, Lithic Ustorthents

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-16	Ap	58.67	17.02	24.31	19.03	13.74	9.62	10.57	5.71	<15	scl	16.19	8.18

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-16	8.58	-	-	0.262	1.60	7.67	-	-	0.24	0.06	-	18.10	0.74	100	0.35

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: Hattikuni (HTK), Pedon: R-7

Location: $16^0$50'46.5"N $77^0$10'16.4"E, Yaddalli village, Hattikuni hobli, Yadgir taluk and district

Analysis at: NBSS&LUP, Regional Centre, Bengaluru **Classification:** Mixed, isohyperthermic, Lithic 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
0-12	Ap	90.89	5.62	3.49	8.50	13.46	29.86	29.55	9.51	20	s	7.73	3.16
12-22	A1	89.97	6.53	3.50	7.19	13.48	29.48	29.79	10.03	20	s	8.00	3.05
22-45	A2	87.20	6.43	6.38	11.09	14.42	31.55	7.16	22.98	40	ls	7.67	3.96

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-12	6.81	-	-	0.062	0.07	-	2.35	0.50	0.16	0.01	3.02	3.0	0.86	100	0.38
12.0-22	6.80	-	-	0.050	0.21	-	1.67	0.30	0.09	0.01	2.07	2.4	0.69	86.30	0.45
22-45	6.85	-	-	0.044	0.19	-	1.82	0.42	0.10	0.06	2.40	2.6	0.41	92.41	2.17

Contd...

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

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

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

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-5	Ap	81.69	5.44	12.87	6.10	8.65	33.88	21.57	11.50	-	sl	8.60	3.37
5-34	Bt1	38.78	6.73	54.49	3.38	9.91	12.42	8.93	4.14	-	c	25.33	15.82
34-75	Bt2	40.35	2.90	56.75	12.91	6.83	10.30	7.48	2.82	35-60	c	24.49	16.20

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-5	6.91	-	-	0.069	0.70	0.00	5.29	1.37	0.28	0.03	6.96	6.90	0.54	100	0.45
5-34	7.05	-	-	0.053	0.62	0.00	16.43	3.89	0.26	0.09	20.67	21.60	0.40	96	0.42
34-75	7.25	-	-	0.058	0.59	0.00	15.22	3.46	0.25	0.14	19.06	19.90	0.35	96	0.69

Contd...

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

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

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

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-15	Ap	66.84	13.62	19.54	12.15	21.22	11.23	12.56	9.68	10	sl	14.42	7.70
15-38	Bw1	59.08	12.11	28.81	12.53	12.42	17.85	8.77	7.52	20	scl	18.21	12.23
38-52	Bw2	68.21	11.68	20.11	17.90	21.81	10.60	10.80	7.10	10	scl	14.54	8.96

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-15	8.42	-	-	0.148	0.70	0.65	-	-	0.15	0.03	-	14.50	0.74	100	0.18
15-38	8.38	-	-	0.226	0.31	2.21	-	-	0.09	0.23	-	21.70	0.75	100	1.05
38-52	8.40	-	-	0.195	0.25	1.17	-	-	0.07	0.19	-	15.90	0.79	100	1.23

Contd...

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

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

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

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

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

Contd...

Soil Series: Shettalli (SHT) **Pedon:** R-14

Location: $16^0$47'21.1"N $77^0$04'91.1"E, Thumakura village, Yadgir hobli, Yadgir taluk and district

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

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-14	Ap	74.39	10.89	14.73	5.64	8.30	21.00	28.89	10.55	50	sl	12.58	4.51
14-35	Bw1	54.37	14.73	30.90	3.58	5.90	15.38	21.71	7.80	25	scl	20.37	10.92
35-63	Bw2	41.16	20.63	38.21	1.71	1.71	10.61	13.61	13.50	30	cl	24.34	15.03
63-83	Bw3	36.96	21.52	41.51	4.31	5.28	8.94	12.39	6.03	35	c	24.76	16.17

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	7.26	-	-	0.199	0.91	0.13	-	-	0.28	0.09	-	10.60	0.72	100	0.86
14-35	7.05	-	-	0.051	0.80	1.17	-	-	0.12	0.09	-	18.20	0.59	100	0.48
35-63	7.67	-	-	0.238	0.70	2.86	-	-	0.14	0.16	-	24.40	0.64	100	0.64
63-83	8.67	-	-	0.142	0.20	12.48	-	-	0.13	0.23	-	27.40	0.66	100	0.84

Contd...

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

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

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

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-15	Ap	91.81	4.70	3.49	17.80	30.23	15.57	20.93	7.28	-	s	4.94	2.29
15-50	Bt1	46.83	4.99	48.17	11.92	16.22	8.59	6.77	3.33	10	sc	24.59	17.37
50-90	Bt2	45.81	4.73	49.46	17.10	14.09	6.45	5.16	3.01	15	sc	24.44	16.57
90-125	Bt3	58.92	5.86	35.22	28.51	10.45	10.98	5.49	3.48	15	sc	21.73	10.30

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-15	6.83	-	-	0.210	0.76	0.00	1.79	0.88	0.41	0.09	3.16	3.15	0.90	100	2.83
15-50	6.20	-	-	0.105	0.48	0.00	12.27	4.45	0.30	0.39	17.40	17.54	0.36	99	2.22
50-90	6.23	-	-	0.080	0.40	0.00	11.51	3.92	0.28	0.37	16.09	17.33	0.35	93	2.16
90-125	6.49	-	-	0.068	0.20	0.00	11.19	3.62	0.27	0.40	15.49	17.43	0.49	89	2.29

Contd...

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

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

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

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

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

Contd...

Soil Series: Belagundi **(**BGD) **Pedon:** T_1/P_2

Location: $16^0$31'65.3"N $77^0$20'84.9"E, Kadechoora village, Sydhapura 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
0-13	Ap	14.90	17.83	67.27	0.77	2.10	2.65	5.96	3.42	-	c	43.97	29.27
13-40	AB	13.07	18.32	68.61	0.80	2.05	2.61	4.20	3.41	-	c	41.23	30.48
40-80	Bss1	11.68	17.18	71.13	0.80	2.06	2.29	3.32	3.21	-	c	46.72	32.41
80-113	Bss2	12.17	16.53	71.30	1.95	1.61	3.21	2.41	2.99	-	c	46.87	35.13

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-13	7.85	-	-	0.253	0.87	5.20	-	-	0.67	0.17	-	65.90	0.98	100	0.26
13-40	8.11	-	-	0.172	0.74	4.29	-	-	0.31	0.16	-	66.70	0.97	100	0.23
40-80	8.44	-	-	0.205	0.58	5.59	-	-	0.20	0.27	-	66.30	0.93	100	0.40
80-113	8.82	-	-	0.201	0.39	10.14	-	-	0.19	0.17	-	63.80	0.89	100	0.27

Contd...

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

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

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

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

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

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

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

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

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-14	Ap	73.39	11.31	15.30	6.76	20.27	24.87	15.66	5.83	-	sl	12.14	7.22
14-43	A2	86.59	8.77	4.64	23.19	26.92	14.11	15.22	7.16	-	ls	6.97	2.68
43-89	Bw1	80.41	3.75	15.84	8.06	13.47	36.73	15.71	6.43	-	sl	22.84	10.18
89-110	Bw2	63.55	5.40	31.05	8.10	23.05	19.00	9.87	3.53	15-35	scl	38.46	17.70

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

Contd...

Soil Series: Kondapura (KDP) **Pedon:** R-2

Location: $16^0$42'03.6"N $77^0$17'20.7"E, Yaleri 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
0-10	Ap	91.15	7.70	1.16	24.04	23.94	23.74	12.58	6.84	20	s	4.59	1.61
10-30	C1	92.15	2.64	5.21	21.45	23.06	26.08	10.47	11.08	20	s	4.43	1.63
30-59	C2	86.75	5.69	7.56	17.49	23.96	27.00	12.94	5.36	20	ls	6.60	2.20
59-118	C3	94.00	2.55	3.45	23.60	27.20	26.70	13.50	3.00	20	s	3.15	0.92
118-157	C4	89.34	7.77	2.89	23.84	24.55	24.65	11.47	4.83	10	s	6.07	1.44

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-10	6.55	-	-	0.07	0.48	0.00	1.12	0.31	0.08	0.03	1.54	2.53	2.19	61	1.37
10-30	6.66	-	-	0.03	0.28	0.00	1.38	0.44	0.06	0.05	1.93	2.86	0.55	67	1.90
30-59	6.85	-	-	0.03	0.15	0.00	1.87	0.66	0.06	0.11	2.69	3.85	0.51	70	2.94
59-118	7.06	-	-	0.03	0.11	0.00	0.93	0.31	0.03	0.06	1.33	2.03	0.59	66	3.10
118-157	7.15	-	-	0.03	0.03	0.00	1.51	0.66	0.03	0.08	2.29	2.68	0.92	85	2.93

Chapter 5

INTERPRETATION FOR LAND RESOURCE MANAGEMENT

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

5.1 Land Capability Classification

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

Soil Characteristics: Depth, texture, gravelliness, calcareousness.

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

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

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

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

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

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

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

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

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

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

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

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

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

The 23 soil map units identified in the Nagalapur-1 microwatershed are grouped under 3 land capability classes and 4 subclasses. Entire area in the microwatershed is suitable for agriculture (Fig. 5.1).

Good lands (Class II) cover an area of about 20 per cent and are distributed in the northern, southern, eastern, central, southwestern and southeastern part of the microwatershed with minor problems of soil and erosion. Moderately good lands (Class III) cover an area of about 5 per cent and are distributed in the southern and southeastern part of the microwatershed with moderate problems of soil and erosion. Fairly good lands (Class IV) cover an area of about 64 per cent and are distributed in the major part of the microwatershed with very severe problems of soil and erosion.

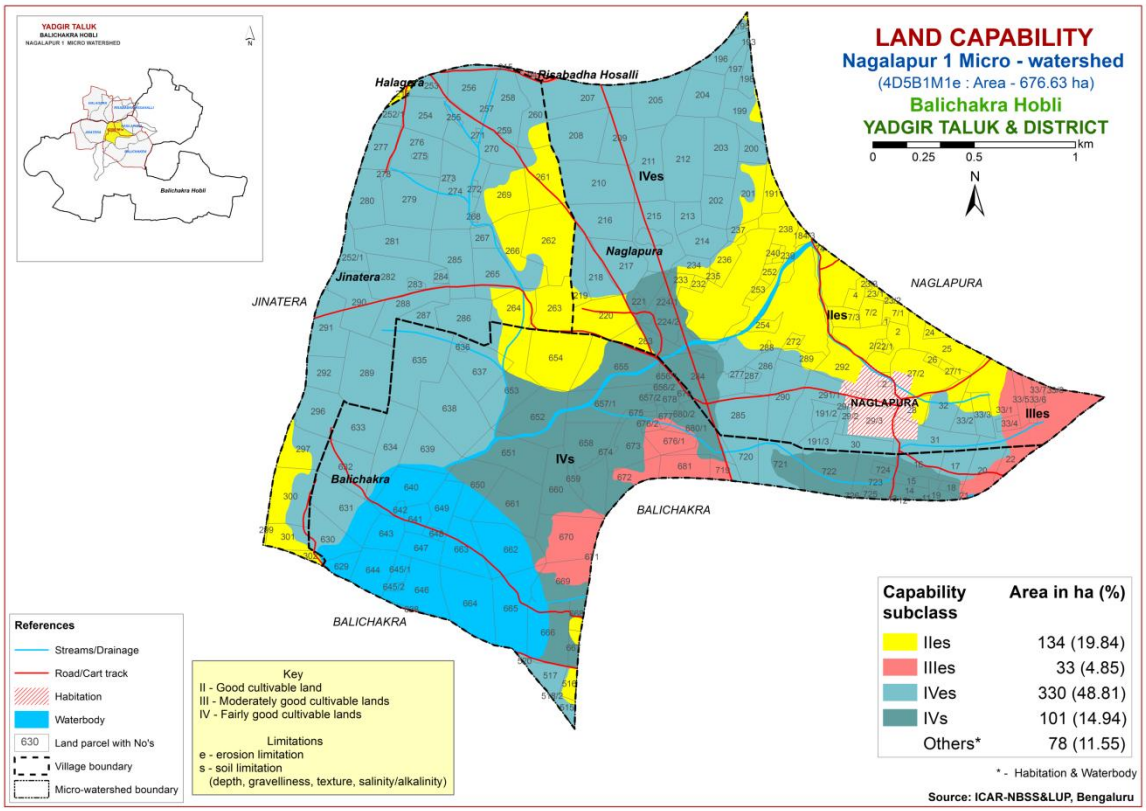


Fig. 5.1 Land Capability map of Nagalapur-1 Microwatershed

5.2 Soil Depth

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

Very shallow (<25 cm) soils occupy an area of about 14 ha (2%) and are distributed in the southeastern part of the microwatershed. Shallow (25-50 cm) soils occupy an area of about 33 ha (5%) and are distributed in the southern and southeastern part of the microwatershed. Moderately shallow (50-75 cm) soils occupy an area of about 131 ha (19%) and are distributed in the northern, southern, western, southeastern, northwestern and southwestern part of the microwatershed. Moderately deep (75-100 cm) soils occupy an area of about 53 ha (8%) and are distributed in the central, northern, southern, southwestern and southeastern part of the microwatershed. Deep (100-150 cm) soils cover an area of 277 ha (41%) and are distributed in the major part of the microwatershed. Very deep (>150 cm) soils occupy an area of about 91 ha (13%) of the

microwatershed and are distributed in the central, southern and southwestern part of the microwatershed.

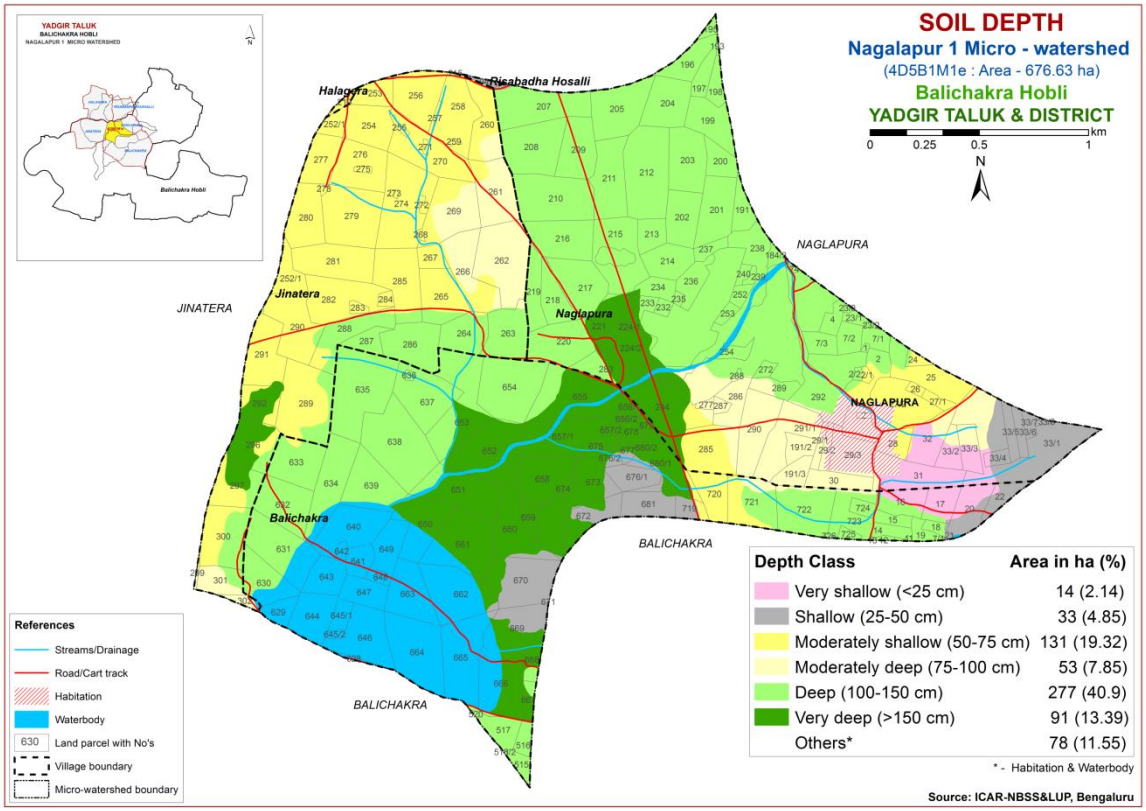


Fig. 5.2 Soil Depth map of Nagalapur-1 Microwatershed

The most productive lands cover an area of 368 ha (54%) with respect to soil rooting depth where all climatically adapted annual and perennial crops can be grown are deep to very deep (100->150 cm depth) soils occurring in the major part of the microwatershed. Problem soils cover 47 ha (7%) where short or medium duration crops can be grown.

5.3 Surface Soil Texture

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

An area of about 5 ha (1%) is sandy at the surface and are distributed in the southwestern part of the microwatershed. A maximum area of 495 ha (73%) has soils that

are loamy and occur in the major part of the microwatershed. An area of about 98 ha (14%) is clayey and are distributed in the eastern and southeastern part of the microwatershed.

An area of 81% has most productive lands with respect to surface soil texture. The clayey soils (14%) and loamy soils (73%) have high potential for soil-water retention and availability, and nutrient retention and availability, but clayey soils have more problems of drainage, infiltration, workability and other physical problems. The other problematic soils are sandy (1%) which have major limitations of moisture and nutrient retention capacity, hence require frequent irrigation with balanced fertilizer application.

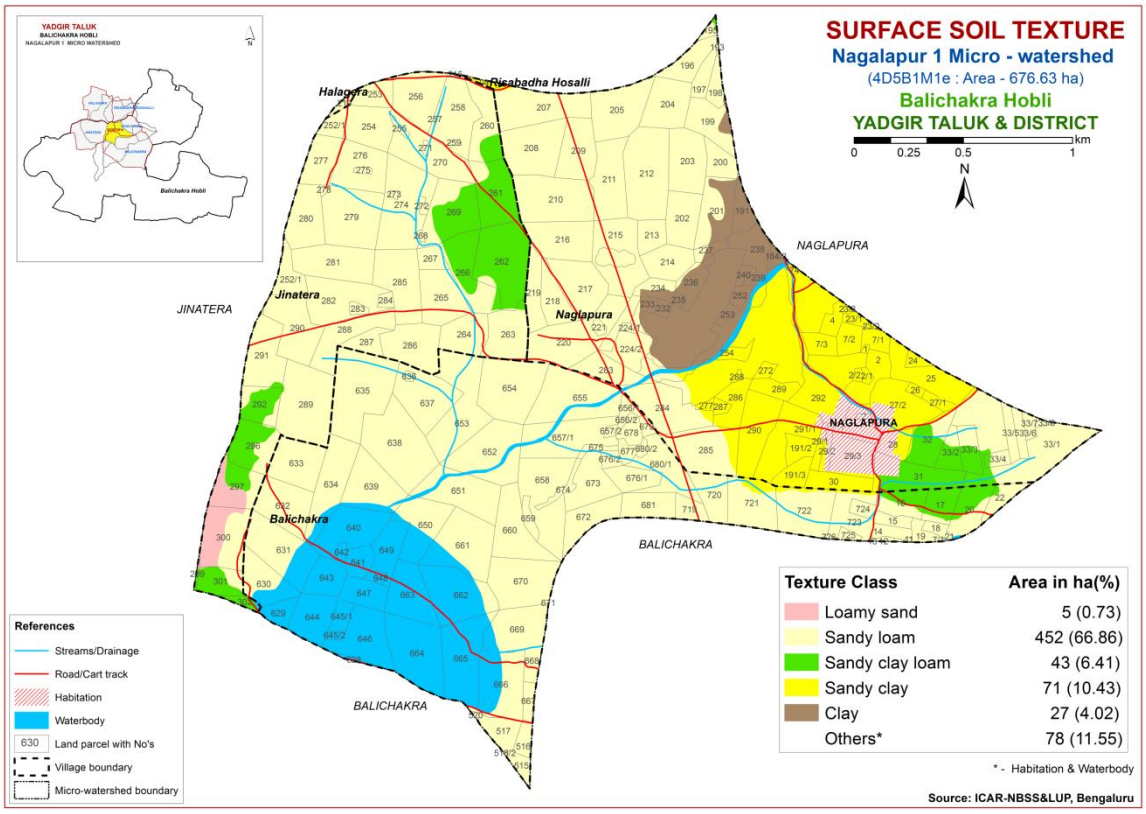


Fig. 5.3 Surface Soil Texture map of Nagalapur-1 Microwatershed

5.4 Soil Gravelliness

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

Non gravelly (<15%) soils cover an area of 579 ha (86%) and are distributed in all parts of the microwatershed. Gravelly (15-35%) soils cover an area of 20 ha (3%) and are distributed in the southeastern part of the microwatershed.

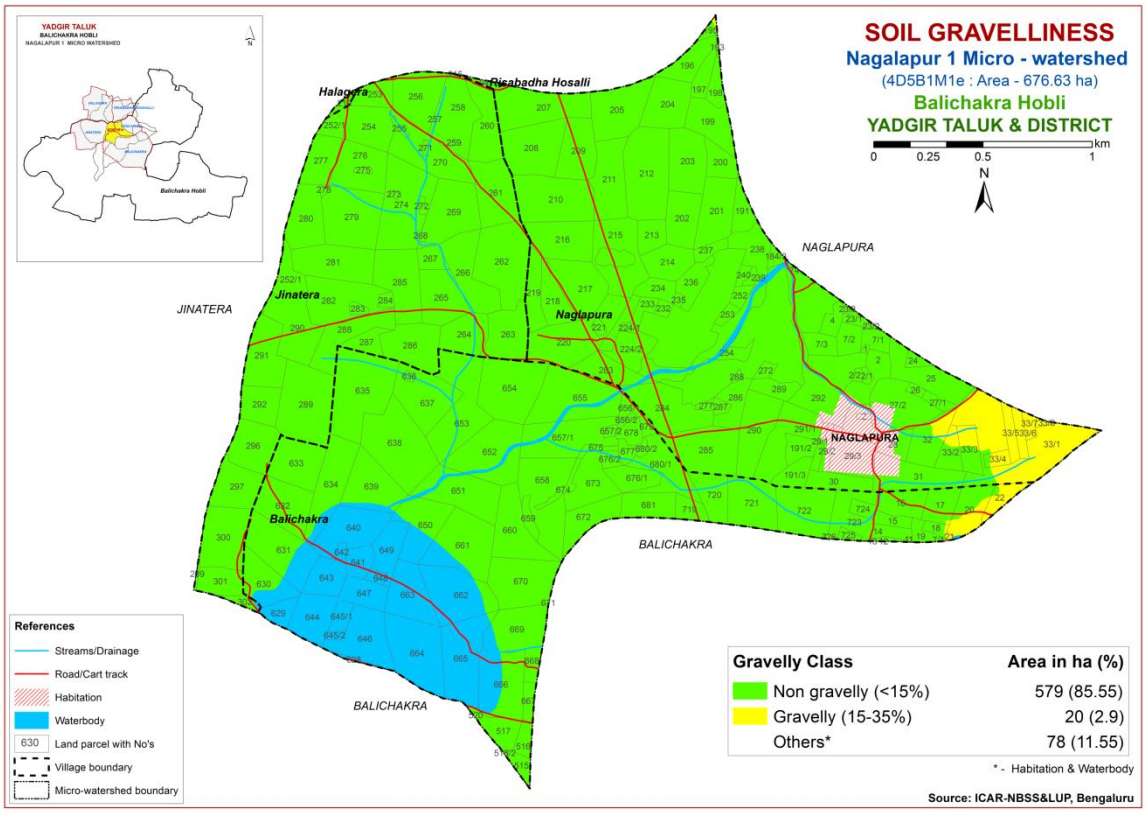


Fig. 5.4 Soil Gravelliness map of Nagalapur-1 Microwatershed

The problem soils (3%) which are gravelly (15-35%), where only short or medium duration crops can be grown. The most productive soils (86%) that are non gravelly (<15%) where, all climatically adapted long duration crops can be grown.

5.5 Available Water Capacity

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

An area of about 105 ha (16%) in the microwatershed has soils that are very low (<50 mm/m) in available water capacity and are distributed in the western, southern, southeastern and northwestern part of the microwatershed. An area of about 319 ha (47%)

in the microwatershed has soils that are low (51-100 mm/m) in available water capacity and are distributed in the major part of the microwatershed. Soils that are medium (101-150 mm/m) in available water capacity occur in 25 ha (4%) and are distributed in the southern and southeastern part of the microwatershed. Soils that are very high (>200 mm/m) in available water capacity occur in 149 ha (22%) and are distributed in the central, southern, eastern, southeastern and southwestern part of the microwatershed.

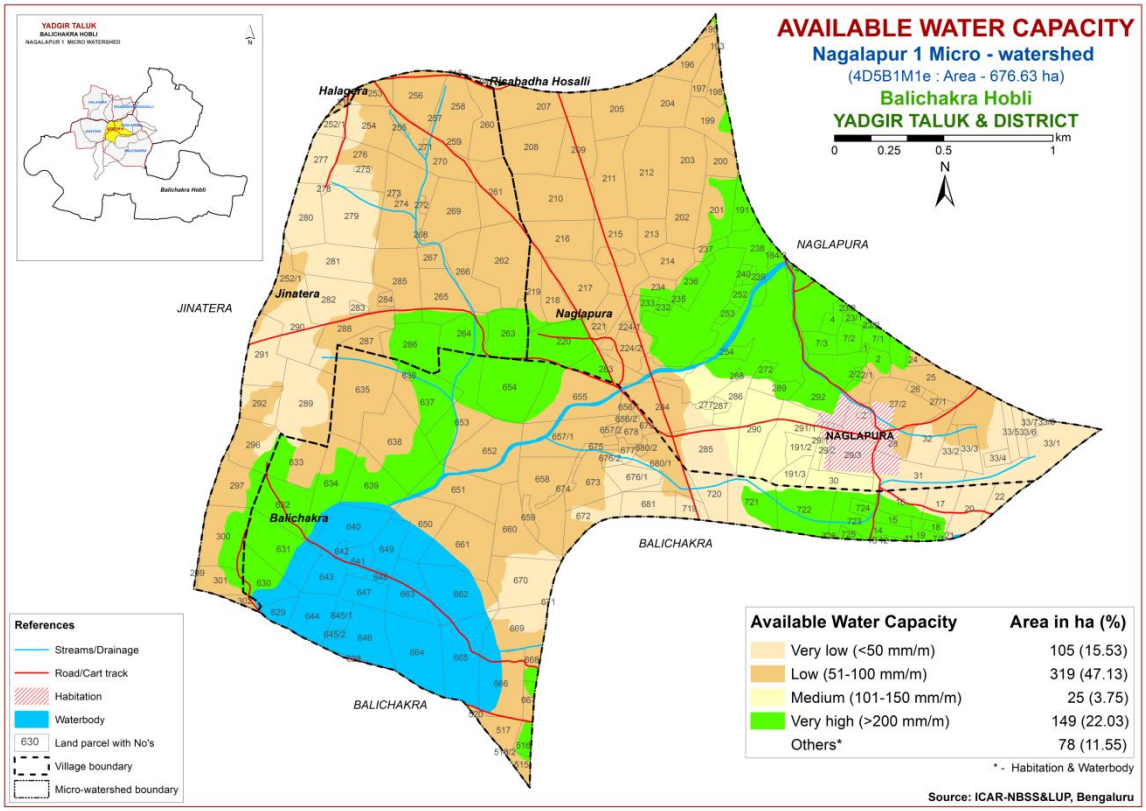


Fig. 5.5 Soil Available Water Capacity map of Nagalapur-1 Microwatershed

About 424 ha (63%) area in the microwatershed has soils that are problematic with regard to available water capacity. Here, only short duration crops can be grown and the probability of crop failure is very high. These areas are best put to other alternative uses. An area of 149 ha (22%) have potential with regard to AWC where all climatically adapted annual and perennial crops can be grown.

5.6 Soil Slope

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

An area of about 101 ha (15%) falls under nearly level (0-1% slope) lands and are distributed in the southern and southeastern part of the microwatershed. A maximum area of about 427 ha (63%) falls under very gently sloping (1-3% slope) lands and are distributed in the major part of the microwatershed. An area of about 70 ha (10%) falls under gently sloping (3-5% slope) lands and are distributed in the northern, western, northwestern and southeastern part of the microwatershed.

In these areas (1-3% slope), all climatically adapted annual and perennial crops can be grown without much soil and water conservation and other land development measures. Soil and water conservation and other land development measures are needed in the areas where (3-5%) slope.

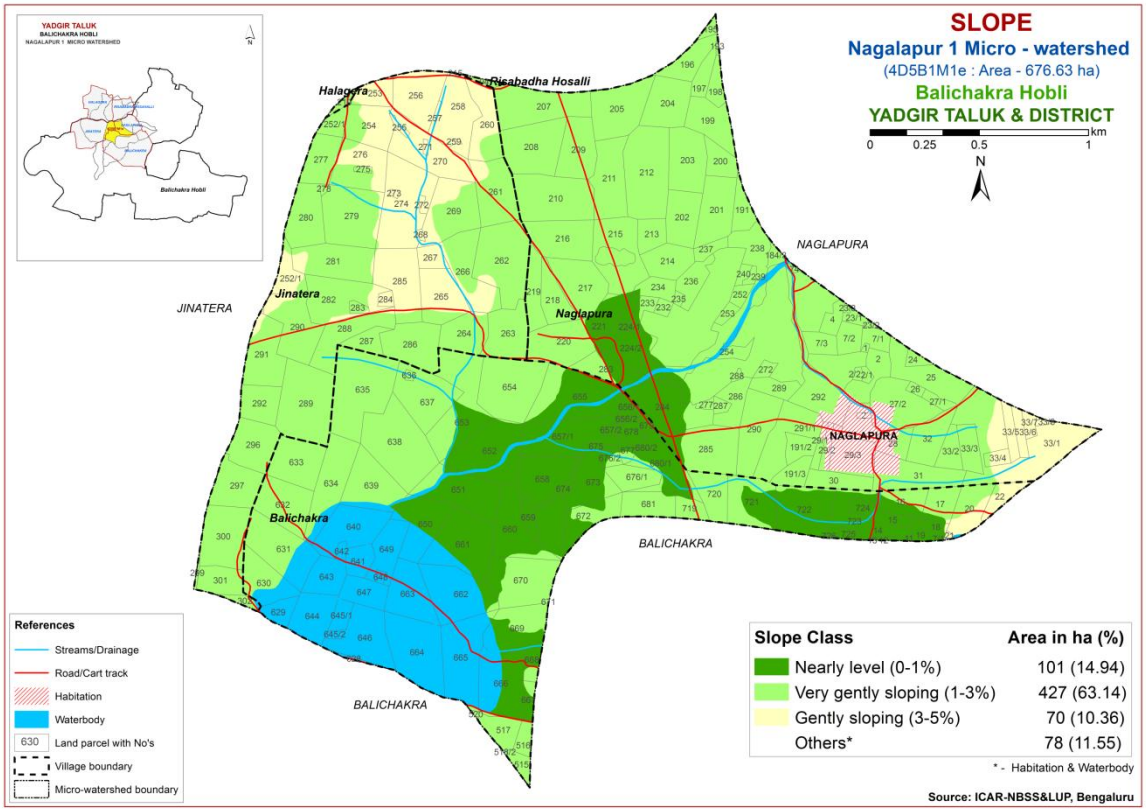


Fig. 5.6 Soil Slope map of Nagalapur-1 Microwatershed

5.7 Soil Erosion

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

grouped into different erosion classes and a soil erosion map generated. The area extent and their spatial distribution in the microwatershed is given in Figure 5.7.

Slightly eroded (e1 class) soils cover an area of 101 ha (15%) and are distributed in the southern and southeastern part of the microwatershed. Moderately eroded (e2 class) soils cover a maximum area of 442 ha (65%) and are distributed in the major part of the microwatershed. Severely eroded (e3 class) soils cover an area of 56 ha (8%) and are distributed in the northern, western and northwestern part of the microwatershed.

Major area (73%) in the microwatershed is problematic because of moderate and severe erosion. For these areas, taking up soil and water conservation and other land development measures are needed.

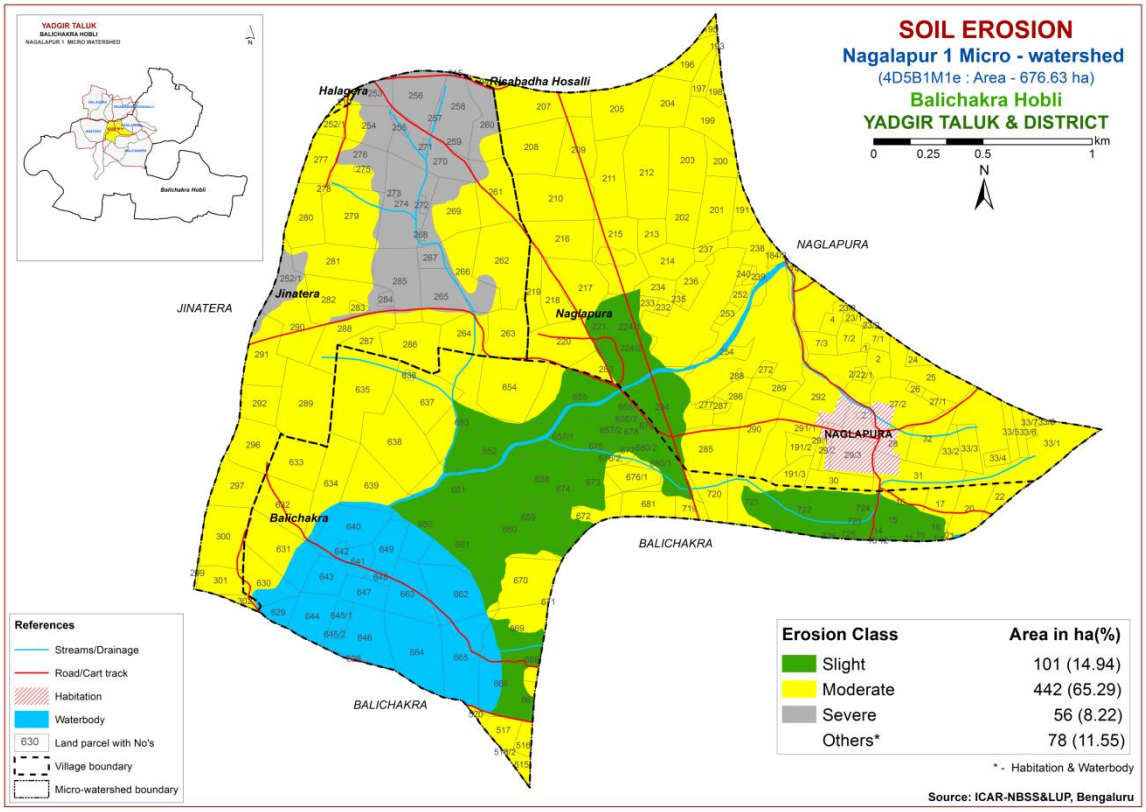


Fig. 5.7 Soil Erosion map of Nagalapur-1 Microwatershed

Chapter 6

FERTILITY STATUS

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

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

6.1 Soil Reaction (pH)

The soil analysis of the Nagalapur-1 microwatershed for soil reaction (pH) showed that a maximum area of about 368 ha (54%) is slightly alkaline (pH 7.3-7.8) and are distributed in the major part of the microwatershed. An area of about 230 ha (34%) is neutral (pH 6.5-7.3) and are distributed in the central, southern, eastern, southeastern and southwestern part of the microwatershed. In all, major area of about 368 ha is alkaline and 230 ha is neutral.

6.2 Electrical Conductivity (EC)

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

6.3 Organic Carbon

The soil organic carbon content (an index of available Nitrogen) in the soils of the microwatershed is high (>0.75%) in an area of about 24 ha (3%) and are distributed in the southwestern part of the microwatershed. Medium (0.50-0.75%) in organic carbon content occur in a maximum area of about 575 ha (85%) and are distributed in all parts of the microwatershed (Fig. 6.3).

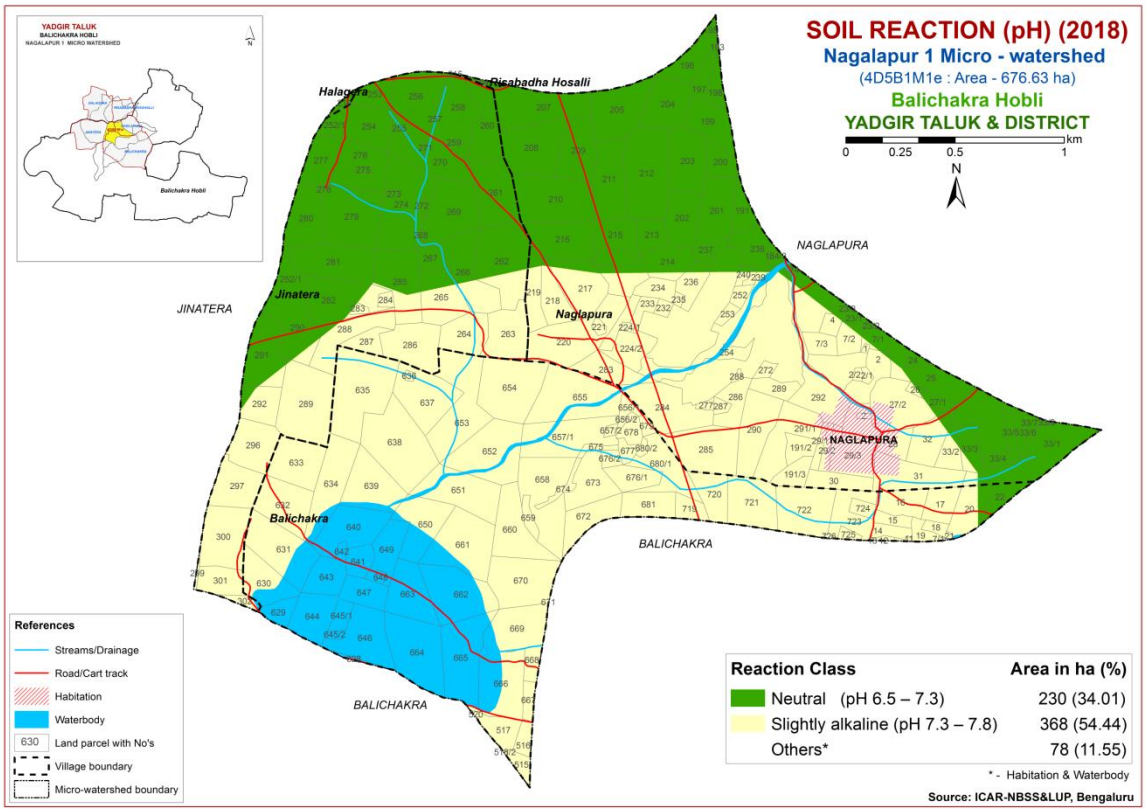


Fig.6.1 Soil Reaction (pH) map of Nagalapur-1 Microwatershed

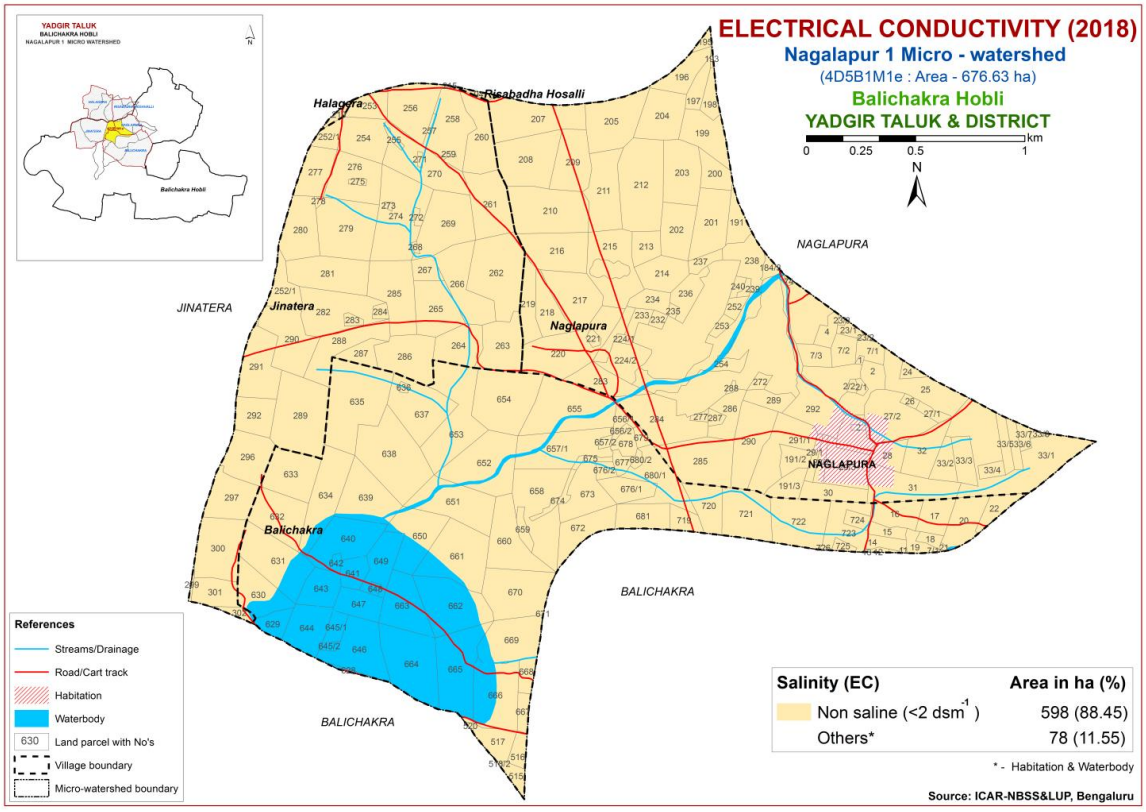


Fig.6.2 Electrical Conductivity (EC) map of Nagalapur-1 Microwatershed

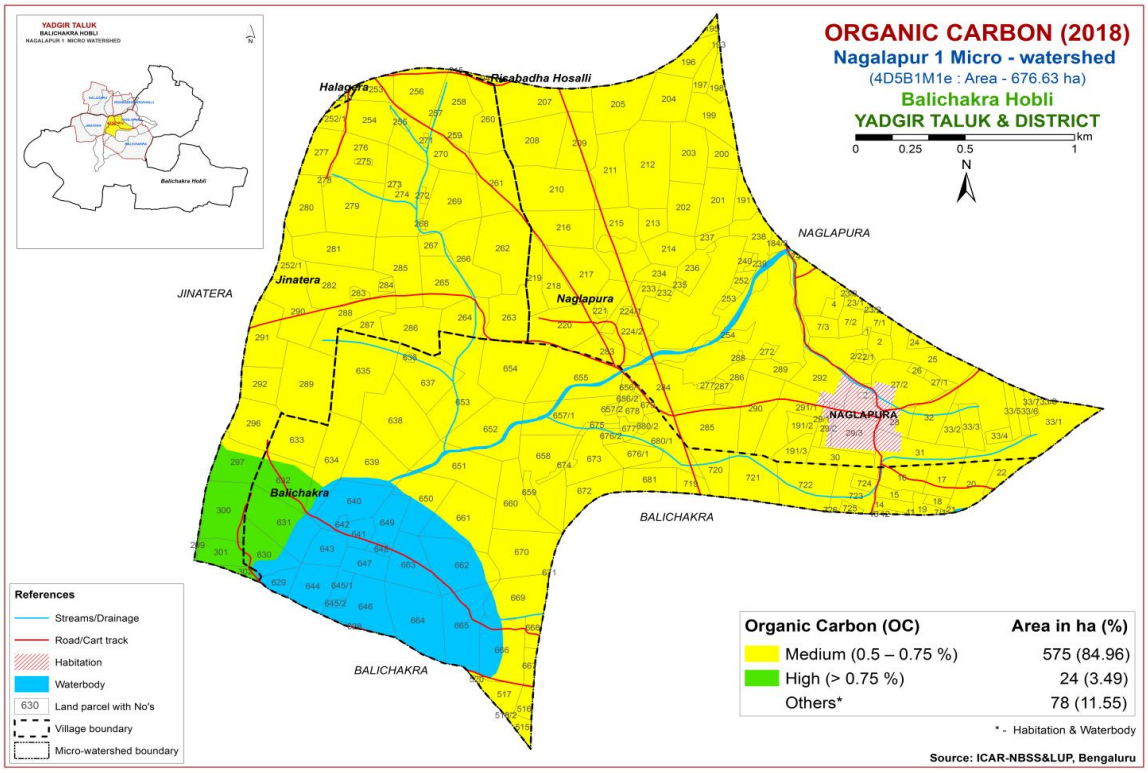


Fig.6.3 Soil Organic Carbon map of Nagalapur-1 Microwatershed

6.4 Available Phosphorus

Available phosphorus content is low (<23 kg/ha) in an area of 224 ha (33%) and are distributed in the southern, western, eastern, southwestern and southeastern part of the microwatershed. High (>57 kg/ha) available phosphorus content occur in an area of 35 ha (5%) and are distributed in the central and southwestern part of the microwatershed. Soils which are medium (23-57 kg/ha) in available phosphorus occur in a maximum area of about 340 ha (50%) and are distributed in the major part of the microwatershed (Fig. 6.4).

6.5 Available Potassium

Available potassium content is medium (145-337 kg/ha) in an area of 302 ha (45%) and are distributed in the central, southern, eastern, southwestern and southeastern part of the microwatershed. Low (<145 kg/ha) available potassium content soils occur in an area of 296 ha (44%) and are distributed in the northern, southern, western, southwestern, northwestern, northeastern and southeastern part of the microwatershed (Fig. 6.5).

6.6 Available Sulphur

An area of 19 ha (3%) is low (<10 ppm) in available sulphur content and are distributed in the eastern and northeastern part of the microwatershed. A maximum area of 580 ha (86%) is medium (10-20 ppm) in available sulphur content and are distributed in all parts of the microwatershed (Fig. 6.6).

6.7 Available Boron

Available boron content is low (<0.5 ppm) in an area of 210 ha (31%) and are distributed in the western, northwestern, southwestern and southeastern part of the microwatershed. Medium (0.5-1.0 ppm) available boron content occur in a maximum area of 389 ha (57%) 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 the entire cultivated area of the microwatershed (Fig 6.8).

6.9 Available Manganese

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

6.10 Available Copper

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

6.11 Available Zinc

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

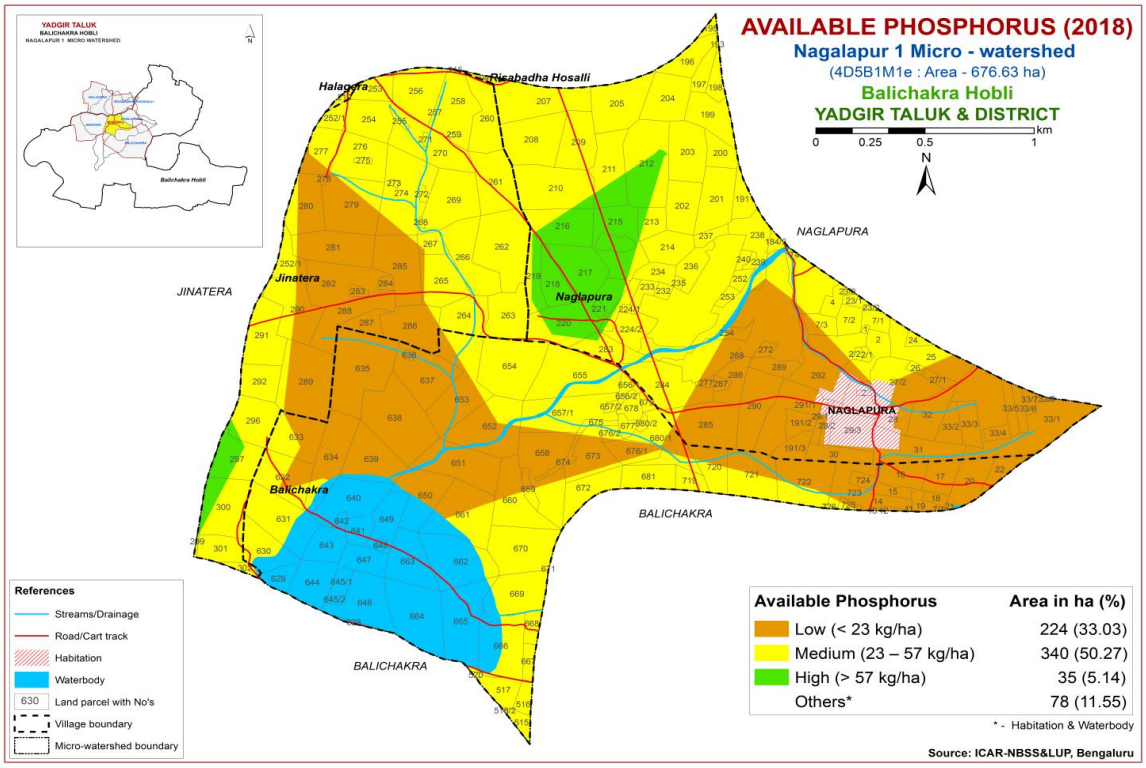


Fig.6.4 Soil Available Phosphorus map of Nagalapur-1 Microwatershed

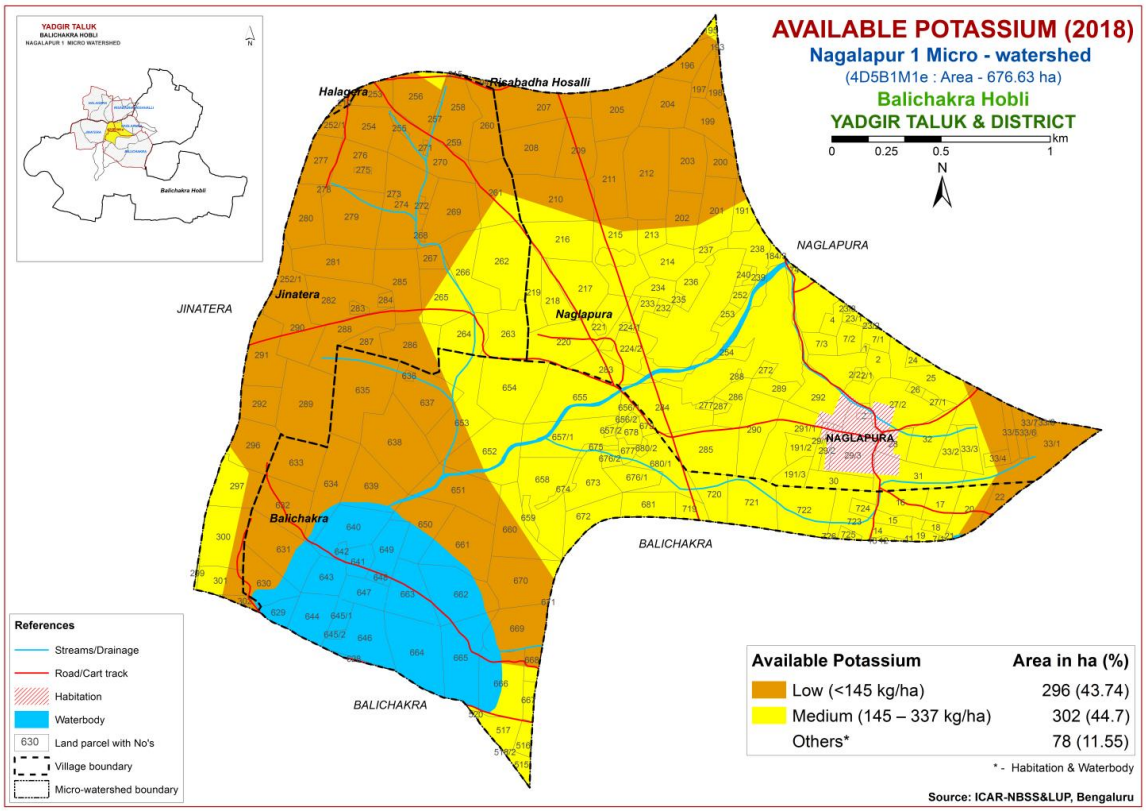


Fig.6.5 Soil Available Potassium map of Nagalapur-1 Microwatershed

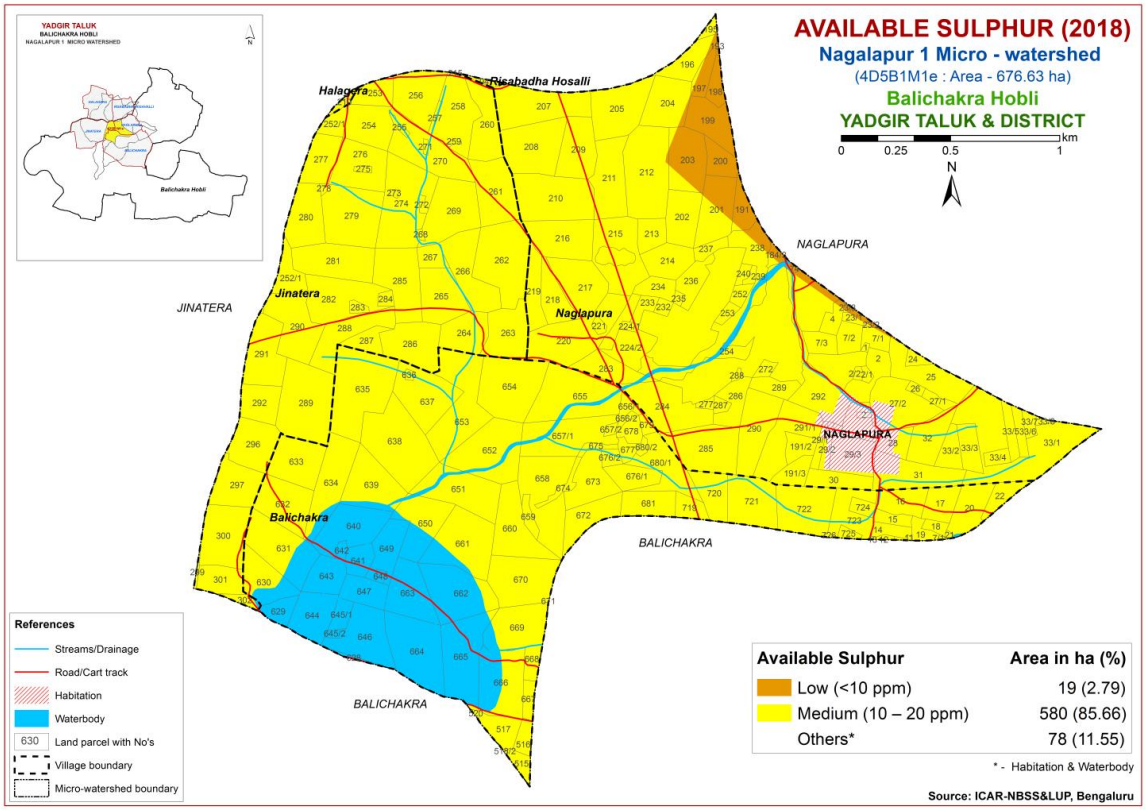


Fig.6.6 Soil Available Sulphur map of Nagalapur-1 Microwatershed

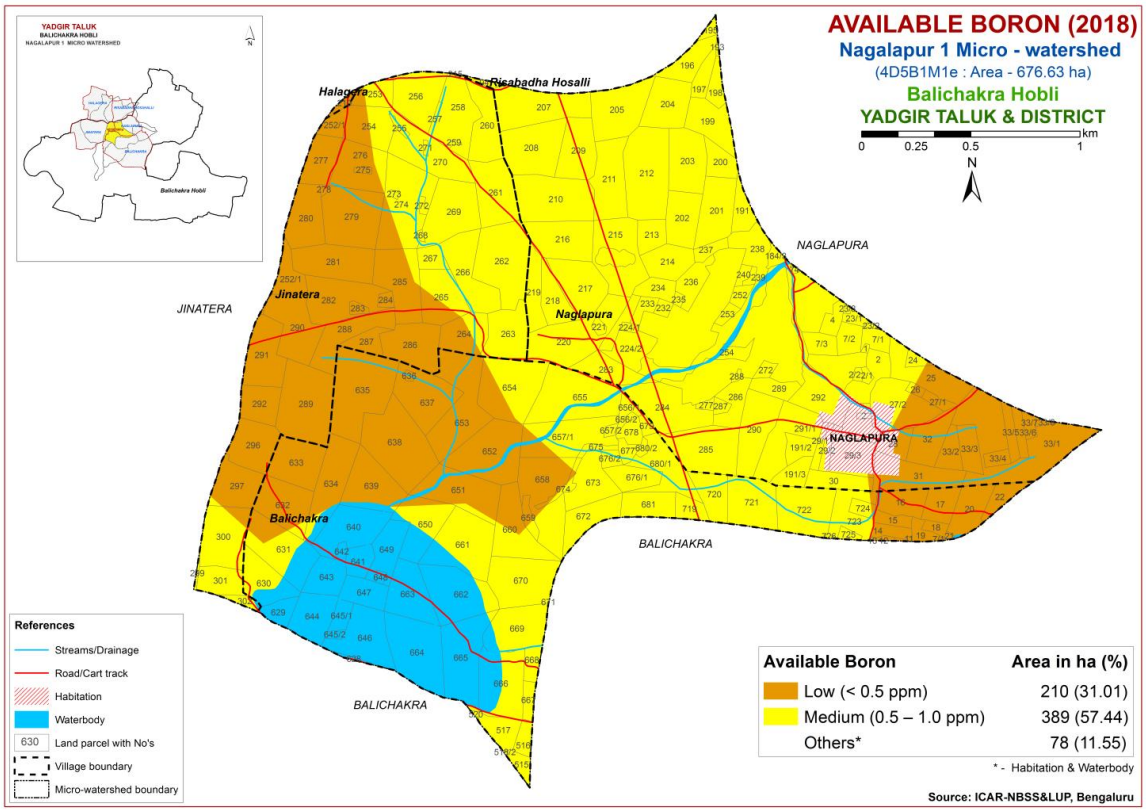


Fig.6.7 Soil Available Boron map of Nagalapur-1 Microwatershed

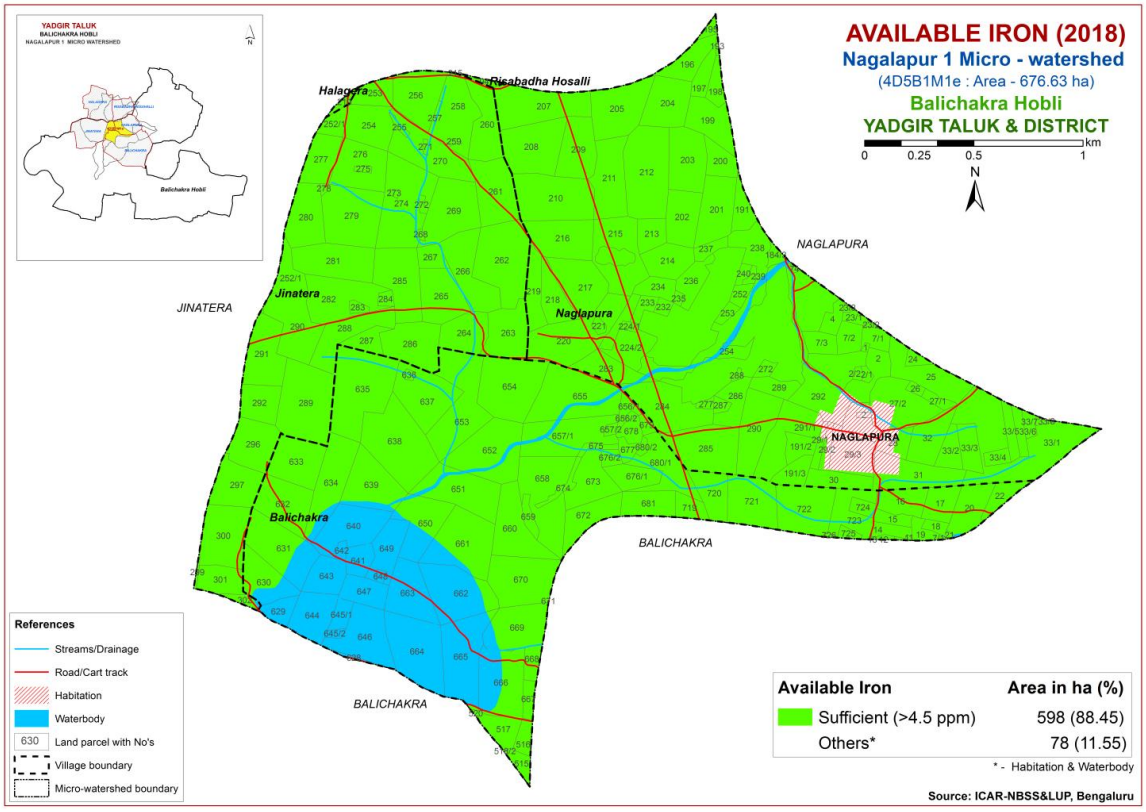


Fig.6.8 Soil Available Iron map of Nagalapur-1 Microwatershed

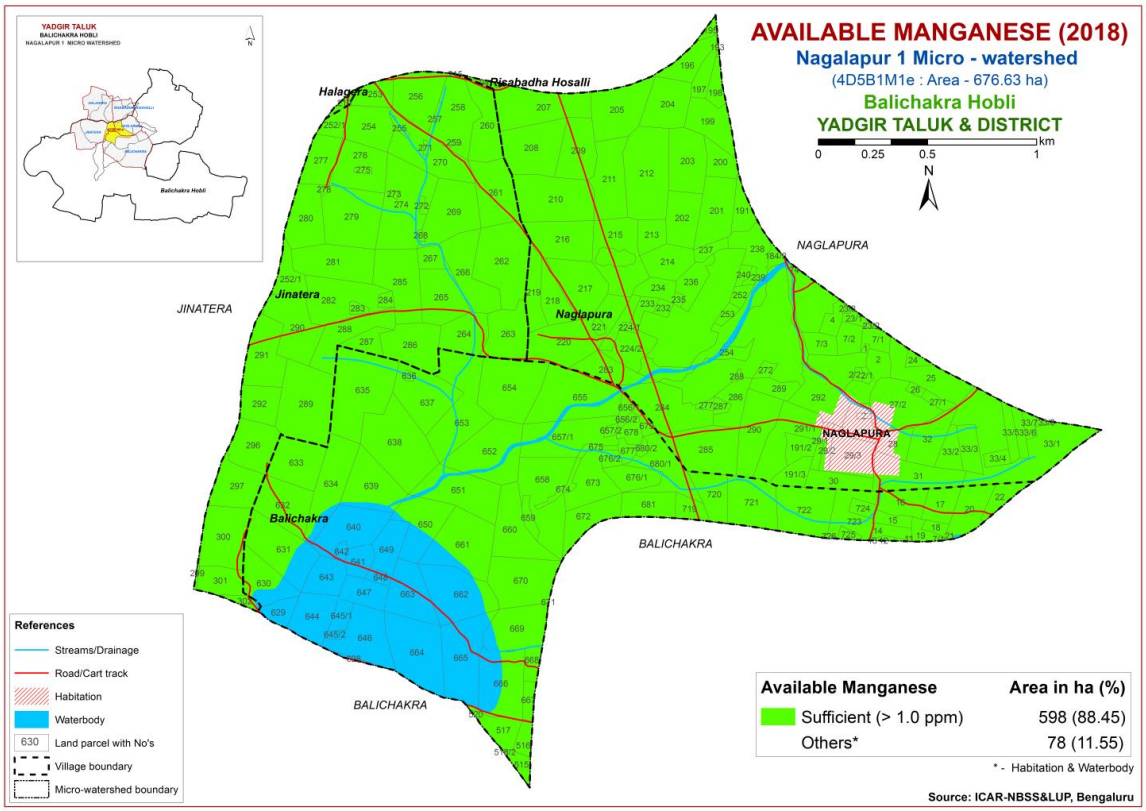


Fig.6.9 Soil Available Manganese map of Nagalapur-1 Microwatershed

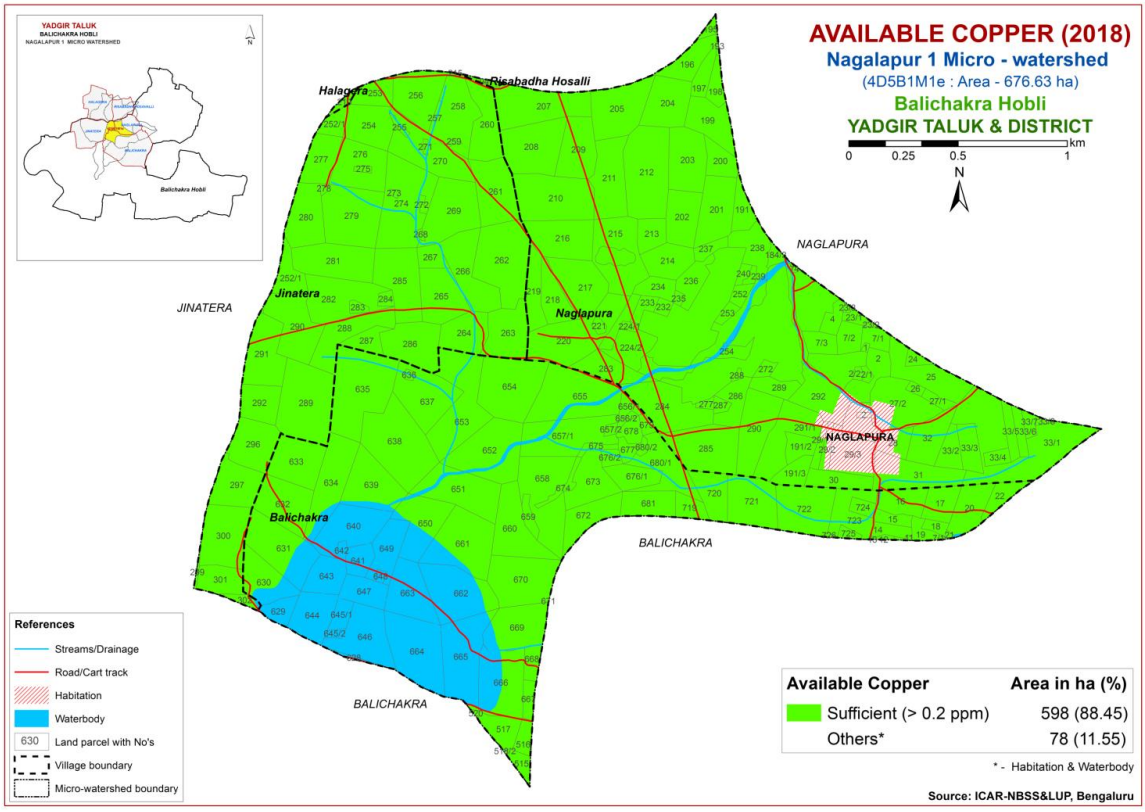


Fig.6.10 Soil Available Copper map of Nagalapur-1 Microwatershed

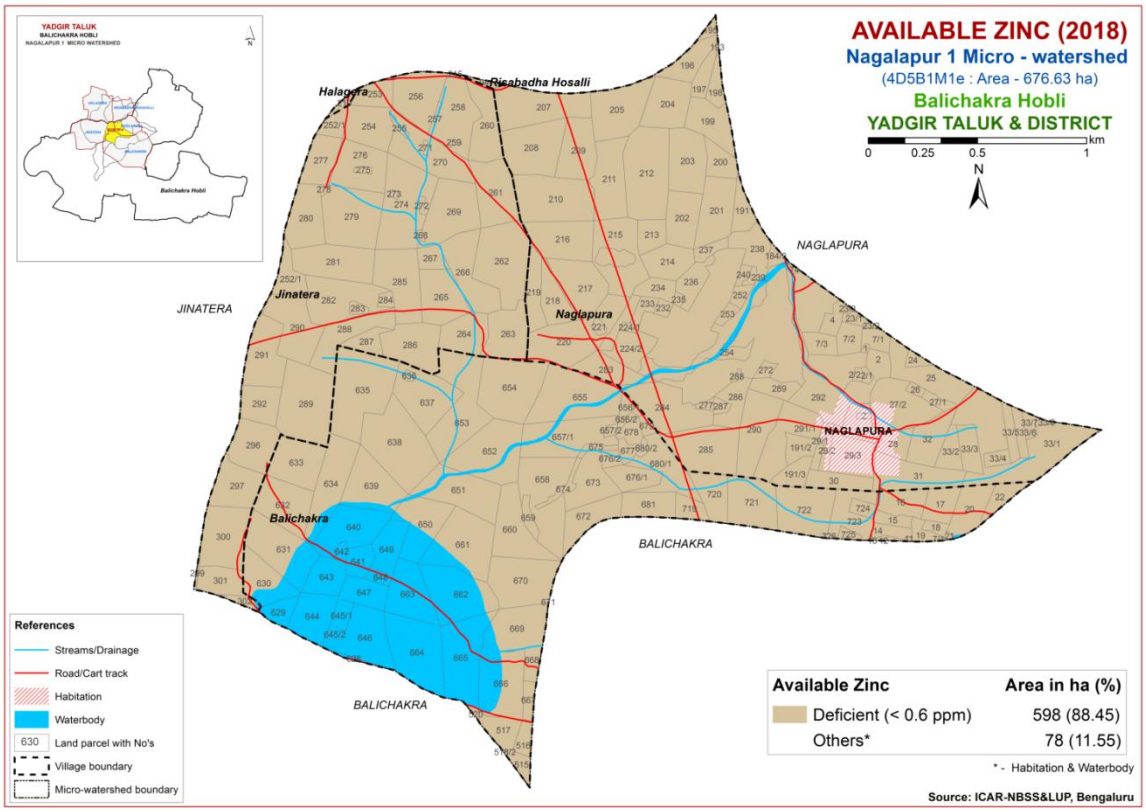


Fig.6.11 Soil Available Zinc map of Nagalapur-1 Microwatershed

Chapter 7

LAND SUITABILITY FOR MAJOR CROPS

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

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

7.1 Land Suitability for Sorghum (*Sorghum bicolor*)

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

An area of about 47 ha (7%) is highly suitable (Class S1) for growing sorghum and are distributed in the central, northern, eastern and northeastern part of the microwatershed with no limitations. An area of about 143 ha (21%) is moderately suitable

(Class S2) for growing sorghum and are distributed in the central, northern, eastern, western, southeastern, southwestern and northwestern part of the microwatershed. They have minor limitations of texture, rooting depth, gravelliness, topography and nutrient availability. A maximum area of about 304 ha (45%) is marginally suitable (Class S3) for growing sorghum and are distributed in the major part of the microwatershed with moderate limitations of rooting depth, texture, nutrient availability and calcareousness. An area of about 105 ha (16%) is currently not suitable (Class N1) for growing sorghum and are distributed in the central, southern, southwestern and southeastern part of the microwatershed with severe limitations of rooting depth and texture.

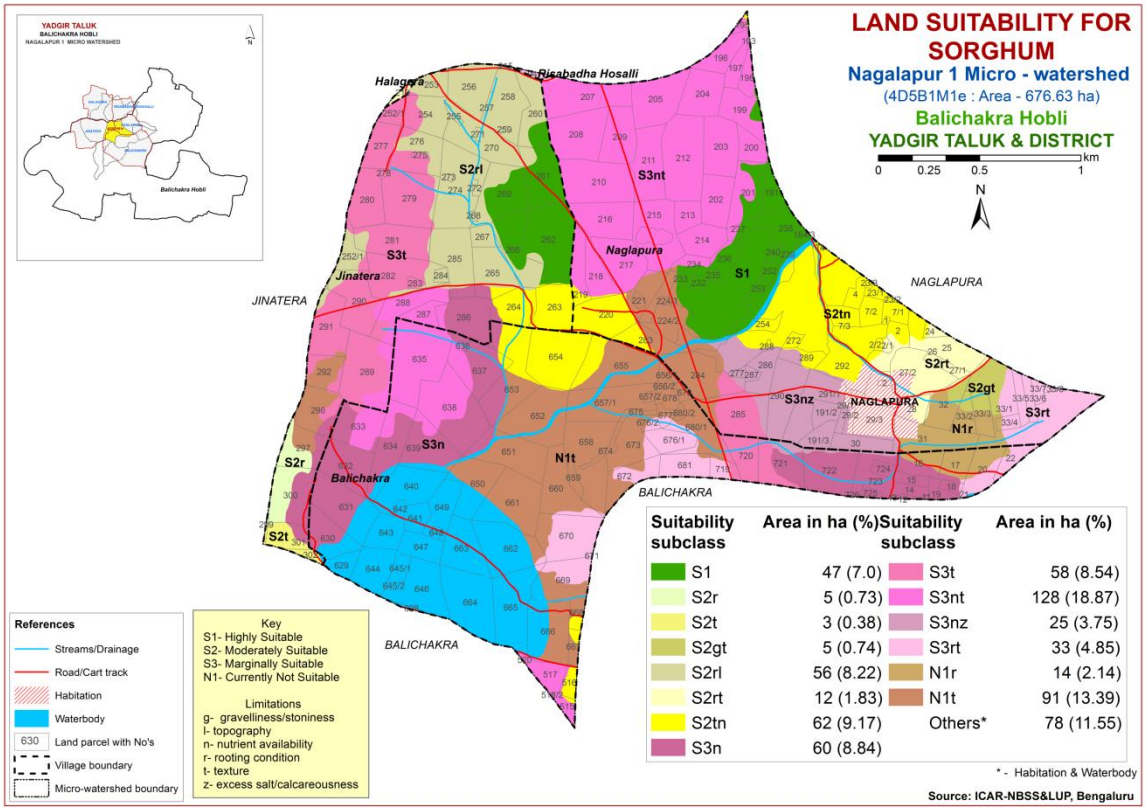


Fig. 7.1 Land Suitability map of Sorghum

7.2 Land Suitability for Maize (*Zea mays*)

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

An area of about 23 ha (3%) is highly suitable (Class S1) for growing maize and are distributed in the northern and southwestern part of the microwatershed with no limitations. An area of about 192 ha (28%) is moderately suitable (Class S2) for growing maize and occur in the central, northern, southern, eastern, western, northwestern, southwestern and southeastern part of the microwatershed. It has minor limitations of

texture, nutrient availability, rooting depth, gravelliness, topography and calcareousness. A maximum area of about 279 ha (41%) is marginally suitable (Class S3) for growing maize and are distributed in the major part of the microwatershed with moderate limitations of rooting depth, texture and nutrient availability. An area of about 105 ha (16%) is currently not suitable (Class N1) for growing maize and are distributed in the central, southern, southwestern and southeastern part of the microwatershed with severe limitations of rooting depth and texture.

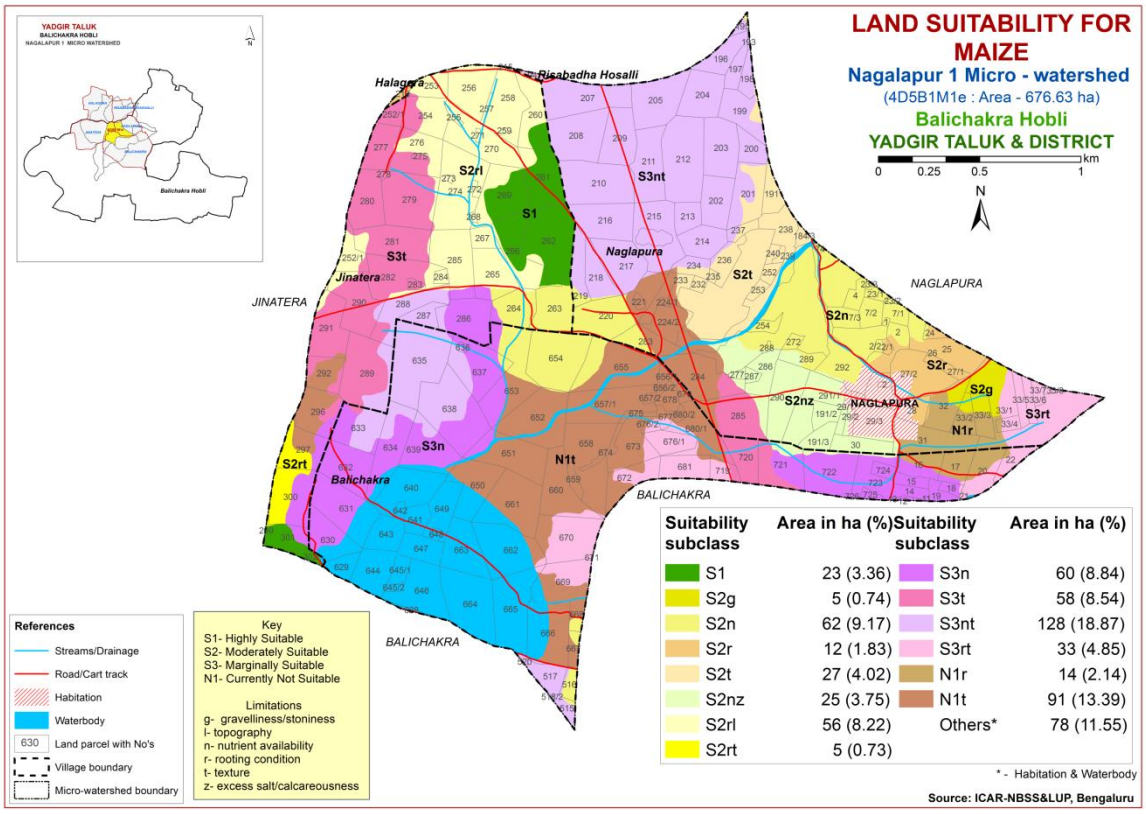


Fig. 7.2 Land Suitability map of Maize

7.3 Land Suitability for Bajra (*Pennisetum glaucum)*

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

An area of about 28 ha (4%) is highly suitable (Class S1) for growing bajra and are distributed in the northern, southeastern and southwestern part of the microwatershed with no limitations. An area of about 162 ha (24%) is moderately suitable (Class S2) for growing bajra and occur in the northern, southern, eastern, western, central, northwestern, southeastern and southwestern part of the microwatershed. It has minor limitations of texture, rooting depth, topography and nutrient availability. A maximum area of about 393 ha (58%) is marginally suitable (Class S3) for growing bajra and are distributed in

the major part of the microwatershed with moderate limitations of texture, rooting depth, calcareousness and nutrient availability. An area of about 14 ha (2%) is currently not suitable (Class N1) for growing bajra and are distributed in the southeastern part of the microwatershed with severe limitation of rooting depth.

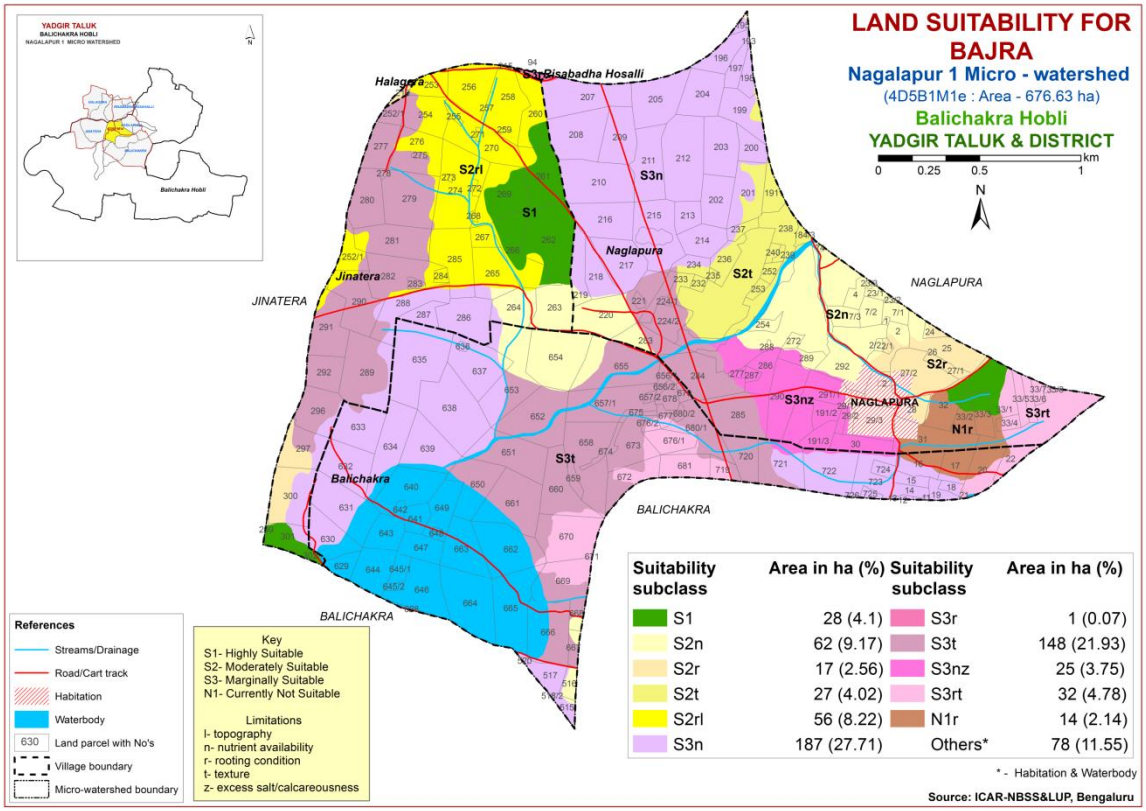


Fig. 7.3 Land Suitability map of Bajra

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 8 ha (1%) is highly suitable (Class S1) for growing groundnut and are distributed in the southeastern and southwestern part of the microwatershed with no limitations. An area of about 32 ha (5%) is moderately suitable (Class S2) for growing groundnut and occur in the northern and southeastern part of the microwatershed. It has minor limitations of rooting depth and texture. Marginally suitable lands (Class S3) for growing groundnut occupy a maximum area of about 331 ha (49%) and are distributed in the major part of the microwatershed. They have moderate limitations of texture, nutrient availability and rooting depth. An area of about 227 ha (34%) is currently not suitable (Class N1) for growing groundnut and are distributed in the central, northern, southern,

southeastern, southwestern and northeastern part of the microwatershed with severe limitations of rooting depth and nutrient availability.

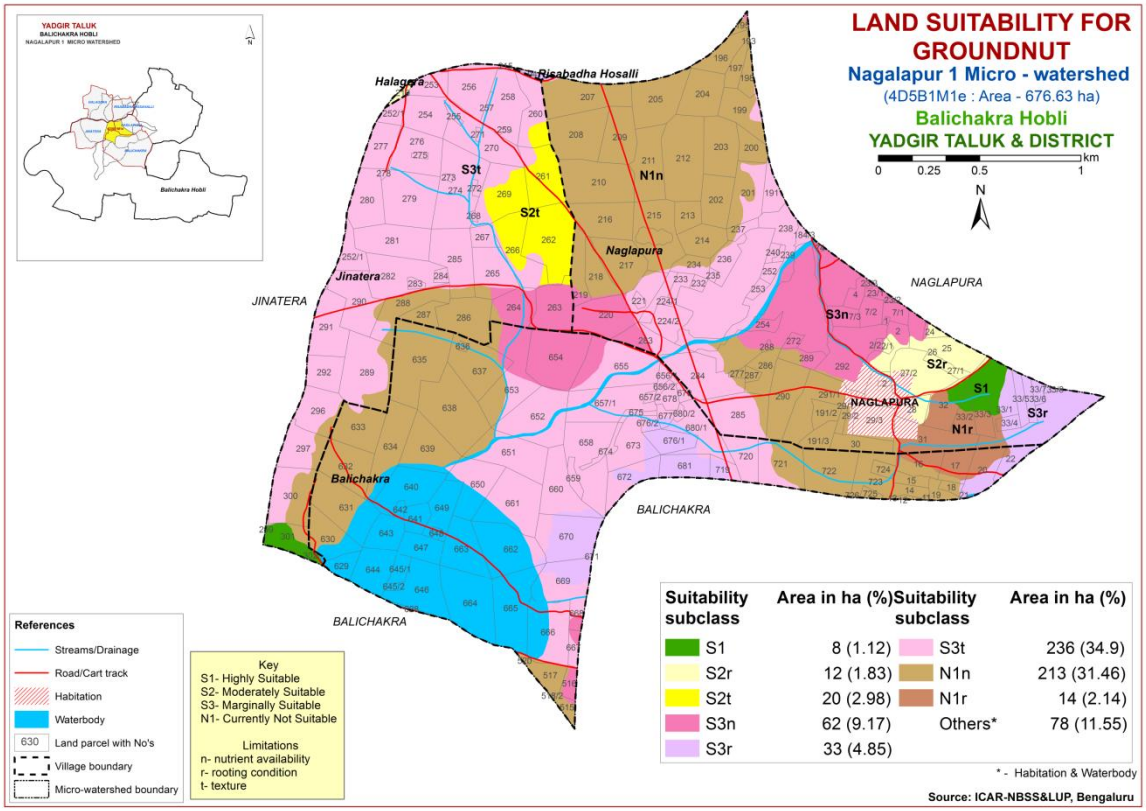


Fig. 7.4 Land Suitability map of Groundnut

7.5 Land Suitability for Sunflower (*Helianthus annus*)

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

An area of about 27 ha (4%) is highly suitable (Class S1) for growing sunflower and is distributed in the eastern and northeastern part of the microwatershed with no limitations. An area of about 28 ha (4%) is moderately suitable (Class S2) for growing sunflower and occur in the northern, southeastern and southwestern part of the microwatershed. It has minor limitations of rooting depth and texture. Marginally suitable (Class S3) lands for sunflower are found to occur in an area of about 193 ha (28%) with moderate limitations of rooting depth, texture and nutrient availability and are distributed in the central, northern, southern, western, eastern, northwestern, southeastern and southwestern part of the microwatershed. A maximum area of about 351 ha (52%) is currently not suitable (Class N1) for growing sunflower and are distributed in the major

part of the microwatershed with severe limitations of rooting depth, texture and nutrient availability.

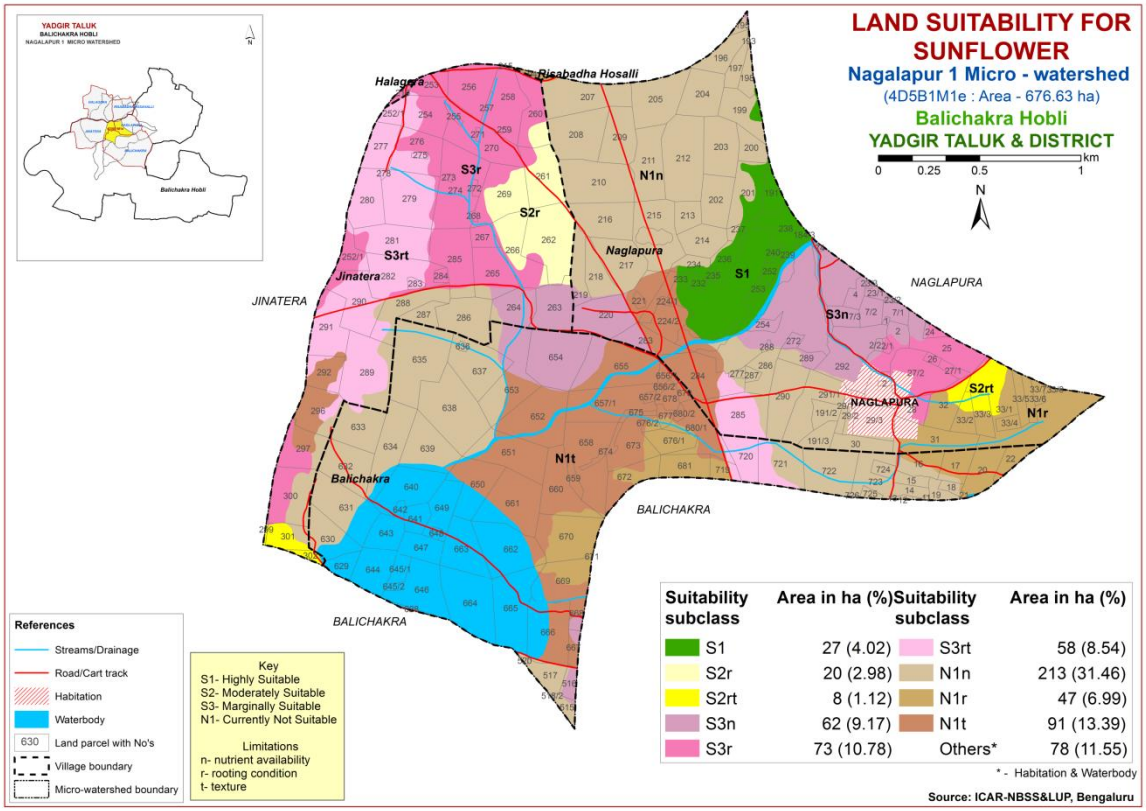


Fig. 7.5 Land Suitability map of Sunflower

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 117 ha (17%) is moderately suitable (Class S2) for growing redgram and are distributed in the central, northern, southern, eastern, southeastern, southwestern and northeastern part of the microwatershed. They have minor limitations of texture, rooting depth and nutrient availability. Marginally suitable lands (Class S3) for growing redgram occupy a maximum area of about 343 ha (51%) and occur in the major part of the microwatershed. They have moderate limitations of rooting depth, texture, nutrient availability and calcareousness. An area of about 138 ha (20%) is currently not suitable (Class N1) for growing redgram and are distributed in the central, southern, southeastern and southwestern part of the microwatershed with severe limitations of rooting depth and texture.

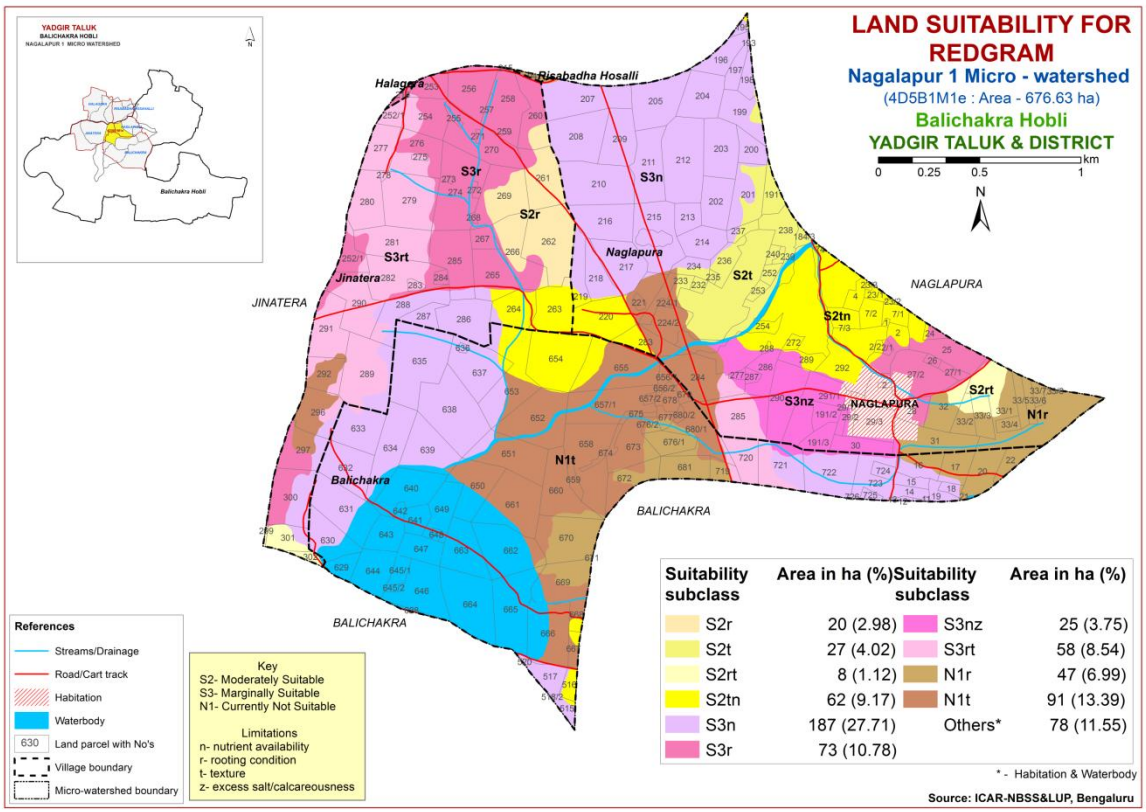


Fig. 7.6 Land Suitability map of Redgram

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

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

Highly (Class S1) suitable lands for growing Bengal gram occur in an area of about 27 ha (4%) and are distributed in the eastern and northeastern part of the microwatershed. Marginally suitable lands (Class S3) for growing Bengal gram occupy an area of about 248 ha (37%) and occur in the central, northern, southern, eastern, western, northwestern, southwestern and southeastern part of the microwatershed. They have moderate limitations of texture, nutrient availability and calcareousness. A maximum area of about 323 ha (48%) is currently not suitable (Class N1) for growing Bengal gram and are distributed in the major part of the microwatershed with severe limitations of texture and rooting depth.

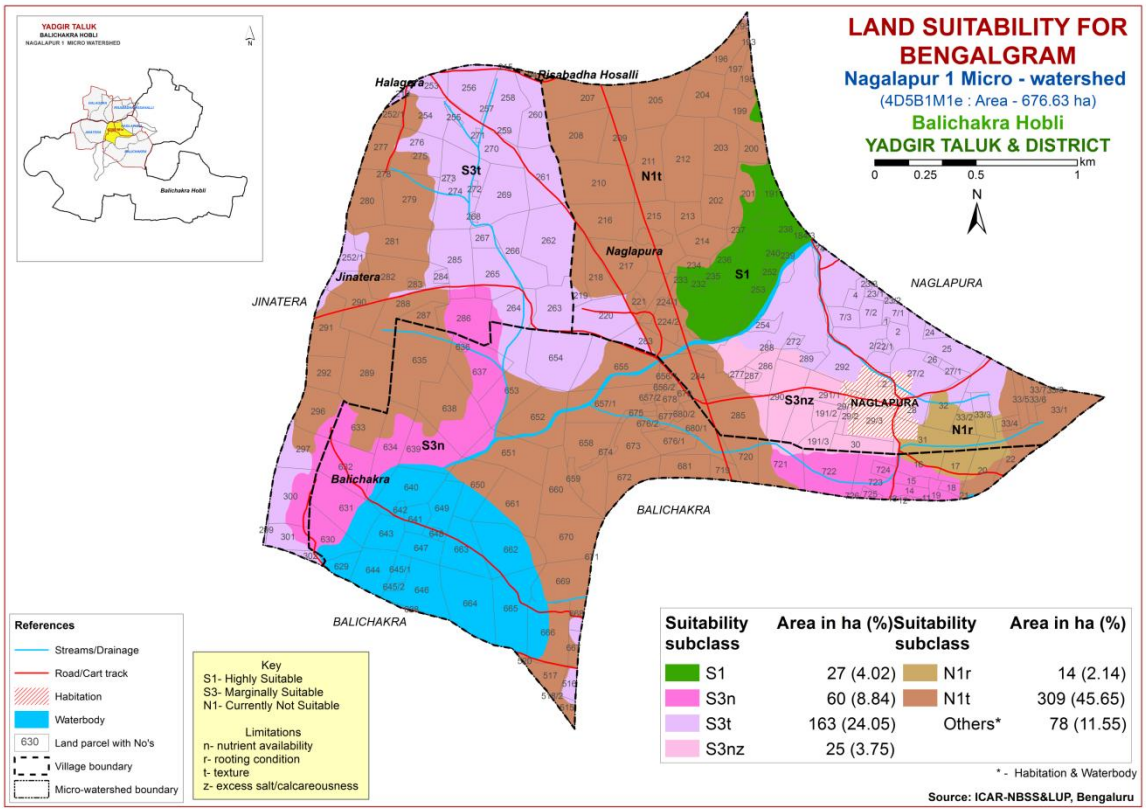


Fig. 7.7 Land Suitability map of Bengal gram.

7.8 Land Suitability for Cotton (*Gossypium hirsutum*)

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

Highly (Class S1) suitable lands for growing cotton occur in an area of about 27 ha (4%) and are distributed in the eastern and northeastern part of the microwatershed. An area of about 25 ha (4%) is moderately suitable (Class S2) for growing cotton and are distributed in the northern and southwestern part of the microwatershed. It has minor limitation of rooting depth. Marginally suitable lands (Class S3) for growing cotton occupy an area of about 223 ha (33%) and occur in the central, northern, southern, eastern, western, northwestern, southwestern and southeastern part of the microwatershed. They have moderate limitations of texture, nutrient availability and calcareousness. A maximum area of about 323 ha (48%) is currently not suitable (Class N1) for growing cotton and are distributed in the major part of the microwatershed with severe limitations of texture and rooting depth.

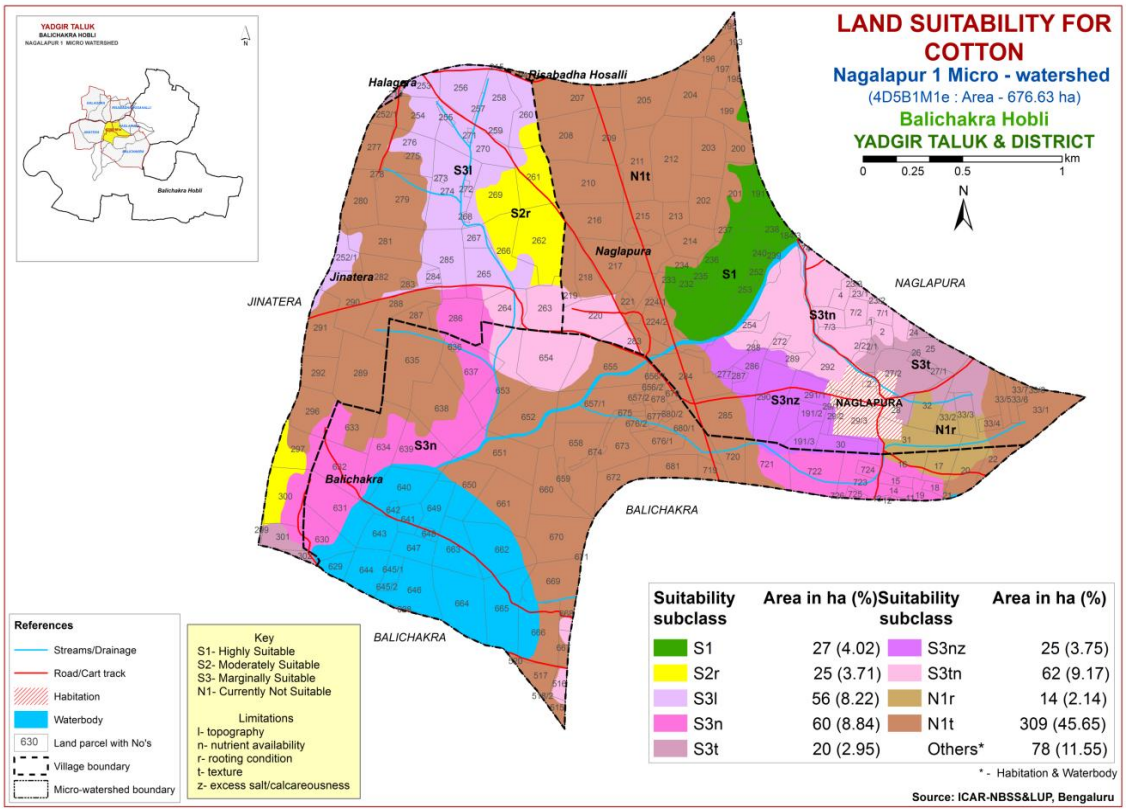


Fig. 7.8 Land Suitability map of Cotton

7.9 Land Suitability for Chilli (*Capsicum annuum)*

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

Highly (Class S1) suitable lands for growing chilli occur in an area of about 23 ha (3%) and are distributed in the northern and southwestern part of the microwatershed. An area of about 105 ha (15%) is moderately suitable (Class S2) for growing chilli and are distributed in the northern, eastern, northwestern, southwestern and southeastern part of the microwatershed. It has minor limitations of rooting depth, texture, gravelliness and topography. An area of about 153 ha (23%) is marginally suitable (Class S3) for growing chilli and are distributed in the central, eastern, western, southern, northwestern and southeastern part of the microwatershed with moderate limitations of rooting depth, texture and nutrient availability. A maximum area of about 318 ha (47%) is currently not suitable (Class N1) for growing chilli and are distributed in the major part of the microwatershed with severe limitations of rooting depth, texture and nutrient availability.

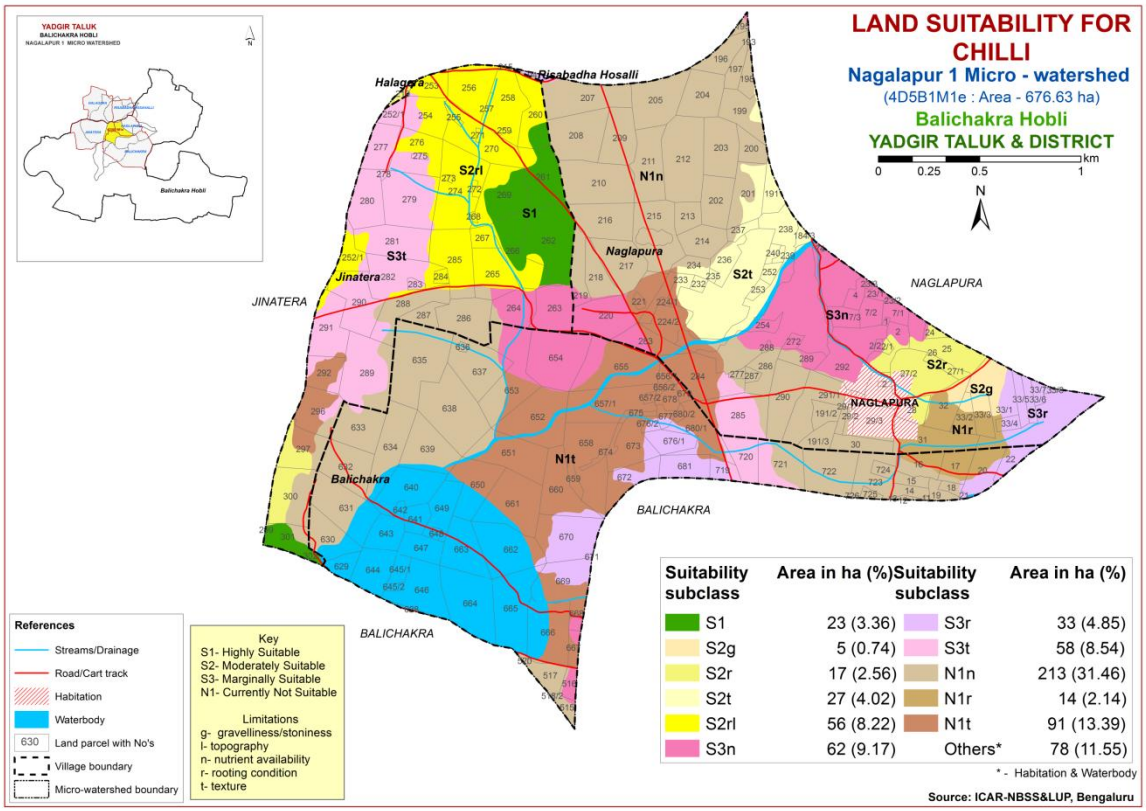


Fig 7.9 Land Suitability map of Chilli

7.10 Land Suitability for Tomato *(Lycopersicon esculentum)*

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

Highly (Class S1) suitable lands for growing tomato occur in an area of about 23 ha (3%) and are distributed in the northern and southwestern part of the microwatershed. An area of about 78 ha (12%) is moderately suitable (Class S2) for growing tomato and are distributed in the northern, western, northwestern, southwestern and southeastern part of the microwatershed. It has minor limitations of rooting depth, gravelliness and topography. An area of about 180 ha (27%) is marginally suitable (Class S3) for growing tomato and are distributed in the central, eastern, western, southern, northwestern and southeastern part of the microwatershed with moderate limitations of rooting depth, nutrient availability and texture. A maximum area of about 318 ha (47%) is currently not suitable (Class N1) for growing tomato and are distributed in the major part of the microwatershed with severe limitations of rooting depth, texture and nutrient availability.

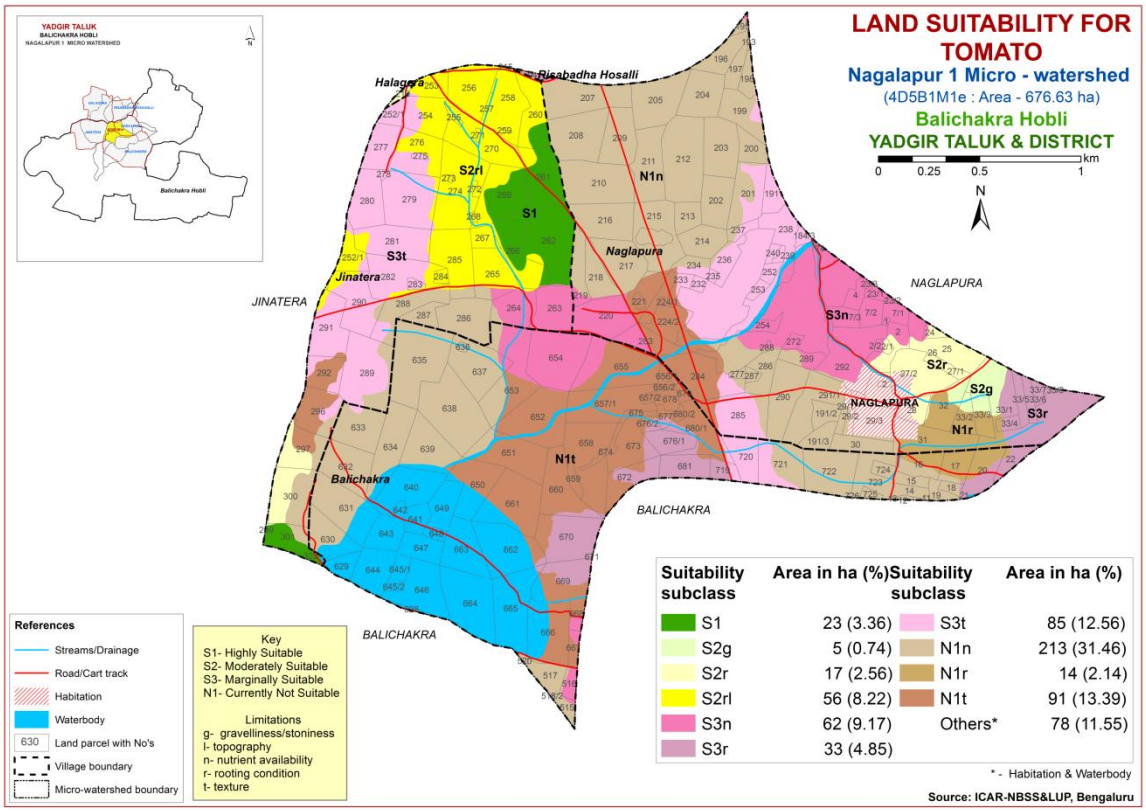


Fig 7.10 Land Suitability map of Tomato

7.11 Land Suitability for Brinjal (*Solanum melongena*)

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

Highly (Class S1) suitable lands for growing brinjal occur in an area of about 23 ha (3%) and are distributed in the northern and southwestern part of the microwatershed. An area of about 78 ha (12%) is moderately suitable (Class S2) for growing brinjal and are distributed in the northern, western, northwestern, southwestern and southeastern part of the microwatershed. It has minor limitations of rooting depth, gravelliness and topography. An area of about 180 ha (27%) is marginally suitable (Class S3) for growing brinjal and are distributed in the central, eastern, western, southern, northwestern and southeastern part of the microwatershed with moderate limitations of rooting depth, nutrient availability and texture. A maximum area of about 318 ha (47%) is currently not suitable (Class N1) for growing brinjal and are distributed in the major part of the microwatershed with severe limitations of rooting depth, texture and nutrient availability.

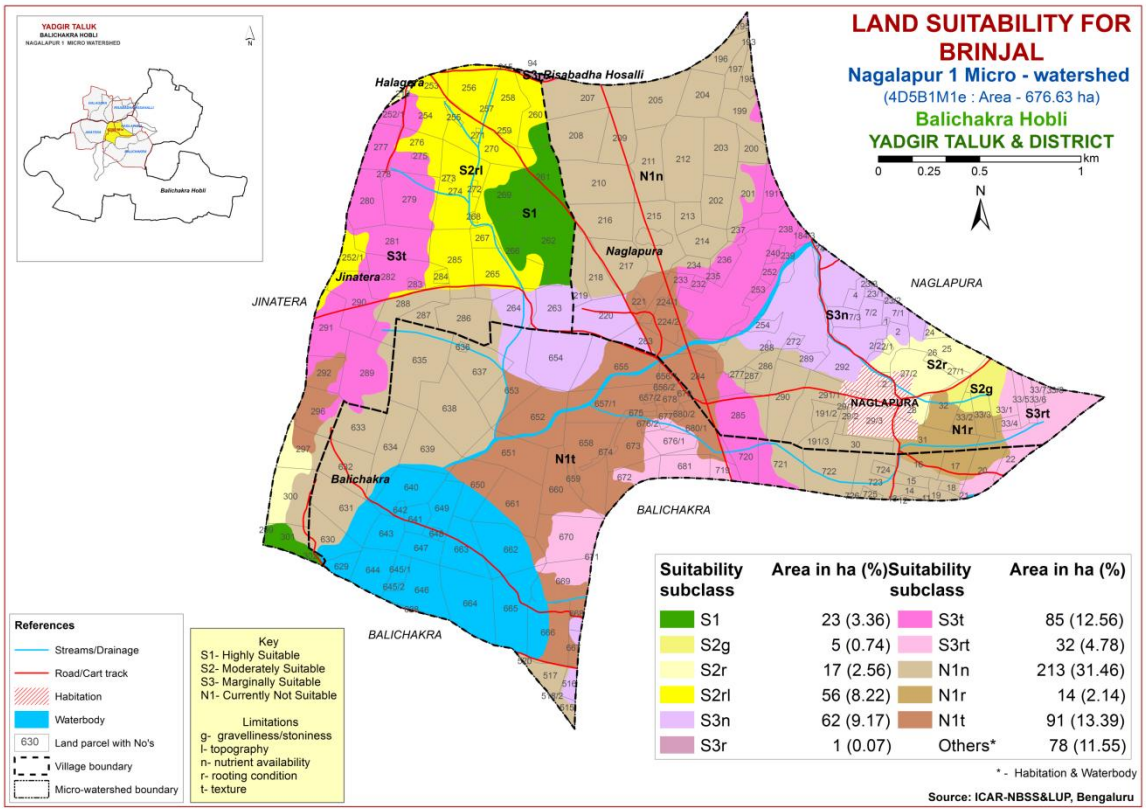


Fig 7.11 Land Suitability map of Brinjal

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

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

Highly (Class S1) suitable lands for growing onion occur in an area of about 23 ha (3%) and are distributed in the northern and southwestern part of the microwatershed. An area of about 78 ha (12%) is moderately suitable (Class S2) for growing onion and are distributed in the northern, western, northwestern, southwestern and southeastern part of the microwatershed. It has minor limitations of rooting depth, gravelliness and topography. An area of about 118 ha (17%) is marginally suitable (Class S3) for growing onion and are distributed in the central, eastern, western, southern, northwestern and southeastern part of the microwatershed with moderate limitations of rooting depth and texture. A maximum area of about 380 ha (56%) is currently not suitable (Class N1) for growing onion and are distributed in the major part of the microwatershed with severe limitations of rooting depth, texture and nutrient availability.

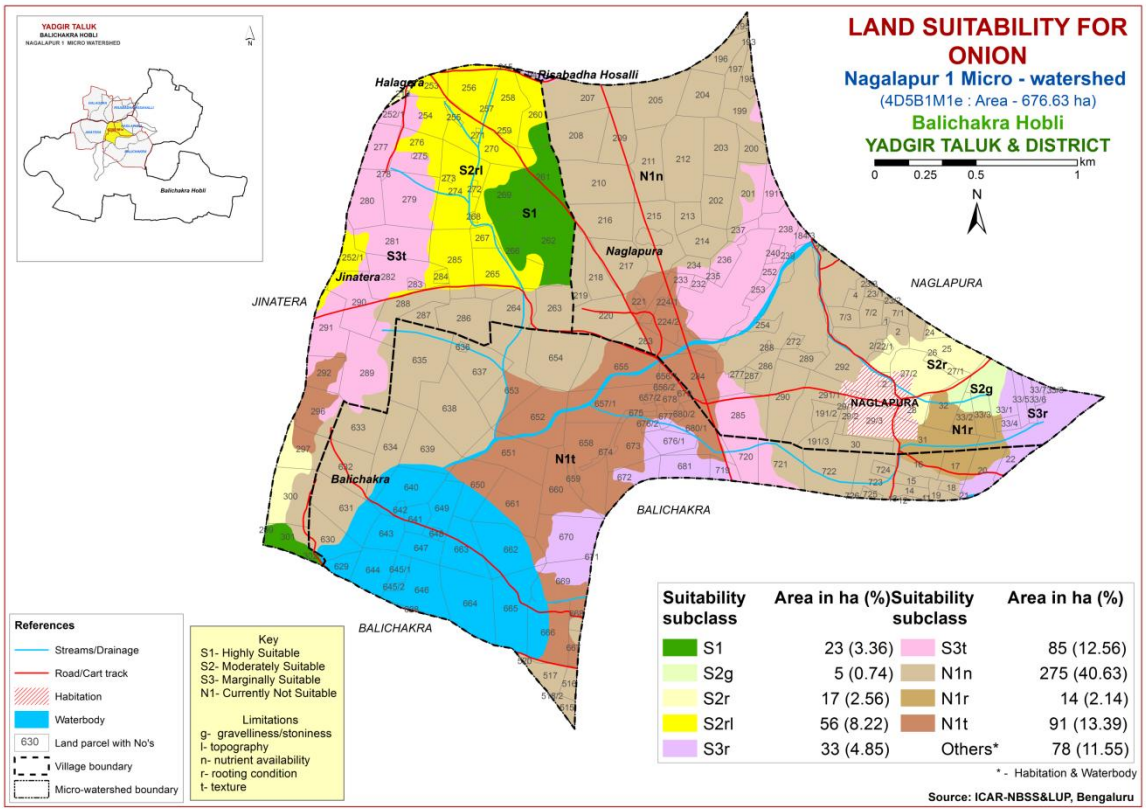


Fig 7.12 Land Suitability map of Onion

7.13 Land Suitability for Bhendi (*Abelmoschus esculentus*)

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

Highly (Class S1) suitable lands for growing bhendi occur in an area of about 23 ha (3%) and are distributed in the northern and southwestern part of the microwatershed. An area of about 105 ha (16%) is moderately suitable (Class S2) for growing bhendi and are distributed in the northern, western, eastern, northwestern, southwestern and southeastern part of the microwatershed. It has minor limitations of rooting depth, gravelliness, texture and topography. An area of about 153 ha (23%) is marginally suitable (Class S3) for growing bhendi and are distributed in the central, eastern, western, southern, northwestern and southeastern part of the microwatershed with moderate limitations of rooting depth, nutrient availability and texture. A maximum area of about 318 ha (47%) is currently not suitable (Class N1) for growing bhendi and are distributed in the major part of the microwatershed with severe limitations of rooting depth, texture and nutrient availability.

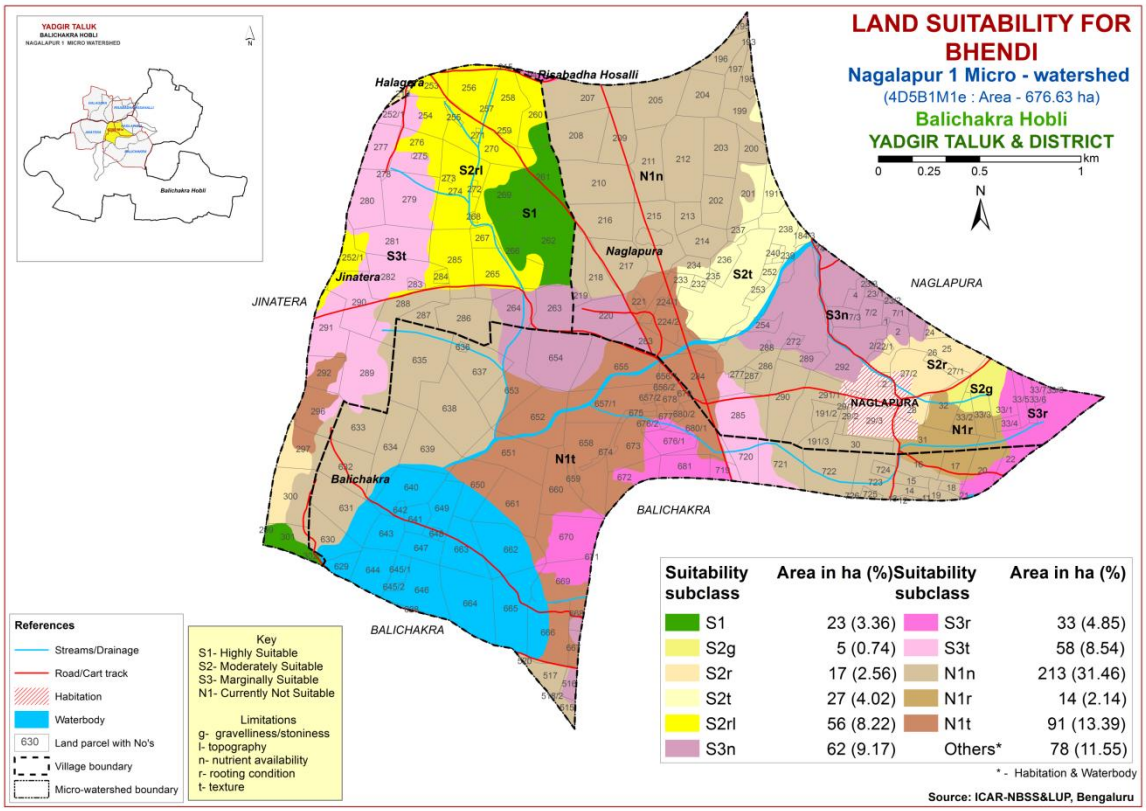


Fig 7.13 Land Suitability map of Bhendi

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 55 ha (8%) is moderately suitable (Class S2) for growing drumstick and are distributed in the eastern, southeastern, southwestern and northern part of the microwatershed. They have minor limitations of texture and rooting depth. Marginally suitable lands (Class S3) for growing drumstick occupy an area of about 131 ha (19%) and occur in the central, northern, southern, western, northwestern, southwestern and southeastern part of the microwatershed. They have moderate limitations of rooting depth and texture. A maximum area of about 413 ha (61%) is currently not suitable (Class N1) for growing drumstick and are distributed in the major part of the microwatershed with severe limitations of rooting depth, nutrient availability and texture.

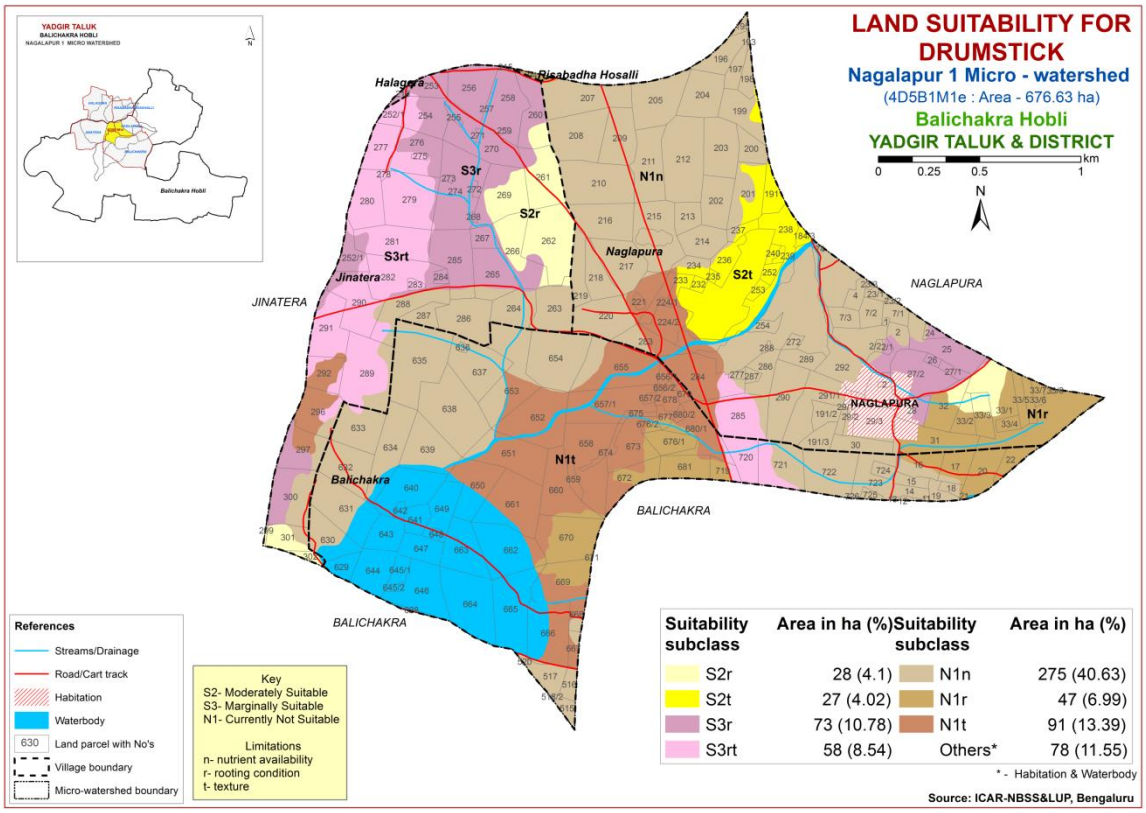


Fig 7.14 Land Suitability map of Drumstick

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 117 ha (17%) is marginally suitable (Class S3) for growing mango and are distributed in the central, eastern, northern, southwestern and southeastern part of the microwatershed. They have moderate limitations of rooting depth, texture and nutrient availability. A maximum area of about 482 ha (71%) is currently not suitable (Class N1) for growing mango and distributed in the major part of the microwatershed. They have severe limitations of rooting depth, texture and nutrient availability.

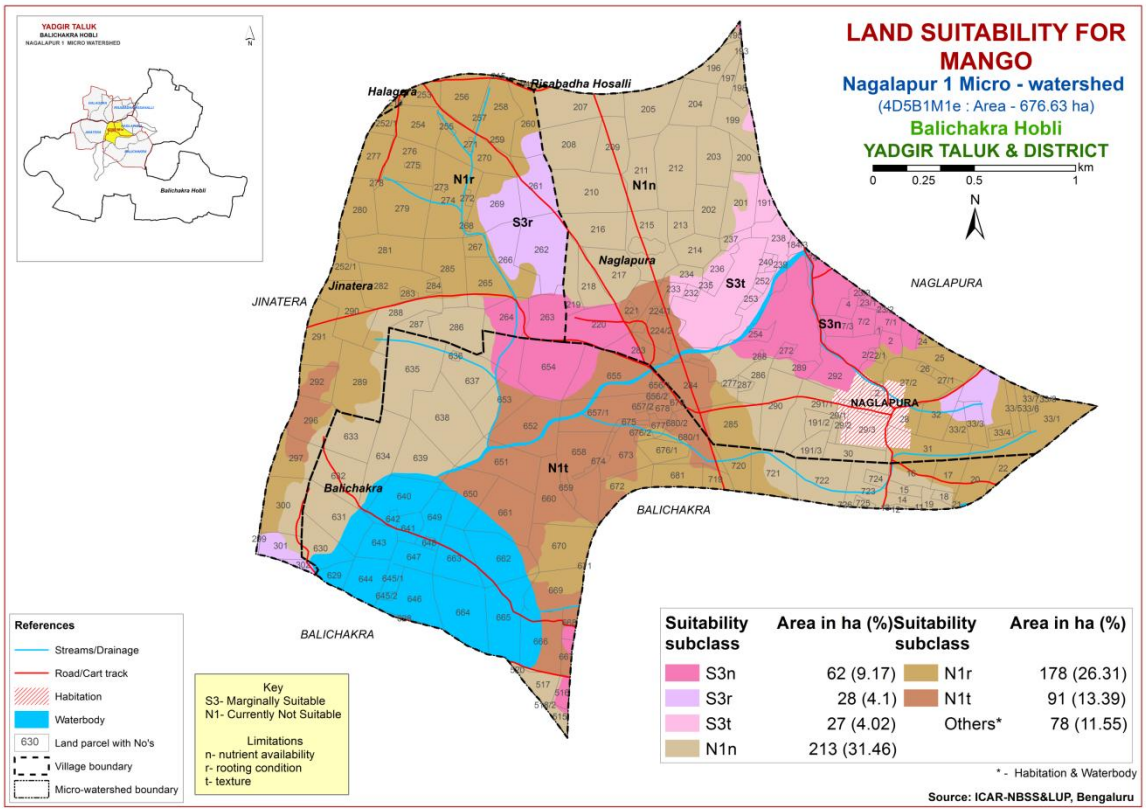


Fig. 7.15 Land Suitability map of Mango

7.16 Land suitability for Guava (*Psidium guajava*)

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

An area of about 28 ha (4%) is moderately suitable (Class S2) for growing guava and are distributed in the northern, southeastern and southwestern part of the microwatershed. It has minor limitation of rooting depth. Marginally suitable lands (Class S3) for growing guava occupy an area of about 158 ha (23%) and occur in the northern, southern, western, northwestern, southwestern and southeastern part of the microwatershed. They have moderate limitations of rooting depth and texture. A maximum area of about 413 ha (61%) is currently not suitable (Class N1) for growing guava and are distributed in the major part of the microwatershed with severe limitations of rooting depth, nutrient availability and texture.

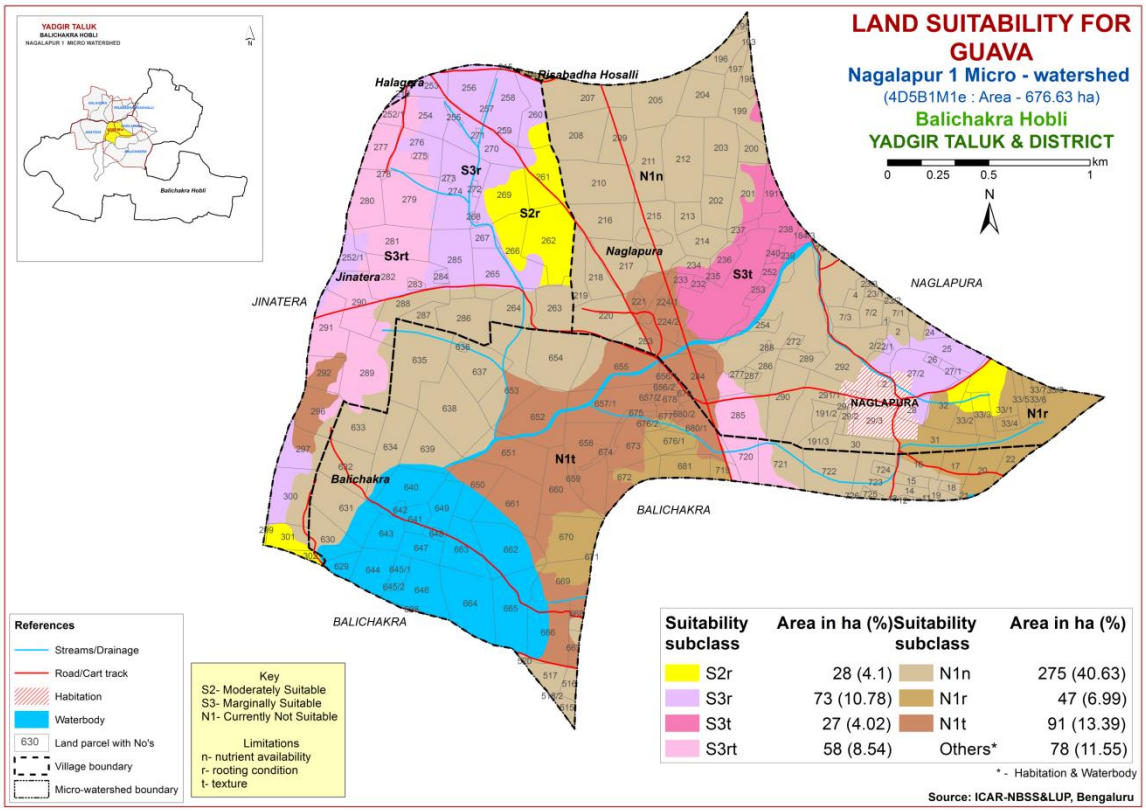


Fig. 7.16 Land Suitability map of Guava

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 28 ha (4%) is moderately suitable (Class S2) for growing sapota and occur in the northern, southeastern and southwestern part of the microwatershed. It has minor limitation of rooting depth. Marginally suitable (Class S3) lands for sapota are found to occur in an area of about 220 ha (32%) with moderate limitations of rooting depth, texture and nutrient availability and are distributed in the central, northern, southern, western, eastern, northwestern, southwestern and southeastern part of the microwatershed. A maximum area of about 351 ha (52%) is currently not suitable (Class N1) for growing sapota and are distributed in the major part of the microwatershed with severe limitations of rooting depth, texture and nutrient availability.

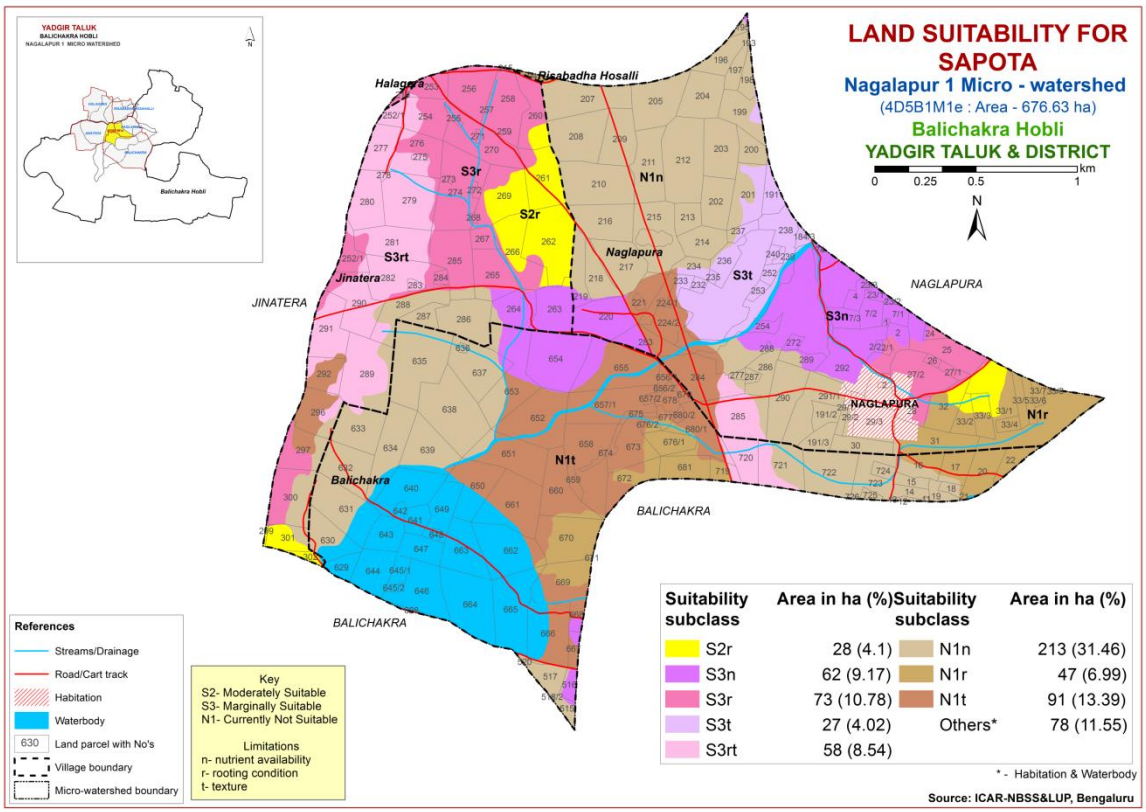


Fig. 7.17 Land Suitability map of Sapota

7.18 Land Suitability for Pomegranate (*Punica granatum*)

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

An area of about 55 ha (8%) is moderately suitable (Class S2) for growing pomegranate and are distributed in the eastern, southeastern, southwestern and northern part of the microwatershed. They have minor limitations of texture and rooting depth. Marginally suitable lands (Class S3) for growing pomegranate occupy an area of about 193 ha (28%) and occur in the central, northern, southern, eastern, western, northwestern, southwestern and southeastern part of the microwatershed. They have moderate limitations of rooting depth, nutrient availability and texture. A maximum area of about 351 ha (52%) is currently not suitable (Class N1) for growing pomegranate and are distributed in the major part of the microwatershed with severe limitations of rooting depth, nutrient availability and texture.

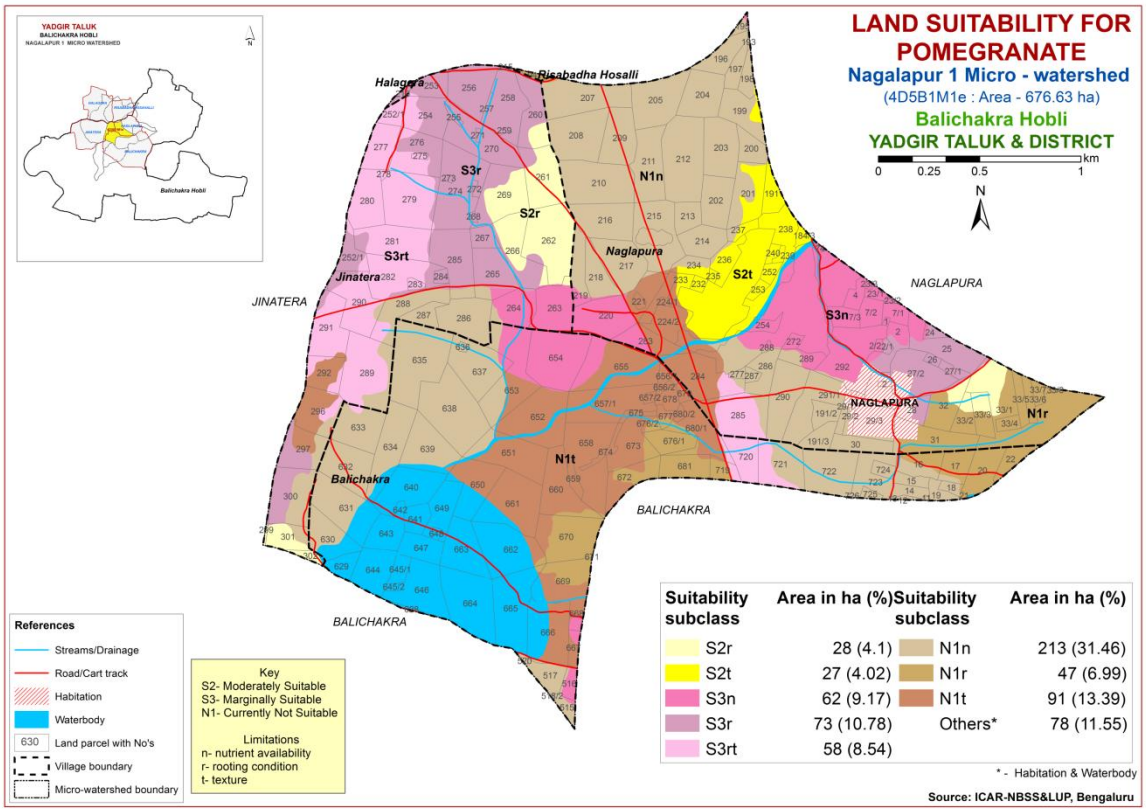


Fig 7.18 Land Suitability map of Pomegranate

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 27 ha (4%) is highly suitable (Class S1) for growing musambi and is distributed in the eastern and northeastern part of the microwatershed with no limitations. An area of about 28 ha (4%) is moderately suitable (Class S2) for growing musambi and occur in the northern, southeastern and southwestern part of the microwatershed. It has minor limitation of rooting depth. Marginally suitable (Class S3) lands for musambi are found to occur in an area of about 193 ha (28%) with moderate limitations of rooting depth, texture and nutrient availability and are distributed in the central, northern, southern, western, eastern, northwestern, southeastern and southwestern part of the microwatershed. A maximum area of about 351 ha (52%) is currently not suitable (Class N1) for growing musambi and are distributed in the major part of the microwatershed with severe limitations of rooting depth, texture and nutrient availability.

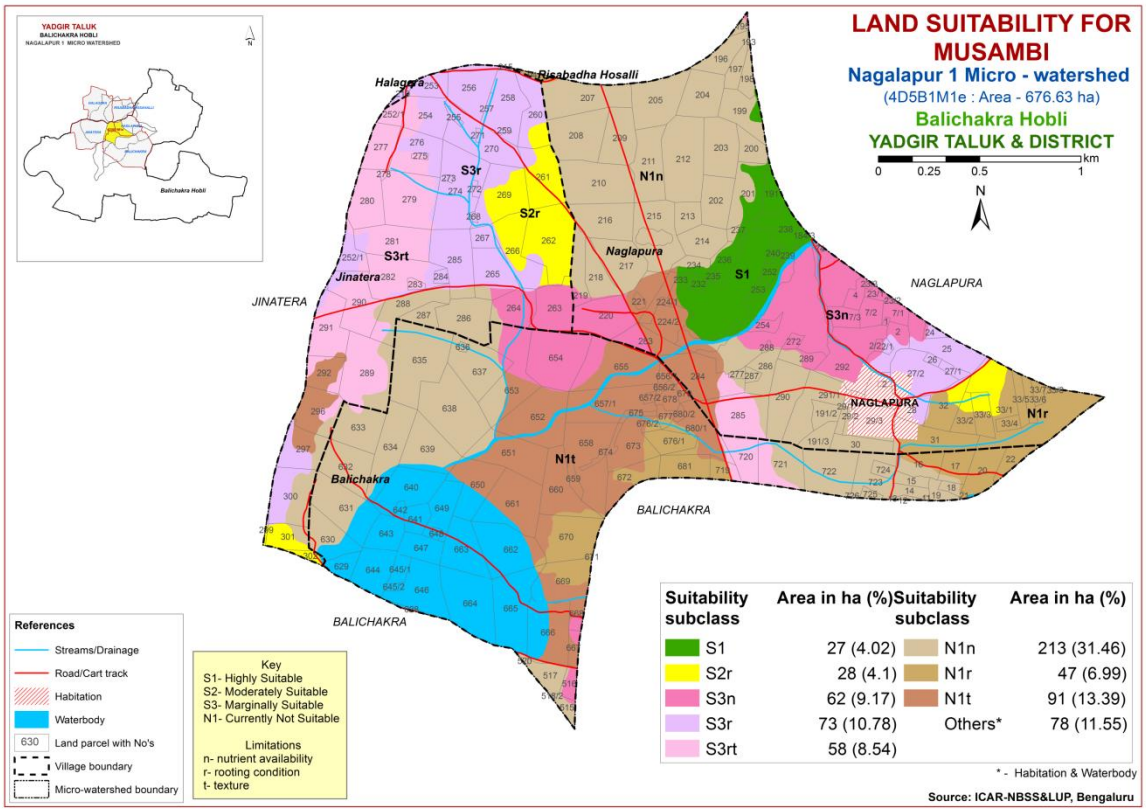


Fig. 7.19 Land Suitability map of Musambi

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 27 ha (4%) is highly suitable (Class S1) for growing lime and is distributed in the eastern and northeastern part of the microwatershed with no limitations. An area of about 28 ha (4%) is moderately suitable (Class S2) for growing lime and occur in the northern, southeastern and southwestern part of the microwatershed. It has minor limitation of rooting depth. Marginally suitable (Class S3) lands for lime are found to occur in an area of about 193 ha (28%) with moderate limitations of rooting depth, texture and nutrient availability and are distributed in the central, northern, southern, western, eastern, northwestern, southeastern and southwestern part of the microwatershed. A maximum area of about 351 ha (52%) is currently not suitable (Class N1) for growing lime and are distributed in the major part of the microwatershed with severe limitations of rooting depth, texture and nutrient availability.

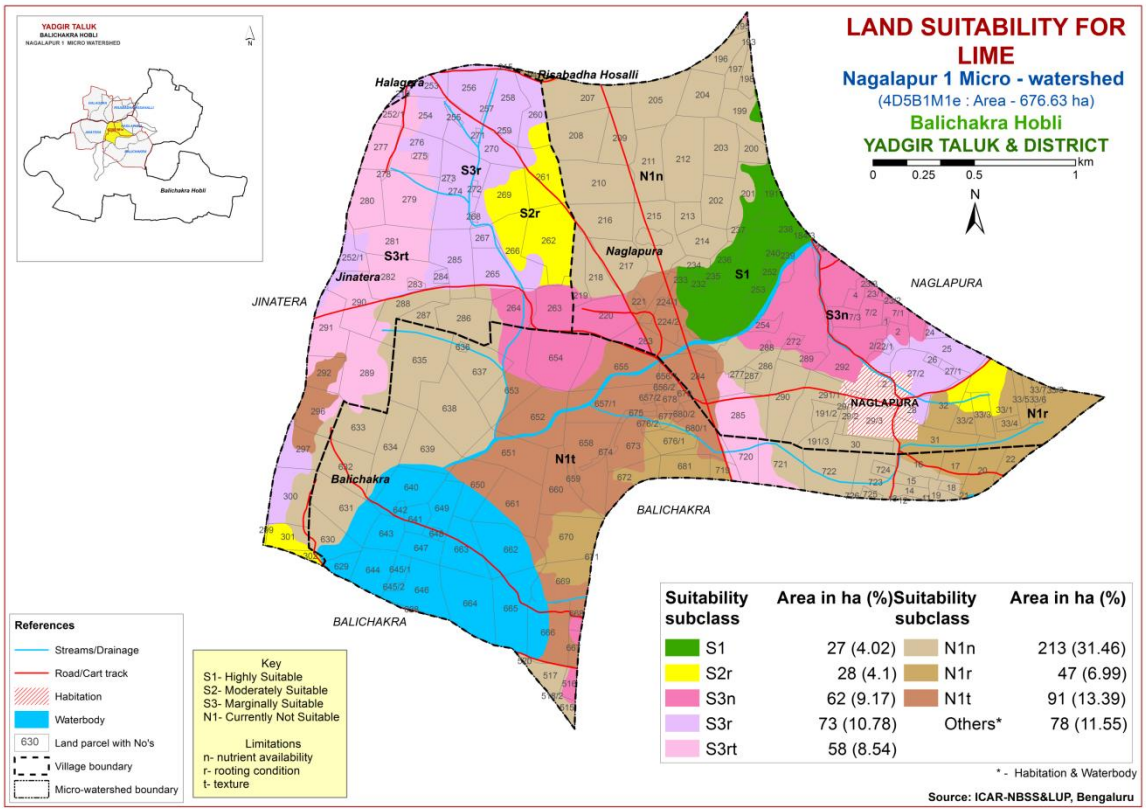


Fig. 7.20 Land Suitability map of Lime

7.21 Land Suitability for Amla (*Phyllanthus emblica*)

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

Highly (Class S1) suitable lands for growing amla occur in an area of about 28 ha (4%) and are distributed in the northern, southeastern and southwestern part of the microwatershed. An area of about 100 ha (15%) is moderately suitable (Class S2) for growing amla and is distributed in the northern, western, northwestern, southwestern and southeastern part of the microwatershed. It has minor limitations of rooting depth, texture and topography. An area of about 91 ha (13%) is marginally suitable (Class S3) for growing amla and are distributed in the western, southern, northwestern and southeastern part of the microwatershed with moderate limitations of rooting depth and texture. A maximum area of about 380 ha (56%) is currently not suitable (Class N1) for growing amla and are distributed in the major part of the microwatershed with severe limitations of rooting depth, texture and nutrient availability.

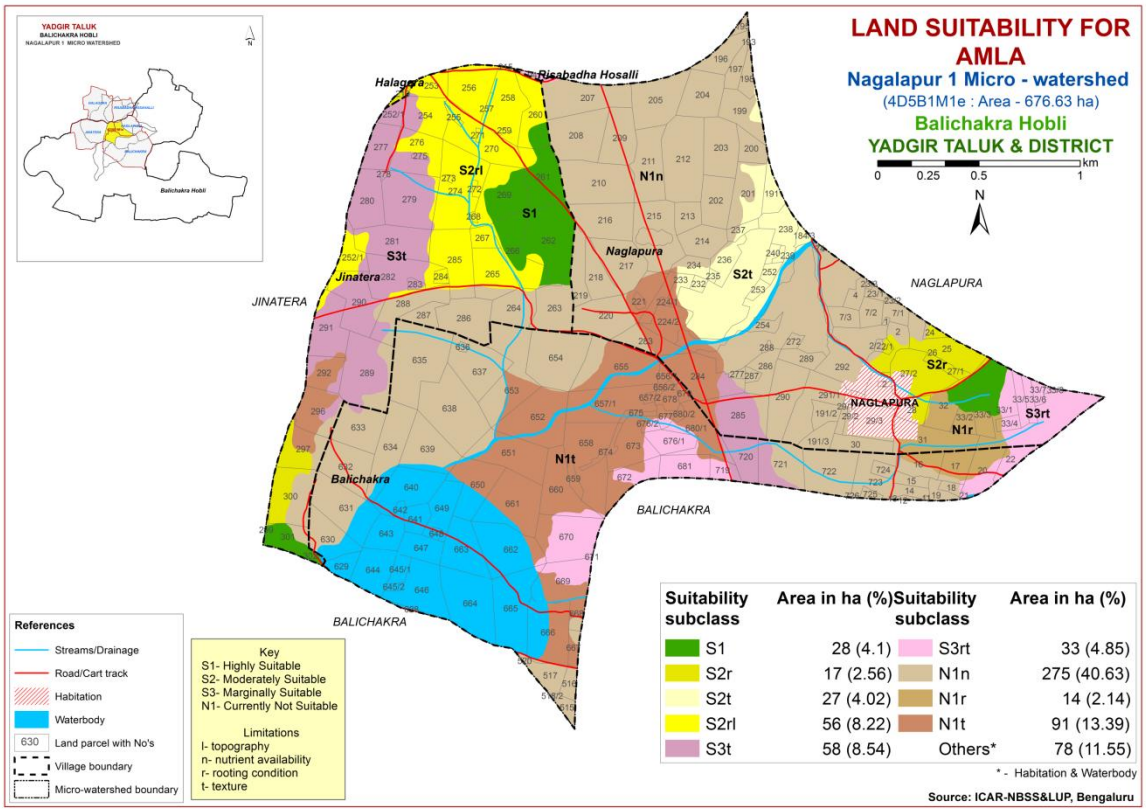


Fig. 7.21 Land Suitability map of Amla

7.22 Land Suitability for Cashew (*Anacardium occidentale)*

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

An area of about 25 ha (4%) is moderately suitable (Class S2) for growing cashew and is distributed in the northern and southeastern part of the microwatershed. It has minor limitations of rooting depth and nutrient availability. Marginally suitable lands (Class S3) for growing cashew occupy an area of about 64 ha (9%) and occur in the northern, western, northwestern, southwestern and southeastern part of the microwatershed. They have moderate limitations of rooting depth and nutrient availability. A maximum area of about 511 ha (75%) is currently not suitable (Class N1) for growing cashew and are distributed in all parts of the microwatershed with severe limitations of rooting depth, nutrient availability and texture.

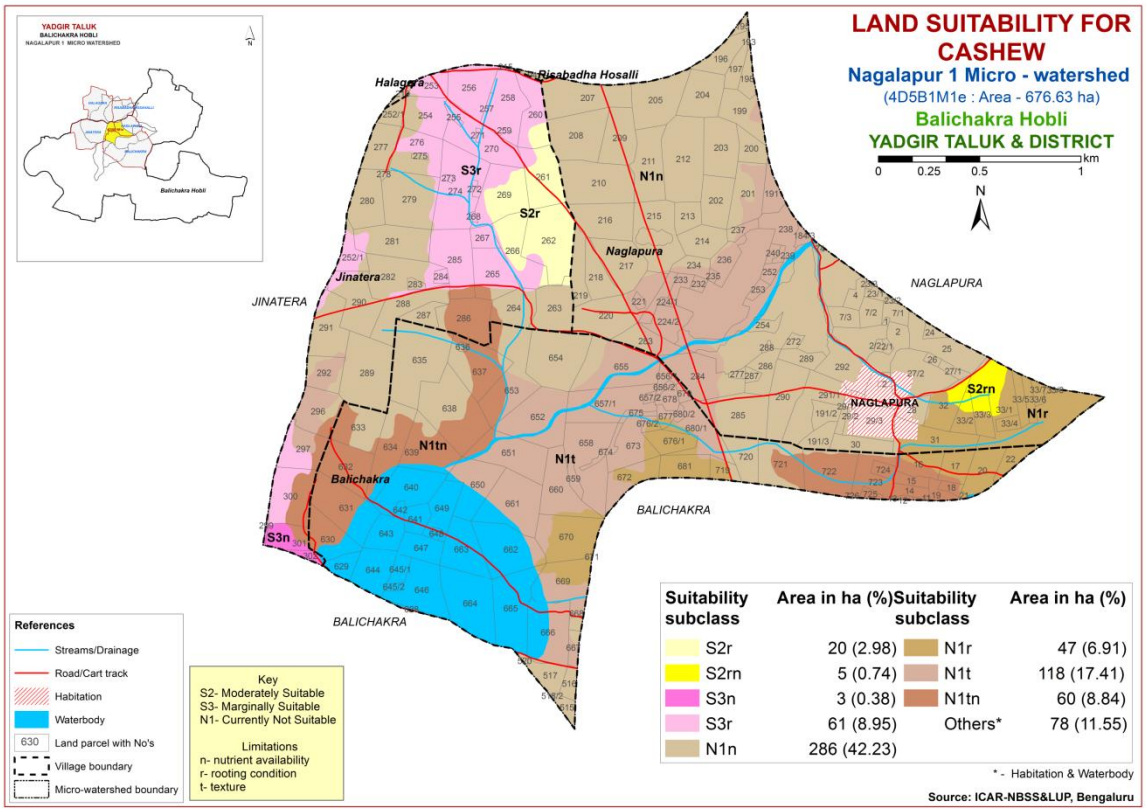


Fig. 7.22 Land Suitability map of Cashew

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

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

An area of about 28 ha (4%) is moderately suitable (Class S2) for growing jackfruit and are distributed in the northern, southeastern and southwestern part of the microwatershed. It has minor limitation of rooting depth. Marginally suitable lands (Class S3) for growing jackfruit occupy an area of about 158 ha (23%) and occur in the northern, southern, western, northwestern, southwestern and southeastern part of the microwatershed. They have moderate limitations of rooting depth and texture. A maximum area of about 413 ha (61%) is currently not suitable (Class N1) for growing jackfruit and are distributed in the major part of the microwatershed with severe limitations of rooting depth, nutrient availability and texture.

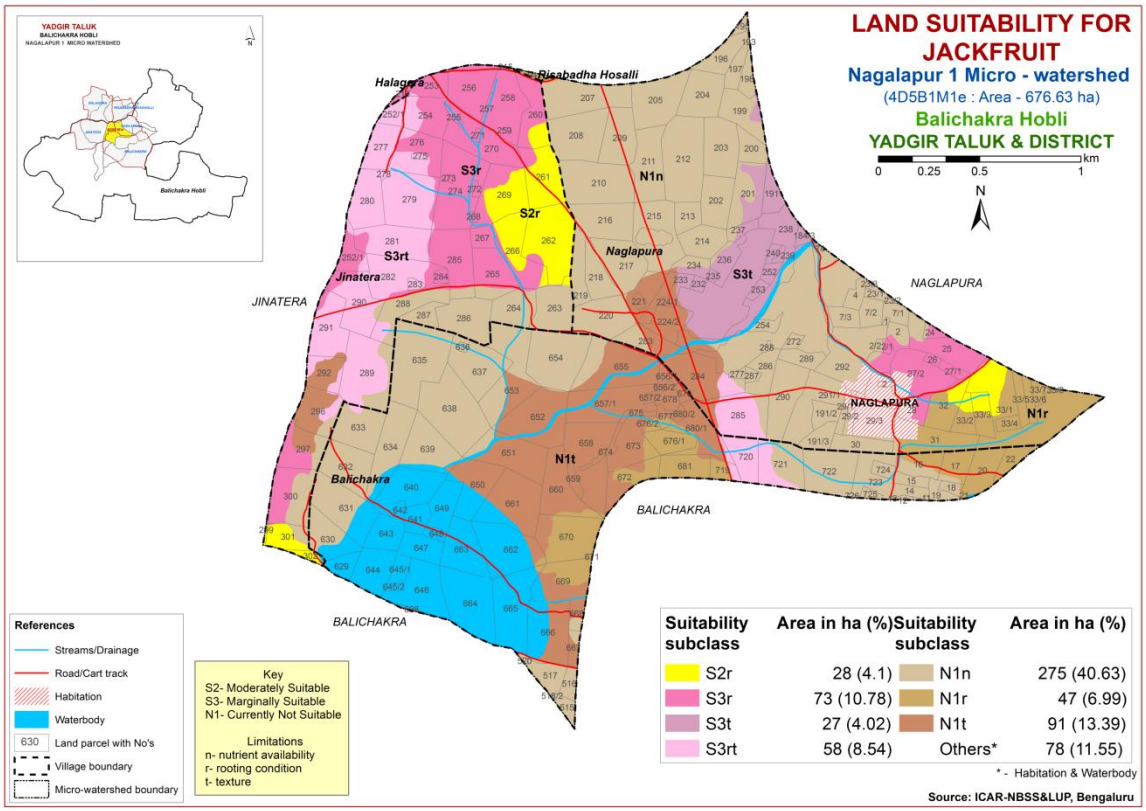


Fig. 7.23 Land Suitability map of Jackfruit

7.24 Land Suitability for Jamun (*Syzygium cumini*)

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

An area of about 27 ha (4%) is moderately suitable (Class S2) for growing jamun and are distributed in the eastern and northeastern part of the microwatershed. It has minor limitations of rooting depth and texture. Marginally suitable lands (Class S3) for growing jamun occupy an area of about 159 ha (23%) and occur in the northern, southern, western, northwestern, southwestern and southeastern part of the microwatershed. They have moderate limitations of rooting depth and texture. A maximum area of about 413 ha (61%) is currently not suitable (Class N1) for growing jamun and are distributed in the major part of the microwatershed with severe limitations of rooting depth, nutrient availability and texture.

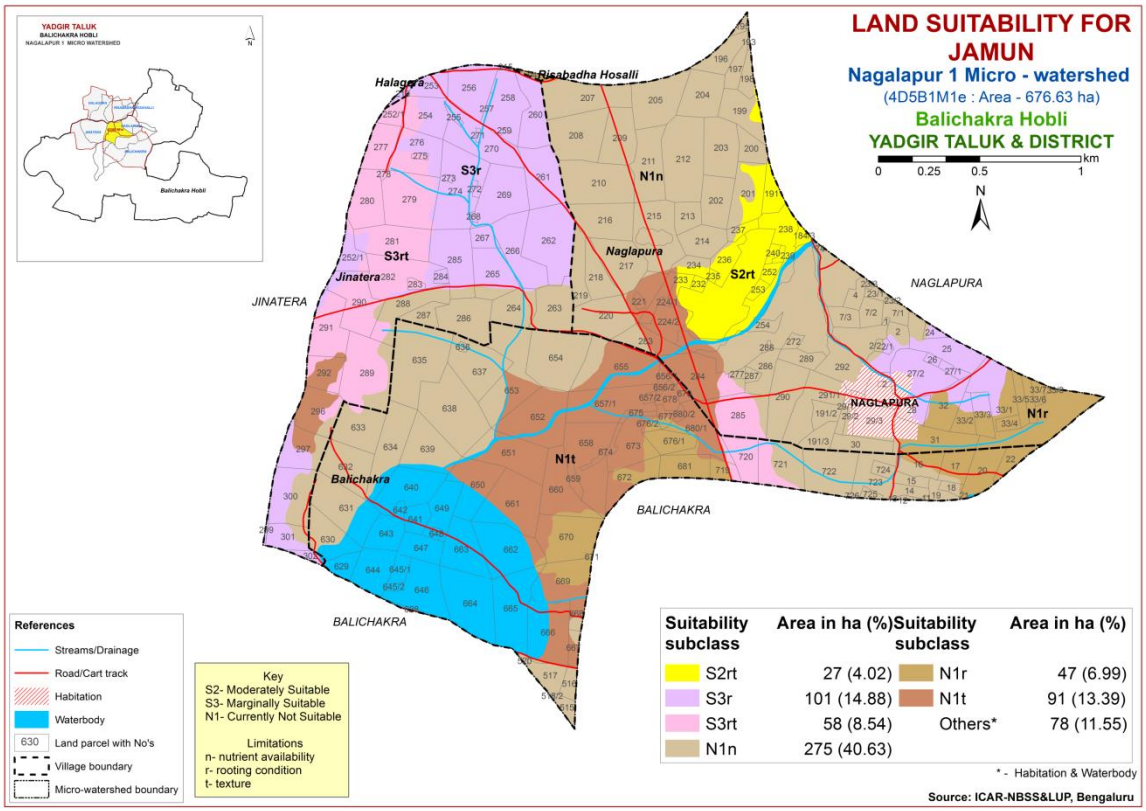


Fig. 7.24 Land Suitability map of Jamun

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

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

Highly (Class S1) suitable lands for growing custard apple occur in an area of about 55 ha (8%) and are distributed in the eastern, northern, northeastern, southwestern and southeastern part of the microwatershed. An area of about 73 ha (11%) is moderately suitable (Class S2) for growing custard apple and are distributed in the northern, northwestern, western, southwestern and southeastern part of the microwatershed. They have minor limitations of rooting depth and topography. A maximum area of about 243 ha (36%) is marginally suitable (Class S3) for growing custard apple and are distributed in the major part of the microwatershed with moderate limitations of rooting depth, nutrient availability and texture. An area of about 227 ha (34%) is currently not suitable (Class N1) for growing custard apple and are distributed in the central, northern, southern, southeastern and southwestern part of the microwatershed with severe limitations of rooting depth and nutrient availability.

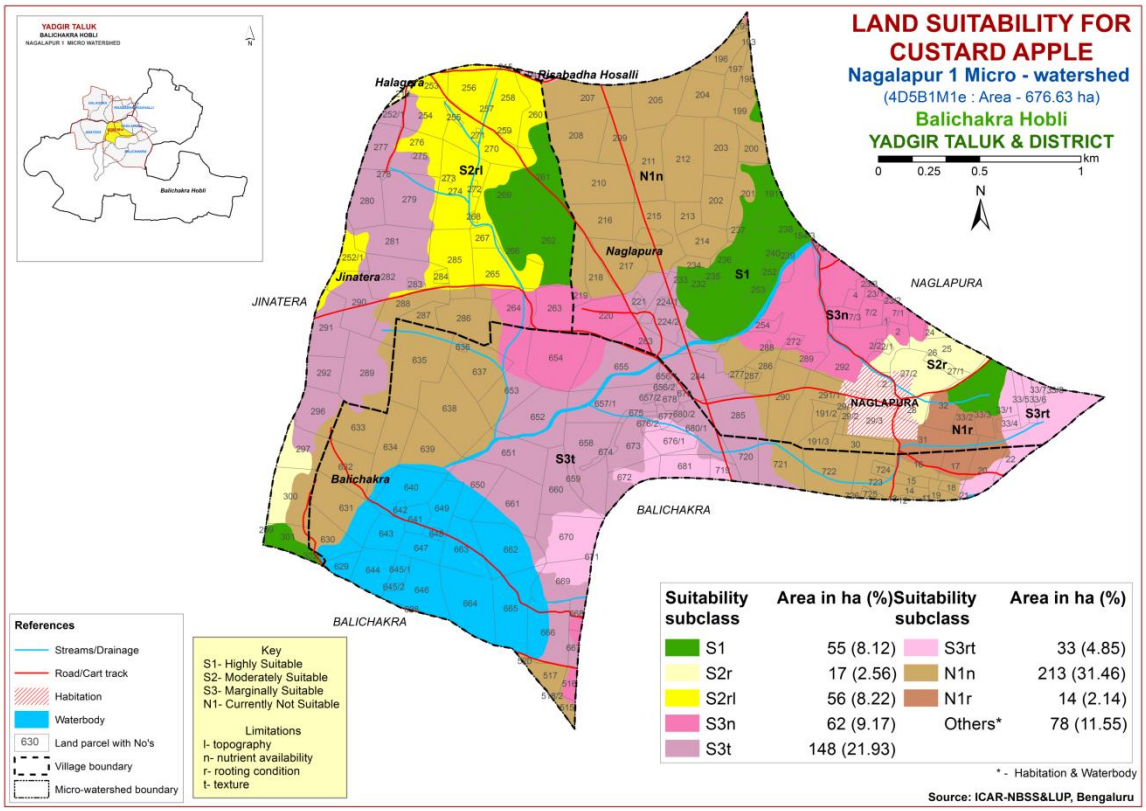


Fig. 7.25 Land Suitability map of Custard Apple

7.26 Land Suitability for Tamarind (*Tamarindus indica*)

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

An area of about 27 ha (4%) is moderately suitable (Class S2) for growing tamarind and is distributed in the eastern and northeastern part of the microwatershed. They have minor limitations of rooting depth and texture. Marginally suitable lands (Class S3) for growing tamarind occupy an area of about 28 ha (4%) and occur in the northern. southwestern and southeastern part of the microwatershed. They have moderate limitation of rooting depth. A maximum area of about 544 ha (80%) is currently not suitable (Class N1) for growing tamarind and are distributed in all parts of the microwatershed with severe limitations of rooting depth, nutrient availability and texture.

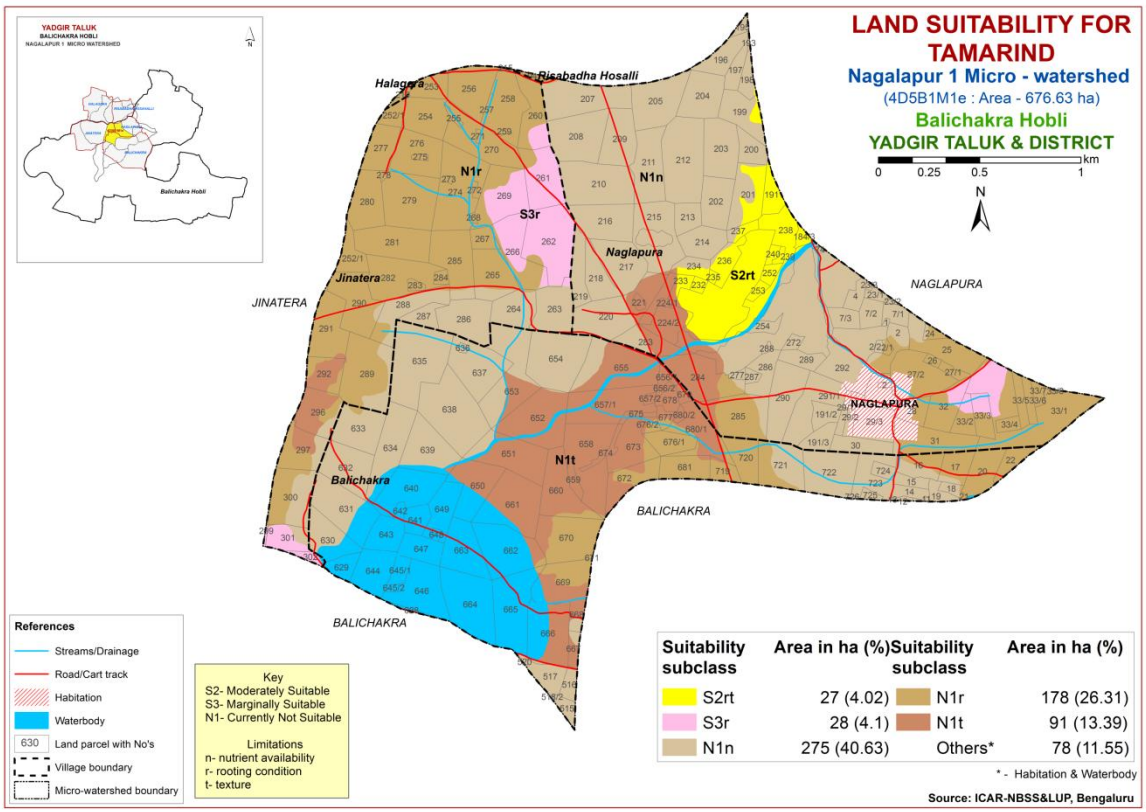


Fig. 7.26 Land Suitability map of Tamarind

7.27 Land Suitability for Mulberry (*Morus nigra*)

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

An area of about 28 ha (4%) is moderately suitable (Class S2) for growing mulberry and are distributed in the northern, southeastern and southwestern part of the microwatershed. It has minor limitation of rooting depth. Marginally suitable lands (Class S3) for growing mulberry occupy an area of about 158 ha (23%) and occur in the northern, southern, western, northwestern, southwestern and southeastern part of the microwatershed. They have moderate limitations of rooting depth and texture. A maximum area of about 413 ha (61%) is currently not suitable (Class N1) for growing mulberry and are distributed in the major part of the microwatershed with severe limitations of rooting depth, nutrient availability and texture.

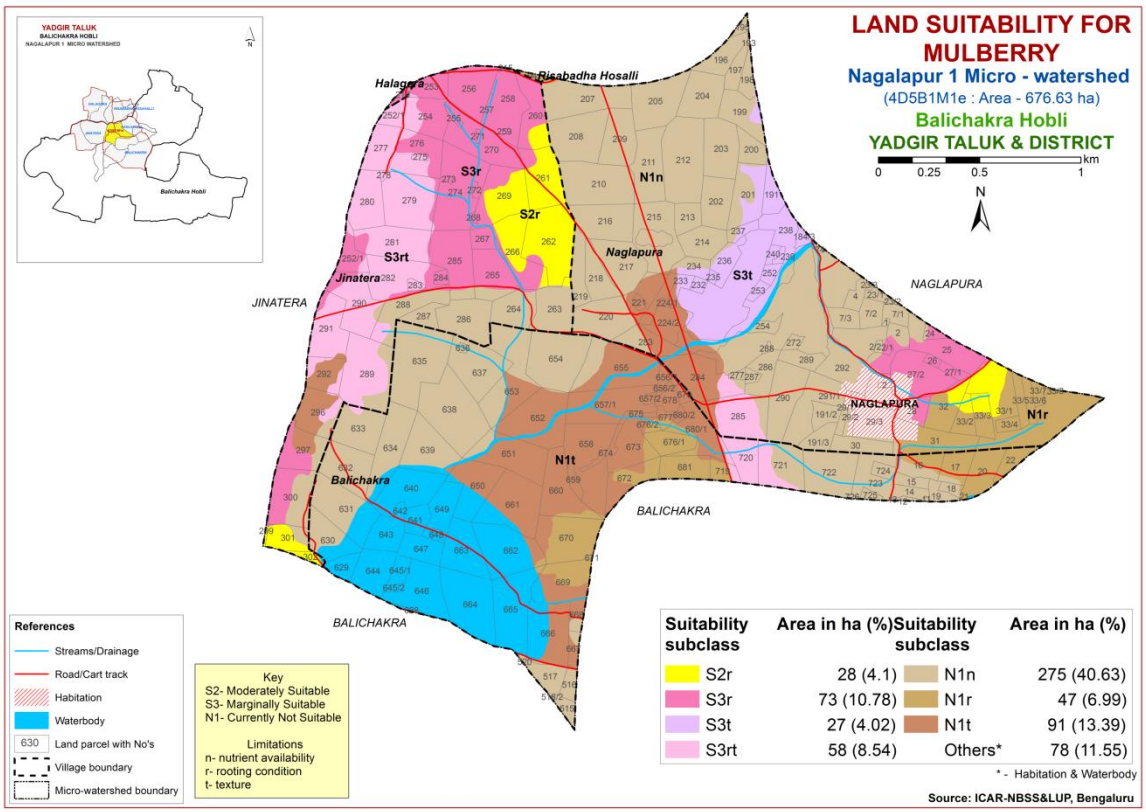


Fig 7.27 Land Suitability map of Mulberry

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

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

Highly (Class S1) suitable lands for growing marigold occur in an area of about 23 ha (3%) and are distributed in the northern and southwestern part of the microwatershed. An area of about 105 ha (16%) is moderately suitable (Class S2) for growing marigold and is distributed in the northern, eastern, western, northwestern, southwestern and southeastern part of the microwatershed. It has minor limitations of texture, rooting depth, gravelliness and topography. An area of about 153 ha (23%) is marginally suitable (Class S3) for growing marigold and are distributed in the central, eastern, western, southern, southeastern and northwestern part of the microwatershed with moderate limitations of rooting depth, nutrient availability and texture. A maximum area of about 318 ha (47%) is currently not suitable (Class N1) for growing marigold and are distributed in the major part of the microwatershed with severe limitations of rooting depth, texture and nutrient availability.

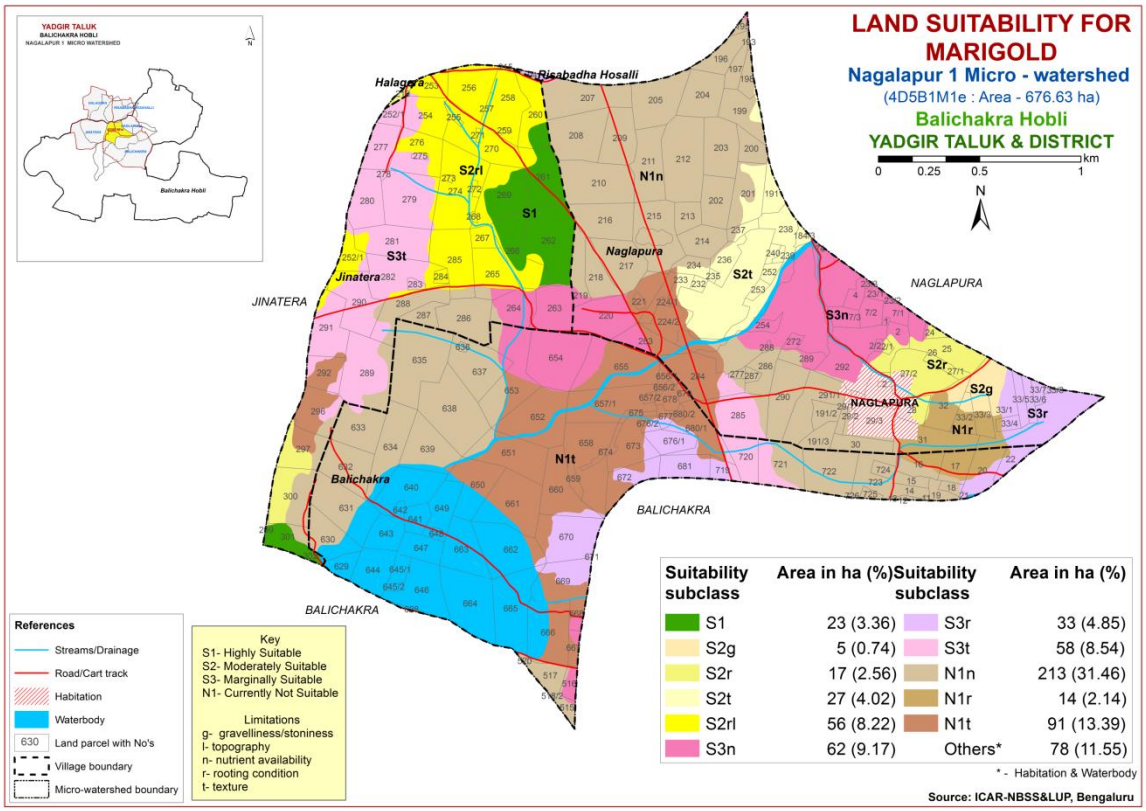


Fig. 7.28 Land Suitability map of Marigold

7.29 Land Suitability for Chrysanthemum (*Dendranthema grandiflora*)

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

Highly (Class S1) suitable lands for growing chrysanthemum occur in an area of about 23 ha (3%) and are distributed in the northern and southwestern part of the microwatershed. An area of about 105 ha (16%) is moderately suitable (Class S2) for growing chrysanthemum and is distributed in the northern, eastern, western, northwestern, southwestern and southeastern part of the microwatershed. It has minor limitations of texture, rooting depth, gravelliness and topography. An area of about 153 ha (23%) is marginally suitable (Class S3) for growing chrysanthemum and are distributed in the central, eastern, western, southern, southeastern and northwestern part of the microwatershed with moderate limitations of rooting depth, nutrient availability and texture. A maximum area of about 318 ha (47%) is currently not suitable (Class N1) for growing chrysanthemum and are distributed in the major part of the microwatershed with severe limitations of rooting depth, texture and nutrient availability.

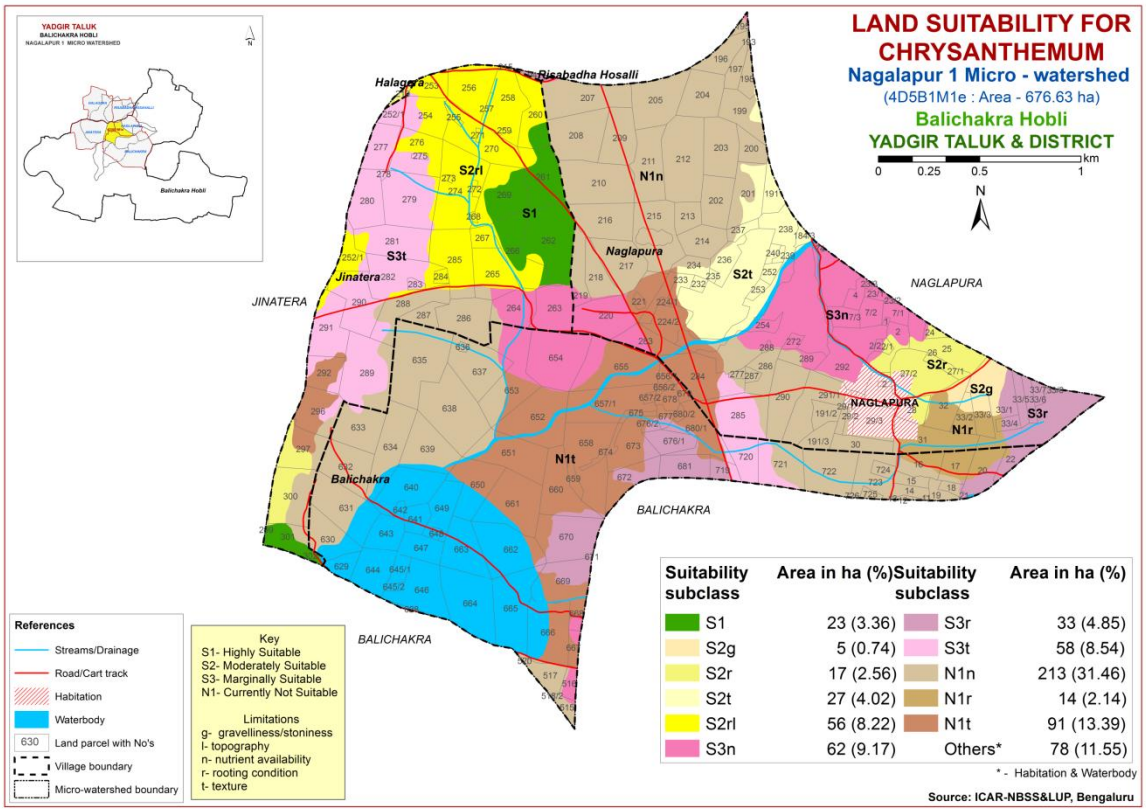


Fig. 7.29 Land Suitability map of Chrysanthemum

Table 7.1 Soil-Site Characteristics of Nagalapur-1 Microwatershed

Soil Map Units	Climate (P) (mm)	Growing period (Days)	Drain-age Class	Soil depth (cm)	Soil texture		Gravelliness		AWC (mm/m)	Slope (%)	Erosion	pH	EC (dSm^{-1})	ESP (%)	CEC [Cmol (p^{+})kg^{-1}]	BS (%)
					Sur-face	Sub-surface	Surface (%)	Sub-surface (%)								
BDPhB2	866	150	WD	<25	scl	scl	<15	<15	<50	1-3	moderate	8.58	0.262	0.35	18.10	100
BDLiB2	866	150	WD	25-50	sc	sl	<15	<15	<50	1-3	moderate	6.20	0.074	0.20	4.20	93
HTKcC2g1	866	150	WD	25-50	sl	sl	15-35	10-25	<50	3-5	moderate	6.81	0.062	0.38	3	101
HTKcB2	866	150	WD	25-50	sl	sl	<15	10-25	<50	1-3	moderate	6.81	0.062	0.38	3	101
YLRbB2	866	150	WD	50-75	ls	c	<15	15-35	51-100	1-3	moderate	6.91	0.069	0.45	6.90	100
YLRcC3	866	150	WD	50-75	sl	c	<15	15-35	51-100	3-5	severe	6.91	0.069	0.45	6.90	100
SBRcB2	866	150	sed	50-75	sl	ls	<15	<15	<50	1-3	moderate	8.24	0.145	1.15	7.50	100
JNKcB2	866	150	W	50-75	sl	scl	<15	<15	51-150	1-3	moderate	8.42	0.148	0.18	14.50	100
JNKiB2	866	150	W	50-75	sc	scl	<15	<15	51-150	1-3	moderate	8.42	0.148	0.18	14.50	100
BLCcB2g1	866	150	WD	75-100	sl	scl	<15	<15	51-100	1-3	moderate	6.75	0.19	1.31	16.80	95
SHThB2	866	150	WD	75-100	scl	scl	15-35	<15	51-100	1-3	moderate	7.26	0.199	0.86	10.60	100
PGPhB2	866	150	WD	75-100	scl	sc	<15	<15	51-100	1-3	moderate	6.83	0.210	2.83	3.15	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
BGDmB2	866	150	MW	100-150	c	c	<15	<15	>200	1-3	moderate	7.85	0.253	0.26	65.90	100
MDGcB2	866	150	WD	100-150	sl	scl	<15	<15	>200	1-3	moderate	8.2	0.399	3.08	4.90	100
MDGhB2g1	866	150	WD	100-150	scl	scl	15-35	<15	>200	1-3	moderate	8.2	0.399	3.08	4.90	100
MDGiB2	866	150	WD	100-150	sc	scl	<15	<15	>200	1-3	moderate	8.2	0.399	3.08	4.90	100
ANRcA1	866	150	MW	100-150	sl	c	<15	<15	>200	0-1	slight	10.17	0.365	7.08	19.90	100
ANRcB2	866	150	MW	100-150	sl	c	<15	<15	>200	1-3	moderate	10.17	0.365	7.08	19.90	100
ANRiB2	866	150	MW	100-150	sc	c	<15	<15	>200	1-3	moderate	10.17	0.365	7.08	19.90	100
YDRcB2	866	150	WD	100-150	sl	sl	<15	<15	51-100	1-3	moderate	7.25	0.114	0.31	3.40	96
KDPcA1	866	150	sed	>150	sl	s	<15	<15	51-100	0-1	slight	6.55	0.07	1.37	2.53	61
KDPhB2	866	150	sed	>150	scl	s	<15	<15	51-100	1-3	moderate	6.55	0.07	1.37	2.53	61

***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 23 soil map units identified in Nagalapur-1 microwatershed have been grouped into 8 Land Management Units (LMU's) for the purpose of preparing a Proposed Crop Plan. Land Management Units are grouped based on the similarities in respect of the type of soil, the depth of the soil, the surface soil texture, gravel content, AWC, slope, erosion etc. and a Land Management Units map (Fig. 7.30) has been generated. These Land Management Units are expected to behave similarly for a given level of management.

The map units that have been grouped into 8 Land Management Units along with brief description of soil and site characteristics are given below.

LMU	Soil map units	Soil and site characteristics
1	179.KDPcA1 180.KDPhB2	Very deep (>150 cm), sandy soils, 0-3 % slopes, non-gravelly (<15%), slight to moderate erosion.
2	167.ANRcA1 168.ANRcB2 55.ANRiB2 42.YDRcB2 35.GWDiB2	Moderately deep to deep (75 to 150 cm), sodic soils, 0-3 % slopes, non-gravelly (<15%), slight to moderate erosion.
3	115.BGDmB2 114.PGPhB2	Moderately deep to deep (75 to 150 cm), sandy clay to clay soils, 1-3% slopes, non-gravelly (<15%), moderate erosion.
4	57.MDGcB2 149.MDGhB2g1 58.MDGiB2 155.BLCcB2g1 36.SHThB2	Moderately deep to deep (75 to 150 cm), sandy clay loam soils, 1-3% slopes, non-gravelly to gravelly (<15-35%), moderate erosion.
5	27.YLRbB2 30.YLRcC3	Moderately shallow (50-75 cm), red clay soils, 1-5% slopes, non-gravelly (<15%), moderate to severe erosion.
6	11.SBRcB2	Moderately shallow (50-75 cm), loamy sand soils, 1-3% slopes, non-gravelly (<15%), moderate erosion.
7	20.JNKcB2 22.JNKiB2	Moderately shallow (50-75 cm), sandy clay loam soils, 1-3% slopes, non-gravelly (<15%), moderate erosion.
8	120.BDPhB2 5.BDLiB2 165.HTKcB2 113.HTKcC2g1	Shallow to very shallow (<25 to 50 cm), sandy clay loam to sandy loam soils, 1-5% slopes, non-gravelly to gravelly (<15-35%), moderate erosion.

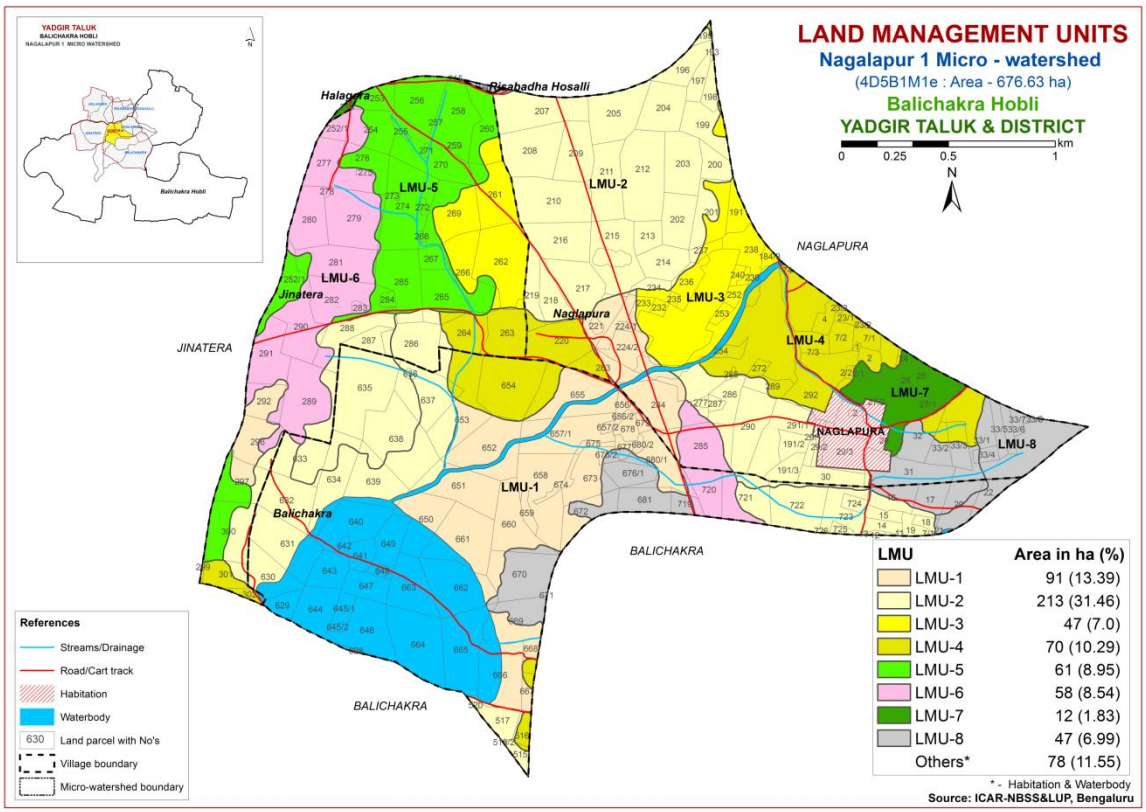


Fig. 7.30 Land Management Units Map- Nagalapur-1 Microwatershed

7.31 Proposed Crop Plan for Nagalapur-1 Microwatershed

After assessing the land suitability for the 29 crops, the Proposed Crop Plan has been prepared for the 8 identified LMUs by considering only highly (Class S1) and moderately (Class S2) suitable lands for each of the 29 crops. The resultant proposed crop plan is presented below in Table 7.31.

Table 7.31 Proposed Crop Plan for Nagalapur-1 Microwatershed

LMU	Soil Map Units	Survey Number	Field Crops/ Commercial crops	Horticulture Crops (Rainfed/Irrigated)	Suitable Interventions
1	179.KDPcA1 180.KDPhB2 (Very deep, sandy soils)	**Balichakra:**650,651,652,655,656/1,656/2,657/1,657/2,658,659,660,661,666,667,668,673,674,675,677,678,679,680/1,680/2 **Jinatera :** 292,296 **Naglapura :** 221,224/1,224/2,283,284	-	**Agri-Silvi-Pasture:** *Styloxanthes hamata*, Glyricidia, *Styloxanthes scabra*	Application of FYM, Bio-fertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices -
2	167.ANRcA1 168.ANRcB2 55.ANRiB2 42.YDRcB2 35.GWDiB2 (Moderately deep to deep, sodic soils)	**Balichakra:**11,12,13,14,15,18,19,515,517,518/2,520,630,631,632,633,634,635,636,637,638,639,721,722,723,724,725,726 **Jinatera :** 286,287,288 **Naglapura:**30,191/2,191/3,193,195,196,197,198,199,200,201,202,203,204,205,207,208,209,210,211,212,213,214,215,216,217,218,219,234,277,286,287,29/1,290, 291/1	-	**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
3	115.BGDmB2 114.PGPhB2 (Moderately deep to deep, sandy clay to clay soils)	**Jinatera :** 261,262,266,269 **Naglapura:**184/3,191,232,233,235,236,237,238,239,240,252,253,254	Sorghum, Maize, Sunflower, Groundnut, Red gram, Bajra, Bengal gram, safflower, linseed	**Fruit crops:** Musambi, Sapota, Pomegranate, Amla, Custard apple, Guava, Jackfruit, Lime **Vegetables:** Tomato, Onion**,** Bhendi, Chilli, Brinjal, Drumstick,, Coriander **Flowers:** Marigold, Chrysanthemum	Application of FYM, Bio-fertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices
4	57.MDGcB2 149.MDGhB2g1 58.MDGiB2 155.BLCcB2g1 36.SHThB2 (Moderately deep	**Balichakra :** 516,653,654 **Jinatera:** 263,264,299,301,302 **Naglapura:**1,2/2,4,7/1,7/2,7/3,74,220,23/1,23/2,23/3,272,288,289,292	Sunflower, Sorghum, Maize, Groundnut, Red gram, Bajra	**Fruit crops**: Musambi, Sapota, Pomegranate, Amla, Custard apple, Guava, Jackfruit, Lime **Vegetables**: Tomato, Onion, Bhendi, Chilli, Brinjal,	Application of FYM, Bio-fertilizers 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
	to deep, sandy clay loam soils)			Drumstick,, Coriander **Flowers**: Marigold, Chrysanthemum	
5	27.YLRbB2 30.YLRcC3 (Moderately shallow, red clay soils)	**Jinatera :** 252/1,253,254,255,256,257, 258,259,260,265,267,268,270,271,272,273, 274,276,284,285, 297,300	Maize, sorghum, Cotton, Bajra	**Fruit crops**: Amla, Custard apple **Vegetables**: Tomato, Onion, Bhendi, Chilli, Brinjal **Flowers**: Marigold, Chrysanthemum	Drip irrigation, mulching, suitable soil and water conservation practices (Crescent Bunding with Catch Pit etc)
6	11.SBRcB2 (Moderately shallow, loamy sand soils	**Balichakra :** 720 **Jinatera:**275,277,278,279,280,281,282, 283,289,290,291 **Naglapura :** 285	-	**Agri-Silvi-Pasture:** Hybrid Napier, *Styloxanthes hamata, Styloxanthes scabra*	Application of FYM, Bio-fertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices
7	20.JNKcB2 22.JNKiB2 (Moderately shallow sandy clay loam soils)	**Halagera :** 219 **Naglapura:** 2,2/1,24,25,26,27/1,27/2	Maize, sorghum Groundnut, Bajra	**Fruit crops**: Amla, Custard apple **Vegetables**: Tomato, Chilli, Brinjal, Bhendi, Onion **Flowers**: Marigold, Chrysanthemum	Application of FYM, Bio-fertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices
8	120.BDPhB2 5.BDLiB2 165.HTKcB2 113.HTKcC2g1 (Shallow to very shallow, sandy clay loam to sandy loam soils)	**Balichakra:**7/1,16,17,20,21,22,669,670,67 1, 672,676/1,676/2,681, 719 **Naglapura :**31,32,33/1,33/2,33/3,33/4, 33/5,33/6,33/7,33/8,33/9 **Risabadha Hosalli :** 94	-	**Agri-Silvi-Pasture:** *Styloxanthes hamata, Styloxanthes scabra*	Use of short duration varieties, sowing across the slope, drip irrigation and mulching 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 Nagalapur-1 Microwatershed

- The soil phases identified in the microwatershed belonged to the soil series of BDP 14 ha (2%), BDL 1 ha (<1%), HTK 32 ha (5%), YLR 61 ha (9%), SBR 58 ha (9%), JNK 12 ha (2%), BLC 5 ha (1%), SHT 3 ha (<1%), PGP 20 ha (3%), GWD 25 ha (4%), BGD 27 ha (4%), MDG 62 ha (9%), ANR 60 ha (9%), YDR 128 ha (19%) and KDP 90 ha (13%).
- As per land capability classification, entire area of the microwatershed falls under arable land category (Class II, III & IV). The major limitations identified in the arable lands were soil erosion and soil limitation.

- On the basis of soil reaction, 230 ha (34%) is neutral (pH 6.5 -7.3) and 368 ha (54%) area is slightly alkaline (pH 7.3-7.8).

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 particular soil pH.
2. Ameliorating the soils through the application of amendments (liming materials).

Liming materials:

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

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

Alkaline soils

Slight alkaline soils cover about 368 ha area.

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

Neutral soils

Neutral soils cover about 230 ha area in the microwatershed.

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

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

Soil Degradation

Soil erosion is one of the major factor affecting the soil health in the microwatershed. Out of total 677 ha area in the microwatershed, an area of about 101 ha is suffering from slight erosion, 442 ha from moderate and 56 ha from severe erosion. The areas which are in moderate to severe erosion need immediate soil and water conservation and, other land development and land husbandry practices for restoring soil health.

Dissemination of Information and Communication of Benefits

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

Inputs for Net Planning (Saturation Plan) and Interventions needed

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

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

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

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

erosion; such soils can be improved by sand mulching. The technology that is developed by the AICRP-Dryland Agriculture, Vijayapura, Karnataka can be adopted.

- **Gravelliness:** More gravel content is favorable for run-off harvesting but poor in soil moisture storage and nutrient availability. It is a significant parameter that decides the kind of crop to be raised.
- **Land Capability Classification:** The land capability map shows the areas suitable and not suitable for agriculture and the major constraints in each of the plot/survey number. Hence, one can decide what kind of enterprise is possible in each of these units. In general, erosion, wetness and soil are the major constraints in Nagalapur-1 microwatershed.
- **Organic Carbon:** The OC content (an index of available Nitrogen) is high (>0.75%) in an area of 24 ha (3%) and medium (0.5-0.75%) in an area of 575 ha (85%) of the microwatershed. The areas that are medium in OC needs to be further improved by applying farmyard manure and rotating crops with cereals and legumes or mixed cropping.
- **Promoting green manuring:** Growing of green manuring crops costs Rs. 1250/ha (green manuring seeds) and about Rs. 2000/ha towards cultivation that totals to Rs. 3250/- per ha. On the other hand, application of organic manure @ 10 tons/ha costs Rs. 5000/ha. The practice needs to be continued for 2-3 years or more. Nitrogen fertilizer needs to be supplemented by 25% in addition to the recommended level in an area where OC is medium (0.5-0.75%). For example, for rainfed maize, recommended level is 50 kg N per ha and an additional 12 kg /ha needs to be applied for all the crops grown in these plots.
- **Available Phosphorus**: Available Phosphorus is low (<23 kg/ha) in an area of 224 ha (33%), medium (23-57 kg/ha) in 340 ha (50%) and high (>57 kg/ha) in 35 ha (5%) area of the microwatershed. For all the crops, 25% additional P needs to be applied where available P is low and medium.
- **Available Potassium:** Available potassium is low (<145 kg/ha) in an area of about 296 ha (44%) and medium (145-337 kg/ha) in an area of 302 ha (45%) of the microwatershed. All the plots, where available potassium is low and medium, for all the crops, additional 25 % potassium may be applied.
- **Available Sulphur:** Available sulphur is a very critical nutrient for oilseed crops. An area of 19 ha (3%) is low (<10 ppm) and 580 ha (56%) is medium (10-20 ppm) in available sulphur content. Medium and low areas need to be applied with magnesium sulphate or gypsum or Factamphos (p) fertilizer (13% sulphur) for 2-3 years for the deficiency to be corrected.
- **Available Boron:** An area of 210 ha (31%) is low (<0.5 ppm) and 389 ha (57%) is medium (0.5-1.0 ppm) in available boron content. For these areas, application of sodium borate @ 10 kg/ha as soil application or 0.2 % borax as foliar spray is recommended.

- **Available Iron:** Entire cultivable area is sufficient (>4.5 ppm) in available iron content of the microwatershed. For the deficient areas, iron sulphate @ 25 kg/ha need to be applied for 2-3 years.
- **Available Zinc:** Entire cultivable area is deficient (<0.6 ppm) and in available zinc content of the microwatershed. Application of zinc sulphate @25 kg/ha is recommended for the deficient areas.
- **Soil Alkalinity:** The microwatershed has 368 ha (54%) area under slight alkaline. These areas need application of gypsum and wherever calcium is in excess, iron pyrites and element sulphur can be recommended. Management practices like treating repeatedly with good quality water to drain out the excess salts and provision of subsurface drainage and growing of salt tolerant crops like Casuarina, Acasia, Neem, Ber etc, are recommended.

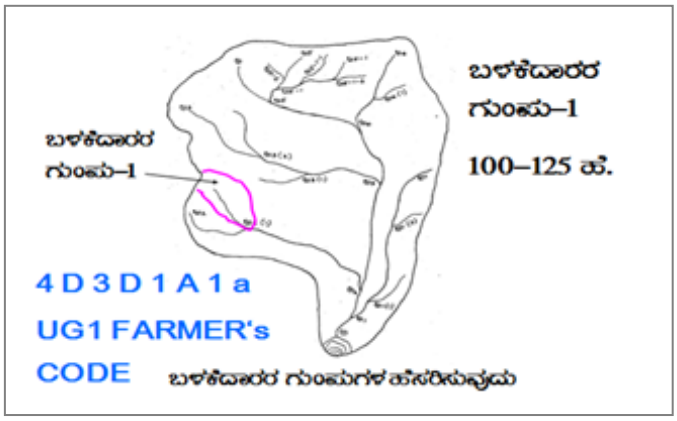
- **Land Suitability for various crops:** Areas that are highly, moderately and marginally suitable for growing various crops are indicated. Along with the suitability, various constraints that are limiting the productivity are also indicated. For example, in case of cotton, gravel content, rooting depth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

Chapter 9

SOIL AND WATER CONSERVATION TREATMENT PLAN

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

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



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

Steps for Survey and Preparation of Treatment Plan

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

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

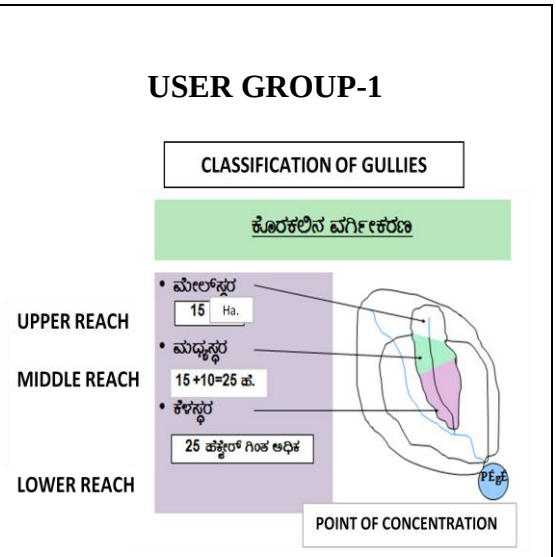
9.1 Treatment Plan

The treatment plan recommended for arable lands is briefly described below

9.1.1 Arable Land Treatment

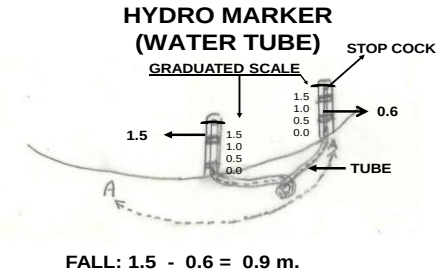
A. BUNDING

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



Measurement of Land Slope

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



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

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

Note: (i) The above intervals are maximum.

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

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

Section of the Bund

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

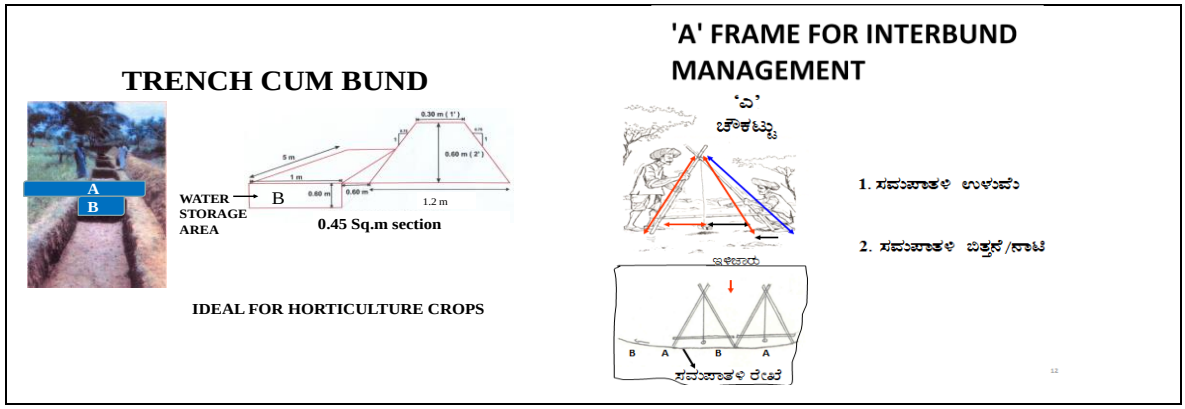
Recommended Bund Section

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

Formation of Trench cum Bund

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

Details of Borrow Pit dimensions are given below:



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

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

B. Water Ways

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

C. Farm Ponds

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

D. Diversion Channel

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

9.1.2 Non-Arable Land Treatment

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

9.1.3 Treatment of Natural Water Course/ Drainage Lines

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

9.2 Recommended Soil and Water Conservation Measures

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

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

A map (Fig. 9.1) showing soil and water conservation plan with different kinds of structures recommended has been prepared which shows the spatial distribution and extent of area. An area of about 100 ha (15%) needs Trench cum bunding, 482 ha (71%) needs Graded Bunding and 17 ha (2%) needs strengthening of existing bunds.

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

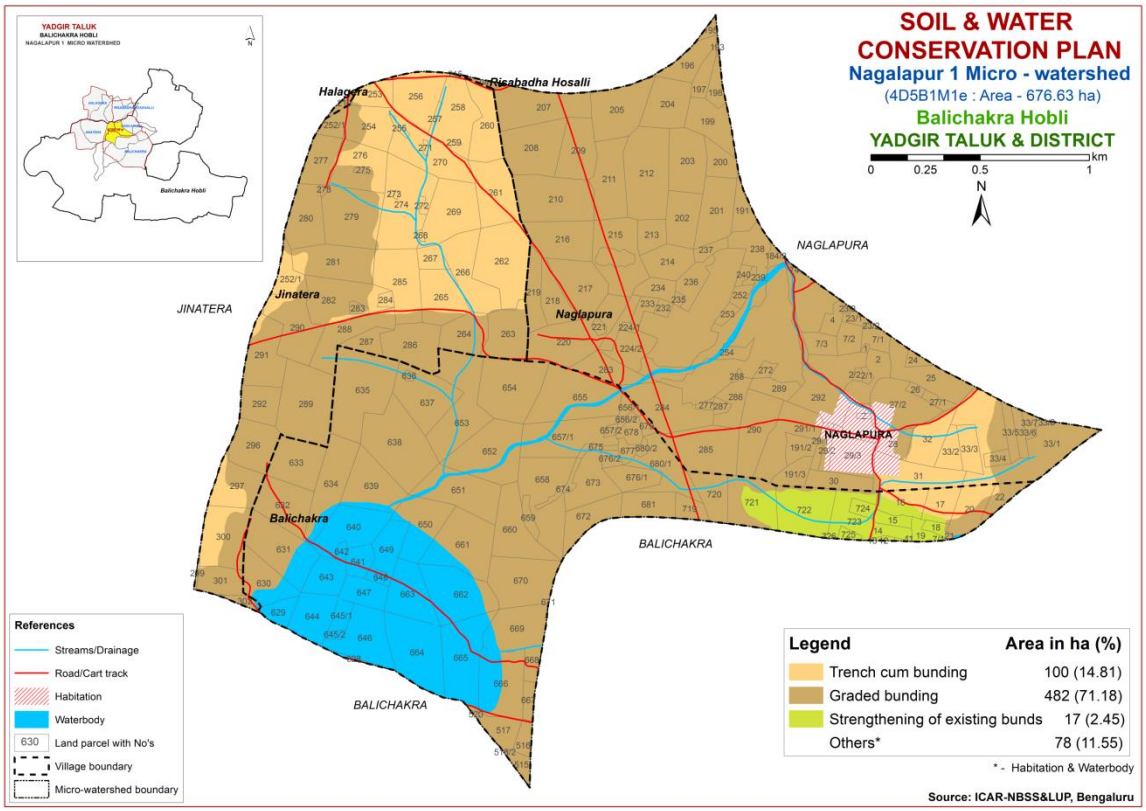


Fig. 9.1 Soil and Water Conservation Plan map of Nagalapur-1 Microwatershed

9.3 Greening of Microwatershed

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

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

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

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

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Appendix I

Nagalapur-1 (1M1e) Microwatershed

Soil Phase Information

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Jinatera	252/1	3.38	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Redgram+Groundnut+ Fallow land(Rg+Gn+Fl)	Not Available	IVes	Trench cum bunding
Jinatera	253	1.97	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Groundnut (Gn)	Not Available	IVes	Trench cum bunding
Jinatera	254	3.83	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Not Available (NA)	Not Available	IVes	Trench cum bunding
Jinatera	255	0.28	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Not Available (NA)	Not Available	IVes	Trench cum bunding
Jinatera	256	4.83	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Groundnut (Gn)	Not Available	IVes	Trench cum bunding
Jinatera	257	0.29	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Not Available (NA)	Not Available	IVes	Trench cum bunding
Jinatera	258	5.14	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Paddy (Pd)	Not Available	IVes	Trench cum bunding
Jinatera	259	0.15	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Not Available (NA)	Not Available	IVes	Trench cum bunding
Jinatera	260	4.2	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Not Available (NA)	Not Available	IVes	Trench cum bunding
Jinatera	261	5.18	PGPhB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Jinatera	262	7.7	PGPhB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Jinatera	263	4.38	MDGcB2	LMU-4	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Fallow land (Fl)	Not Available	IIes	Graded bunding
Jinatera	264	3.52	MDGcB2	LMU-4	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Fallow land (Fl)	Not Available	IIes	Graded bunding
Jinatera	265	4.52	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Paddy (Pd)	Not Available	IVes	Trench cum bunding
Jinatera	266	5.18	PGPhB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Fallow land (Fl)	Not Available	IIes	Trench cum bunding
Jinatera	267	1.29	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Not Available (NA)	Not Available	IVes	Trench cum bunding
Jinatera	268	0.14	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Not Available (NA)	Not Available	IVes	Trench cum bunding
Jinatera	269	5.98	PGPhB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Jinatera	270	5.62	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Groundnut+Paddy (Gn+Pd)	Not Available	IVes	Trench cum bunding
Jinatera	271	0.15	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Not Available (NA)	Not Available	IVes	Trench cum bunding
Jinatera	272	0.24	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Not Available (NA)	Not Available	IVes	Trench cum bunding
Jinatera	273	0.13	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Not Available (NA)	Not Available	IVes	Trench cum bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Jinatera	274	7.92	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Paddy (Pd)	Not Available	IVes	Trench cum bunding
Jinatera	275	0.23	SBRcB2	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Jinatera	276	4.63	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Groundnut+Paddy (Gn+Pd)	Not Available	IVes	Trench cum bunding
Jinatera	277	3.08	SBRcB2	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Jinatera	278	0.15	SBRcB2	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Jinatera	279	6.86	SBRcB2	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Jinatera	280	4.31	SBRcB2	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Jinatera	281	5.46	SBRcB2	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Jinatera	282	5.62	SBRcB2	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Fallow land (Fl)	Not Available	IVes	Graded bunding
Jinatera	283	0.41	SBRcB2	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Jinatera	284	0.46	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Paddy (Pd)	Not Available	IVes	Trench cum bunding
Jinatera	285	5.71	YLRcC3	LMU-5	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Gently sloping (3-5%)	Severe	Not Available (NA)	Not Available	IVes	Trench cum bunding
Jinatera	286	4.86	ANRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Jinatera	287	1.57	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Jinatera	288	4.32	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Jinatera	289	8.11	SBRcB2	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Jinatera	290	5.47	SBRcB2	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Fallow land (Fl)	Not Available	IVes	Graded bunding
Jinatera	291	4.92	SBRcB2	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Fallow land (Fl)	Not Available	IVes	Graded bunding
Jinatera	292	2.92	KDPhB2	LMU-1	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IVes	Graded bunding
Jinatera	296	4.27	KDPhB2	LMU-1	Very deep (>150 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Fallow land (Fl)	Not Available	IVes	Graded bunding
Jinatera	297	4.02	YLRbB2	LMU-5	Moderately shallow (50-75 cm)	Loamy sand	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Fallow land (Fl)	Not Available	IIes	Trench cum bunding
Jinatera	299	0.17	SHThB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Jinatera	300	5.62	YLRbB2	LMU-5	Moderately shallow (50-75 cm)	Loamy sand	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Trench cum bunding
Jinatera	301	2.54	SHThB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding

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Jinatera	302	0.65	SHThB2	LMU-4	Moderately deep (75-100 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Balichakra	7/1	0.02	HTKcC2g1	LMU-8	Shallow (25-50 cm)	Sandy loam	Gravelly (15-35%)	Very low (<50 mm/m)	Gently sloping (3-5%)	Moderate	Paddy (Pd)	Not Available	IIIes	Graded bunding
Balichakra	11	0.12	ANRcA1	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	12	0.18	ANRcA1	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	13	0.01	ANRcA1	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	14	0.98	ANRcA1	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	15	0.91	ANRcA1	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	16	2.55	BDPhB2	LMU-8	Very shallow (<25 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Trench cum bunding
Balichakra	17	2.23	BDPhB2	LMU-8	Very shallow (<25 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Trench cum bunding
Balichakra	18	0.58	ANRcA1	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	19	0.91	ANRcA1	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	20	3.18	BDPhB2	LMU-8	Very shallow (<25 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Trench cum bunding
Balichakra	21	0.12	HTKcC2g1	LMU-8	Shallow (25-50 cm)	Sandy loam	Gravelly (15-35%)	Very low (<50 mm/m)	Gently sloping (3-5%)	Moderate	Paddy (Pd)	Not Available	IIIes	Graded bunding
Balichakra	22	1.55	HTKcC2g1	LMU-8	Shallow (25-50 cm)	Sandy loam	Gravelly (15-35%)	Very low (<50 mm/m)	Gently sloping (3-5%)	Moderate	Rockout crops (Rc)	Not Available	IIIes	Graded bunding
Balichakra	515	0.93	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Balichakra	516	1.05	MDGcB2	LMU-4	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	No Crop (Nc)	Not Available	IIes	Graded bunding
Balichakra	517	2.03	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Balichakra	518/2	0.03	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Balichakra	520	0.09	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Balichakra	628	0.24	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody	Not Available	Others	Others
Balichakra	629	1.48	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody	Not Available	Others	Others
Balichakra	630	3.9	ANRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Balichakra	631	6.33	ANRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Balichakra	632	4.91	ANRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	No Crop (Nc)	Not Available	IVes	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Balichakra	633	4.64	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Greengram (Gg)	Not Available	IVes	Graded bunding
Balichakra	634	5.79	ANRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Balichakra	635	9.21	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Greengram (Gg)	Not Available	IVes	Graded bunding
Balichakra	636	0.19	ANRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Greengram (Gg)	Not Available	IVes	Graded bunding
Balichakra	637	5.65	ANRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Greengram (Gg)	Not Available	IVes	Graded bunding
Balichakra	638	8.84	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Greengram+No crop (Gg+Nc)	Not Available	IVes	Graded bunding
Balichakra	639	5.34	ANRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Balichakra	640	5.13	Waterbody	Others	Others	Others	Others	Others	Others	Others	Scrub land (Sl)	Not Available	Others	Others
Balichakra	641	1.62	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody	Not Available	Others	Others
Balichakra	642	0.37	Waterbody	Others	Others	Others	Others	Others	Others	Others	Scrub land (Sl)	Not Available	Others	Others
Balichakra	643	2.7	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody	Not Available	Others	Others
Balichakra	644	3.77	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody	Not Available	Others	Others
Balichakra	645/1	1.06	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody	Not Available	Others	Others
Balichakra	645/2	0.31	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody	Not Available	Others	Others
Balichakra	646	5.35	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody	Not Available	Others	Others
Balichakra	647	2.49	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody	Not Available	Others	Others
Balichakra	648	0.23	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody	Not Available	Others	Others
Balichakra	649	3.15	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody	Not Available	Others	Others
Balichakra	650	4.95	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Scrub land (Sl)	Not Available	IVs	Graded bunding
Balichakra	651	6.01	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Scrub land (Sl)	Not Available	IVs	Graded bunding
Balichakra	652	7.18	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Scrub land (Sl)	Not Available	IVs	Graded bunding
Balichakra	653	7.97	MDGcB2	LMU-4	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Greengram+Scrub land (Gg+Sl)	Not Available	IIes	Graded bunding
Balichakra	654	7.35	MDGcB2	LMU-4	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Greengram (Gg)	Not Available	IIes	Graded bunding
Balichakra	655	8.11	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Greengram (Gg)	Not Available	IVs	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Balichakra	656/1	0.73	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	656/2	0.29	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	657/1	6.28	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Scrub land (Sl)	Not Available	IVs	Graded bunding
Balichakra	657/2	0.28	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	658	7.28	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Scrub land (Sl)	Not Available	IVs	Graded bunding
Balichakra	659	0.78	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Scrub land (Sl)	Not Available	IVs	Graded bunding
Balichakra	660	5.25	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Groundnut (Gn)	Not Available	IVs	Graded bunding
Balichakra	661	7.05	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Scrub land (Sl)	Not Available	IVs	Graded bunding
Balichakra	662	6.51	Waterbody	Others	Others	Others	Others	Others	Others	Others	Scrub land (Sl)	Not Available	Others	Others
Balichakra	663	4.63	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody	Not Available	Others	Others
Balichakra	664	7.25	Waterbody	Others	Others	Others	Others	Others	Others	Others	Waterbody	Not Available	Others	Others
Balichakra	665	6.94	Waterbody	Others	Others	Others	Others	Others	Others	Others	No Crop (Nc)	Not Available	Others	Others
Balichakra	666	6.25	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	No Crop (Nc)	Not Available	IVs	Graded bunding
Balichakra	667	0.91	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	No Crop (Nc)	Not Available	IVs	Graded bunding
Balichakra	668	1.12	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	No Crop (Nc)	Not Available	IVs	Graded bunding
Balichakra	669	5.15	HTKcB2	LMU-8	Shallow (25-50 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIIes	Graded bunding
Balichakra	670	6.25	HTKcB2	LMU-8	Shallow (25-50 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIIes	Graded bunding
Balichakra	671	0	HTKcB2	LMU-8	Shallow (25-50 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Balichakra	672	3.35	HTKcB2	LMU-8	Shallow (25-50 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Greengram+Redgram (Gg+Rg)	Not Available	IIIes	Graded bunding
Balichakra	673	3.86	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IVs	Graded bunding
Balichakra	674	0.78	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Not Available (NA)	Not Available	IVs	Graded bunding
Balichakra	675	0.5	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	676/1	2.23	HTKcB2	LMU-8	Shallow (25-50 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Balichakra	676/2	0.67	HTKcB2	LMU-8	Shallow (25-50 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIIes	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Balichakra	677	0.73	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	678	1	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	679	0.5	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	680/1	4.36	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	No Crop (Nc)	Not Available	IVs	Graded bunding
Balichakra	680/2	0.29	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	681	2.85	HTKcB2	LMU-8	Shallow (25-50 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Greengram (Gg)	Not Available	IIIes	Graded bunding
Balichakra	719	1.39	HTKcB2	LMU-8	Shallow (25-50 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Greengram+Redgram (Gg+Rg)	Not Available	IIIes	Graded bunding
Balichakra	720	2.86	SBRcB2	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Balichakra	721	4.97	ANRcA1	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IVs	Graded bunding
Balichakra	722	5.47	ANRcA1	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram+Greengram (Rg+Gg)	Not Available	IVs	Graded bunding
Balichakra	723	3.18	ANRcA1	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	724	0.77	ANRcA1	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	725	0.43	ANRcA1	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Balichakra	726	0.07	ANRcA1	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Paddy (Pd)	Not Available	IVs	Graded bunding
Halagera	215	0	JNKcB2	LMU-7	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Halagera	219	0.43	JNKcB2	LMU-7	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Naglapura	1	0.11	MDGiB2	LMU-4	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	2	2.63	JNKiB2	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	2/1	0.28	JNKiB2	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	2/2	0.25	MDGiB2	LMU-4	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	4	1.09	MDGiB2	LMU-4	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	7/1	1.17	MDGiB2	LMU-4	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	7/2	1.51	MDGiB2	LMU-4	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	7/3	1.43	MDGiB2	LMU-4	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Naglapura	23/1	0.56	MDGiB2	LMU-4	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	23/2	0.13	MDGiB2	LMU-4	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	23/3	0.12	MDGiB2	LMU-4	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	24	0.57	JNKiB2	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	25	4.41	JNKiB2	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	26	0.35	JNKiB2	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	27/1	0.65	JNKiB2	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	27/2	5.46	JNKiB2	LMU-7	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	28	1.78	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Naglapura	29/1	0.7	GWDiB2	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Habitation	Not Available	IVes	Graded bunding
Naglapura	29/2	0.82	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Naglapura	29/3	3.56	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Naglapura	30	2.23	GWDiB2	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Sunflower (Sf)	Not Available	IVes	Graded bunding
Naglapura	31	4.98	BDPhB2	LMU-8	Very shallow (<25 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Sunflower (Sf)	Not Available	IVes	Trench cum bunding
Naglapura	32	3.35	BDPhB2	LMU-8	Very shallow (<25 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Sunflower (Sf)	Not Available	IVes	Trench cum bunding
Naglapura	33/1	11.87	HTKcC2g1	LMU-8	Shallow (25-50 cm)	Sandy loam	Gravelly (15-35%)	Very low (<50 mm/m)	Gently sloping (3-5%)	Moderate	Cotton+Paddy+Forest (Ct+Pd+Fo)	Not Available	IIIes	Graded bunding
Naglapura	33/2	1.65	BDPhB2	LMU-8	Very shallow (<25 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Sunflower (Sf)	Not Available	IVes	Trench cum bunding
Naglapura	33/3	1.93	BDPhB2	LMU-8	Very shallow (<25 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Sunflower (Sf)	Not Available	IVes	Trench cum bunding
Naglapura	33/4	0.77	HTKcC2g1	LMU-8	Shallow (25-50 cm)	Sandy loam	Gravelly (15-35%)	Very low (<50 mm/m)	Gently sloping (3-5%)	Moderate	Sunflower (Sf)	Not Available	IIIes	Graded bunding
Naglapura	33/5	1.17	HTKcC2g1	LMU-8	Shallow (25-50 cm)	Sandy loam	Gravelly (15-35%)	Very low (<50 mm/m)	Gently sloping (3-5%)	Moderate	Forest (Fo)	Not Available	IIIes	Graded bunding
Naglapura	33/6	0.97	HTKcC2g1	LMU-8	Shallow (25-50 cm)	Sandy loam	Gravelly (15-35%)	Very low (<50 mm/m)	Gently sloping (3-5%)	Moderate	Forest (Fo)	Not Available	IIIes	Graded bunding
Naglapura	33/7	0.63	HTKcC2g1	LMU-8	Shallow (25-50 cm)	Sandy loam	Gravelly (15-35%)	Very low (<50 mm/m)	Gently sloping (3-5%)	Moderate	Forest (Fo)	Not Available	IIIes	Graded bunding
Naglapura	33/8	0.19	HTKcC2g1	LMU-8	Shallow (25-50 cm)	Sandy loam	Gravelly (15-35%)	Very low (<50 mm/m)	Gently sloping (3-5%)	Moderate	Forest (Fo)	Not Available	IIIes	Graded bunding
Naglapura	33/9	0.01	HTKcC2g1	LMU-8	Shallow (25-50 cm)	Sandy loam	Gravelly (15-35%)	Very low (<50 mm/m)	Gently sloping (3-5%)	Moderate	Forest (Fo)	Not Available	IIIes	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Naglapura	74	0.11	MDGiB2	LMU-4	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Naglapura	184/3	0.55	BGDmB2	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
Naglapura	191	1.69	BGDmB2	LMU-3	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Naglapura	191/2	1.46	GWDiB2	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Sunflower (Sf)	Not Available	IVes	Graded bunding
Naglapura	191/3	1.64	GWDiB2	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Sunflower (Sf)	Not Available	IVes	Graded bunding
Naglapura	193	0.1	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Sunflower (Sf)	Not Available	IVes	Graded bunding
Naglapura	195	0.44	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Naglapura	196	2.54	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Naglapura	197	1.38	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Naglapura	198	1.24	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Naglapura	199	3.6	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Naglapura	200	1.91	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Naglapura	201	4.58	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Naglapura	202	3.64	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IVes	Graded bunding
Naglapura	203	4.79	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Naglapura	204	4.29	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Naglapura	205	5.66	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Naglapura	207	6.48	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut+Cotton (Gn+Ct)	Not Available	IVes	Graded bunding
Naglapura	208	6.05	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Sunflower+Cotton (Sf+Ct)	Not Available	IVes	Graded bunding
Naglapura	209	4.33	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Naglapura	210	7.18	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Sunflower+Cotton (Sf+Ct)	Not Available	IVes	Graded bunding
Naglapura	211	5.2	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IVes	Graded bunding
Naglapura	212	8.13	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut+Cotton (Gn+Ct)	Not Available	IVes	Graded bunding
Naglapura	213	1.82	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Naglapura	214	3.02	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Naglapura	215	5.6	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Naglapura	216	4.98	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Naglapura	217	4.78	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Naglapura	218	2.8	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Naglapura	219	2.57	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Naglapura	220	7.24	MDGcB2	LMU-4	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Scrub land (Rg+Sl)	Not Available	IIes	Graded bunding
Naglapura	221	0.37	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Not Available (NA)	Not Available	IVs	Graded bunding
Naglapura	224/1	0.32	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Not Available (NA)	Not Available	IVs	Graded bunding
Naglapura	224/2	2.68	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Scrub land (Sl)	Not Available	IVs	Graded bunding
Naglapura	232	0.49	BGDmB2	LMU-3	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIes	Graded bunding
Naglapura	233	0.84	BGDmB2	LMU-3	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIes	Graded bunding
Naglapura	234	1.56	YDRcB2	LMU-2	Deep (100-150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IVes	Graded bunding
Naglapura	235	0.24	BGDmB2	LMU-3	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIes	Graded bunding
Naglapura	236	2.07	BGDmB2	LMU-3	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIes	Graded bunding
Naglapura	237	0.89	BGDmB2	LMU-3	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Naglapura	238	2.83	BGDmB2	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
Naglapura	239	0.31	BGDmB2	LMU-3	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	240	0.43	BGDmB2	LMU-3	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	252	0.72	BGDmB2	LMU-3	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	253	0.56	BGDmB2	LMU-3	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	254	5.21	BGDmB2	LMU-3	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	272	0.53	MDGiB2	LMU-4	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Naglapura	277	0.32	GWDiB2	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Naglapura	283	2.89	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Cotton (Ct)	Not Available	IVs	Graded bunding
Naglapura	284	5.77	KDPcA1	LMU-1	Very deep (>150 cm)	Sandy loam	Non gravelly (<15%)	Low (51-100 mm/m)	Nearly level (0-1%)	Slight	Scrub land (Sl)	Not Available	IVs	Graded bunding
Naglapura	285	6.13	SBRcB2	LMU-6	Moderately shallow (50-75 cm)	Sandy loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IVes	Graded bunding
Naglapura	286	2.31	GWDiB2	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Naglapura	287	0.46	GWDiB2	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Naglapura	288	0.17	MDGiB2	LMU-4	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Naglapura	289	1.57	MDGiB2	LMU-4	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Cotton (Ct)	Not Available	IIes	Graded bunding
Naglapura	290	5.14	GWDiB2	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IVes	Graded bunding
Naglapura	291/1	4.97	GWDiB2	LMU-2	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Sunflower+Paddy(Sf+Pd)	Not Available	IVes	Graded bunding
Naglapura	292	4.07	MDGiB2	LMU-4	Deep (100-150 cm)	Sandy clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Risabadha Hosalli	94	0.36	BDLiB2	LMU-8	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIIes	Graded bunding

Appendix II

Nagalapur-1 (1M1e) Microwatershed

Soil Fertility Information

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Jinatera	252/1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	253	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	254	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	255	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	256	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	257	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	258	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	259	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	260	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	261	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	262	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	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)
Jinatera	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	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)
Jinatera	266	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	267	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	268	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	269	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	270	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	271	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	272	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	273	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Jinatera	274	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	275	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	276	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	277	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	278	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	279	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	280	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	281	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	282	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	283	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	284	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	285	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	286	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	287	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	288	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	289	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	290	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	291	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	292	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	296	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	297	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	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)	Deficient (< 0.6 ppm)
Jinatera	299	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	300	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Jinatera	301	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Jinatera	302	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 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)
Balichakra	7/1	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	11	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	12	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	13	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	14	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	15	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	16	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	17	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	18	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	19	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	20	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	21	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	22	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	515	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)
Balichakra	516	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)
Balichakra	517	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)
Balichakra	518/2	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)
Balichakra	520	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)
Balichakra	628	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	629	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	630	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 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)
Balichakra	631	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 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)
Balichakra	632	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	633	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	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
Balichakra	634	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	635	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	636	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	637	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	638	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	639	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	640	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	641	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	642	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	643	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	644	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	645/1	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	645/2	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	646	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	647	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	648	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	649	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	650	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 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)
Balichakra	651	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	652	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	653	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	654	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)
Balichakra	655	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)
Balichakra	656/1	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)
Balichakra	656/2	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)
Balichakra	657/1	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)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Balichakra	657/2	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)
Balichakra	658	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	659	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)
Balichakra	660	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	661	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 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)
Balichakra	662	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	663	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	664	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	665	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	666	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)
Balichakra	667	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)
Balichakra	668	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	669	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	670	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	671	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Balichakra	672	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)
Balichakra	673	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)
Balichakra	674	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)
Balichakra	675	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)
Balichakra	676/1	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)
Balichakra	676/2	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)
Balichakra	677	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)
Balichakra	678	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)
Balichakra	679	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)
Balichakra	680/1	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)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Balichakra	680/2	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)
Balichakra	681	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)
Balichakra	719	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)
Balichakra	720	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)
Balichakra	721	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)
Balichakra	722	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)
Balichakra	723	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)
Balichakra	724	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)
Balichakra	725	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)
Balichakra	726	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)
Halagera	215	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Halagera	219	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	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)
Naglapura	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)
Naglapura	2/1	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)
Naglapura	2/2	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)
Naglapura	4	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	7/1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	7/2	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)
Naglapura	7/3	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)
Naglapura	23/1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	23/2	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	23/3	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	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)
Naglapura	24	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Naglapura	25	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)
Naglapura	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)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	27/1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Naglapura	27/2	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)
Naglapura	28	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Naglapura	29/1	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)
Naglapura	29/2	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Naglapura	29/3	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Naglapura	30	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)
Naglapura	31	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	32	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	33/1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	33/2	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)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	33/3	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 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)
Naglapura	33/4	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	33/5	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	33/6	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	33/7	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	33/8	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	33/9	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Low (< 23 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	74	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	184/3	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	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)
Naglapura	191	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	191/2	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)
Naglapura	191/3	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)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Naglapura	193	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	195	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	196	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	197	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	198	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	199	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	200	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	201	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	202	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	203	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	204	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	205	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	207	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	208	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	209	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	210	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	211	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	212	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	213	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	215	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	High (> 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	216	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	High (> 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	217	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	High (> 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	218	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	High (> 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Naglapura	219	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	High (> 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	220	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	High (> 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	221	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	High (> 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	224/1	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)
Naglapura	224/2	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)
Naglapura	232	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)
Naglapura	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)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	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)
Naglapura	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)
Naglapura	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)	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)
Naglapura	237	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	238	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Naglapura	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)
Naglapura	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)
Naglapura	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)
Naglapura	253	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)
Naglapura	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)
Naglapura	272	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)
Naglapura	277	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)
Naglapura	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)
Naglapura	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)
Naglapura	285	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)
Naglapura	286	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)
Naglapura	287	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)

Village	Survey Number	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Naglapura	288	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)
Naglapura	289	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)
Naglapura	290	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)
Naglapura	291/1	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)
Naglapura	292	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)
Risabadha Hosalli	94	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	Medium (0.5 – 0.75 %)	Medium (23 – 57 kg/ha)	Low (<145 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Appendix III

Nagalapur-1 (1M1e) 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
Jinatera	252/1	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	253	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	254	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	255	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	256	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	257	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	258	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	259	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	260	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	261	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S1	S2r	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Jinatera	262	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S1	S2r	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Jinatera	263	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
Jinatera	264	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
Jinatera	265	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	266	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S1	S2r	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Jinatera	267	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	268	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	269	S3r	S1	S2r	S1	S2r	S2r	S3r	S2r	S3t	S2r	S2r	S1	S2r	S1	S2r	S3r	S2r	S2t	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Jinatera	270	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	271	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	272	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	273	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	274	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	275	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
Jinatera	276	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	277	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
Jinatera	278	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
Jinatera	279	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
Jinatera	280	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
Jinatera	281	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
Jinatera	282	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
Jinatera	283	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
Jinatera	284	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	285	N1r	S2rl	S3r	S2rl	S3r	S3l	N1r	S3r	S3t	S3r	S3r	S2rl	S3r	S2rl	S3r	S3r	S3r	S3t	S2rl	S2rl	S2rl	S2rl	S2rl	S3r	S2rl	S2rl	S2rl	S3r	S3r
Jinatera	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
Jinatera	287	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Jinatera	288	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Jinatera	289	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
Jinatera	290	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
Jinatera	291	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
Jinatera	292	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Jinatera	296	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Jinatera	297	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Jinatera	299	S3r	S1	S2r	S2t	S2r	S3t	S3r	S2r	S3t	S2rt	S2rt	S1	S2r	S1	S3n	S3r	S2r	S1	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Jinatera	300	N1r	S2rt	S3r	S2r	S3r	S2r	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	S3r	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Jinatera	301	S3r	S1	S2r	S2t	S2r	S3t	S3r	S2r	S3t	S2rt	S2rt	S1	S2r	S1	S3n	S3r	S2r	S1	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Jinatera	302	S3r	S1	S2r	S2t	S2r	S3t	S3r	S2r	S3t	S2rt	S2rt	S1	S2r	S1	S3n	S3r	S2r	S1	S1	S1	S1	S1	S1	S2r	S1	S1	S1	S2r	S2r
Balichakra	7/1	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Balichakra	11	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
Balichakra	12	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
Balichakra	13	N1n	S3n	N1n	S3n	N1n	S3n	N1n	N1n	S3n	N1n	S3n	N1n	N1n	N1n	N1tn	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n

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
Balichakra	14	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
Balichakra	15	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
Balichakra	16	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r
Balichakra	17	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r
Balichakra	18	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
Balichakra	19	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
Balichakra	20	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r
Balichakra	21	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Balichakra	22	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Balichakra	515	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Balichakra	516	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
Balichakra	517	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Balichakra	518/2	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Balichakra	520	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Balichakra	628	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	629	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	630	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
Balichakra	631	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
Balichakra	632	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
Balichakra	633	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Balichakra	634	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
Balichakra	635	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Balichakra	636	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
Balichakra	637	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
Balichakra	638	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Balichakra	639	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
Balichakra	640	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	641	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	642	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	643	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	644	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	645/1	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
Balichakra	645/2	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
Balichakra	646	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	647	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	648	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	649	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	650	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	651	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	652	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	653	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
Balichakra	654	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
Balichakra	655	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	656/1	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	656/2	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	657/1	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	657/2	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	658	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	659	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	660	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	661	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t

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
Balichakra	662	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	663	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	664	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	665	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Balichakra	666	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	667	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	668	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	669	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Balichakra	670	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Balichakra	671	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Balichakra	672	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Balichakra	673	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	674	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	675	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	676/1	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Balichakra	676/2	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Balichakra	677	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	678	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	679	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	680/1	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	680/2	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Balichakra	681	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Balichakra	719	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Balichakra	720	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
Balichakra	721	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
Balichakra	722	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
Balichakra	723	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
Balichakra	724	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
Balichakra	725	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
Balichakra	726	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
Halagera	215	N1r	S2r	S3r	S2rt	S3r	S3t	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	N1n	S3r	S3r	S2r	S2r	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Halagera	219	N1r	S2r	S3r	S2rt	S3r	S3t	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	N1n	S3r	S3r	S2r	S2r	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Naglapura	1	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
Naglapura	2	N1r	S2r	S3r	S2rt	S3r	S3t	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	N1n	S3r	S3r	S2r	S2r	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Naglapura	2/1	N1r	S2r	S3r	S2rt	S3r	S3t	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	N1n	S3r	S3r	S2r	S2r	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Naglapura	2/2	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
Naglapura	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
Naglapura	7/1	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
Naglapura	7/2	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
Naglapura	7/3	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
Naglapura	23/1	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
Naglapura	23/2	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
Naglapura	23/3	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
Naglapura	24	N1r	S2r	S3r	S2rt	S3r	S3t	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	N1n	S3r	S3r	S2r	S2r	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Naglapura	25	N1r	S2r	S3r	S2rt	S3r	S3t	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	N1n	S3r	S3r	S2r	S2r	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Naglapura	26	N1r	S2r	S3r	S2rt	S3r	S3t	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	N1n	S3r	S3r	S2r	S2r	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Naglapura	27/1	N1r	S2r	S3r	S2rt	S3r	S3t	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	N1n	S3r	S3r	S2r	S2r	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Naglapura	27/2	N1r	S2r	S3r	S2rt	S3r	S3t	N1r	S3r	S3t	S3r	S3r	S2r	S3r	S2r	N1n	S3r	S3r	S2r	S2r	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Naglapura	28	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Naglapura	29/1	N1n	S2nz	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
Naglapura	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	Others
Naglapura	29/3	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Naglapura	30	N1n	S2nz	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
Naglapura	31	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r
Naglapura	32	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r
Naglapura	33/1	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Naglapura	33/2	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r
Naglapura	33/3	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r	N1r
Naglapura	33/4	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Naglapura	33/5	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Naglapura	33/6	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Naglapura	33/7	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Naglapura	33/8	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Naglapura	33/9	N1r	S3rt	N1r	S3rt	N1r	N1t	N1r	N1r	N1t	N1r	N1r	S3rt	N1r	S3rt	N1r	N1r	N1r	S3r	S3r	S3r	S3r	S3r	S3r	N1r	S3rt	S3rt	S3r	N1r	N1r
Naglapura	74	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
Naglapura	184/3	S3t	S2t	S3t	S1	S3t	S1	S2rt	S1	S1	S1	S2t	S2t	S3t	S1	N1t	S2rt	S1	S3t	S3t	S2t	S3t	S2t	S2t	S2t	S2t	S3t	S2t	S2t	S3t
Naglapura	191	S3t	S2t	S3t	S1	S3t	S1	S2rt	S1	S1	S1	S2t	S2t	S3t	S1	N1t	S2rt	S1	S3t	S3t	S2t	S3t	S2t	S2t	S2t	S2t	S3t	S2t	S2t	S3t
Naglapura	191/2	N1n	S2nz	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
Naglapura	191/3	N1n	S2nz	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
Naglapura	193	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	195	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	196	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	197	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	198	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	199	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	200	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	201	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	202	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	203	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Naglapura	204	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	205	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	207	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	208	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	209	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	210	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	211	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	212	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	213	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	214	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	215	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	216	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	217	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	218	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	219	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	220	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
Naglapura	221	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Naglapura	224/1	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Naglapura	224/2	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Naglapura	232	S3t	S2t	S3t	S1	S3t	S1	S2rt	S1	S1	S1	S2t	S2t	S3t	S1	N1t	S2rt	S1	S3t	S3t	S2t	S3t	S2t	S2t	S2t	S2t	S3t	S2t	S2t	S3t
Naglapura	233	S3t	S2t	S3t	S1	S3t	S1	S2rt	S1	S1	S1	S2t	S2t	S3t	S1	N1t	S2rt	S1	S3t	S3t	S2t	S3t	S2t	S2t	S2t	S2t	S3t	S2t	S2t	S3t
Naglapura	234	N1n	S3nt	N1n	S3nt	N1n	N1t	N1n	N1n	N1t	N1n	S3n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3n	N1n	N1n	N1n	N1n
Naglapura	235	S3t	S2t	S3t	S1	S3t	S1	S2rt	S1	S1	S1	S2t	S2t	S3t	S1	N1t	S2rt	S1	S3t	S3t	S2t	S3t	S2t	S2t	S2t	S2t	S3t	S2t	S2t	S3t
Naglapura	236	S3t	S2t	S3t	S1	S3t	S1	S2rt	S1	S1	S1	S2t	S2t	S3t	S1	N1t	S2rt	S1	S3t	S3t	S2t	S3t	S2t	S2t	S2t	S2t	S3t	S2t	S2t	S3t
Naglapura	237	S3t	S2t	S3t	S1	S3t	S1	S2rt	S1	S1	S1	S2t	S2t	S3t	S1	N1t	S2rt	S1	S3t	S3t	S2t	S3t	S2t	S2t	S2t	S2t	S3t	S2t	S2t	S3t
Naglapura	238	S3t	S2t	S3t	S1	S3t	S1	S2rt	S1	S1	S1	S2t	S2t	S3t	S1	N1t	S2rt	S1	S3t	S3t	S2t	S3t	S2t	S2t	S2t	S2t	S3t	S2t	S2t	S3t

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
Naglapura	239	S3t	S2t	S3t	S1	S3t	S1	S2rt	S1	S1	S1	S2t	S2t	S3t	S1	N1t	S2rt	S1	S3t	S3t	S2t	S3t	S2t	S2t	S2t	S2t	S3t	S2t	S2t	S3t
Naglapura	240	S3t	S2t	S3t	S1	S3t	S1	S2rt	S1	S1	S1	S2t	S2t	S3t	S1	N1t	S2rt	S1	S3t	S3t	S2t	S3t	S2t	S2t	S2t	S2t	S3t	S2t	S2t	S3t
Naglapura	252	S3t	S2t	S3t	S1	S3t	S1	S2rt	S1	S1	S1	S2t	S2t	S3t	S1	N1t	S2rt	S1	S3t	S3t	S2t	S3t	S2t	S2t	S2t	S2t	S3t	S2t	S2t	S3t
Naglapura	253	S3t	S2t	S3t	S1	S3t	S1	S2rt	S1	S1	S1	S2t	S2t	S3t	S1	N1t	S2rt	S1	S3t	S3t	S2t	S3t	S2t	S2t	S2t	S2t	S3t	S2t	S2t	S3t
Naglapura	254	S3t	S2t	S3t	S1	S3t	S1	S2rt	S1	S1	S1	S2t	S2t	S3t	S1	N1t	S2rt	S1	S3t	S3t	S2t	S3t	S2t	S2t	S2t	S2t	S3t	S2t	S2t	S3t
Naglapura	272	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
Naglapura	277	N1n	S2nz	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
Naglapura	283	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Naglapura	284	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t	N1t	N1t	S3t	N1t	N1t	N1t	N1t
Naglapura	285	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
Naglapura	286	N1n	S2nz	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
Naglapura	287	N1n	S2nz	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
Naglapura	288	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
Naglapura	289	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
Naglapura	290	N1n	S2nz	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
Naglapura	291/1	N1n	S2nz	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
Naglapura	292	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
Risabadha Hosalli	94	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

PART-B

SOCIO-ECONOMIC STATUS OF FARM HOUSEHOLDS

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Chapter 1

SALIENT FINDINGS OF THE SURVEY

- *The data indicated that there were 105 (61.40%) men and 66 (38.6%) women among the sampled households.*
- *The average family size of landless farmers' was 4.8, marginal farmers' was 4.3, small farmers' was 5.2 and semi medium farmers' was 4.5.*
- *The data indicated that, 39 (22.81%) people were in 0-15 years of age, 72 (42.11%) were in 16-35 years of age, 53 (30.99%) were in 36-60 years of age and 7 (49%) were above 61 years of age.*
- *The results indicated that Nagalapur-1 had 50.88 per cent illiterates, 11.70 per cent of them had Primary School, 72 per cent of them had Middle School, 16.37 per cent of them had High School, 4.68 per cent of them had PUC education, 1.75 per cent of them had diploma education and 2.34 per cent of them had Degree education.*
- *The results indicate that, 5.56 per cent of household heads were practicing agriculture, 91.67 per cent of the household heads were agricultural laborers and 2.78 per cent of the household's heads were trade and business.*
- *The results indicate that agriculture was the major occupation for 6.43 per cent of the household members, 65.50 per cent were agricultural laborers, 0.58 per cent were in Household trade and business and dairy farm, 18.71 per cent were students, 2.92 per cent were housewives and 5.26 per cent were children.*
- *The results show that, 0.58 per cent of the population in the micro watershed has participated in grama panchayat and 99.42 per cent of the population in the micro watershed has not participated in local institution.*
- *The results indicate that 52.78 per cent of the households possess Thatched house, 16.67 per cent of the households possess Katcha house, 22.22 per cent of them possess pucca/RCC house and 8.33 per cent of the households possess semi pacca house.*
- *The results show that 72.22 per cent of the households possess TV, 58.33 per cent of the households possess mixer/grinder, 2.78 per cent of the households possess refrigerator and car/four wheeler, 41.67 per cent of the households possess motor cycle and 91.67 per cent of the households possess mobile phones.*
- *The results show that the average value of television was Rs. 8,830, mixer/grinder was Rs. 1,976, refrigerator was Rs. 1,500, Motor Cycle was Rs. 37,366, car/four wheeler was Rs. 30,000 and mobile phone was Rs. 2,774.*
- *About 27.78 per cent of the households possess bullock cart, 38.89 per cent of them possess plough, 2.78 per cent of them possess seed/ fertilizer drill, irrigation pump and thresher, 11.11 per cent of them possess Sprayer and sprinkler and 69.44 per cent of them possess weeder.*
- *The results show that the average value of bullock cart was Rs. 14,580, plough was Rs. 20,078, seed/ fertilizer drill was Rs. 4,000, irrigation pump was Rs. 7,000,*

Sprayer was Rs. 3,800, sprinkler was Rs. 4,300, weeder was Rs. 252 and the average value of thresher was Rs. 180.

- *The results indicate that, 41.67 per cent of the households possess bullocks, 25 per cent of the households possess local cow, 2.78 per cent of the households possess cross breed cow and sheep, 11.11 per cent of the households possess buffalo and 5.56 per cent of the households possess goat.*
- *The results indicate that, average own labour men available in the micro watershed was 2.19, average own labour (women) available was 1.5, average hired labour (men) available was 10.61 and average hired labour (women) available was 9.42.*
- *The results indicate that, 88.89 per cent of the households opined that the hired labour was adequate and 11.11 per cent of the households opined that the hired labour was inadequate.*
- *The results show that, 2.34 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, 50 per cent of the population has migrated for the purpose of job/wage/work and business.*
- *The results indicate that, households of the Nagalapur-1 micro-watershed possess 14.31 ha (28.80%) of dry land, 34.98 ha (70.38%) of irrigated land and 0.4 ha (0.81%) of permanent fallow land. Marginal farmers possess 5.9 ha (87.68%) of dry land, 0.42 ha (6.31%) of irrigated land and o.4 ha (6.1%) of permanent fallow land. Small farmers possess 7.39 ha (59.9%) of dry land and 40.91 ha (40.91%) of irrigated land. Semi medium farmers possess 12 ha (6.86%) of dry land and 13.79 ha (93.14%) of irrigated land. Medium farmers possess 15.64 ha (100%) of irrigated land.*
- *The results indicate that, the average value of dry land was Rs. 583,107.15, the average value of irrigated land was Rs. 429,813.72 and the average value of permanent fallow land was Rs. 1,235,000. In case of marginal famers, the average land value was Rs. 550,205.61 for dry land, Rs. 1,881,904.85 for irrigated land and Rs. 1,235,000 for permanent fallow land. In case of small famers, the average land value was Rs. 554,296.67 for dry land and Rs. 671,683.80 for irrigated land. In case of semi medium famers, the average land value was Rs. 984,063.75 for dry land and Rs. 489,216.55 for irrigated land. Medium farmers, the average land value were Rs. 258,822.77 for irrigated land.*
- *The results indicate that, there were 19 de-functioning and 23 functioning bore wells in the micro watershed.*
- *The results indicate that, bore well was the major irrigation source in the micro water shed for 63.89per cent of the farmers.*
- *The results indicate that, the depth of bore well was found to be 4.68 meters.*

- *The results indicate that, marginal, small, semi medium and medium farmers had an irrigated area of 0.43 ha, 3.40 ha, 13.41 ha and 12 ha respectively.*
- *The results indicate that, farmers have grown groundnut (21.08 ha), cotton (10.48ha), paddy and red gram (3.79 ha), green garm (22 ha), sorghum (0.81ha) and sweet potato (42.1 ha).*
- *The results indicate that, the cropping intensity in Nagalapur-1 micro-watershed was found to be 97.14 per cent.*
- *The results indicate that, 88.89 per cent of the households have bank account and 41.67 per cent of the households have savings.*
- *The results indicate that, 27.78 per cent of the households have availed credit from different sources.*
- *The results indicate that, 46.67 per cent of the households have borrowed from commercial bank, 6.67 per cent of the households have borrowed from cooperative, grameena bank and money lender and 20 per cent of the households have borrowed from friends/relatives.*
- *The results indicate that, the average credit amount borrowed by households in micro-watershed was Rs, 61,666.67.*
- *The results indicate that, 90 per cent of the households borrowed from institutional sources for the purpose of agricultural production and 10 per cent of the households from institutional sources for purpose of social functions like marriage.*
- *The results indicate that, 75 per cent of the households borrowed from private sources for the purpose of agricultural production and 25 per cent of the households from private sources for the purpose of household consumption.*
- *The results indicated that 10 per cent of the households partially paid their loan borrowed from institutional sources and 90 per cent of the households not paid their loan borrowed from institutional sources.*
- *The results indicated that 100 per cent of the households did not repay their loan borrowed from private sources.*
- *The results indicate that, 60 per cent opined that the loan amount borrowed from helped to perform timely agricultural operations and 30 per cent opined that the loan amount borrowed from higher rate of interest and 10 per cent opined that the loan amount borrowed from forced to sell the produce at low price to repay loan in time. The results indicate that, around 100 per cent opined that the loan amount was adequate to fulfil the requirement.*
- *The results indicate that, the total cost of cultivation for red gram was Rs. 52355.73. The gross income realized by the farmers was Rs. 49965.31. The net income from red gram cultivation was Rs. -2390.43. Thus the benefit cost ratio was found to be 1:0.95.*

- *The total cost of cultivation for green gram was Rs. 21594.32. The gross income realized by the farmers was Rs. 43225. The net income from green gram cultivation was Rs. 21630.68. Thus the benefit cost ratio was found to be 1:2.*
- *The total cost of cultivation for paddy was Rs. 50657.82. The gross income realized by the farmers was Rs. 41762.31. The net income from paddy cultivation was Rs. -8895.51. Thus the benefit cost ratio was found to be 1:0.82.*
- *The total cost of cultivation for groundnut was Rs. 487325. The gross income realized by the farmers was Rs. 76436.68. The net income from groundnut cultivation was Rs. 27704.63. Thus the benefit cost ratio was found to be 1:1.57.*
- *The total cost of cultivation for Sorghum was Rs. 33099.27. The gross income realized by the farmers was Rs. 37050. The net income from Sorghum cultivation was Rs. 3950.73. Thus the benefit cost ratio was found to be 1:1.12.*
- *The total cost of cultivation for Cotton was Rs. 29179.73. The gross income realized by the farmers was Rs. 80363.79. The net income from Cotton cultivation was Rs. 511847. Thus the benefit cost ratio was found to be 1:2.75.*
- *The results indicate that, 41.67 per cent of the households opined that dry fodder was adequate and 30.56 per cent of the households opined that green fodder was adequate.*
- *The results indicate that the annual gross income was Rs. 121,055.56 marginal farmers, for small farmers it was Rs. 98,545.45 and for semi medium farmers it was Rs. 130,930 and medium farmers it was Rs. 161,166.67.*
- *The results indicate that the average annual expenditure is Rs. 115,444.47. For marginal farmers it was Rs. 11,544.44, for small farmers it was Rs. 3,776.86, for semi medium farmers it was Rs. 20,332.22 and medium farmers it was Rs. 11,138.89.*
- *The results indicate that, sampled households have grown 5 coconut, 22 lemon and 19 mango trees in their field.*
- *The results indicate that, households have planted 9 Teak, 72 neem, 8 tamarind, 10 acacia, 4 Banyan and peepul trees in their field and also 1 neem trees in their backyard.*
- *The results indicated that, households have an average investment capacity of Rs. 11,361.11 for land development; households have an average investment capacity of Rs. 3,277.78 for irrigation facility, households have an average investment capacity of Rs. 2,583.33 for improved crop production, households have an average investment capacity of Rs. 1,055.56 for improved livestock management, households have an average investment capacity of Rs.166.67 for orchard development/ maintenance and households have an average investment capacity of Rs.55.56 for purchase of farm machinery.*
- *The results indicated that government subsidy was the source of additional investment for 2.78 per cent for irrigation facility and improved livestock*

management. Loan from bank was the source of additional investment for 2.78 per cent for land development and 5.56 per cent for irrigation facility and improved livestock management. Own funds was the source of additional investment for 22.22 per cent for land development, 5.56 per cent for irrigation facility and 5.56 per cent for improved crop production. Soft loan was the source of additional investment for 22.22 per cent for land development, 19.44 per cent for irrigation facility, 16.67 per cent for improved crop production and 5.56 per cent for improved livestock management.

- *The results indicated that, Cotton was sold to the extent of 72.38 per cent, green gram was sold to the extent of 100 per cent, groundnut was sold to the extent of 78.96 per cent, paddy was sold to the extent of 82.86 per cent, Sorghum was sold to the extent of 80 per cent, and red gram to the extent of 88.24 per cent.*
- *The results indicated that, about 77.78 per cent of the farmers sold their produce to local/village merchants, 8.33per cent of the farmers sold their produce to regulated markets and 11.11 per cent of the farmers sold their produce to cooperative marketing society.*
- *The results indicated that, 13.89 per cent of the households have used head load, 5.56 per cent of the households have used Cart, 58.33 per cent of the households used tractor and 19.44 per cent of the households used truck as a mode of transportation.*
- *The results indicated that, 94.44 per cent of the households have experienced soil and water erosion problems in the farm. The results indicated that, 91.67 per cent have shown interest in soil test.*
- *The results indicated that, 19.44 per cent of the population adopted field bunding, 5.56 per cent of the population adopted summer ploughing and dead furrow.*
- *The results indicated that, condition of field bunding was 71.43 per cent of good, 14.29 per cent were slightly damaged and severely damaged.*
- *The results indicated that, 8.33 per cent of the population involved own and government agency, 2.78 per cent of the population involved farmer's organization in the micro watershed.*
- *The results indicated that, 80.56 per cent of the households used firewood and 33.33 per cent of them used LPG as a source of fuel.*
- *The results indicated that, piped supply was the major source of drinking water for 36.11 per cent of the households in the micro watershed and Bore Well was the source of drinking water for 41.67 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, 38.89 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, 80.56 per cent of the households participated in NREGA programme.*
- *The results indicated that, cereals and pulses were adequate for 100 per cent of the households, oilseeds were adequate for 8.33 per cent, vegetables and meat were adequate for 41.67 per cent, fruits were adequate for 11.11 per cent, Milk were adequate for 52.78 per cent and Egg were adequate for 47.22 per cent.*
- *The results indicated that, oilseeds and fruits were inadequate for 88.89 per cent of the households, vegetables and meat were inadequate for 58.33 per cent, milk were inadequate for 44.44 per cent, Egg were inadequate for 52.78 per cent.*
- *The results indicated that, lower fertility status of the soil was the constraint experienced by 80.56 per cent of the households, Wild animal menace on farm field, frequent incidence of pest and diseases and Lack of marketing facilities in the area (91.67%), inadequacy of irrigation water and high cost of fertilizers and plant protection chemicals (72.22%), High rate of interest on credit (75%), Low price for the agricultural commodities (97.22%), Inadequate extension services (27.78%), Lack of transport for safe transport of the Agril produce to the market (94.44%), Less rainfall (5.56%) and Source of Agri-technology information (2.78%).*

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

Yadgiri 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. Yadgiri 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.

Yadgiri 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 Yadgiri 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%. Yadgiri has a sex ratio of 984 females for every 1000 males, and a literacy rate of 52.36%.

Description of the micro watershed

Nagalapur-1 micro-watershed in Nagalapur sub-watershed (Yadgiri taluk and district) is located in between $16^0$42’35.934’’ to 16^0 40’41.3602’’ North latitudes and 77^0 18’18.473’’ to $77^0$13’54.506’’East longitudes, covering an area of about 676.32 ha, bounded by Jinatora, Naglapura and Balichakra 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 36 households located in the micro-watershed were interviewed for the survey.

Chapter 4

SALIENT FEATURES OF THE SURVEY

Households sampled for socio-economic survey: The data on households sampled for socio economic survey in Nagalapur-1 micro-watershed is presented in Table 1 and it indicated that 36 farmers were sampled in Nagalapur-1 micro-watershed among them 9 (25%) were landless, 11 (30.56%) were marginal farmers, 10 (27.78%) were small farmers and 6 (16.67%) were semi medium farmers.

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

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Farmers	9	25	11	30.56	10	27.78	6	16.67	36	100

Population characteristics: The population characteristics of households sampled for socio-economic survey in Nagalapur-1 micro-watershed is presented in Table 2. The data indicated that there were 105 (61.40%) men and 66 (38.6%) women among the sampled households. The average family size of landless farmers' was 4.8, marginal farmers' was 4.3, small farmers' was 5.2 and semi medium farmers' was 4.5.

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

Sl.No.	Particulars	MF (44)		SF (48)		SMF (52)		MDF (27)		All (171)	
		N	%	N	%	N	%	N	%	N	%
1	Men	28	63.64	27	56.25	34	65.38	16	59.26	105	61.40
2	Women	16	36.36	21	43.75	18	34.62	11	40.74	66	38.60
Total		44	100	48	100	52	100	27	100	171	100
Average		4.8		4.3		5.2		4.5		4.75	

Age wise classification of population: The age wise classification of household members in Nagalapur-1 micro-watershed is presented in Table 3. The data indicated that, 39 (22.81%) people were in 0-15 years of age, 72 (42.11%) were in 16-35 years of age, 53 (30.99%) were in 36-60 years of age and 7 (49%) were above 61 years of age.

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

Sl.No.	Particulars	MF (44)		SF (48)		SMF (52)		MDF (27)		All (171)	
		N	%	N	%	N	%	N	%	N	%
1	0-15 years of age	17	38.64	12	25	7	13.46	3	11.11	39	22.81
2	16-35 years of age	13	29.55	19	39.58	29	55.77	11	40.74	72	42.11
3	36-60 years of age	12	27.27	13	278	15	28.85	13	48.15	53	30.99
4	> 61 years	2	4.55	4	8.33	1	1.92	0	0	7	49
Total		44	100	48	100	52	100	27	100	171	100

Education level of household members: Education level of household members in Nagalapur-1 micro-watershed is presented in Table 4. The results indicated that Nagalapur-1 had 50.88 per cent illiterates, 11.70 per cent of them had Primary School, 72 per cent of them had Middle School, 16.37 per cent of them had High School, 4.68 per

cent of them had PUC education, 1.75 per cent of them had diploma education and 2.34 per cent of them had Degree education.

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

Sl.No.	Particulars	MF (44)		SF (48)		SMF (52)		MDF (27)		All (171)	
		N	%	N	%	N	%	N	%	N	%
1	Illiterate	20	45.45	25	528	31	59.62	11	40.74	87	50.88
2	Primary School	8	18.18	4	8.33	4	7.69	4	14.81	20	11.70
3	Middle School	5	11.36	3	6.25	2	3.85	2	7.41	12	72
4	High School	8	18.18	7	14.58	8	15.38	5	18.52	28	16.37
5	PUC	0	0	1	28	3	5.77	4	14.81	8	4.68
6	Diploma	0	0	1	28	1	1.92	1	3.70	3	1.75
7	Degree	1	2.27	1	28	2	3.85	0	0	4	2.34
8	Others	2	4.55	6	12.50	1	1.92	0	0	9	5.26
Total		44	100	48	100	52	100	27	100	171	100

Occupation of household heads: The data regarding the occupation of the household heads in Nagalapur-1 micro-watershed is presented in Table 5. The results indicate that, 5.56 per cent of household heads were practicing agriculture, 91.67 per cent of the household heads were agricultural labourers and 2.78 per cent of the household's heads were trade and business.

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

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Agriculture	1	11.11	0	0	1	10	0	0	2	5.56
2	Agricultural Labour	8	88.89	11	100	8	80	6	100	33	91.67
3	Trade & Business	0	0	0	0	1	10	0	0	1	2.78
Total		9	100	11	100	10	100	6	100	36	100

Occupation of the household members: The data regarding the occupation of the household members in Nagalapur-1 micro-watershed is presented in Table 6. The results indicate that agriculture was the major occupation for 6.43 per cent of the household members, 65.50 per cent were agricultural labourers, 0.58 per cent were in Household trade and business and dairy farm, 18.71 per cent were students, 2.92 per cent were housewives and 5.26 per cent were children.

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

Sl. No.	Particulars	MF (44)		SF (48)		SMF (52)		MDF (27)		All (171)	
		N	%	N	%	N	%	N	%	N	%
1	Agriculture	4	99	0	0	7	13.46	0	0	11	6.43
2	Agricultural Labour	25	56.82	30	62.50	35	67.31	22	81.48	112	65.50
3	Trade & Business	0	0	0	0	1	1.92	0	0	1	0.58
4	Student	12	27.27	7	14.58	8	15.38	5	18.52	32	18.71
5	Housewife	0	0	4	8.33	1	1.92	0	0	5	2.92
6	Children	3	6.82	6	12.50	0	0	0	0	9	5.26
7	Dairy farm	0	0	1	28	0	0	0	0	1	0.58
Total		44	100	48	100	52	100	27	100	171	100

Institutional participation of the household members: The data regarding the institutional participation of the household members in Nagalapur-1 micro-watershed is presented in Table 7. The results show that, 0.58 per cent of the population in the micro watershed has participated in grama panchayat and 99.42 per cent of the population in the micro watershed has not participated in local institution.

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

Sl.No.	Particulars	MF (44)		SF (48)		SMF (52)		MDF (27)		All (171)	
		N	%	N	%	N	%	N	%	N	%
1	Gram Panchayat	0	0	0	0	1	1.92	0	0	1	0.58
2	No Participation	44	100	48	100	51	988	27	100	170	99.42
Total		44	100	48	100	52	100	27	100	171	100

Type of house owned: The data regarding the type of house owned by the households in Nagalapur-1 micro-watershed is presented in Table 8. The results indicate that 52.78 per cent of the households possess Thatched house, 16.67 per cent of the households possess Katcha house, 22.22 per cent of them possess pucca/RCC house and 8.33 per cent of the households possess semi pacca house.

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

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Thatched	5	55.56	8	72.73	3	30	3	50	19	52.78
2	Katcha	2	22.22	1	99	2	20	1	16.67	6	16.67
3	Pucca/RCC	2	22.22	1	99	4	40	1	16.67	8	22.22
4	Semi pacca	0	0	1	99	1	10	1	16.67	3	8.33
Total		9	100	11	100	10	100	6	100	36	100

Durable Assets owned by the households: The data regarding the Durable Assets owned by the households in Nagalapur-1 micro-watershed is presented in Table 9. The results show that 72.22 per cent of the households possess TV, 58.33 per cent of the households possess mixer/grinder, 2.78 per cent of the households possess refrigerator and car/four wheeler, 41.67 per cent of the households possess motor cycle and 91.67 per cent of the households possess mobile phones.

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

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Television	5	55.56	7	63.64	9	90	5	83.33	26	72.22
2	Mixer/Grinder	3	33.33	6	54.55	8	80	4	66.67	21	58.33
3	Refrigerator	0	0	1	99	0	0	0	0	1	2.78
4	Motor Cycle	3	33.33	4	36.36	6	60	2	33.33	15	41.67
5	Car/Four Wheeler	0	0	0	0	1	10	0	0	1	2.78
6	Mobile Phone	7	77.78	11	100	9	90	6	100	33	91.67

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

results show that the average value of television was Rs. 8,830, mixer/grinder was Rs. 1,976, refrigerator was Rs. 1,500, Motor Cycle was Rs. 37,366, car/four wheeler was Rs. 30,000 and mobile phone was Rs. 2,774.

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

Average value (Rs.)

Sl.No.	Particulars	MF (9)	SF (11)	SMF (10)	MDF (6)	All (36)
1	Television	6,400	14,142	7,022	7,080	8,830
2	Mixer/Grinder	1,600	1,416	2,125	2,800	1,976
3	Refrigerator	0	1,500	0	0	1,500
4	Motor Cycle	23,666	37,500	39,083	52,500	37,366
5	Car/Four Wheeler	0	0	30,000	0	30,000
6	Mobile Phone	2,012	2,721	2,750	3,814	2,774

Farm Implements owned: The data regarding the farm implements owned by the households in Nagalapur-1 micro-watershed is presented in Table 11. About 27.78 per cent of the households possess bullock cart, 38.89 per cent of them possess plough, 2.78 per cent of them possess seed/ fertilizer drill, irrigation pump and thresher, 11.11 per cent of them possess Sprayer and sprinkler and 69.44 per cent of them possess weeder.

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

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Bullock Cart	0	0	3	27.27	4	40	3	50	10	27.78
2	Plough	2	22.22	3	27.27	7	70	2	33.33	14	38.89
3	Seed/Fertilizer Drill	0	0	0	0	0	0	1	16.67	1	2.78
4	Irrigation Pump	1	11.11	0	0	0	0	0	0	1	2.78
5	Sprayer	0	0	1	99	3	30	0	0	4	11.11
6	Sprinkler	0	0	0	0	2	20	2	33.33	4	11.11
7	Weeder	3	33.33	8	72.73	8	80	6	100	25	69.44
8	Thresher	0	0	0	0	1	10	0	0	1	2.78
9	Blank	4	44.44	3	27.27	1	10	0	0	8	22.22

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

Average Value (Rs.)

Sl.No.	Particulars	LL (0)	MF (9)	SF (11)	SMF (10)	MDF (6)	All (36)
1	Bullock Cart	0	0	8,266	19,000	15,000	14,580
2	Plough	0	2,400	63,833	9,857	7,900	20,078
3	Seed/Fertilizer Drill	0	0	0	0	4,000	4,000
4	Irrigation Pump	0	7,000	0	0	0	7,000
5	Sprayer	0	0	8,000	2,750	0	3,800
6	Sprinkler	0	0	0	3,666	5,250	4,300
7	Weeder	0	266	222	175	588	252
8	Thresher	0	0	0	180	0	180

Average value of farm implements: The data regarding the average value of farm Implements owned by the households in Nagalapur-1 micro-watershed is presented in Table 12. The results show that the average value of bullock cart was Rs. 14,580, plough was Rs. 20,078, seed/ fertilizer drill was Rs. 4,000, irrigation pump was Rs. 7,000,

Sprayer was Rs. 3,800, sprinkler was Rs. 4,300, weeder was Rs. 252 and the average value of thresher was Rs. 180.

Livestock possession by the households: The data regarding the Livestock possession by the households in Nagalapur-1 micro-watershed is presented in Table 13. The results indicate that, 41.67 per cent of the households possess bullocks, 25 per cent of the households possess local cow, 2.78 per cent of the households possess cross breed cow and sheep, 11.11 per cent of the households possess buffalo and 5.56 per cent of the households possess goat.

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

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Bullock	3	33.33	4	36.36	5	50	3	50	15	41.67
2	Local cow	1	11.11	2	18.18	4	40	2	33.33	9	25
3	Crossbred cow	0	0	0	0	1	10	0	0	1	2.78
4	Buffalo	0	0	1	99	3	30	0	0	4	11.11
5	Sheep	0	0	0	0	1	10	0	0	1	2.78
6	Goat	1	11.11	1	99	0	0	0	0	2	5.56
7	blank	5	55.56	4	36.36	4	40	1	16.67	14	38.89

Average Labour availability: The data regarding the average labour availability in Nagalapur-1 micro-watershed is presented in Table 14. The results indicate that, average own labour men available in the micro watershed was 2.19, average own labour (women) available was 1.5, average hired labour (men) available was 10.61 and average hired labour (women) available was 9.42.

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

Sl.No.	Particulars	MF (9)	SF (11)	SMF (10)	MDF (6)	All (36)
1	Hired labour Female	8.56	9.27	8.50	12.50	9.42
2	Own Labour Female	1.56	1.55	1.60	1.17	1.50
3	Own labour Male	1.78	1.91	3.20	1.67	2.19
4	Hired labour Male	9	11.36	9.60	13.33	10.61

Adequacy of Hired Labour: The data regarding the adequacy of hired labour in Nagalapur-1 micro-watershed is presented in Table 15. The results indicate that, 88.89 per cent of the households opined that the hired labour was adequate and 11.11 per cent of the households opined that the hired labour was inadequate.

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

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Adequate	7	77.78	10	90.91	10	100	5	83.33	32	88.89
2	Inadequate	2	22.22	1	99	0	0	1	16.67	4	11.11

Migration among the households: The data regarding the migration among the household members in Nagalapur-1 micro-watershed is presented in Table 16. The results show that, 2.34 per cent of the population in the micro watershed has migrated.

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

Sl.No.	Particulars	MF (44)		SF (48)		SMF (52)		MDF (27)		All (171)	
		N	%	N	%	N	%	N	%	N	%
1	Migration	0	0	1	28	1	1.92	2	7.41	4	2.34

Average distance and duration of migration: The data regarding the average distance and duration of migration of household members in Nagalapur-1 micro-watershed is presented in Table 17. The results show that, average distance of migration was 1,000 kms and average duration of migration was 4 months.

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

Sl.No.	Particulars	MF (0)	SF (1)	SMF (1)	MDF (2)	All (4)
1	Avg. Distance (kms)	0	750	750	1,500	1,000
2	Avg. Duration (months)	0	4	5	3	4

Purpose of migration by household members: The data regarding the average distance and duration of migration of household members in Nagalapur-1 micro-watershed is presented in Table 18. The results show that, 50 per cent of the population has migrated for the purpose of job/wage/work and business.

Table 18. Purpose of migration of households in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (0)		SF (1)		SMF (1)		MDF (2)		All (4)	
		N	%	N	%	N	%	N	%	N	%
1	Job/wage/work	0	0	1	100	1	100	0	0	2	50
2	Business	0	0	0	0	0	0	2	100	2	50
Total		0	100	1	100	1	100	2	100	4	100

Distribution of land (ha): The data regarding the distribution of land (ha) in Nagalapur-1 micro-watershed is presented in Table 19. The results indicate that, households of the Nagalapur-1 micro-watershed possess 14.31 ha (28.80%) of dry land, 34.98 ha (70.38%) of irrigated land and 0.4 ha (0.81%) of permanent fallow land. Marginal farmers possess 5.9 ha (87.68%) of dry land, 0.42 ha (6.31%) of irrigated land and o.4 ha (6.1%) of permanent fallow land. Small farmers possess 7.39 ha (59.9%) of dry land and 40.91 ha (40.91%) of irrigated land. Semi medium farmers possess 12 ha (6.86%) of dry land and 13.79 ha (93.14%) of irrigated land. Medium farmers possess 15.64 ha (100%) of irrigated land.

Table 19. Distribution of land (Ha) in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		ha	%	ha	%	ha	%	ha	%	ha	%
1	Dry	5.90	87.68	7.39	59.9	12	6.86	0	0	14.31	28.80
2	Irrigated	0.42	6.31	5.12	40.91	13.79	93.14	15.64	100	34.98	70.38
3	Permanent Fallow	0.40	6.1	0	0	0	0	0	0	0.40	0.81
Total		6.73	100	12.51	100	14.81	100	15.64	100	49.70	100

Average land value (Rs./ha): The data regarding the average land value (Rs./ha) in Nagalapur-1 micro-watershed is presented in Table 20. The results indicate that, the average value of dry land was Rs. 583,107.15, the average value of irrigated land was Rs.

429,813.72 and the average value of permanent fallow land was Rs. 1,235,000. In case of marginal famers, the average land value was Rs. 550,205.61 for dry land, Rs. 1,881,904.85 for irrigated land and Rs. 1,235,000 for permanent fallow land. In case of small famers, the average land value was Rs. 554,296.67 for dry land and Rs. 671,683.80 for irrigated land. In case of semi medium famers, the average land value was Rs. 984,063.75 for dry land and Rs. 489,216.55 for irrigated land. Medium farmers, the average land value was Rs. 258,822.77 for irrigated land.

Table 20. Average land value (Rs./ha) in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)	SF (11)	SMF (10)	MDF (6)	All (36)
1	Dry	550,205.61	554,296.67	984,063.75	0	583,107.15
2	Irrigated	1,881,904.85	671,683.80	489,216.55	258,822.77	429,813.72
3	Permanent Fallow	1,235,000	0	0	0	1,235,000

Status of bore wells: The data regarding the status of bore wells in Nagalapur-1 micro-watershed is presented in Table 21. The results indicate that, there were 19 de-functioning and 23 functioning bore wells in the micro watershed.

Table 21. Status of bore wells in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)	SF (11)	SMF (10)	MDF (6)	All (36)
1	De-functioning	0	3	10	6	19
2	Functioning	1	5	10	7	23

Source of irrigation: The data regarding the source of irrigation in Nagalapur-1 micro-watershed is presented in Table 22. The results indicate that, bore well was the major irrigation source in the micro water shed for 63.89 per cent of the farmers.

Table 22. Source of irrigation in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Bore Well	1	11.11	5	45.45	10	100	7	116.67	23	63.89

Depth of water (Avg in meters): The data regarding the depth of water in Nagalapur-1 micro-watershed is presented in Table 23. The results indicate that, the depth of bore well was found to be 4.68 meters.

Table 23. Depth of water (Avg in meters) in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)	SF (11)	SMF (10)	MDF (6)	All (36)
1	Bore Well	7.45	35.19	74.74	76.20	4.68

Irrigated Area (ha): The results (Table 24) indicate that, marginal, small, semi medium and medium farmers had an irrigated area of 0.43 ha, 3.40 ha, 13.41 ha and 12 ha respectively.

Table 24. Irrigated Area (ha) in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)	SF (11)	SMF (10)	MDF (6)	All (36)
1	Kharif	0	3.40	13.41	8.25	256
2	Rabi	0.43	0	0	3.75	4.18
Total		0.43	3.40	13.41	12	29.24

Cropping pattern: The data regarding the cropping pattern in Nagalapur-1 micro-watershed is presented in Table 25. The results indicate that, farmers have grown groundnut (21.08 ha), cotton (10.48ha), paddy and red gram (3.79 ha), green gram (22 ha), sorghum (0.81ha) and sweet potato (42.1 ha).

Table 25. Cropping pattern in Nagalapur-1 micro-watershed (Area in ha)

Sl.No.	Particulars	MF (9)	SF (11)	SMF (10)	MDF (6)	All (36)
1	Kharif - Groundnut	1.24	7.62	5.9	6.22	21.08
2	Kharif - Cotton	2.67	0.84	1.3	5.68	10.48
3	Kharif - Paddy	0	0.81	2.98	0	3.79
4	Kharif - Red gram	0.81	1.36	1.62	0	3.79
5	Kharif - Greengram	0.81	0	1.21	0	22
6	Rabi - Sorghum	0.81	0	0	0	0.81
7	Kharif - Sweet potato	0	0	04	0	04
Total		6.33	10.63	13.4	12	42.1

Cropping intensity: The data regarding the cropping intensity in Nagalapur-1 micro-watershed is presented in Table 26. The results indicate that, the cropping intensity in Nagalapur-1 micro-watershed was found to be 97.14 per cent.

Table 26. Cropping intensity (%) in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)	SF (11)	SMF (10)	MDF (6)	All (36)
1	Cropping Intensity	100	92.76	96.96	100	97.14

Possession of Bank account and savings: The data regarding the possession of bank account and saving in Nagalapur-1 micro-watershed is presented in Table 27. The results indicate that, 88.89 per cent of the households have bank account and 41.67 per cent of the households have savings.

Table 27. Possession of bank account and savings in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Account	7	77.78	11	100	9	90	5	83.33	32	88.89
2	Savings	4	44.44	4	36.36	4	40	3	50	15	41.67

Borrowing status: The data regarding the borrowing status in Nagalapur-1 micro-watershed is presented in Table 28. The results indicate that, 27.78 per cent of the households have availed credit from different sources.

Table 28. Borrowing status in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Credit Availed	4	44.44	1	99	1	10	4	66.67	10	27.78

Source of credit availed by households: The data regarding the source of credit availed by households in Nagalapur-1 micro-watershed is presented in Table 29. The results indicate that, 46.67 per cent of the households have borrowed from commercial bank, 6.67 per cent of the households have borrowed from cooperative, grameena bank and money lender and 20 per cent of the households have borrowed from friends/relatives.

Table 29. Source of credit availed by households in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (4)		SF (3)		SMF (4)		MDF (4)		All (15)	
		N	%	N	%	N	%	N	%	N	%
1	Commercial Bank	0	0	0	0	4	100	3	75	7	46.67
2	Cooperative Bank	0	0	1	33.33	0	0	0	0	1	6.67
3	Friends/Relatives	0	0	2	66.67	1	25	0	0	3	20
4	Grameena Bank	0	0	0	0	1	25	0	0	1	6.67
5	Money Lender	1	25	0	0	0	0	0	0	1	6.67

Avg. Credit amount: The data regarding the avg. Credit amount in Nagalapur-1 micro-watershed is presented in Table 30. The results indicate that, the average credit amount borrowed by households in micro-watershed was Rs, 61,666.67.

Table 30. Avg. credit amount by household in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (4)	SF (3)	SMF (4)	MDF (4)	All (15)
1	Average Credit	35,000	36,666.67	88,750	80,000	61,666.67

Purpose of credit borrowed - Institutional Credit: The data regarding the purpose of credit borrowed - Institutional Credit in Nagalapur-1 micro-watershed is presented in Table 31. The results indicate that, 90 per cent of the households borrowed from institutional sources for the purpose of agricultural production and 10 per cent of the households from institutional sources for purpose of social functions like marriage.

Table 31. Purpose of credit borrowed - Institutional Credit by household in Nagalapur-1 micro-watershed

Sl.No.	Particulars	SF (1)		SMF (6)		MDF (3)		All (10)	
		N	%	N	%	N	%	N	%
1	Agriculture production	1	100	5	83.33	3	100	9	90
2	Social functions like marriage	0	0	1	16.67	0	0	1	10

Purpose of credit borrowed - Private Credit: The data regarding the purpose of credit borrowed - private Credit in Nagalapur-1 micro-watershed is presented in Table 32. The results indicate that, 75 per cent of the households borrowed from private sources for the purpose of agricultural production and 25 per cent of the households from private sources for the purpose of household consumption.

Table 32. Purpose of credit borrowed - Private Credit in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (1)		SF (2)		SMF (1)		All (4)	
		N	%	N	%	N	%	N	%
1	Agriculture production	1	100	2	100	0	0	3	75
2	Household consumption	0	0	0	0	1	100	1	25

Repayment status of households – Institutional: The data regarding the repayment status of credit borrowed from institutional sources by households in Nagalapur-1 micro watershed is presented in Table 33. The results indicated that 10 per cent of the households partially paid their loan borrowed from institutional sources and 90 per cent of the households not paid their loan borrowed from institutional sources.

Table 33. Repayment status of households – Institutional Credit in Nagalapur-1 micro-watershed

Sl.No.	Particulars	SF (1)		SMF (6)		MDF (3)		All (10)	
		N	%	N	%	N	%	N	%
1	Partially paid	1	100	0	0	0	0	1	10
2	Un paid	0	0	6	100	3	100	9	90

Repayment status of households – Private: The data regarding the repayment status of credit borrowed from private sources by households in Nagalapur-1 micro watershed is presented in Table 34. The results indicated that 100 per cent of the households did not repay their loan borrowed from private sources.

Table 34. Repayment status of households – private Credit in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (1)		SF (2)		SMF (1)		All (4)	
		N	%	N	%	N	%	N	%
1	Un paid	1	100	2	100	1	100	4	100

Opinion on institutional sources of credit: The data regarding the opinion on institutional sources of credit in Nagalapur-1 micro watershed is presented in Table 35. The results indicate that, 60 per cent opined that the loan amount borrowed from helped to perform timely agricultural operations and 30 per cent opined that the loan amount borrowed from higher rate of interest and 10 per cent opined that the loan amount borrowed from forced to sell the produce at low price to repay loan in time.

Table 35. Opinion on institutional sources of credit in Nagalapur-1 micro watershed

Sl.No.	Particulars	MF (0)		SF (1)		SMF (6)		MDF (3)		All (10)	
		N	%	N	%	N	%	N	%	N	%
1	Helped to perform timely agricultural operations	0	0	1	100	3	50	2	66.67	6	60
2	Higher rate of interest	0	0	0	0	2	33.33	1	33.33	3	30
3	Forced to sell the produce at low price to repay loan in time	0	0	0	0	1	16.67	0	0	1	10

Opinion on non-institutional sources of credit: The data regarding the opinion on non-institutional sources of credit in Nagalapur-1 micro watershed is presented in Table 36. The results indicate that, around 100 per cent opined that the loan amount was adequate to fulfil the requirement.

Table 36. Opinion on non- institutional sources of credit in Nagalapur-1 micro watershed

Sl.No.	Particulars	MF (1)		SF (2)		SMF (1)		All (4)	
		N	%	N	%	N	%	N	%
1	Helped to perform timely agricultural operations	1	100	1	50	0	0	2	50
2	None	0	0	1	50	0	0	1	25
3	Other	0	0	0	0	1	100	1	25

Cost of cultivation of Red gram: The data regarding the cost of cultivation of red gram in Nagalapur-1 micro-watershed is presented in Table 37. The results indicate that, the total cost of cultivation for red gram was Rs. 52355.73. The gross income realized by the farmers was Rs. 49965.31. The net income from red gram cultivation was Rs. -2390.43. Thus the benefit cost ratio was found to be 1:0.95.

Table 37. Cost of Cultivation of red gram in Nagalapur-1 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	62.20	151961	292
2	Bullock		Pairs/day	2.93	2101.71	41
3	Tractor		Hours	5.30	5271.91	107
4	Machinery		Hours	3.45	3882.53	7.42
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	19.73	2423.54	4.63
6	Seed Inter Crop		Kgs.	0	0	0
7	FYM		Quintal	2.47	4940	9.44
8	Fertilizer + micronutrients		Quintal	4.75	4531.27	8.65
9	Pesticides (PPC)		Kgs / liters	1.57	2005.40	3.83
10	Irrigation		Number	13	0	0
11	Repairs			0	0	0
12	Msc. Charges (Marketing costs etc)			0	0	0
13	Depreciation charges			0	2.50	0
14	Land revenue and Taxes			0	0	0
II	**Cost B1**					
16	Interest on working capital				1668.63	3.19
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				42023.50	80.27
III	**Cost B2**					
18	Rental Value of Land				316.67	0.60
19	**Cost B2 = (Cost B1 + Rental value)**				42340.17	80.87
IV	**Cost C1**					
20	Family Human Labour			17.95	5250.96	103
21	**Cost C1 = (Cost B2 + Family Labour)**				47591.12	90.90
V	**Cost C2**					
22	Risk Premium				5	01
23	**Cost C2 = (Cost C1 + Risk Premium)**				47596.12	90.91
VI	**Cost C3**					
24	Managerial Cost				4759.61	99
25	**Cost C3 = (Cost C2 + Managerial Cost)**				52355.73	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		11.97	49965.31	
		b) Main Crop Sales Price (Rs.)			4175	
b.	Gross Income (Rs.)				49965.31	
c.	Net Income (Rs.)				-2390.43	
d.	Cost per Quintal (Rs./q.)				4374.74	
e.	Benefit Cost Ratio (BC Ratio)				1:0.95	

Cost of Cultivation of Green gram: The data regarding the cost of cultivation of green gram in Nagalapur-1 micro-watershed is presented in Table 38. The results indicate that, the total cost of cultivation for green gram was Rs. 21594.32. The gross income realized by the farmers was Rs. 43225. The net income from green gram cultivation was Rs. 21630.68. Thus the benefit cost ratio was found to be 1:2.

Table 38. Cost of Cultivation of Green gram in Nagalapur-1 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	39.52	9046.38	41.89
2	Bullock		Pairs/day	1.24	926.25	4.29
3	Tractor		Hours	0	0	0
4	Machinery		Hours	0	0	0
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	6.59	913.90	4.23
6	Seed Inter Crop		Kgs.	0	0	0
7	FYM		Quintal	0	0	0
8	Fertilizer + micronutrients		Quintal	1.44	1584.92	7.34
9	Pesticides (PPC)		Kgs / liters	1.44	1008.58	4.67
10	Irrigation		Number	1.65	0	0
11	Repairs			0	0	0
12	Msc. Charges (Marketing costs etc)			0	0	0
13	Depreciation charges			0	148.20	0.69
14	Land revenue and Taxes			0	0	0
II	**Cost B1**					
16	Interest on working capital				420.89	1.95
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				14049.11	656
III	**Cost B2**					
18	Rental Value of Land				333.33	1.54
19	**Cost B2 = (Cost B1 + Rental value)**				14382.45	66.60
IV	**Cost C1**					
20	Family Human Labour			22.23	5248.75	24.31
21	**Cost C1 = (Cost B2 + Family Labour)**				19631.20	90.91
V	**Cost C2**					
22	Risk Premium				0	0
23	**Cost C2 = (Cost C1 + Risk Premium)**				19631.20	90.91
VI	**Cost C3**					
24	Managerial Cost				1963.12	99
25	**Cost C3 = (Cost C2 + Managerial Cost)**				21594.32	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		8.65	43225	
		b) Main Crop Sales Price (Rs.)			5000	
b.	Gross Income (Rs.)				43225	
c.	Net Income (Rs.)				21630.68	
d.	Cost per Quintal (Rs./q.)				2497.90	
e.	Benefit Cost Ratio (BC Ratio)				1:2	

Cost of Cultivation of Paddy: The data regarding the cost of cultivation of paddy in Nagalapur-1 micro-watershed is presented in Table 39. The results indicate that, the total cost of cultivation for paddy was Rs. 50657.82. The gross income realized by the farmers was Rs. 41762.31. The net income from paddy cultivation was Rs. -8895.51. Thus the benefit cost ratio was found to be 1:0.82.

Table 39. Cost of Cultivation of Paddy in Nagalapur-1 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	24.64	40094	7.91
2	Bullock		Pairs/day	2.30	1825.72	3.60
3	Tractor		Hours	4.31	3451.42	6.81
4	Machinery		Hours	4.10	3327.92	6.57
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	85.99	13383.59	26.42
6	Seed Inter Crop		Kgs.	0	0	0
7	FYM		Quintal	1.41	3942.88	7.78
8	Fertilizer + micronutrients		Quintal	7.93	68541	13.53
9	Pesticides (PPC)		Kgs / liters	1.36	8782	1.73
10	Irrigation		Number	6.68	0	0
11	Repairs			0	0	0
12	Msc. Charges (Marketing costs etc)			0	0	0
13	Depreciation charges			0	254.70	0.50
14	Land revenue and Taxes			0	0	0
II	**Cost B1**					
16	Interest on working capital				3007.32	5.94
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				40934.61	80.81
III	**Cost B2**					
18	Rental Value of Land				358.33	0.71
19	**Cost B2 = (Cost B1 + Rental value)**				41292.94	81.51
IV	**Cost C1**					
20	Family Human Labour			193	4757.12	9.39
21	**Cost C1 = (Cost B2 + Family Labour)**				460506	90.90
V	**Cost C2**					
22	Risk Premium				2.50	0
23	**Cost C2 = (Cost C1 + Risk Premium)**				46052.56	90.91
VI	**Cost C3**					
24	Managerial Cost				4605.26	99
25	**Cost C3 = (Cost C2 + Managerial Cost)**				50657.82	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		23.45	38686.91	
		b) Main Crop Sales Price (Rs.)			1650	
	By Product	e) Main Product (q)		3	3075.40	
		f) Main Crop Sales Price (Rs.)			1025	
b.	Gross Income (Rs.)				41762.31	
c.	Net Income (Rs.)				-8895.51	
d.	Cost per Quintal (Rs./q.)				2160.56	
e.	Benefit Cost Ratio (BC Ratio)				1:0.82	

Cost of cultivation of Groundnut: The data regarding the cost of cultivation of groundnut in Nagalapur-1 micro-watershed is presented in Table 40. The results indicate that, the total cost of cultivation for groundnut was Rs. 487325. The gross income realized by the farmers was Rs. 76436.68. The net income from groundnut cultivation was Rs. 27704.63. Thus the benefit cost ratio was found to be 1:1.57.

Table 40. Cost of Cultivation of Groundnut in Nagalapur-1 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	44.78	7280.15	14.94
2	Bullock		Pairs/day	1.98	1608.44	3.30
3	Tractor		Hours	4.52	3369	6.91
4	Machinery		Hours	16	8406	1.72
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	113.72	15153.97	31.10
7	FYM		Quintal	2.27	3274.97	6.72
8	Fertilizer + micronutrients		Quintal	4.13	3482.99	7.15
9	Pesticides (PPC)		Kgs / liters	16	1061.30	2.18
10	Irrigation		Number	2.88	169.64	0.35
11	Repairs			0	0	0
12	Msc. Charges (Marketing costs etc)			0	0	0
13	Depreciation charges			0	303.69	0.62
14	Land revenue and Taxes			0	1.36	0
II	**Cost B1**					
16	Interest on working capital				2757.37	5.66
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				39302.95	80.65
III	**Cost B2**					
18	Rental Value of Land				392.16	0.80
19	**Cost B2 = (Cost B1 + Rental value)**				39695.10	81.46
IV	**Cost C1**					
20	Family Human Labour			19.68	4601.94	9.44
21	**Cost C1 = (Cost B2 + Family Labour)**				442974	90.90
V	**Cost C2**					
22	Risk Premium				4.82	01
23	**Cost C2 = (Cost C1 + Risk Premium)**				44301.86	90.91
VI	**Cost C3**					
24	Managerial Cost				4430.19	99
25	**Cost C3 = (Cost C2 + Managerial Cost)**				487325	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		20.29	74344.63	
		b) Main Crop Sales Price (Rs.)			3664.71	
	By Product	e) Main Product (q)		3.20	20925	
		f) Main Crop Sales Price (Rs.)			652.94	
b.	Gross Income (Rs.)				76436.68	
c.	Net Income (Rs.)				27704.63	
d.	Cost per Quintal (Rs./q.)				2402.17	
e.	Benefit Cost Ratio (BC Ratio)				1:1.57	

Cost of Cultivation of Sorghum: The data regarding the cost of cultivation of Sorghum in Nagalapur-1 micro-watershed is presented in Table 41. The results indicate that, the total cost of cultivation for Sorghum was Rs. 33099.27. The gross income realized by the farmers was Rs. 37050. The net income from Sorghum cultivation was Rs. 3950.73. Thus the benefit cost ratio was found to be 1:1.12.

Table 41. Cost of Cultivation of Sorghum in Nagalapur-1 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	40.76	4075.50	12.31
2	Bullock		Pairs/day	1.24	1235	3.73
3	Tractor		Hours	2.47	1729	5.22
4	Machinery		Hours	0	0	0
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	148.20	8892	26.86
7	FYM		Quintal	0	0	0
8	Fertilizer + micronutrients		Quintal	4.94	4199	12.69
9	Pesticides (PPC)		Kgs / liters	0	0	0
10	Irrigation		Number	1.24	0	0
11	Repairs			0	0	0
12	Msc. Charges (Marketing costs etc)			0	0	0
13	Depreciation charges			0	19.76	06
14	Land revenue and Taxes			0	8.23	02
II	**Cost B1**					
16	Interest on working capital				1570.92	4.75
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				21729.41	65.65
III	**Cost B2**					
18	Rental Value of Land				333.33	11
19	**Cost B2 = (Cost B1 + Rental value)**				22062.75	66.66
IV	**Cost C1**					
20	Family Human Labour			30.88	8027.50	24.25
21	**Cost C1 = (Cost B2 + Family Labour)**				30090.25	90.91
V	**Cost C2**					
22	Risk Premium				0	0
23	**Cost C2 = (Cost C1 + Risk Premium)**				30090.25	90.91
VI	**Cost C3**					
24	Managerial Cost				30092	99
25	**Cost C3 = (Cost C2 + Managerial Cost)**				33099.27	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		12.35	24700	
		b) Main Crop Sales Price (Rs.)			2000	
	By Product	e) Main Product (q)		12.35	12350	
		f) Main Crop Sales Price (Rs.)			1000	
b.	Gross Income (Rs.)				37050	
c.	Net Income (Rs.)				3950.73	
d.	Cost per Quintal (Rs./q.)				2680.10	
e.	Benefit Cost Ratio (BC Ratio)				1:1.12	

Cost of Cultivation of Cotton: The data regarding the cost of cultivation of Cotton in Nagalapur-1 micro-watershed is presented in Table 42. The results indicate that, the total cost of cultivation for Cotton was Rs. 29179.73. The gross income realized by the farmers was Rs. 80363.79. The net income from Cotton cultivation was Rs. 511847. Thus the benefit cost ratio was found to be 1:2.75.

Table 42. Cost of Cultivation of Cotton in Nagalapur-1 micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	37.89	5580.48	19.12
2	Bullock		Pairs/day	2.18	1660.70	5.69
3	Tractor		Hours	1.24	870.17	2.98
4	Machinery		Hours	0	0	0
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	291	6378.59	21.86
6	Seed Inter Crop		Kgs.	0	0	0
7	FYM		Quintal	0.96	2145.16	7.35
8	Fertilizer + micronutrients		Quintal	3.96	3290.82	11.28
9	Pesticides (PPC)		Kgs / liters	1.42	964.71	3.31
10	Irrigation		Number	1.81	136.77	0.47
11	Repairs			0	0	0
12	Msc. Charges (Marketing costs etc)			0	0	0
13	Depreciation charges			0	706	0.24
14	Land revenue and Taxes			0	2.35	01
II	**Cost B1**					
16	Interest on working capital				1533.86	5.26
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				22633.68	77.57
III	**Cost B2**					
18	Rental Value of Land				323.81	1.11
19	**Cost B2 = (Cost B1 + Rental value)**				22957.49	78.68
IV	**Cost C1**					
20	Family Human Labour			15.27	3566.68	12.22
21	**Cost C1 = (Cost B2 + Family Labour)**				26524.17	90.90
V	**Cost C2**					
22	Risk Premium				2.86	01
23	**Cost C2 = (Cost C1 + Risk Premium)**				265273	90.91
VI	**Cost C3**					
24	Managerial Cost				2652.70	99
25	**Cost C3 = (Cost C2 + Managerial Cost)**				29179.73	100
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		16.55	80363.79	
		b) Main Crop Sales Price (Rs.)			4857.14	
b.	Gross Income (Rs.)				80363.79	
c.	Net Income (Rs.)				511847	
d.	Cost per Quintal (Rs./q.)				1763.61	
e.	Benefit Cost Ratio (BC Ratio)				1:2.75	

Adequacy of fodder: The data regarding the adequacy of fodder in Nagalapur-1 micro-watershed is presented in Table 43. The results indicate that, 41.67 per cent of the households opined that dry fodder was adequate and 30.56 per cent of the households opined that green fodder was adequate.

Table 43. Adequacy of fodder in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Adequate-Dry Fodder	1	11.11	7	63.64	4	40	3	50	15	41.67
2	Adequate-Green Fodder	1	11.11	6	54.55	2	20	2	33.33	11	30.56

Annual gross income: The data regarding the annual gross income in Nagalapur-1 micro-watershed is presented in Table 44. The results indicate that the annual gross income was Rs. 121,055.56 marginal farmers, for small farmers it was Rs. 98,545.45 and for semi medium farmers it was Rs. 130,930 and medium farmers it was Rs. 161,166.67.

Table 44. Annual gross income in Nagalapur-1 micro-watershed

(Avg value in Rs.)

Sl.No.	Particulars	MF (9)	SF (11)	SMF (10)	MDF (6)	All (36)
1	Service/salary	33,333.33	0	25,000	0	15,277.78
2	Business	11,111.11	0	0	0	2,777.78
3	Wage	27,222.22	22,363.64	30,400	24,833.33	26,222.22
4	Agriculture	48,277.78	75,272.73	74,080	135,000	78,147.22
5	Dairy Farm	0	9099	1,450	1,333.33	902.78
6	Goat Farming	1,111.11	0	0	0	277.78
Income(Rs.)		121,055.56	98,545.45	130,930	161,166.67	123,605.56

Average annual expenditure: The data regarding the average annual expenditure in Nagalapur-1 micro-watershed is presented in Table 45. The results indicate that the average annual expenditure is Rs. 115,444.47. For marginal farmers it was Rs. 11,544.44, for small farmers it was Rs. 3,776.86, for semi medium farmers it was Rs. 20,332.22 and medium farmers it was Rs. 11,138.89.

Table 45. Average annual expenditure in Nagalapur-1 micro-watershed

(Avg value in Rs.)

Sl.No.	Particulars	MF (9)	SF (11)	SMF (10)	MDF (6)	All (36)
1	Service/salary	50,000	0	150,000	0	6,944.44
2	Business	20,000	0	0	0	555.56
3	Wage	10,000	8,000	17,222.22	7,666.67	10,250
4	Agriculture	21,900	32,545.45	33,600	57,166.67	34,888.89
5	Dairy Farm	0	1,000	2,500	2,000	250
6	Goat Farming	2,000	0	0	0	55.56
Total		103,900	41,545.45	203,322.22	66,833.33	415,6011
Average		11,544.44	3,776.86	20,332.22	11,138.89	115,444.47

Horticulture species grown: The data regarding horticulture species grown in Nagalapur-1 micro-watershed is presented in Table 46. The results indicate that, sampled households have grown 5 coconut, 22 lemon and 19 mango trees in their field.

Table 46. Horticulture species grown in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		F	B	F	B	F	B	F	B	F	B
1	Coconut	0	0	2	0	1	0	2	0	5	0
2	Lemon	0	0	20	0	0	0	2	0	22	0
3	Mango	2	0	4	0	7	0	6	0	19	0

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

Forest species grown: The data regarding forest species grown in Nagalapur-1 micro-watershed is presented in Table 47. The results indicate that, households have planted 9 Teak, 72 neem, 8 tamarind, 10 acacia, 4 Banyan and peepul trees in their field and also 1 neem trees in their backyard.

Table 47: Forest species grown in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		F	B	F	B	F	B	F	B	F	B
1	Teak	0	0	0	0	8	0	1	0	9	0
2	Neem	19	0	21	0	19	1	13	0	72	1
3	Tamarind	1	0	5	0	2	0	0	0	8	0
4	Acacia	2	0	0	0	8	0	0	0	10	0
5	Banyan	3	0	1	0	0	0	0	0	4	0
6	Peepul Tree	3	0	1	0	0	0	0	0	4	0

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

Average Additional investment capacity: The data regarding average additional investment capacity in Nagalapur-1 micro-watershed is presented in Table 48. The results indicated that, households have an average investment capacity of Rs. 11,361.11 for land development; households have an average investment capacity of Rs. 3,277.78 for irrigation facility, households have an average investment capacity of Rs. 2,583.33 for improved crop production, households have an average investment capacity of Rs. 1,055.56 for improved livestock management, households have an average investment capacity of Rs.166.67 for orchard development/ maintenance and households have an average investment capacity of Rs.55.56 for purchase of farm machinery.

Table 48: Source of funds for additional investment capacity in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)	SF (11)	SMF(10)	MDF(6)	All (36)
1	Land development	11,444.44	4,818.18	23,300	3,333.33	11,361.11
2	Irrigation facility	0	1,454.55	8,400	3,000	3,277.78
3	Improved crop production	1,444.44	2,000	4,800	1,666.67	2,583.33
4	Improved livestock management	444.44	1,454.55	1,000	1,333.33	1,055.56
5	Orchard development/ maintenance	0	272.73	300	0	166.67
6	Purchase of Farm machinery	222.22	0	0	0	55.56

Source of additional investment: The data regarding source of funds for additional investment in Nagalapur-1 micro-watershed is presented in Table 49. The results indicated that government subsidy was the source of additional investment for 2.78 per

cent for irrigation facility and improved livestock management. Loan from bank was the source of additional investment for 2.78 per cent for land development and 5.56 per cent for irrigation facility and improved livestock management. Own funds was the source of additional investment for 22.22 per cent for land development, 5.56 per cent for irrigation facility and 5.56 per cent for improved crop production. Soft loan was the source of additional investment for 22.22 per cent for land development, 19.44 per cent for irrigation facility, 16.67 per cent for improved crop production and 5.56 per cent for improved livestock management.

Table 49: Source of funds for additional investment capacity in Nagalapur-1 micro – watershed

Sl.No	Item	Land development		Irrigation facility		Improved crop production		Improved livestock management	
		N	%	N	%	N	%	N	%
1	Government subsidy	0	0	1	2.78	0	0	1	2.78
2	Loan from bank	1	2.78	2	5.56	2	5.56	0	0
3	Own funds	8	22.22	2	5.56	5	13.89	4	11.11
4	Soft loan	8	22.22	7	19.44	6	16.67	2	5.56

Marketing of the agricultural produce: The data regarding marketing of the agricultural produce in Nagalapur-1 micro-watershed is presented in Table 50. The results indicated that, Cotton was sold to the extent of 100 per cent, green gram was sold to the extent of 100 per cent, groundnut was sold to the extent of 78.96 per cent, paddy was sold to the extent of 82.86 per cent, Sorghum was sold to the extent of 80 per cent, and red gram to the extent of 88.24 per cent.

Table 50. Marketing of the agricultural produce in Nagalapur-1 micro-watershed

Sl.No	Crops	Output obtained (q)	Output retained (q)	Output sold (q)	Output sold (%)	Avg. Price obtained (Rs/q)
1	Cotton	181	0	181	100	4857.14
2	Greengram	18	0	18	100	5000
3	Groundnut	385	81	304	78.96	3841.18
4	Paddy	105	18	87	82.86	1650
5	Redgram	34	4	30	88.24	4175
6	Sorghum	10	2	8	80	2000

Table 51. Marketing Channels used for sale of agricultural produce in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Local/village Merchant	5	55.56	10	90.91	7	70	6	100	28	77.78
2	Regulated Market	2	22.22	0	0	1	10	0	0	3	8.33
3	Cooperative marketing Society	1	11.11	1	99	2	20	0	0	4	11.11

Marketing Channels used for sale of agricultural produce: The data regarding marketing channels used for sale of agricultural produce in Nagalapur-1 micro-watershed is presented in Table 51. The results indicated that, about 77.78 per cent of the farmers

sold their produce to local/village merchants, 8.33per cent of the farmers sold their produce to regulated markets and 11.11 per cent of the farmers ssold their produce to cooperative marketing society.

Mode of transport of agricultural produce: The data regarding mode of transport of agricultural produce in Nagalapur-1 micro-watershed is presented in Table 52. The results indicated that, 13.89 per cent of the households have used head load, 5.56 per cent of the households have used Cart, 58.33 per cent of the households used tractor and 19.44 per cent of the households used truck as a mode of transportation.

Table 52. Mode of transport of agricultural produce in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Head Load	2	22.22	1	99	1	10	1	16.67	5	13.89
2	Cart	0	0	2	18.18	0	0	0	0	2	5.56
3	Tractor	4	44.44	6	54.55	7	70	4	66.67	21	58.33
4	Truck	2	22.22	2	18.18	2	20	1	16.67	7	19.44

Incidence of soil and water erosion problems: The data regarding incidence of soil and water erosion problems in Nagalapur-1 micro-watershed is presented in Table 53. The results indicated that, 94.44 per cent of the households have experienced soil and water erosion problems in the farm.

Table 53. Incidence of soil and water erosion problems in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Soil and water erosion problems in the farm	8	88.89	11	100	9	90	6	100	34	94.44

Interest shown towards soil testing: The data regarding Interest shown towards soil testing in Nagalapur-1 micro-watershed is presented in Table 54. The results indicated that, 91.67 per cent have shown interest in soil test.

Table 54. Interest shown towards soil testing in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Interest in soil test	8	88.89	11	100	8	80	6	100	33	91.67

Table 55. Soil and water conservation practices and structures adopted in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Field Bunding	0	0	1	99	5	50	1	16.67	7	19.44
2	Summer Ploughing	1	11.11	1	99	0	0	0	0	2	5.56
3	Dead Furrow	1	11.11	1	99	0	0	0	0	2	5.56

Soil and water conservation practices and structures adopted: The data regarding incidence of soil and water conservation practices and structures adopted in Nagalapur-1 micro-watershed is presented in Table 55. The results indicated that, 19.44 per cent of the population adopted field bunding, 5.56 per cent of the population adopted summer ploughing and dead furrow.

Status of soil and water conservation structures: The data regarding incidence of soil and water conservation practices and structures in Nagalapur-1 micro-watershed is presented in Table 56. The results indicated that, condition of field bunding was 71.43 per cent of good, 14.29 per cent were slightly damaged and severely damaged.

Table 56. Soil and water conservation structures in Nagalapur-1 micro-watershed

Sl.No	Item	Good		Slightly Damaged		Severely Damaged	
		N	%	N	%	N	%
1	Field Bunding	5	71.43	1	14.29	1	14.29

Agencies involved in soil conservation structures: The data regarding incidence of soil and water conservation practices and structures in Nagalapur-1 micro-watershed is presented in Table 57. The results indicated that, 8.33 per cent of the population involved own and government agency, 2.78 per cent of the population involved farmer's organization in the micro watershed.

Table 57. Agencies involved in soil conservation structures in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Own	0	0	1	99	1	10	1	16.67	3	8.33
2	Govt.	0	0	0	0	3	30	0	0	3	8.33
3	Farmer organization	0	0	0	0	1	10	0	0	1	2.78

Usage pattern of fuel for domestic use: The data regarding usage pattern of fuel for domestic use in Nagalapur-1 micro-watershed is presented in Table 58. The results indicated that, 80.56 per cent of the households used firewood and 33.33 per cent of them used LPG as a source of fuel.

Table 58. Usage pattern of fuel for domestic use in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Fire Wood	8	88.89	9	81.82	8	80	4	66.67	29	80.56
2	LPG	3	33.33	4	36.36	2	20	3	50	12	33.33

Source of drinking water: The data regarding source of drinking water in Nagalapur-1 micro-watershed is presented in Table 59. The results indicated that, piped supply was the major source of drinking water for 36.11 per cent of the households in the micro watershed and Bore Well was the source of drinking water for 41.67 per cent of the households in the micro watershed.

Table 59. Source of drinking water in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Piped supply	4	44.44	3	27.27	3	30	3	50	13	36.11
2	Bore Well	3	33.33	7	63.64	4	40	1	16.67	15	41.67

Source of light: The data regarding source of light in Nagalapur-1 micro-watershed is presented in Table 60. The results indicated that, Electricity was the major source of light for 100 per cent of the households in micro watershed.

Table 60. Source of light in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Electricity	9	100	11	100	10	100	6	100	36	100

Existence of Sanitary toilet facility: The data regarding existence of sanitary toilet facilit**y** in Nagalapur-1 micro-watershed is presented in Table 61. The results indicated that, 38.89 per cent of the households possess sanitary toilet facility.

Table 61. Existence of Sanitary toilet facility in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Sanitary toilet facility	4	44.44	3	27.27	1	10	6	100	14	38.89

Possession of PDS card: The data regarding possession of PDS card in Nagalapur-1 micro-watershed is presented in Table 62. The results indicated that, 100 per cent of the sampled households possessed BPL cards.

Table 62. Possession of PDS card in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	BPL	9	100	11	100	10	100	6	100	36	100

Participation in NREGA program: The data regarding participation in NREGA programme in Nagalapur-1 micro-watershed is presented in Table 63. The results indicated that, 80.56 per cent of the households participated in NREGA programme.

Table 63. Participation in NREGA programme in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Participation in NREGA programme	8	88.89	9	81.82	7	70	5	83.33	29	80.56

Adequacy of food items: The data regarding adequacy of food items in Nagalapur-1 micro-watershed is presented in Table 64. The results indicated that, cereals and pulses were adequate for 100 per cent of the households, oilseeds were adequate for 8.33 per cent, vegetables and meat were adequate for 41.67 per cent, fruits were adequate for 11.11 per cent, Milk were adequate for 52.78 per cent and Egg were adequate for 47.22 per cent.

Table 64. Adequacy of food items in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Cereals	9	100	11	100	10	100	6	100	36	100
2	Pulses	9	100	11	100	10	100	6	100	36	100
3	Oilseed	1	11.11	0	0	2	20	0	0	3	8.33
4	Vegetables	2	22.22	5	45.45	5	50	3	50	15	41.67
5	Fruits	1	11.11	0	0	2	20	1	16.67	4	11.11
6	Milk	4	44.44	5	45.45	7	70	3	50	19	52.78
7	Egg	4	44.44	5	45.45	5	50	3	50	17	47.22
8	Meat	3	33.33	5	45.45	4	40	3	50	15	41.67

Response on Inadequacy of food items: The data regarding inadequacy of food items in Nagalapur-1 micro-watershed is presented in Table 65. The results indicated that, oilseeds and fruits were inadequate for 88.89 per cent of the households, vegetables and meat were inadequate for 58.33 per cent, milk were inadequate for 44.44 per cent, Egg were inadequate for 52.78 per cent.

Table 65. Response on Inadequacy of food items in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF (10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Oilseed	7	77.78	11	100	8	80	6	100	32	88.89
2	Vegetables	7	77.78	6	54.55	5	50	3	50	21	58.33
3	Fruits	8	88.89	11	100	8	80	5	83.33	32	88.89
4	Milk	5	55.56	6	54.55	2	20	3	50	16	44.44
5	Egg	5	55.56	6	54.55	5	50	3	50	19	52.78
6	Meat	6	66.67	6	54.55	6	60	3	50	21	58.33

Table 66. Farming constraints Experienced in Nagalapur-1 micro-watershed

Sl.No.	Particulars	MF (9)		SF (11)		SMF(10)		MDF (6)		All (36)	
		N	%	N	%	N	%	N	%	N	%
1	Lower fertility status of the soil	7	77.78	9	81.82	8	80	5	83.33	29	80.56
2	Wild animal menace on farm field	7	77.78	11	100	9	90	6	100	33	91.67
3	Frequent incidence of pest and diseases	9	100	10	90.91	8	80	6	100	33	91.67
4	Inadequacy of irrigation water	7	77.78	7	63.64	7	70	5	83.33	26	72.22
5	High cost of Fertilizers and plant protection chemicals	6	66.67	8	72.73	9	90	3	50	26	72.22
6	High rate of interest on credit	6	66.67	7	63.64	7	70	7	116.67	27	75
7	Low price for the agricultural commodities	8	88.89	11	100	10	100	6	100	35	97.22
8	Lack of marketing facilities in the area	9	100	11	100	8	80	5	83.33	33	91.67
9	Inadequate extension services	3	33.33	4	36.36	2	20	1	16.67	10	27.78
10	Lack of transport for safe transport of the Agril produce to the market.	8	88.89	10	90.91	10	100	6	100	34	94.44
11	Less rainfall	1	11.11	0	0	1	10	0	0	2	5.56
12	Source of Agri-technology information	0	0	0	0	1	10	0	0	1	2.78

Farming constraints: The data regarding farming constraints experienced by households in Nagalapur-1 micro-watershed is presented in Table 66. The results indicated that, lower fertility status of the soil was the constraint experienced by 80.56 per cent of the households, Wild animal menace on farm field, frequent incidence of pest and diseases and Lack of marketing facilities in the area (91.67%), inadequacy of irrigation water and high cost of fertilizers and plant protection chemicals (72.22%), High rate of interest on credit (75%), Low price for the agricultural commodities (97.22%), Inadequate extension services (27.78%), Lack of transport for safe transport of the Agril produce to the market (94.44%), Less rainfall (5.56%) and Source of Agri-technology information (2.78%).

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

The data indicated that there were 105 (61.40%) men and 66 (38.6%) women among the sampled households. The average family size of landless farmers' was 4.8, marginal farmers' was 4.3, small farmers' was 5.2 and semi medium farmers' was 4.5. The data indicated that, 39 (22.81%) people were in 0-15 years of age, 72 (42.11%) were in 16-35 years of age, 53 (30.99%) were in 36-60 years of age and 7 (49%) were above 61 years of age.

The results indicated that Nagalapur-1 had 50.88 per cent illiterates, 11.70 per cent of them had Primary School, 72 per cent of them had Middle School, 16.37 per cent of them had High School, 4.68 per cent of them had PUC education, 1.75 per cent of them had diploma education and 2.34 per cent of them had Degree education.

The results indicate that, 5.56 per cent of household heads were practicing agriculture, 91.67 per cent of the household heads were agricultural labourers and 2.78 per cent of the household's heads were trade and business. The results indicate that agriculture was the major occupation for 6.43 per cent of the household members, 65.50 per cent were agricultural labourers, 0.58 per cent were in Household trade and business and dairy farm, 18.71 per cent were students, 2.92 per cent were housewives and 5.26 per cent were children.

The results show that, 0.58 per cent of the population in the micro watershed has participated in grama panchayat and 99.42 per cent of the population in the micro watershed has not participated in local institution. The results indicate that 52.78 per cent of the households possess Thatched house, 16.67 per cent of the households possess Katcha house, 22.22 per cent of them possess pucca/RCC house and 8.33 per cent of the households possess semi pacca house.

The results show that 72.22 per cent of the households possess TV, 58.33 per cent of the households possess mixer/grinder, 2.78 per cent of the households possess refrigerator and car/four wheeler, 41.67 per cent of the households possess motor cycle and 91.67 per cent of the households possess mobile phones. The results show that the average value of television was Rs. 8,830, mixer/grinder was Rs. 1,976, refrigerator was

Rs. 1,500, Motor Cycle was Rs. 37,366, car/four wheeler was Rs. 30,000 and mobile phone was Rs. 2,774.

About 27.78 per cent of the households possess bullock cart, 38.89 per cent of them possess plough, 2.78 per cent of them possess seed/ fertilizer drill, irrigation pump and thresher, 11.11 per cent of them possess Sprayer and sprinkler and 69.44 per cent of them possess weeder. The results show that the average value of bullock cart was Rs. 14,580, plough was Rs. 20,078, seed/ fertilizer drill was Rs. 4,000, irrigation pump was Rs. 7,000, Sprayer was Rs. 3,800, sprinkler was Rs. 4,300, weeder was Rs. 252 and the average value of thresher was Rs. 180.

The results indicate that, 41.67 per cent of the households possess bullocks, 25 per cent of the households possess local cow, 2.78 per cent of the households possess cross breed cow and sheep, 11.11 per cent of the households possess buffalo and 5.56 per cent of the households possess goat.

The results indicate that, average own labour men available in the micro watershed was 2.19, average own labour (women) available was 1.5, average hired labour (men) available was 10.61 and average hired labour (women) available was 9.42. The results indicate that, 88.89 per cent of the households opined that the hired labour was adequate and 11.11 per cent of the households opined that the hired labour was inadequate.

The results show that, 2.34 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, 50 per cent of the population has migrated for the purpose of job/wage/work and business.

The results indicate that, households of the Nagalapur-1 micro-watershed possess 14.31 ha (28.80%) of dry land, 34.98 ha (70.38%) of irrigated land and 0.4 ha (0.81%) of permanent fallow land. Marginal farmers possess 5.9 ha (87.68%) of dry land, 0.42 ha (6.31%) of irrigated land and o.4 ha (6.1%) of permanent fallow land. Small farmers possess 7.39 ha (59.9%) of dry land and 40.91 ha (40.91%) of irrigated land. Semi medium farmers possess 12 ha (6.86%) of dry land and 13.79 ha (93.14%) of irrigated land. Medium farmers possess 15.64 ha (100%) of irrigated land.

The results indicate that, the average value of dry land was Rs. 583,107.15, the average value of irrigated land was Rs. 429,813.72 and the average value of permanent fallow land was Rs. 1,235,000. In case of marginal famers, the average land value was Rs. 550,205.61 for dry land, Rs. 1,881,904.85 for irrigated land and Rs. 1,235,000 for permanent fallow land. In case of small famers, the average land value was Rs. 554,296.67 for dry land and Rs. 671,683.80 for irrigated land. In case of semi medium famers, the average land value was Rs. 984,063.75 for dry land and Rs. 489,216.55 for

irrigated land. Medium farmers, the average land value was Rs. 258,822.77 for irrigated land.

The results indicate that, there were 19 de-functioning and 23 functioning bore wells in the micro watershed. The results indicate that, bore well was the major irrigation source in the micro water shed for 63.89per cent of the farmers. The results indicate that, the depth of bore well was found to be 4.68 meters.

The results indicate that, marginal, small, semi medium and medium farmers had an irrigated area of 0.43 ha, 3.40 ha, 13.41 ha and 12 ha respectively. The results indicate that, farmers have grown groundnut (21.08 ha), cotton (10.48ha), paddy and red gram (3.79 ha), green garm (22 ha), sorghum (0.81ha) and sweet potato (42.1 ha). The results indicate that, the cropping intensity in Nagalapur-1 micro-watershed was found to be 97.14 per cent.

The results indicate that, 88.89 per cent of the households have bank account and 41.67 per cent of the households have savings. The results indicate that, 27.78 per cent of the households have availed credit from different sources. The results indicate that, 46.67 per cent of the households have borrowed from commercial bank, 6.67 per cent of the households have borrowed from cooperative, grameena bank and money lender and 20 per cent of the households have borrowed from friends/relatives. The results indicate that, the average credit amount borrowed by households in micro-watershed was Rs, 61,666.67. The results indicate that, 90 per cent of the households borrowed from institutional sources for the purpose of agricultural production and 10 per cent of the households from institutional sources for purpose of social functions like marriage. The results indicate that, 75 per cent of the households borrowed from private sources for the purpose of agricultural production and 25 per cent of the households from private sources for the purpose of household consumption. The results indicated that 10 per cent of the households partially paid their loan borrowed from institutional sources and 90 per cent of the households not paid their loan borrowed from institutional sources. The results indicated that 100 per cent of the households did not repay their loan borrowed from private sources. The results indicate that, 60 per cent opined that the loan amount borrowed from helped to perform timely agricultural operations and 30 per cent opined that the loan amount borrowed from higher rate of interest and 10 per cent opined that the loan amount borrowed from forced to sell the produce at low price to repay loan in time. The results indicate that, around 100 per cent opined that the loan amount was adequate to fulfil the requirement.

The results indicate that, the total cost of cultivation for red gram was Rs. 52355.73. The gross income realized by the farmers was Rs. 49965.31. The net income from red gram cultivation was Rs. -2390.43. Thus the benefit cost ratio was found to be 1:0.95. The total cost of cultivation for green gram was Rs. 21594.32. The gross income realized by the farmers was Rs. 43225. The net income from green gram cultivation was

Rs. 21630.68. Thus the benefit cost ratio was found to be 1:2. The total cost of cultivation for paddy was Rs. 50657.82. The gross income realized by the farmers was Rs. 41762.31. The net income from paddy cultivation was Rs. -8895.51. Thus the benefit cost ratio was found to be 1:0.82. The total cost of cultivation for groundnut was Rs. 487325. The gross income realized by the farmers was Rs. 76436.68. The net income from groundnut cultivation was Rs. 27704.63. Thus the benefit cost ratio was found to be 1:1.57. The total cost of cultivation for Sorghum was Rs. 33099.27. The gross income realized by the farmers was Rs. 37050. The net income from Sorghum cultivation was Rs. 3950.73. Thus the benefit cost ratio was found to be 1:1.12. The total cost of cultivation for Cotton was Rs. 29179.73. The gross income realized by the farmers was Rs. 80363.79. The net income from Cotton cultivation was Rs. 511847. Thus the benefit cost ratio was found to be 1:2.75.

The results indicate that, 41.67 per cent of the households opined that dry fodder was adequate and 30.56 per cent of the households opined that green fodder was adequate.

The results indicate that the annual gross income was Rs. 121,055.56 marginal farmers, for small farmers it was Rs. 98,545.45 and for semi medium farmers it was Rs. 130,930 and medium farmers it was Rs. 161,166.67. The results indicate that the average annual expenditure is Rs. 115,444.47. For marginal farmers it was Rs. 11,544.44, for small farmers it was Rs. 3,776.86, for semi medium farmers it was Rs. 20,332.22 and medium farmers it was Rs. 11,138.89.

The results indicate that, sampled households have grown 5 coconut, 22 lemon and 19 mango trees in their field. The results indicate that, households have planted 9 Teak, 72 neem, 8 tamarind, 10 acacia, 4 Banyan and peepul trees in their field and also 1 neem trees in their backyard.

The results indicated that, households have an average investment capacity of Rs. 11,361.11 for land development; households have an average investment capacity of Rs. 3,277.78 for irrigation facility, households have an average investment capacity of Rs. 2,583.33 for improved crop production, households have an average investment capacity of Rs. 1,055.56 for improved livestock management, households have an average investment capacity of Rs.166.67 for orchard development/ maintenance and households have an average investment capacity of Rs.55.56 for purchase of farm machinery.

The results indicated that government subsidy was the source of additional investment for 2.78 per cent for irrigation facility and improved livestock management. Loan from bank was the source of additional investment for 2.78 per cent for land development and 5.56 per cent for irrigation facility and improved livestock management. Own funds was the source of additional investment for 22.22 per cent for land development, 5.56 per cent for irrigation facility and 5.56 per cent for improved crop

production. Soft loan was the source of additional investment for 22.22 per cent for land development, 19.44 per cent for irrigation facility, 16.67 per cent for improved crop production and 5.56 per cent for improved livestock management.

The results indicated that, Cotton was sold to the extent of 72.38 per cent, green gram was sold to the extent of 100 per cent, groundnut was sold to the extent of 78.96 per cent, paddy was sold to the extent of 82.86 per cent, Sorghum was sold to the extent of 80 per cent, and red gram to the extent of 88.24 per cent.

The results indicated that, about 77.78 per cent of the farmers sold their produce to local/village merchants, 8.33per cent of the farmers sold their produce to regulated markets and 11.11 per cent of the farmers sold their produce to cooperative marketing society. The results indicated that, 13.89 per cent of the households have used head load, 5.56 per cent of the households have used Cart, 58.33 per cent of the households used tractor and 19.44 per cent of the households used truck as a mode of transportation.

The results indicated that, 94.44 per cent of the households have experienced soil and water erosion problems in the farm. The results indicated that, 91.67 per cent have shown interest in soil test.

The results indicated that, 19.44 per cent of the population adopted field bunding, 5.56 per cent of the population adopted summer ploughing and dead furrow. The results indicated that, condition of field bunding was 71.43 per cent of good, 14.29 per cent were slightly damaged and severely damaged. The results indicated that, 8.33 per cent of the population involved own and government agency, 2.78 per cent of the population involved farmer's organization in the micro watershed.

The results indicated that, 80.56 per cent of the households used firewood and 33.33 per cent of them used LPG as a source of fuel. The results indicated that, piped supply was the major source of drinking water for 36.11 per cent of the households in the micro watershed and Bore Well was the source of drinking water for 41.67 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, 38.89 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, 80.56 per cent of the households participated in NREGA programme.

The results indicated that, cereals and pulses were adequate for 100 per cent of the households, oilseeds were adequate for 8.33 per cent, vegetables and meat were adequate for 41.67 per cent, fruits were adequate for 11.11 per cent, Milk were adequate for 52.78 per cent and Egg were adequate for 47.22 per cent.

The results indicated that, oilseeds and fruits were inadequate for 88.89 per cent of the households, vegetables and meat were inadequate for 58.33 per cent, milk were inadequate for 44.44 per cent, Egg were inadequate for 52.78 per cent.

The results indicated that, lower fertility status of the soil was the constraint experienced by 80.56 per cent of the households, Wild animal menace on farm field, frequent incidence of pest and diseases and Lack of marketing facilities in the area (91.67%), inadequacy of irrigation water and high cost of fertilizers and plant protection chemicals (72.22%), High rate of interest on credit (75%), Low price for the agricultural commodities (97.22%), Inadequate extension services (27.78%), Lack of transport for safe transport of the Agril produce to the market (94.44%), Less rainfall (5.56%) and Source of Agri-technology information (2.78%).