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

NARAYANAPUR (4D2D6D2a) MICROWATERSHED

Gurumitkal Hobli, Yadgir Taluk and District, Karnataka

Karnataka Watershed Development Project – II

SUJALA – III

World Bank funded Project

ICAR – NATIONAL BUREAU OF SOIL SURVEY AND LAND USE PLANNING

ICAR - NBSS & LUP

WATERSHED DEVELOPMENT DEPARTMENT
GOVT. OF KARNATAKA, BANGALORE

About ICAR - NBSS&LUP

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

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

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TO OBTAIN COPIES,

Please write to:
Director, ICAR - NBSS & LUP,

Amaravati Road, NAGPUR - 440 033, India

Phone : (0712) 2500386, 2500664, 2500545 (O)

Telefax : 0712-2522534

E-Mail : director@nbsslup.ernet.in

Website URL : nbsslup.in

Or

Head, Regional Centre, ICAR - NBSS&LUP, Hebbal, Bangalore - 560 024

Phone : (080) 23412242, 23510350 (O)

Telefax : 080-23510350

E-Mail : nbssrcb@gmail.com

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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 Honageri-2Microwatershed, 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: 20-08-2019

S.K. SINGH
Director, ICAR - NBSS&LUP Nagpur

Contributors

Dr. Rajendra Hegde Principal Scientist, Head & Project Leader, Sujala-III Project ICAR-NBSS&LUP, Regional Centre, Bangalore	**Dr. S.K.Singh** Director, ICAR-NBSS&LUP Coordinator, Sujala-III Project Nagpur
Soil Survey, Mapping & Report Preparation	
Dr. B.A. Dhanorkar	Sh. R.S. Reddy
Dr. K.V. Niranjana	Sh. Somashekar T N
	Smt. Chaitra, S.P.
	Dr. Gopali bardhan
	Ms. Arpitha G.M
	Dr. Mahendra kumar M.B
Field Work	
Sh. C.BacheGowda	Sh. Mahesh, D.B.
Sh. Somashekar	Sh. Ashok S Sindagi
Sh. M. Jayaramaiah	Sh. Veerabhadrappa B.
Sh. Paramesha, K.	Sh. Shankarappa
Sh. B. M. Narayana Reddy	Sh. Anand
	Sh. Arun N Kambar.
	Sh Kamalesh Awate
	Sh. Sharaan Kumar Huppar
	Sh. Yogesh H.N.
	Sh. Kalaveerachari R Kammar
GIS Work	
Dr. S.Srinivas	Sh. A.G.Devendra Prasad
Sh. D.H.Venkatesh	Sh. Prakashanaik, M.K.
Smt.K.Sujatha	Sh. Abhijith Sastry, N.S.
Smt. K.V.Archana	Sh. Sudip Kumar Suklabaidya
Sh. N. Maddileti	Sh. Avinash, K.N.
	Sh. Amar Suputhra, S
	Sh. Deepak, M.J.
	Smt. K.Karunya Lakshmi
	Ms. Seema, K.V.
	Ms. A. Rajab Nisha

Laboratory Analysis	
Dr. K.M.Nair	Ms. Steffi Peter
Smt. Arti Koyal	Ms. Thara, V.R
Smt. Parvathy	Ms. Roopa, G.
	Ms. Swati, H.
	Sh. Shantaveera Swami
	Ms. Shwetha, N.K.
	Smt. Ishrat Haji
	Ms. P. Pavan Kumari
	Ms. Padmaja
	Ms. Veena, M.
Socio-Economic Analysis	
Dr. S.C. Ramesh Kumar	Sh. M.K. Prakashanaik
	Ms. Shraddha Hegde
	Sh. Vijay Kumar Lamani
	Ms. Sowmya K.B
	Mrs. Prathibha, D.G
	Sh. Rajendra,D
Soil & Water Conservation	
Sh. Sunil P. Maske	
Watershed Development Department, GoK, Bangalore	
Sh. Rajeev Ranjan IFS Project Director & Commissioner, WDD	Dr. A. Natarajan NRM Consultant, Sujala-III Project
Dr. S.D. Pathak IFS Executive Director & Chief Conservator of Forests, WDD	

PART-A

LAND RESOURCE INVENTORY

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EXECUTIVE SUMMARY

The land resource inventory of Narayanapur 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 709 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 610 ha in the microwatershed is covered by soils, about 8 ha covered by forest 2 ha covered by rock outcrops and 89 ha by others (Habitation and water body). The salient findings from the land resource inventory are summarized briefly below.

- *The soils belong to 7 soil series and 21 soil phases (management units) and 5 land management units.*
- *The length of crop growing period is about 120-150 days starting from 1st week of June to 4th week of October.*
- *From the master soil map, several interpretative and thematic maps like land capability, soil depth, surface soil texture, soil gravelliness, available water capacity, soil slope and soil erosion were generated.*
- *Soil fertility status maps for macro and micronutrients were generated based on the surface soil samples collected at every 320 m grid interval.*
- *Land suitability for growing 29 major agricultural and horticultural crops was assessed and maps showing the degree of suitability along with constraints were generated.*
- *An area about 610 ha (86%) in the microwatershed is suitable for agriculture.*
- *About 40 per cent area of the microwatershed has soils that are deep to very deep (100->150 cm) 16 per cent soils are moderately deep (75-100), whereas 17 per cent soils are moderately shallow (50 -75 cm) and 12 per cent soils are shallow (25 -50 cm) in the microwatershed.*
- *About 35 percent soils are loamy and 51 per cent area is clayey soils at the surface.*
- *An area of about 27 percent soils are non gravelly (<15%), about 48 percent soils are gravelly (15-35%) and 12 percent soils are very gravelly (35-60%) in the microwatershed.*
- *About 40 per cent area of the microwatershed is very high (>200 mm/m) in available water capacity, 11 percent soils are medium (51-100), 35 per cent soils are low (51-100 mm/m) and very low (<50 mm/m) available water capacity.*

- *About 81 per cent area of the microwatershed has very gently sloping (1-3% slope) land and 5 per cent is nearly level (0-1% slope) lands.*
- *An area of about 4 per cent area is severely (e3) eroded. About 77 per cent area is moderately (e2) eroded and 5 percent soils are slightly eroded (e1).*
- *An area of about 2 per cent soils are slightly acid (pH 6.0-6.5), about 77 per cent soil are neutral (pH 6.5-7.3) and 7 per cent soil are slightly alkaline (pH 7.3-7.8).soils.*
- *The Electrical Conductivity (EC) of the soils in the entire cultivated area of the microwatershed is dominantly <2 ds^{m-1} indicating that the soils are non-saline.*
- *Entire cultivated area of the microwatershed is high (>0.75%) in organic carbon content.*
- *An area of 36 percent is low (<23 kg/ha) in available phosphorus, about 14 percent is medium (23-57 kg/ha) and 36 percent soils are high (>57 kg/ha) in available phosphorus.*
- *An area of about 52 percent is medium (145-337kg/ha) and 34 percent is high (>337kg/ha) in available potassium.*
- *An area of about 67 percent is medium (10-20ppm) and 19 percent area is low (<10ppm) in available sulphur*
- *Available boron is low (<0.5 ppm) in a maximum area of about 59 per cent and medium (0.5-1.0 ppm) in about 26 per cent soils.*
- *Available iron content is sufficient (>4.5ppm) in the entire cultivated area of the microwatershed.*
- *Available manganese and copper are sufficient in all soils of the microwatershed.*
- *Available zinc is deficient (<0.6 ppm) in an area of about 51 per cent and sufficient (>0.6 ppm) in 35 percent in 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	*275(39)*	*244(34)*	*Guava*	-	*269(38)*
Maize	-	*520(73)*	*Sapota*	-	*113(16)*
Bajra	-	*519(73)*	*Pomegranate*	-	*395(56)*
Groundnut	-	*113(16)*	*Musambi*	*127(18)*	*269(38)*
Sunflower	*119(17)*	*276(39)*	*Lime*	*127(18)*	*269(38)*
Redgram	-	*396(56)*	*Amla*	-	*519(73)*
Bengal gram	*282(40)*	*161(23)*	*Cashew*	-	-
Cotton	*282(40)*	*161(23)*	*Jackfruit*	-	*113(16)*
Chilli	-	*356(50)*	*Jamun*	-	*282(40)*
Tomato	-	*356(50)*	*Custard apple*	*186(26)*	*334(47)*
Drumstick	-	*396(56)*	*Tamarind*	-	*282(40)*
Brinjal	-	*519(73)*	*Mulberry*	-	*113(16)*
Onion	*21(3)*	*215(30)*	*Marigold*	-	*520(73)*
Bhendi	*21(3)*	*497(69)*	*Chrysanthemum*	-	*520(73)*
Mango	-	-	*Bhendi*	*21(3)*	*497(69)*

- *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, fiber 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 submarginal lands, field bunds and also in the hillocks, mounds and ridges. This would help in not only supplementing the farm income but also provide fodder and fuel to 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 Narayanapur 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 Narayanapur microwatershed is located in the northern part of Karnataka in Yadgir Taluk & District, Karnataka State (Fig.2.1). It comprises parts of Gurumitkal and Narayanapura villages. It lies between 16^0 51' and 16^0 53' North latitudes and 77^0 22' and 77^0 24' East longitudes, covering an area of about 709 ha, It is about 41 km northeast of Yadgir town and is surrounded by Gurumitkal on the southeast, north and northwest and Narayanapura on the southeast and southern part of the microwatershed.

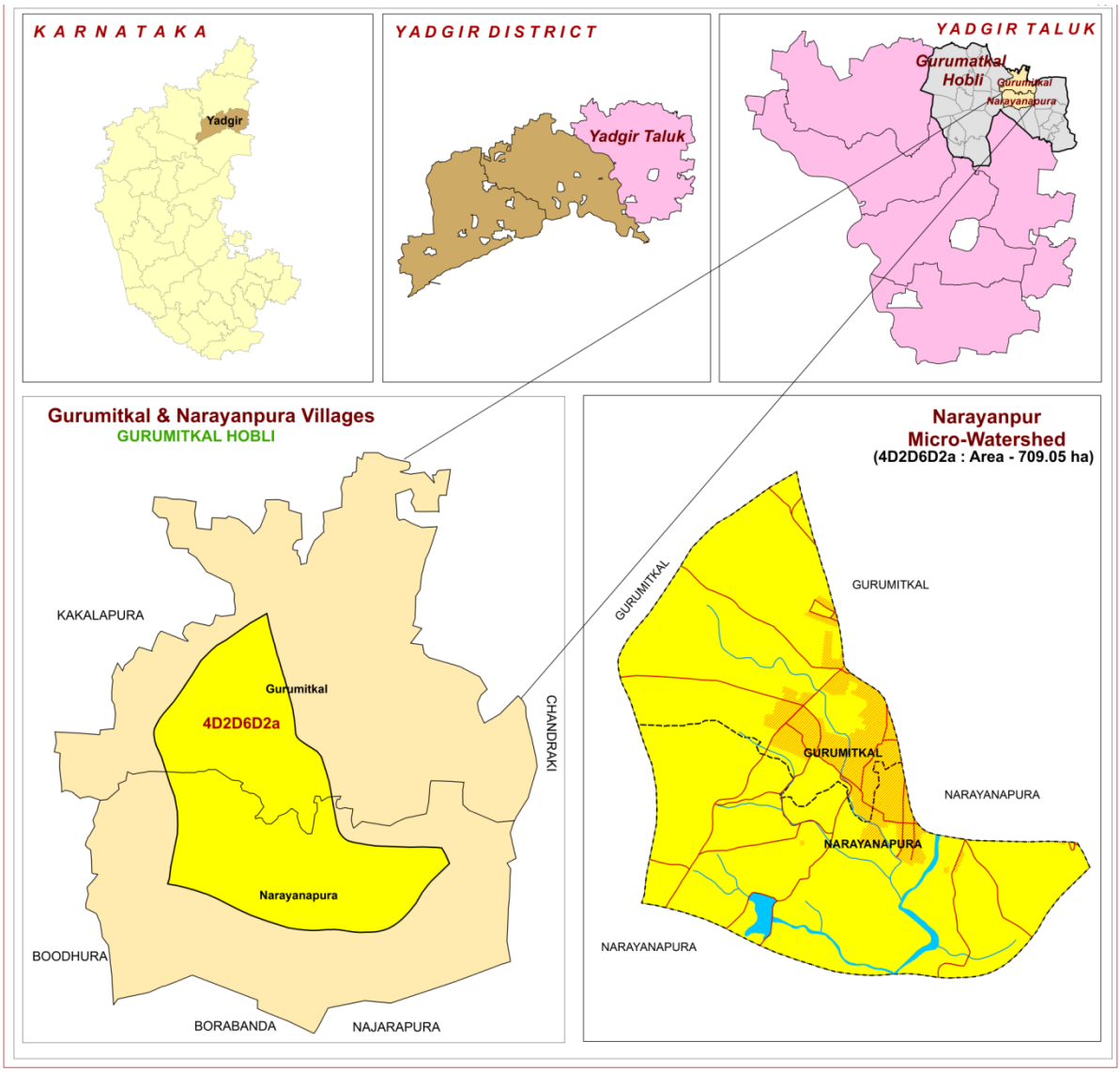

Fig.2.1 Location map of Narayanapur Microwatershed

2.2 Geology

Major rock formations observed in the microwatershed is granite gneiss (Figs.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 is highly weathered, fractured and fissured upto a depth of about 10 m. Dolerite dykes and quartz veins are common with variable width and found to occur in Narayanapur microwatershed.

Fig.2.2 Granite and granite gneiss rocks

2.3 Physiography

Physiographically, the area has been identified as granite gneiss 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 546-629 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 29.5^0C and 10^0C respectively. During peak summer, temperature shoots up to 45^0C. 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**		

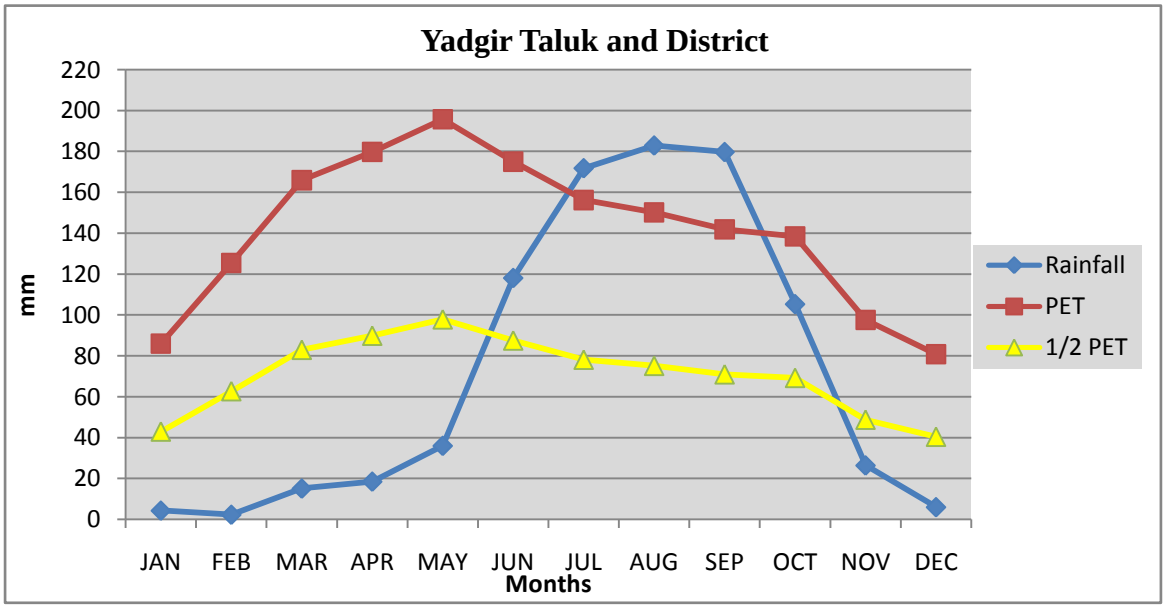

Fig 2.3 Rainfall distribution in Yadgir Taluk, Yadgir District

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 Narayanapur Microwatershed

2.7 Land Utilization

About 72 per cent area (Table 2.2) in Yadgir district is cultivated at present. An area of about 2 per cent is permanently under pasture, 20 per cent under current fallows and 6 per cent under non-agricultural land and 5 per cent under currently barren. Forests occupy an area of about 7 per cent and the tree cover is in a very poor state. Most of the mounds, ridges and bouldery areas have very poor vegetative cover. Major crops grown in the area are sorghum, maize, cotton, sunflower, groundnut, red gram, mango, pomegranate, marigold and sapota. 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 Narayanapur microwatershed is presented in Fig.2.5. The location of wells in the Narayanapur microwatershed is shown in fig. 2.6. The

different crops and cropping systems adopted in the microwatershed are presented in Figures 2.7 a & b.

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

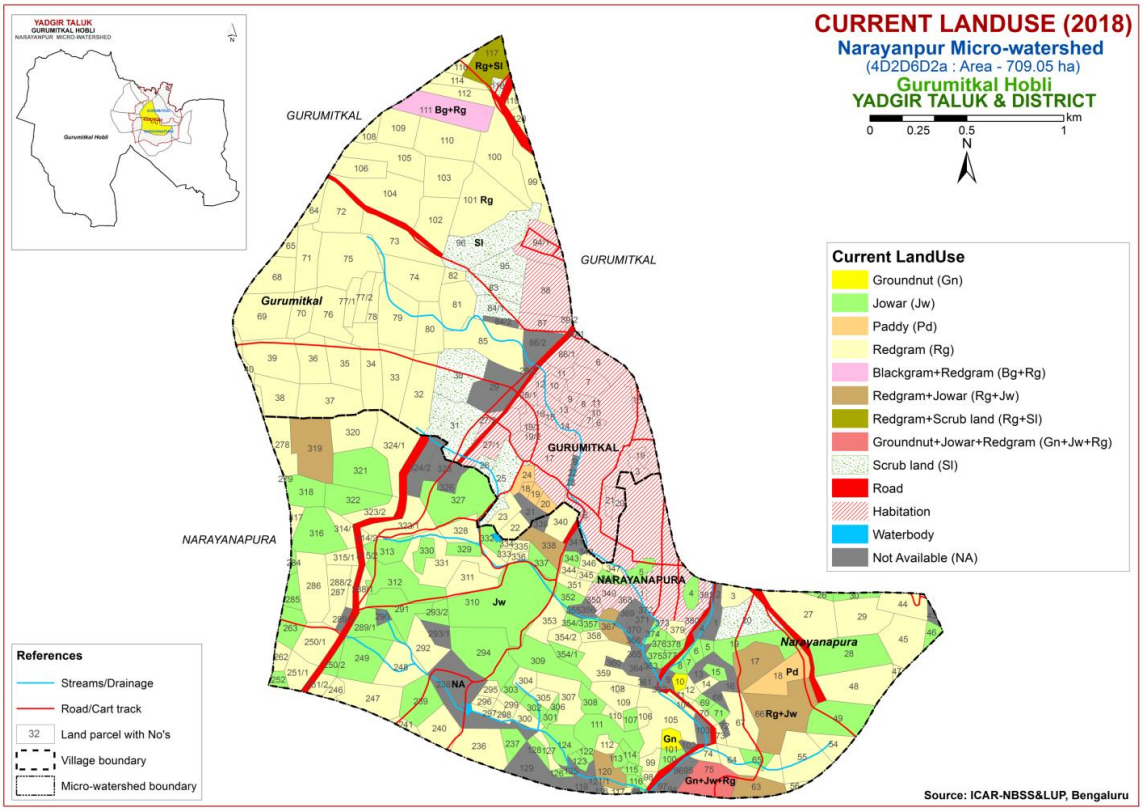

Fig.2.5 Current Land Use map of Narayanapur Microwatershed

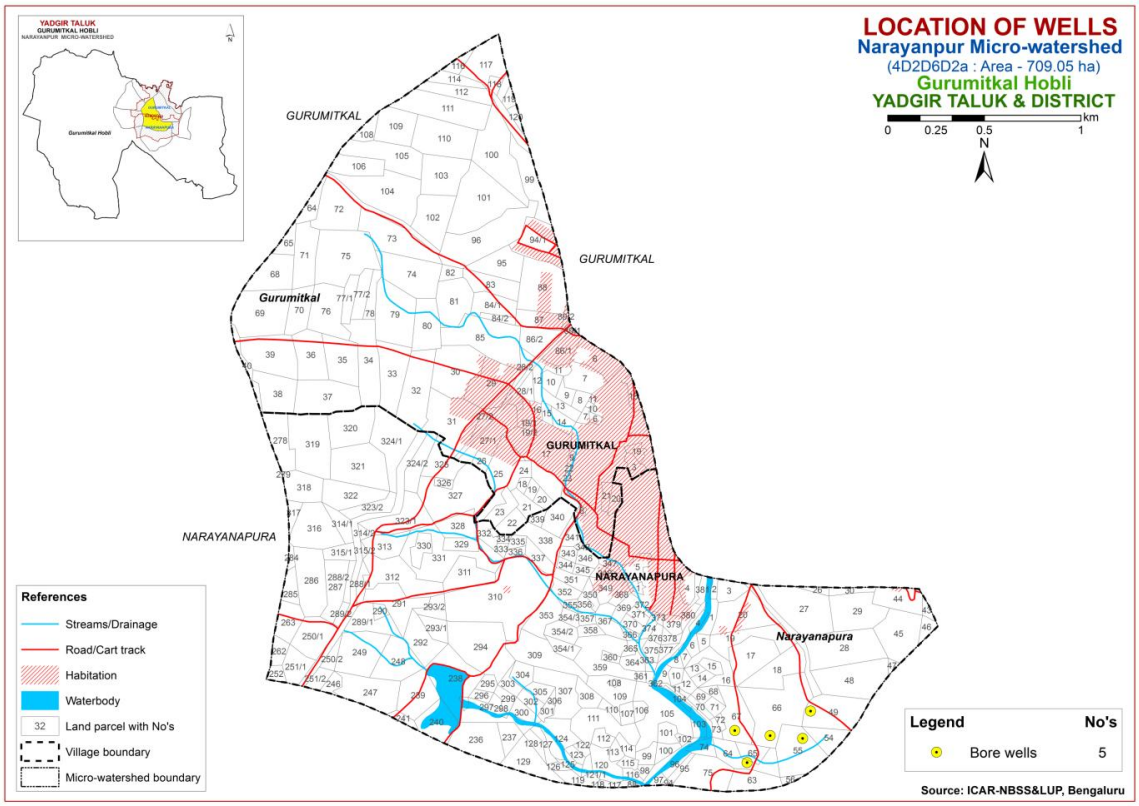

Fig.2.6 Location of wells map of Narayanapur Microwatershed.

Fig. 2.7 a. Different Crops and Cropping Systems in Narayanapur Microwatershed

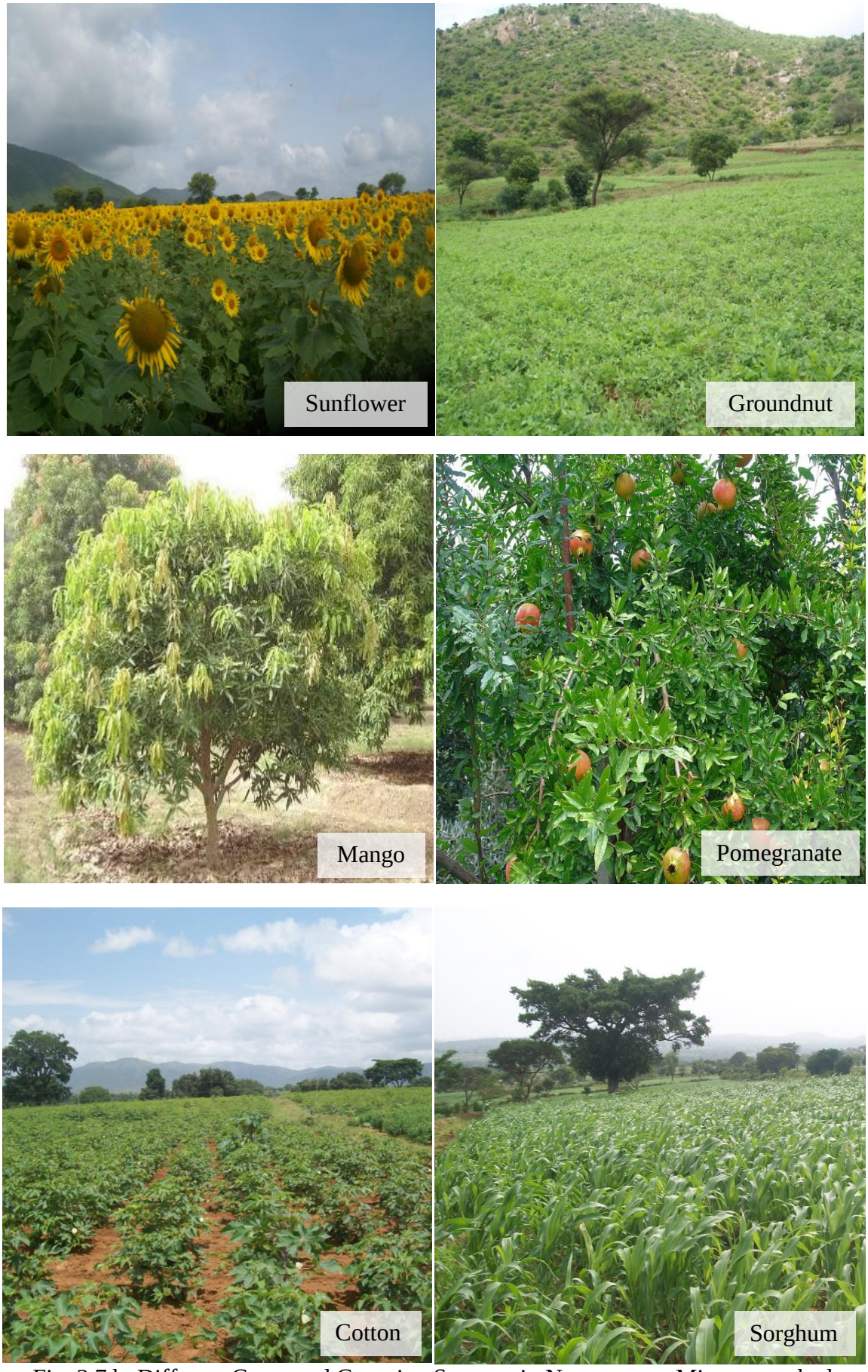

Fig. 2.7 b. Different Crops and Cropping Systems in Narayanapur Microwatershed

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 Narayanapur 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 709 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 and IRS satellite imagery map as base supplied by KSRSAC. The cadastral map shows field boundaries with their survey numbers, location of tanks, streams and other permanent features of the area (Fig. 3.1). Apart from the cadastral map, remote sensing data products from Cartosat-1 and LISS IV merged at the scale of 1:7920 were used in conjunction with the cadastral map to identify the landscapes, landforms and other surface features. The imagery helped in the identification and delineation of boundaries between hills, uplands and lowlands, water bodies, forest and vegetated areas, roads, habitations and other cultural features of the area (Fig. 3.2). The cadastral map was overlaid on the satellite imagery (Fig. 3.3) that helps to identify the parcel boundaries and other permanent features. Apart from cadastral maps and images, toposheets of the area (1:50,000 scale) were also used for initial traversing, identification of geology and landforms, drainage features, present land use and also for selection of transects in the microwatershed.

3.2 Image Interpretation for Physiography

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

Image Interpretation Legend for Physiography

G- Granite Gneiss Landscape

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

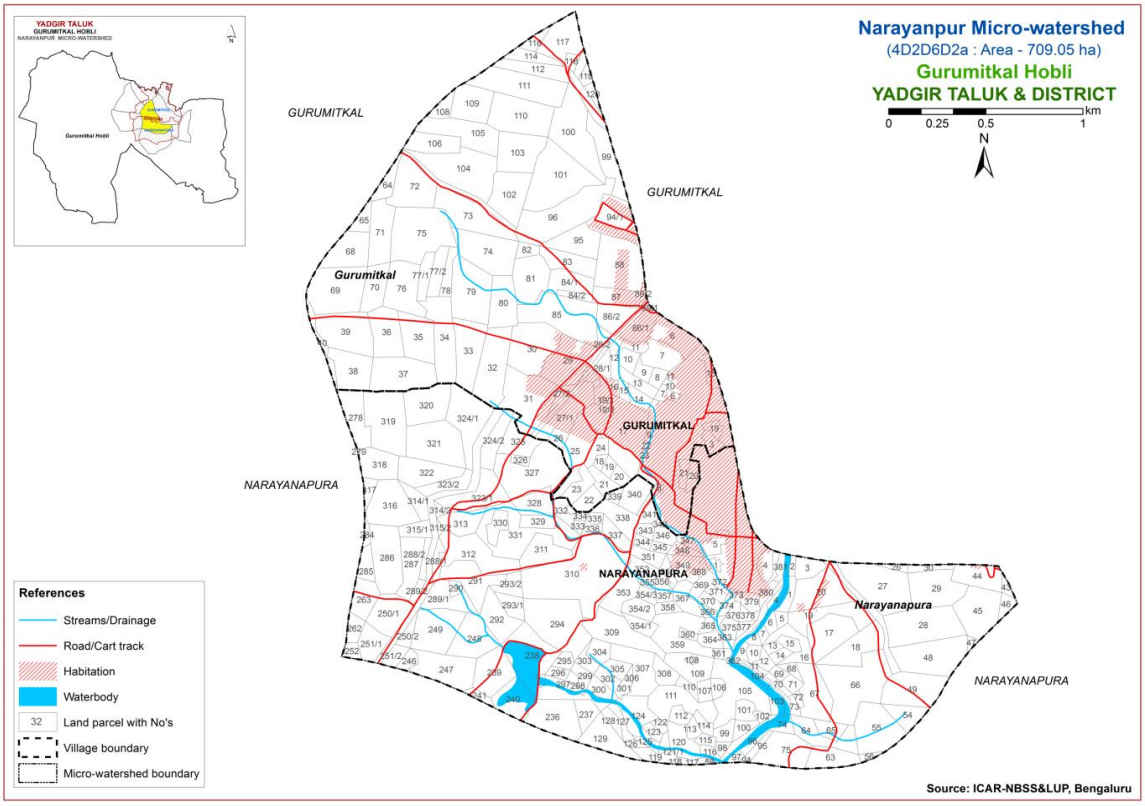

Fig 3.1 Scanned and Digitized Cadastral map of Narayanapur Microwatershed

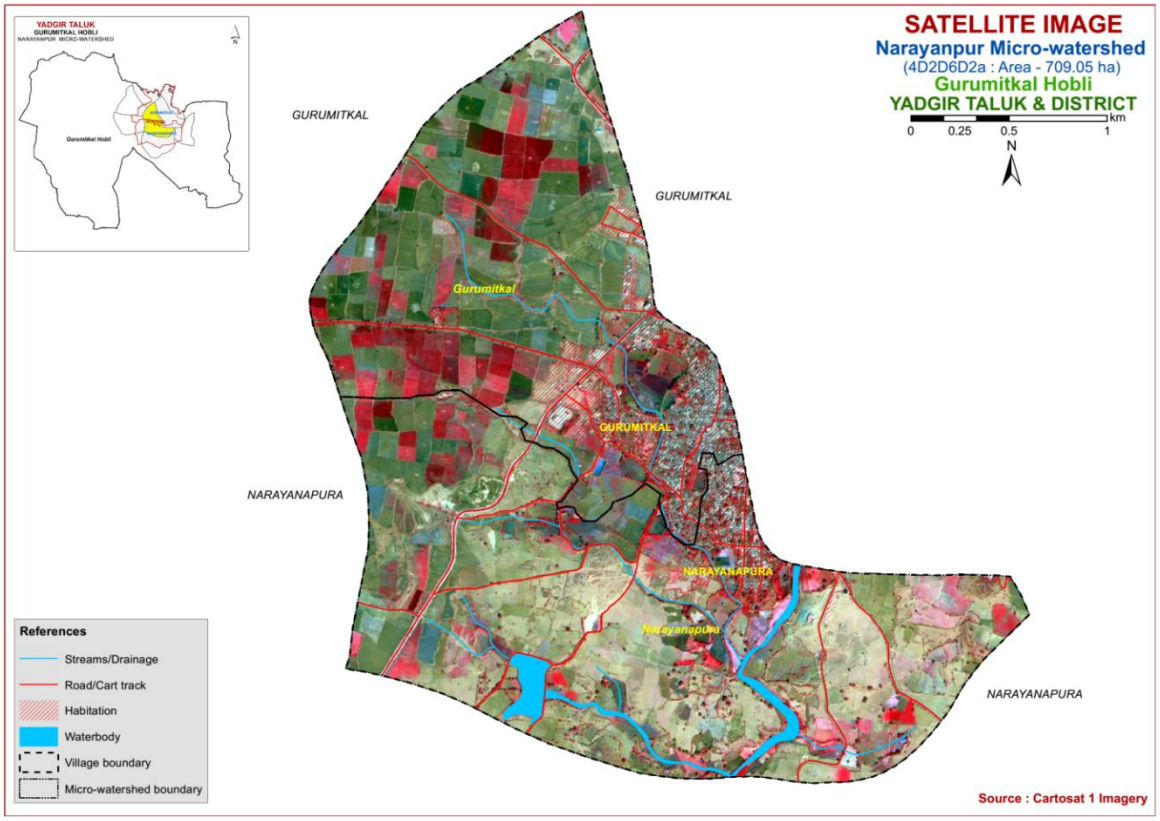

Fig.3.2 Satellite Image of Narayanapur Microwatershed

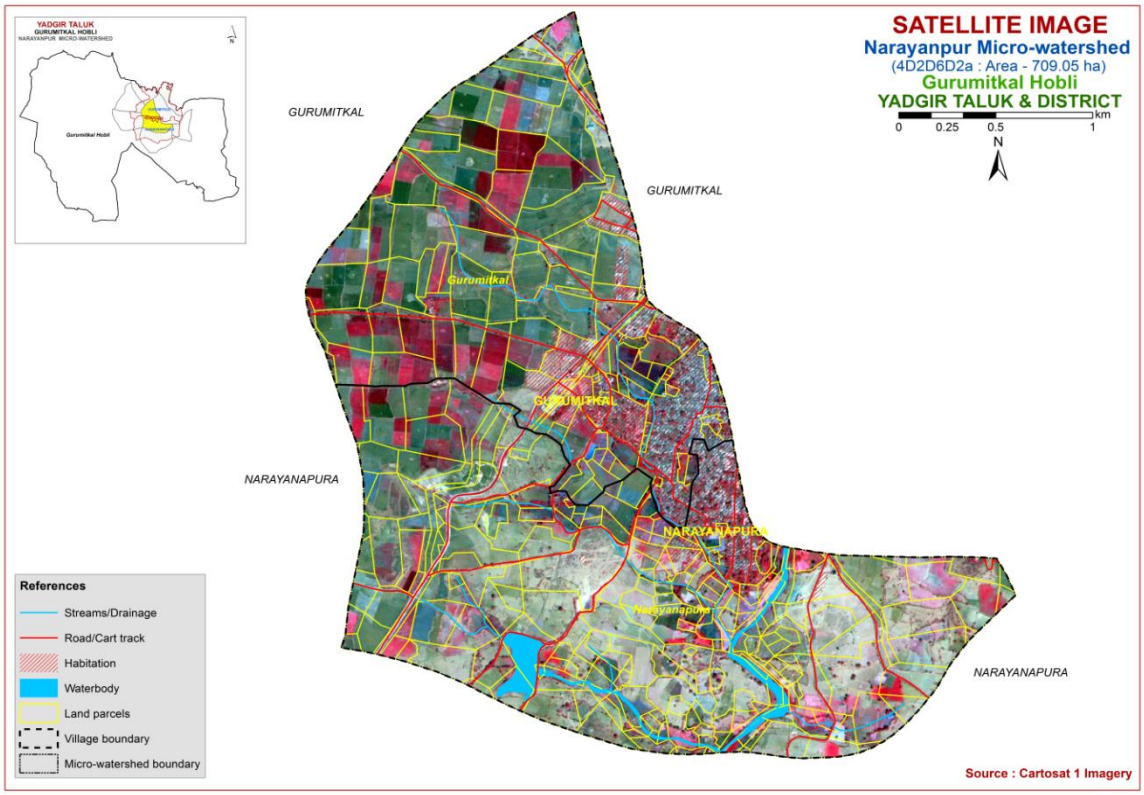

Fig.3.3 Cadastral map overlaid on IRS PAN+LISS IV merged imagery of Narayanapur Microwatershed

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).

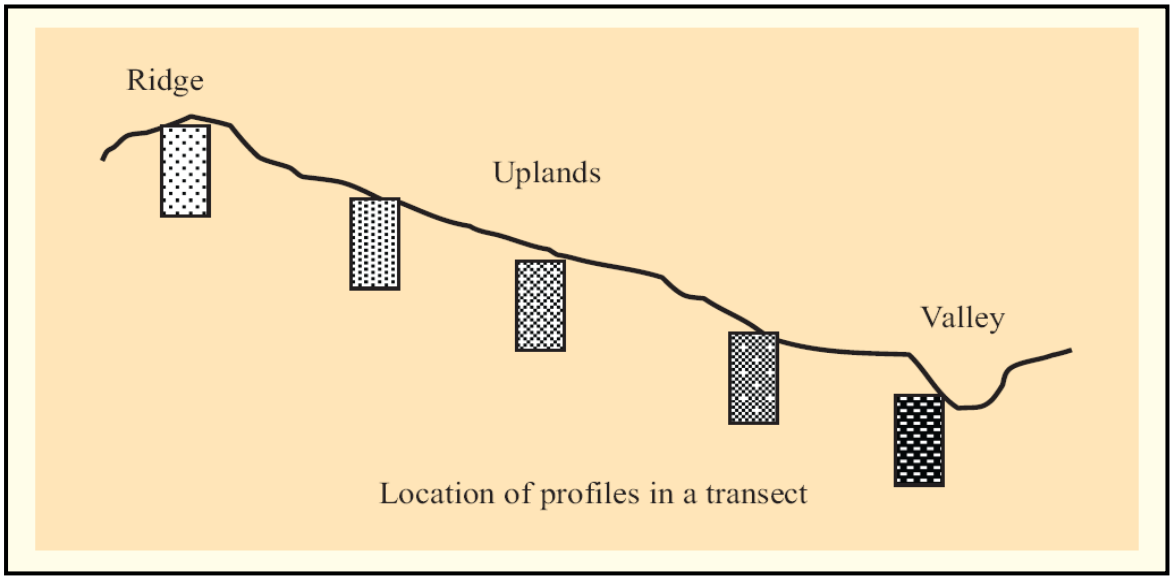

Fig: 3.4. Location of profiles in a transect

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 upto 200 cm or to the depth limited by rock or hard substratum and studied in detail for all their morphological and physical characteristics. The soil and site characteristics were recorded for all profile sites on a standard proforma as per the guidelines given in USDA Soil Survey Manual (Soil Survey Staff, 2012). Apart from the transect study, profiles were also studied at random, almost like in a grid pattern, outside the transect areas.

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

nature of substratum etc, were used as the major differentiating characteristics for identifying soil series occurring in the area. The differentiating characteristics used for identifying the soil series are given in Table 3.1. Based on the above characteristics, 7 soil series were identified in the Narayanapur 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**	**Calcareous-ness**
Soil of Granite and Granite Gneiss Landscape							
1	BDL (Badiyala)	25-50	7.5YR2.5/3,2.5/2,3/3 10YR 3/4,4/3	sl	<15	Ap-Bw	e
2	JNK (Jinkera)	50-75	10YR 3/1,3/2 7.5YR ¾	scl	<15	Ap-Bw	e
3	GWD (Gowdagera)	75-100	10YR 3/1,3/2,4/2	scl	<15	Ap-Bw	es
4	HSL (Hosalli)	75-100	10YR 5/4,4/4,4/6	sc	<15	Ap-Bw	e
5	NGP/NPR (Naglapur)	100-150	10YR 3/2,3/1,2/1	c	<15	Ap-Bss	es
6	ANR (Anur)	100-150	10YR 4/3,4/1	c	<15	Ap-Bw	es
7	BMN (Bhimanahalli)	>150	10YR 3/1	c	<15	Ap-Bss	es

3.4 Soil Mapping

The area under each soil series was further separated into soil phases and their boundaries delineated on the cadastral map based on the variations observed in the texture of the surface soil, slope, erosion, presence of gravel, stoniness etc. A soil phase is a subdivision of soil series based mostly on surface features that affect its use and management. The soil mapping units are shown on the map (Fig.3.5) in the form of symbols. During the survey many profile pits, few minipits and a few auger bores representing different landforms occurring in the microwatershed were studied. In addition to the profile study, spot observations in the form of minipits, road cuts, terrace cuts etc., were studied to validate the soil boundaries on the soil map.

The soil map shows the geographic distribution of 21 mapping units representing 7 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 21 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 21 soil phases identified and mapped in the microwatershed were grouped into 5 Land Management Units (LMU's) for the purpose of preparing a Proposed Crop Plan for sustained development of the microwatershed. The database (soil phases) generated under LRI was utilized for identifying Land Management Units (LMU's) based on the management needs. One or more than one soil site characteristic having influence on the management have been choosen for identification and delineation of LMUs. For Narayanapur microwatershed, five soil and site characteristics, namely soil depth, soil texture,slope, erosion and gravel content have been considered for defining LMUs. The land use classes 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 2017 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 Narayanapur Microwatershed

*Soil map unit No.	Soil Series	Soil Phase	Mapping Unit Description	Area in ha (%)
Soils of Granite Gneiss Landscape				
	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		**86 (12.14)**
174		BDLcB2g2	Sandy loam surface, slope 1-3%, moderate erosion, very gravelly (35-60%)	28 (3.96)
4		BDLhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	5 (0.71)
162		BDLhB2g1	Sandy clay loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	45 (6.29)
5		BDLiB2	Sandy clay surface, slope 1-3%, moderate erosion	0.36 (0.05)
6		BDLiB3	Sandy clay surface, slope 1-3%, severe erosion	8 (1.13)
	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		**124 (17.46)**
21		JNKcB2g1	Sandy loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	39 (5.51)

110		JNKhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	45 (6.36)
22		JNKiB2	Sandy clay surface, slope 1-3%, moderate erosion	22 (3.09)
24		JNKiB3g1	Sandy clay surface, slope 1-3%, severe erosion, gravelly (15-35%)	18 (2.5)
152		JNKmB2	Clay surface, slope 1-3%, moderate erosion	0.01 (0.002)
	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		**4 (0.55)**
150		GWDiB2g1	Sandy clay surface, slope 1-3%, moderate erosion, gravelly (15-35%)	4 (0.55)
	HSL	Hosalli soils are moderately deep (75-100 cm), moderately well drained, have yellowish brown to dark yellowish brown, slightly calcareous sandy clay soils occurring on very gently sloping uplands under cultivation		**113 (15.89)**
160		HSLcB2g1	Sandy loam surface, slope 1-3%, moderate erosion, gravelly (15-35%)	8 (1.06)
176		HSLcB2g2	Sandy loam surface, slope 1-3%, moderate erosion, very gravelly (35-60%)	54 (7.61)
33		HSLiB2	Sandy clay surface, slope 1-3%, moderate erosion	37 (5.26)
173		HSLiB2g1	Sandy clay surface, slope 1-3%, moderate erosion, gravelly (15-35%)	14 (1.96)
	NGP	Nagalapur soils are deep (100-150 cm), moderately well drained, have very dark gray to very dark grayish brown, black calcareous cracking clay soils occurring on very gently sloping uplands under cultivation		**163 (22.99)**
49		NGPmB2	Clay surface, slope 1-3%, moderate erosion	7 (1.04)
146		NGPmB2g1	Clay surface, slope 1-3%, moderate erosion, gravelly (15-35%)	156 (21.95)
	ANR	Anur soils are deep (100-150 cm), moderately well drained, have dark gray to brown, calcareous cracking clay soils occurring on very gently sloping uplands under cultivation		**27 (3.88)**
53		ANRhB2	Sandy clay loam surface, slope 1-3%, moderate erosion	27 (3.88)
	BMN	Bhimanahalli soils are very deep (>150 cm), moderately well drained, have very dark gray, calcareous cracking clay black soils occurring on very gently sloping uplands under cultivation		**92 (12.98)**
159		BMNmA1	Clay surface, slope 0-1%, slight erosion	34 (4.85)
62		BMNmB2	Clay surface, slope 1-3%, moderate erosion	1 (0.13)
63		BMNmB2g1	Clay surface, slope 1-3%, moderate erosion, gravelly (15-35%)	57 (8.0)
900		Forest		**8 (1.16)**
1000	Others	Habitation and Water body		**89 (12.62)**

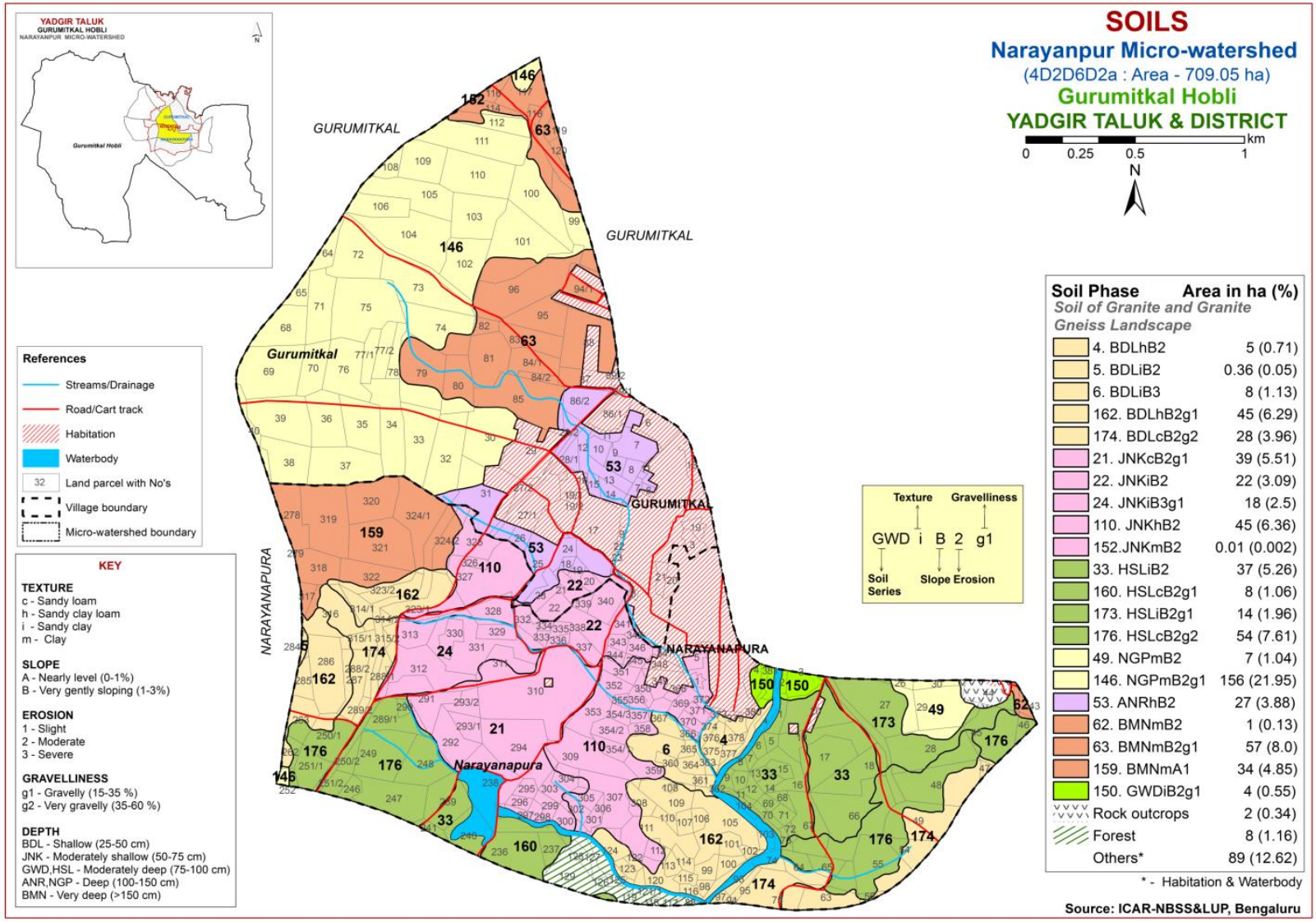

Fig 3.5 Soil Phase or Management Units - Narayanapur Microwatershed

Chapter 4

THE SOILS

Detailed information pertaining to the nature, extent and their distribution of different kinds of soils occurring in Narayanapur microwatershed is provided in this chapter. The microwatershed area has been identified as granite gneiss landscape based on geology. In all, 7 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 7 soil series identified followed by 21 soil phases (management units) mapped under each series are furnished below. The physical and chemical characteristics of soil series identified in Narayanapur 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, 7 soil series are identified and mapped. Of these, NGP series occupies maximum area of 163 ha (23%) followed by JNK 124 ha (17%), HSL 113 ha (16%), BMN 92 ha (13%), BDL 86 ha (12%), ANR 27 ha (4%) and GWD 4 ha (<1%). Brief description of each series identified and number of soil phases mapped is given below.

4.1.1 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). Five phases were identified and mapped.

Landscape and Soil Profile characteristics of Badiyala (BDL) Series

4.1.2 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). Five phases were identified and mapped.

Landscape and Soil Profile characteristics of Jinkera (JNK) Series

4.1.3 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). One phase was identified and mapped.

Landscape and Soil Profile characteristics of Gowdagera (GWD) Series

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

The thickness of the solum ranges from 76 to 100 cm. The thickness of A horizon ranges from 6 to 15 cm. Its colour is in hue 10 YR and 7.5 YR with value 3 to 5 and chroma 2 to 4. Its texture varies from loamy sand to sandy loam and sandy clay loam. The thickness of B horizon ranges from 62 to 93 cm. Its colour is in hue 10 YR with value 3 to 4 and chroma 2 to 4. Its texture varies from sandy clay loam to sandy clay and clay and is slightly calcareous. The available water capacity is medium (101-150 mm/m). Four phases were identified and mapped.

Landscape and Soil Profile characteristics of Hosalli (HSL) Series

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

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

Landscape and Soil Profile characteristics of Naglapur (NGP) Series

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

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

Landscape and Soil Profile characteristics of Anur (ANR) Series

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

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

Landscape and Soil Profile characteristics of Bhimanahalli (BMN) Series

Table: 4.1 Physical and Chemical Characteristics of Soil Series identified in Narayanapur microwatershed

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
28-52	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
28-52	9.41	-	-	0.364	1.10	3.60	-	-	0.16	1.39	-	11.10	0.75	100	12.52

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
38-50	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
38-50	8.40	-	-	0.195	0.25	1.17	-	-	0.07	0.19	-	15.90	0.79	100	1.23

Contd…

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

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

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

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

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

Contd…

Soil Series: Hosalli (HSL) **Pedon:** R-3

Location: $16^0$46'60.3"N $77^0$05'47.6"E, Mudhanala village, Yadgir hobli, Yadgir taluk and district

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

Depth (cm)	Horizon	Size class and particle diameter (mm)								Coarse fragments w/w (%)	Texture Class (USDA)	% Moisture	
		Total			Sand								
		Sand (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)			1/3 Bar	15 Bar
0-10	Ap	88.43	5.15	6.42	5.69	6.40	36.04	27.31	12.99	-	s	7.40	2.74
10-30	Bw1	58.47	7.24	34.29	4.26	9.37	19.91	19.28	5.64	-	scl	19.07	11.57
30-50	Bw2	51.43	12.67	35.90	3.49	8.89	16.72	15.87	6.46	<15	sc	21.64	12.44
50-90	Bw3	49.89	13.64	36.47	2.43	2.96	20.61	16.17	7.72	<15	sc	21.12	12.95

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-10	7.16	-	-	0.117	0.48	0.00	2.83	1.50	0.15	0.29	4.76	4.90	0.76	97	5.94
10-30	6.91	-	-	0.040	0.36	0.00	10.64	5.43	0.10	0.26	16.43	17.80	0.52	92	1.47
30-50	8.17	-	-	0.182	0.24	1.43	-	-	0.12	0.22	-	19.90	0.55	100	1.08
50-90	8.60	-	-	0.148	0.20	4.29	-	-	0.13	0.16	-	19.70	0.54	100	0.81

Contd…

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

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

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

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

Depth (cm)	pH (1:2.5)			E.C. (1:2.5)	O.C.	$CaCO_3$	Exchangeable bases					CEC	CEC/ Clay	Base saturation	ESP
							Ca	Mg	K	Na	Total				
	Water	$CaCl_2$	M KCl	dS m^{-1}	%	%	cmol kg^{-1}							%	%
0-10	7.42	-	-	0.24	0.84	1.30	-	-	0.84	0.15	-	67.10	0.92	100	0.22
10-35	8.52	-	-	0.291	0.64	2.86	-	-	0.17	0.29	-	65.20	0.87	100	0.45
35-60	7.89	-	-	0.134	0.62	4.55	-	-	0.15	0.20	-	65.00	0.90	100	0.30
60-102	8.68	-	-	0.213	0.54	8.32	-	-	0.17	0.15	-	64.10	0.88	100	0.24

Contd…

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

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

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

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

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

Contd…

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

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

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

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

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

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 and, soil and water conservation measures and structures needed thus helping to maintain good soil health for sustained crop production. The various interpretative and thematic maps generated are described below.

5.1 Land Capability Classification

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

Soil Characteristics: Depth, texture, gravelliness, calcareousness.

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

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

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

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

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

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

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

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

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

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

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

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

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

The 21 soil map units identified in the Narayanapur microwatershed are grouped under 3 land capability classes and 4 subclasses. An area about 610 ha (86%) in the microwatershed is suitable for agriculture (fig. 5.1).About 2 ha covered by rock outcrops, about 8 ha covered by forest and others (habitation and water body) cover an area of about 89 ha in the microwatershed.

Good lands (Class II) cover an area of 505 ha (71%) and are distributed in the major part of the microwatershed. They have minor limitations of soil, drainage and erosion. Moderately good lands (Class III) cover an area of about 96 ha (14%) and are distributed in the southwestern and southern part of the microwatershed. They have moderate limitations of soil and erosion. Fairly good lands (Class IV) cover about 8 ha (1%) and are distributed in the southern part of the microwatershed. They have very severe limitations of soil and erosion.

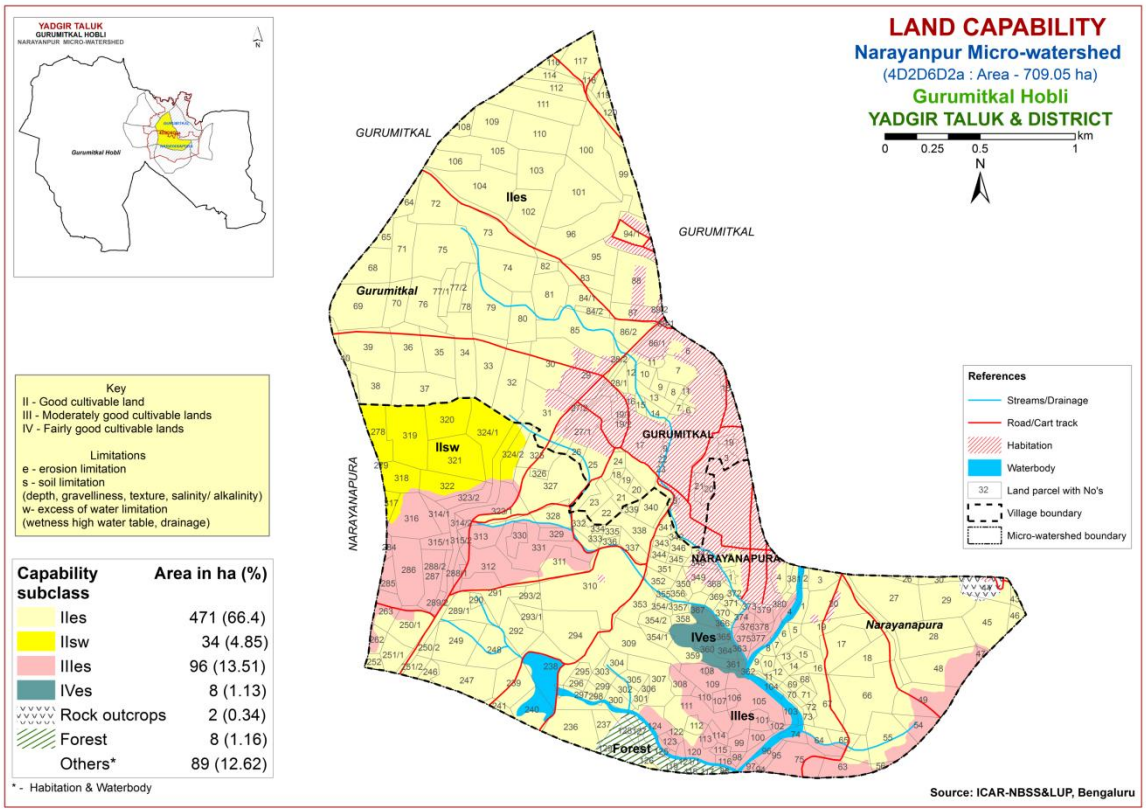

Fig. 5.1 Land Capability map of Narayanapur Microwatershed

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.

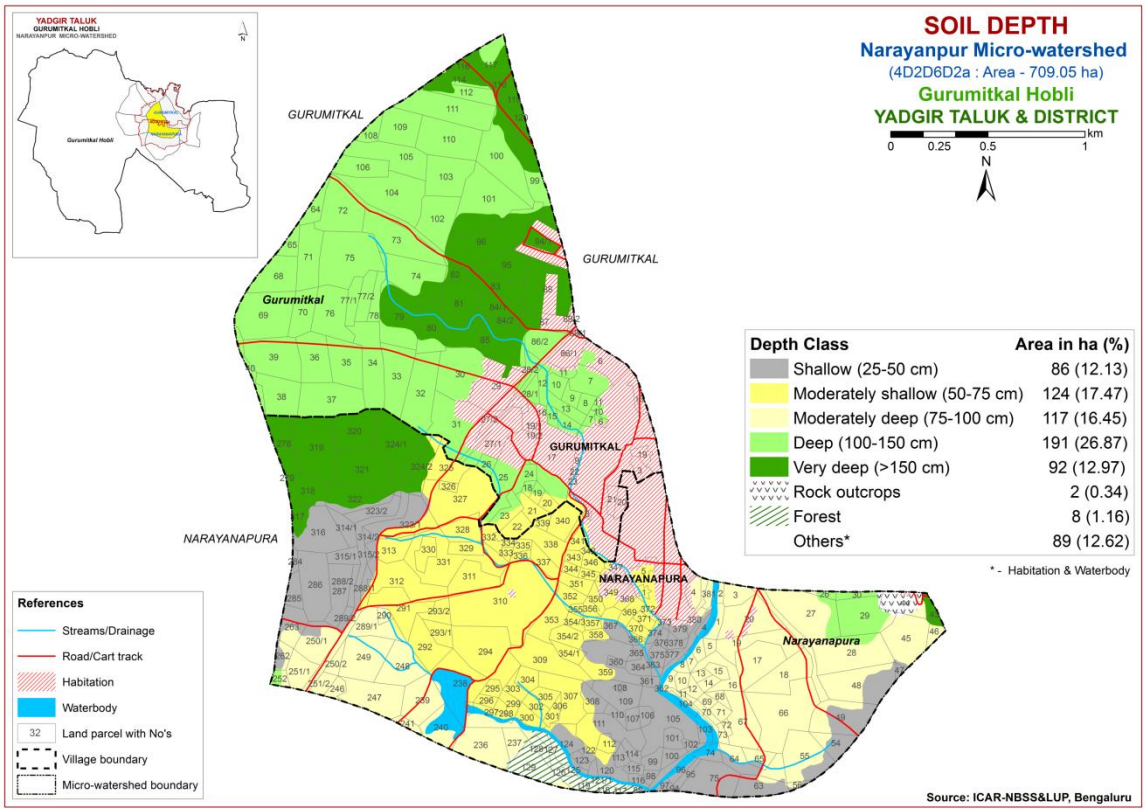

Fig. 5.2 Soil Depth map of Narayanapur Microwatershed

Shallow (25-50 cm) soils cover an area of 86 ha (12%) and are distributed in the southwestern and southern part of the microwatershed. Moderately shallow (50-75 cm) soils cover an area of 124 ha (17%) and are distributed in the southern and southwestern part of the microwatershed. Moderately deep (75-100 cm) soils cover an area of 117 ha (16%) and are distributed in the southwestern, southern and southeastern part of the microwatershed. Deep (100-150 cm) soils cover an area of 191 ha (27%) and are distributed in the major part of the microwatershed. Very deep (>150 cm) soils cover an area of 92 ha (13%) and are distributed in the northern and western part of the microwatershed.

The most productive lands 283 ha (40%) with respect to soil rooting depth where all climatically adapted annual and perennial crops can be grown are deep (100 to >150 cm depth) soils occurring in the major part of the microwatershed.

5.3 Surface Soil Texture

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

LRI were used to classify and a surface soil texture map was generated. The area extent and their geographical distribution in the microwatershed is shown in Figure 5.3.

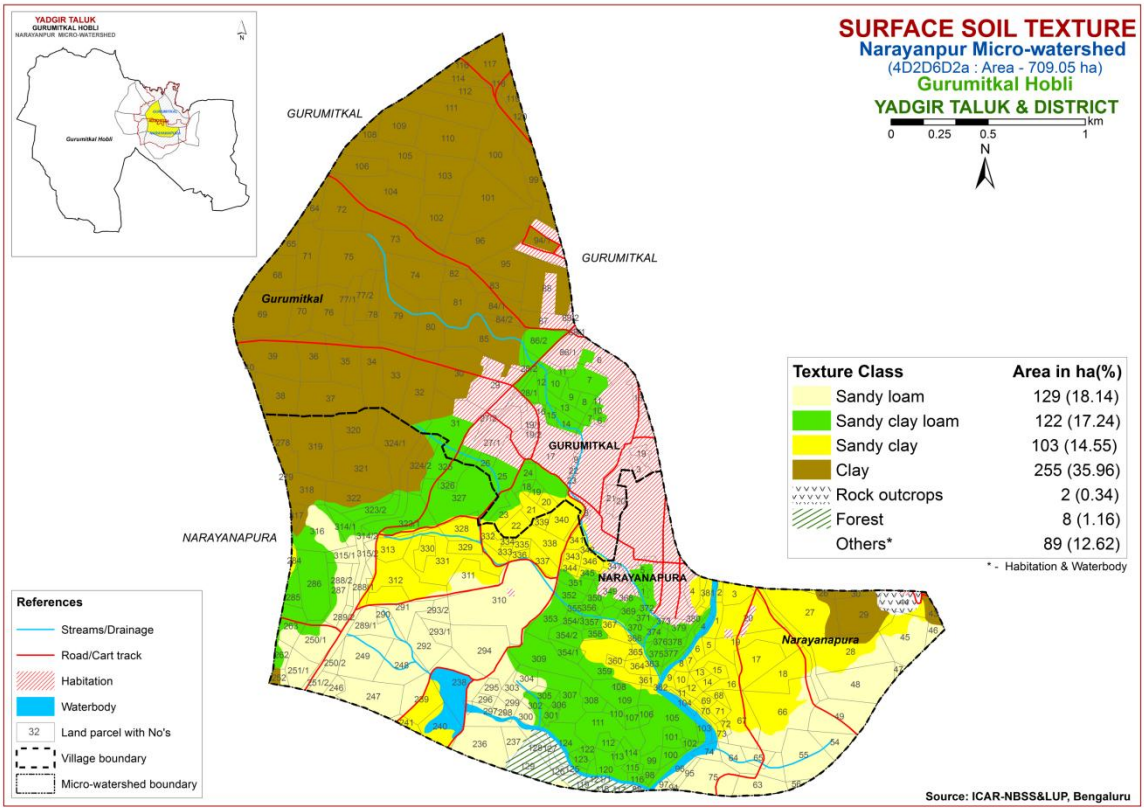

Fig. 5.3 Surface Soil Texture map of Narayanapur Microwatershed

An area of 251 ha (35%) has soils that are loamy at the surface and occur in the central, southeastern, southern, southwestern and northeastern part of the microwatershed. An area of 358 ha (51%) has soils that are clayey at the surface and occur in the major part of the microwatershed.

Major area of (51%) the microwatershed is most productive with respect to surface soil texture. The clayey soils (51%) have high potential for soil-water retention and availability, and nutrient retention and availability, but have more problems of drainage, infiltration, workability and other physical problems. The other productive lands are loamy soils (35%) which also have high potential for soil-water retention and nutrient availability but have no drainage or other physical problems.

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.

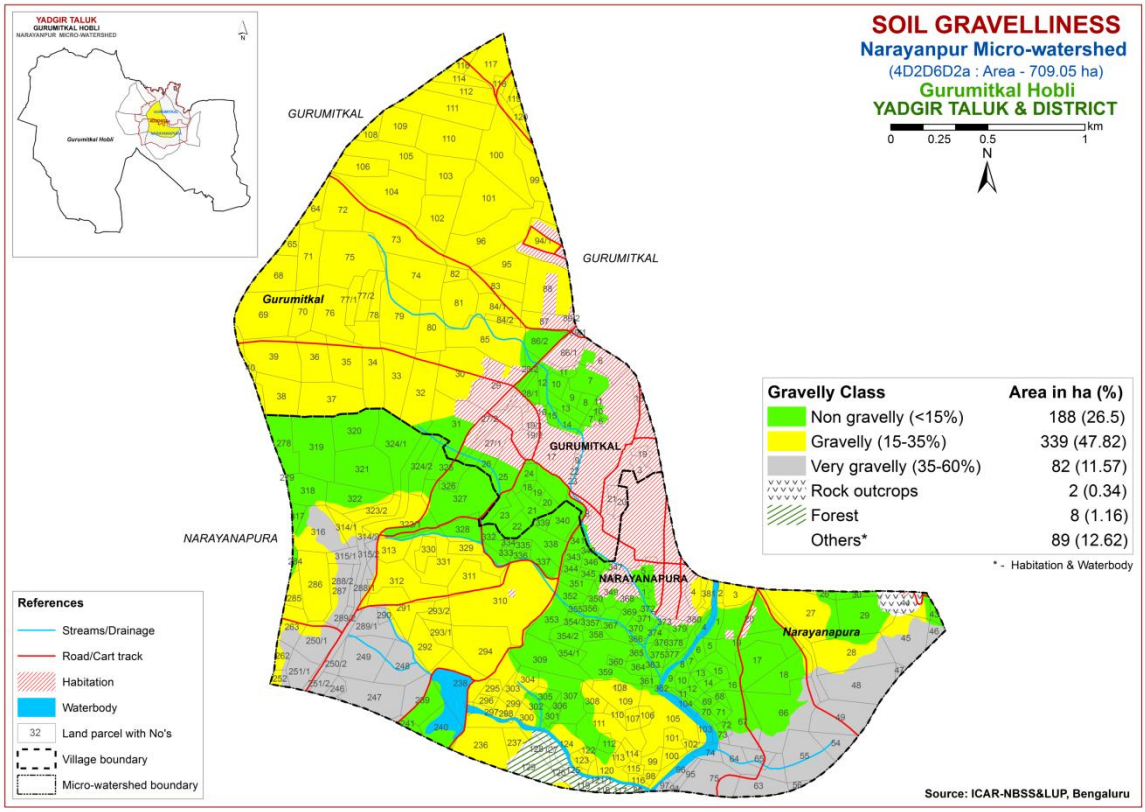

Fig. 5.4 Soil Gravelliness map of Narayanapur Microwatershed

An area of about 188 ha (27%) is non gravelly (<15%), and occur in the central, southern, southeastern and northeastern part of the microwatershed. Maximum area of about 339 ha (48%) is gravelly (15-35%) soil and occur in the major part of the microwatershed. About 82 ha (12%) is very gravelly (35-60%) soils and occur in the southern, southwestern and southeastern part of the of the microwatershed.

The most productive soils (27%) that are non gravelly (<15%), where all climatically adapted long duration crops can be grown. the problem soils (12%) that are very gravelly (35-60%) where only short 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.

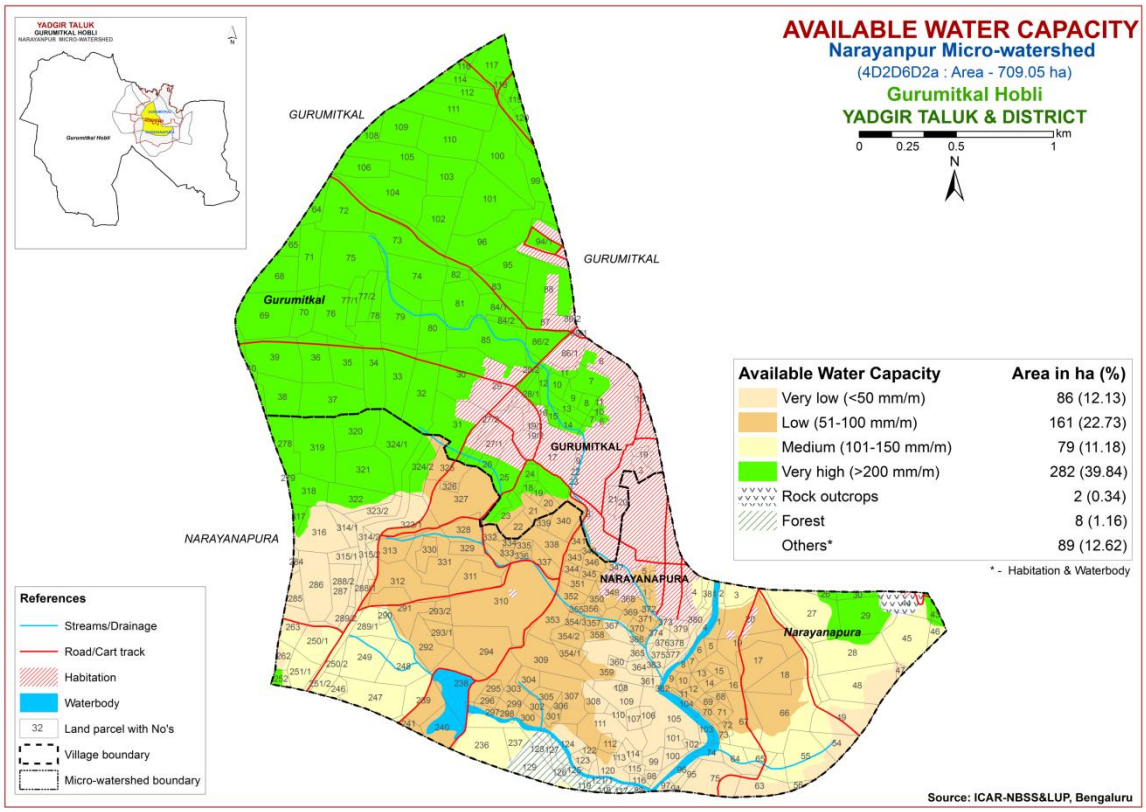

Fig. 5.5 Soil Available Water Capacity map of Narayanapur Microwatershed

An area of about 247 ha (35%) in the microwatershed has soils that are low (51-100 mm/m) and very low (<50mm/m) available water capacity and are distributed in the southern, southeastern and southwestern part of the microwatershed. Medium (101-150 mm/m) in an area of 79 ha (11%) and are distributed in the southern, southwestern and southeastern part of the microwatershed. Very high (>200 mm/m) in an area of 282 ha (40%) and are distributed in the major part of the microwatershed.

About 247 ha (35%) 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 282 ha (40%) are potential areas 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).

Maximum area of about 575 ha (81%) falls under very gently sloping (1-3% slope) lands and are distributed in the major part of the microwatershed. An area of about 34 ha (5%) falls under nearly level (0-1% slope) lands and are distributed in the western part of the microwatershed.

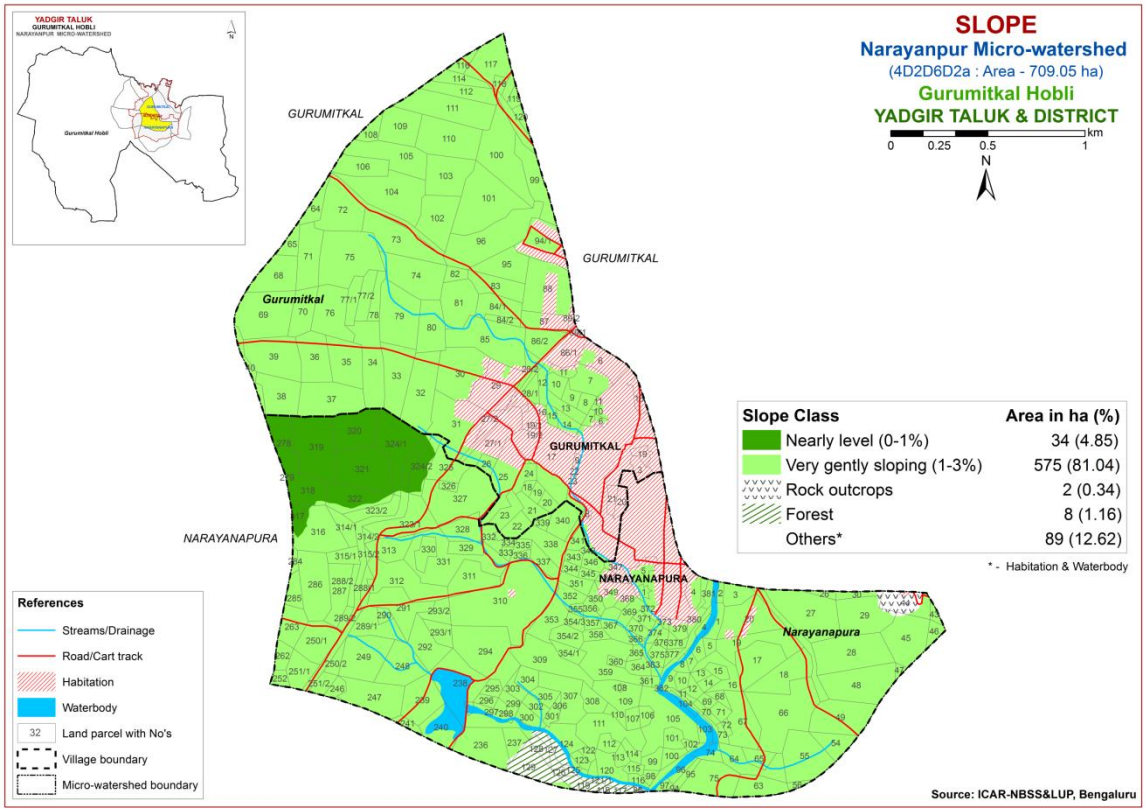

Fig. 5.6 Soil Slope map of Narayanapur Microwatershed

Entire cultivated area in the microwatershed has high potential in respect of soil slopes. In these areas, all climatically adapted annual and perennial crops can be grown without much soil and water conservation and other land development measures.

5.7 Soil Erosion

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

Soils that are slightly eroded (e1 class) cover an area of 34 ha (5%) and are distributed in the western part of the microwatershed. Soils that are moderately eroded (e2 class) cover a maximum area of 549 ha (77%) and are distributed in the major part of the microwatershed. Soils that are severely eroded (e3 class) cover an area of 26 ha (4%) and are distributed in the southern part of the microwatershed.

An area of about 575 ha (81%) in the microwatershed is problematic because of moderate to severe erosion. For these areas, taking up soil and water conservation and other land development measures are needed.

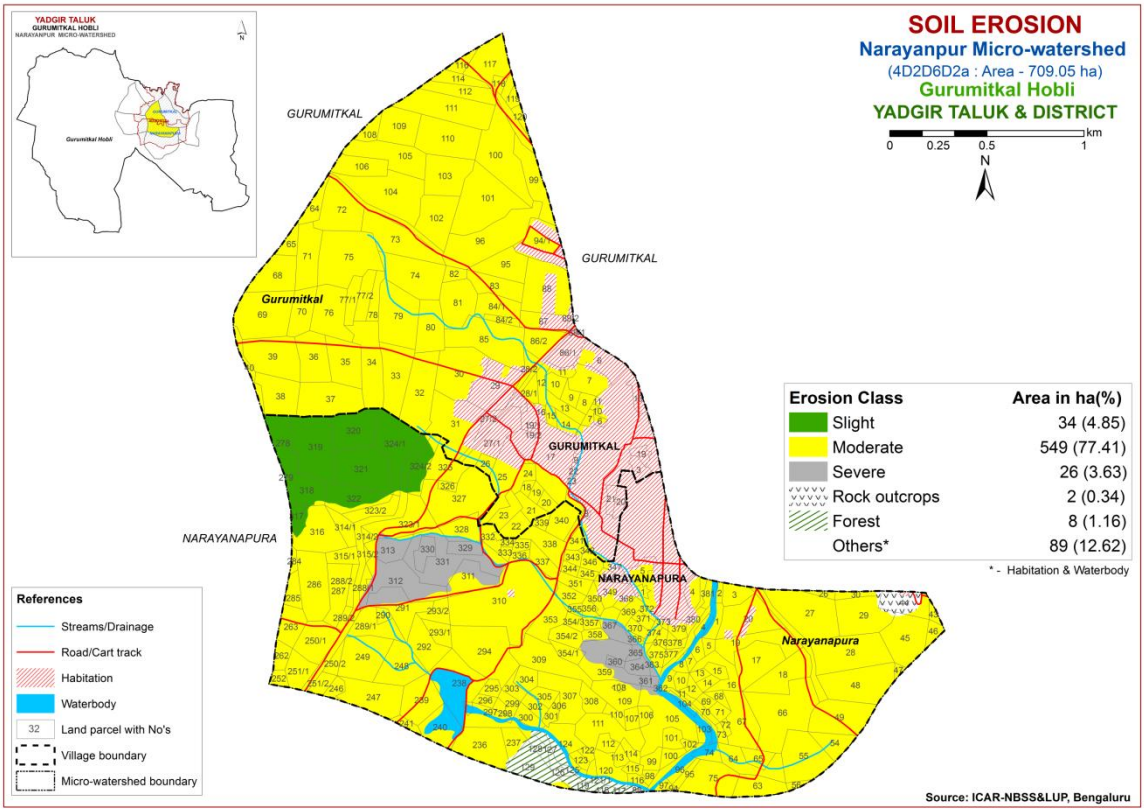

Fig. 5.7 Soil Erosion map of Narayanapur Microwatershed

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 2017 were analysed for pH, EC, organic carbon, available phosphorus and potassium, and for micronutrients like zinc, boron, copper, iron and manganese, and secondary nutrient sulphur.

Soil fertility data generated has been assessed and individual maps for all the nutrients for the microwatershed have been generated using 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 Narayanapur microwatershed for soil reaction (ph) showed that an area of about 12 ha (2%) is slightly acid (ph 6.0- 6.5) and are distributed in the southern part of the microwatershed. Maximum area of about 547 ha (77%) is neutral (6.5-7.3) and are distributed in the major part of the microwatershed. An area of about 49 ha (7%) is slightly alkaline (ph 7.3-7.8) and are distributed in the northern part of the microwatershed (fig.6.1). In all, major area of about 547 ha is neutral, 49 ha is under alkaline soils and 12 ha is under acidic in reaction

6.2 Electrical Conductivity (EC)

The Electrical Conductivity of the soils in the 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 entire cultivated area in the microwatershed is high (>0.75), (Fig. 6.3).

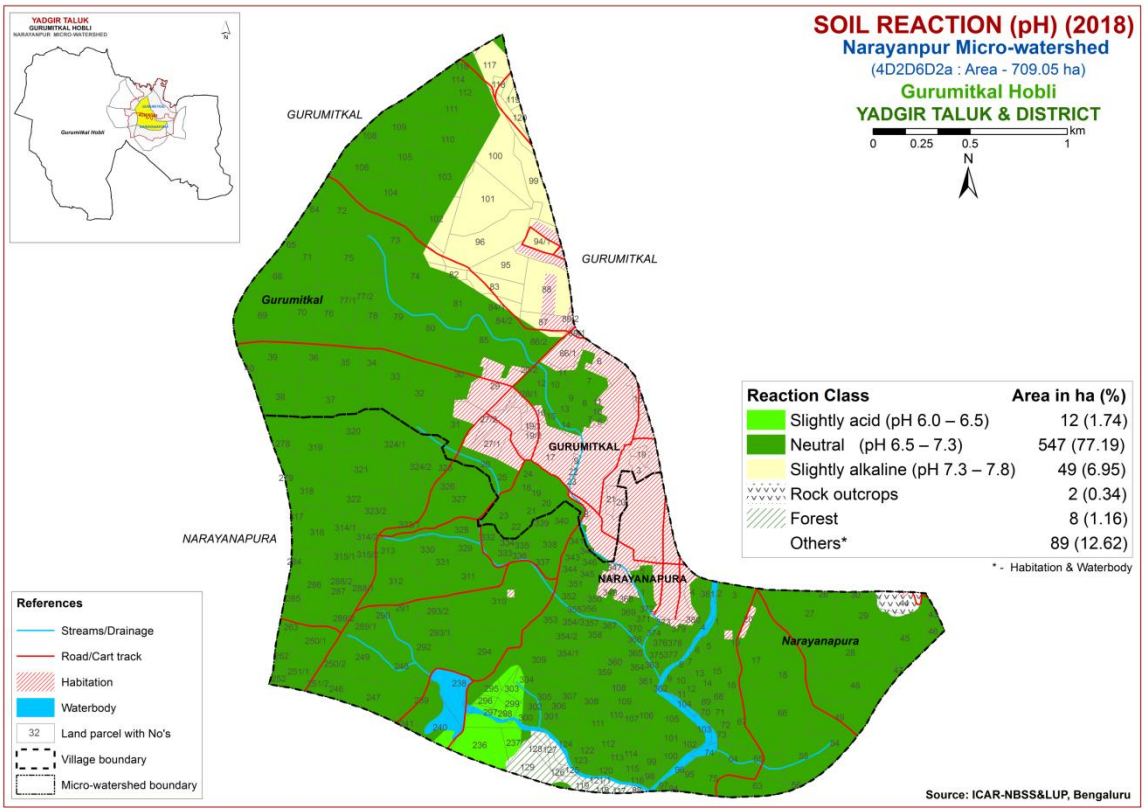

Fig.6.1 Soil Reaction (pH) map of Narayanapur Microwatershed

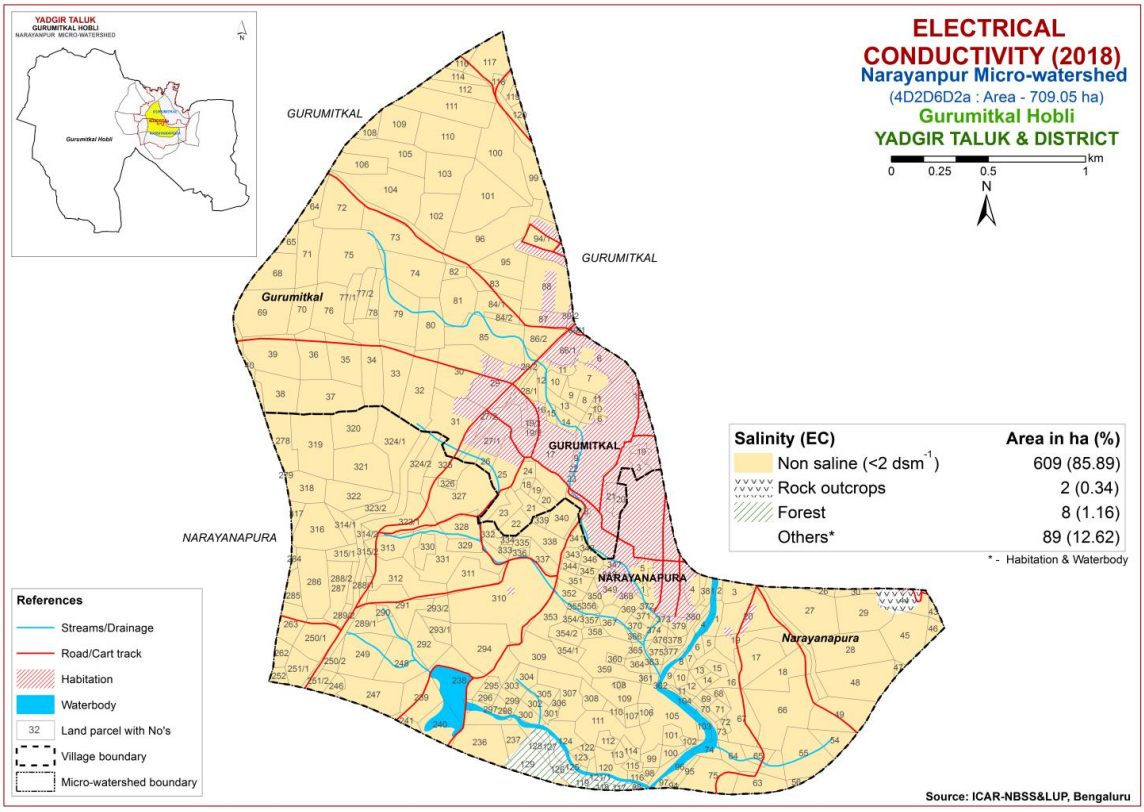

Fig.6.2 Electrical Conductivity (EC) map of Narayanapur Microwatershed

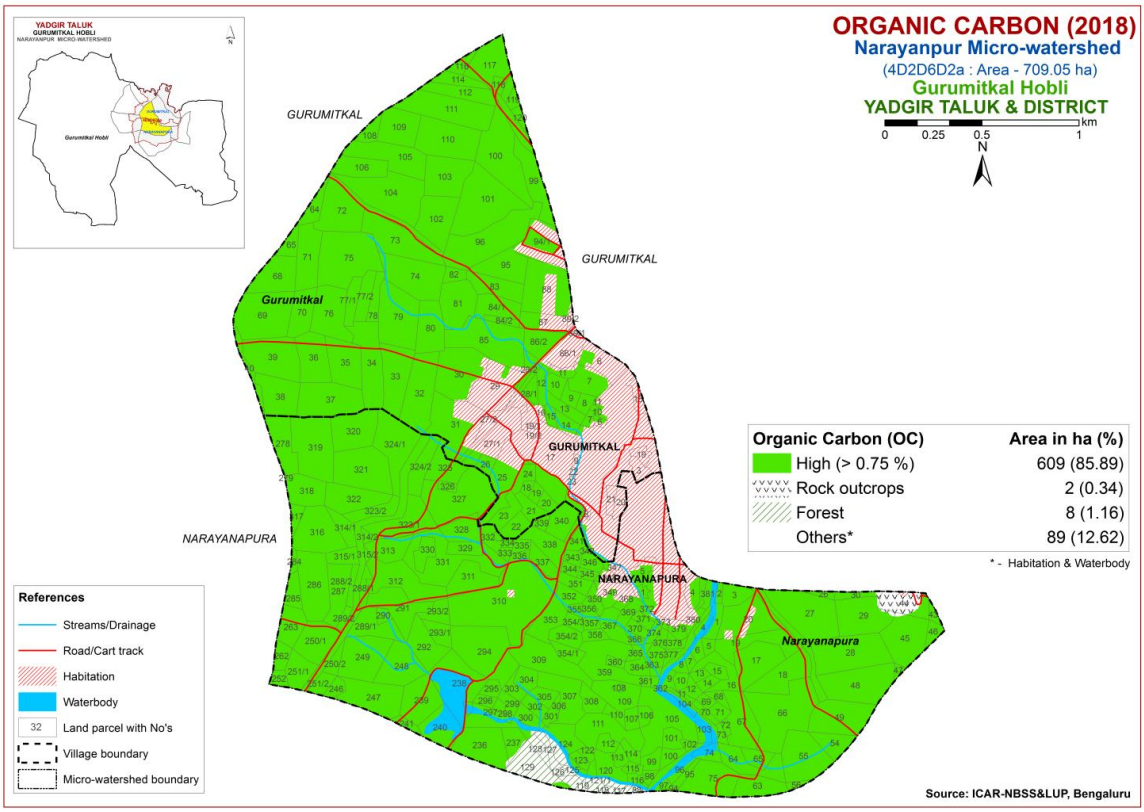

Fig.6.3 Soil Organic Carbon map of Narayanapur Microwatershed

6.4 Available Phosphorus

Available phosphorus content is low (<23 kg/ha) which covers an area of about 258 ha (36%) and occur in the northern, western and northwestern part of the microwatershed. Available phosphorus content is medium (23-57 kg/ha) which covers in an area of about 98 ha (14%) and occur in the southwestern, central and southeastern part of the microwatershed. Available phosphorus content is high (>57 kg/ha) which covers an area of about 252 ha (36%) and occur in the southern, southeastern and southwestern part of the microwatershed (Fig. 6.4).

6.5 Available Potassium

Available potassium content is medium (145-337 kg/ha) in a maximum area of about 369 ha (52%) and occur in the major part of the microwatershed. Available potassium content is high (>337 kg/ha) in an area of about 240 ha (34%) and occur in the northern, southern and northwestern part of the microwatershed (Fig.6.5).

6.6 Available Sulphur

Available sulphur is medium (10-20 ppm) which covers a maximum area of about 473 ha (67%) and occur in the major part of the microwatershed. Available sulphur is low (<10 ppm) in an area of about 136 ha (19%) and occur in the northern and northwestern part of the microwatershed (Fig. 6.6).

6.7 Available Boron

Available boron content is low (<0.5 ppm) in a maximum area of 421 ha (59%) and are distributed in the major part of the microwatershed. An area of about 188 ha (26%) is medium (0.5-1.0 ppm) in available boron and are distributed in the southern and southeastern 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 area (Fig 6.10).

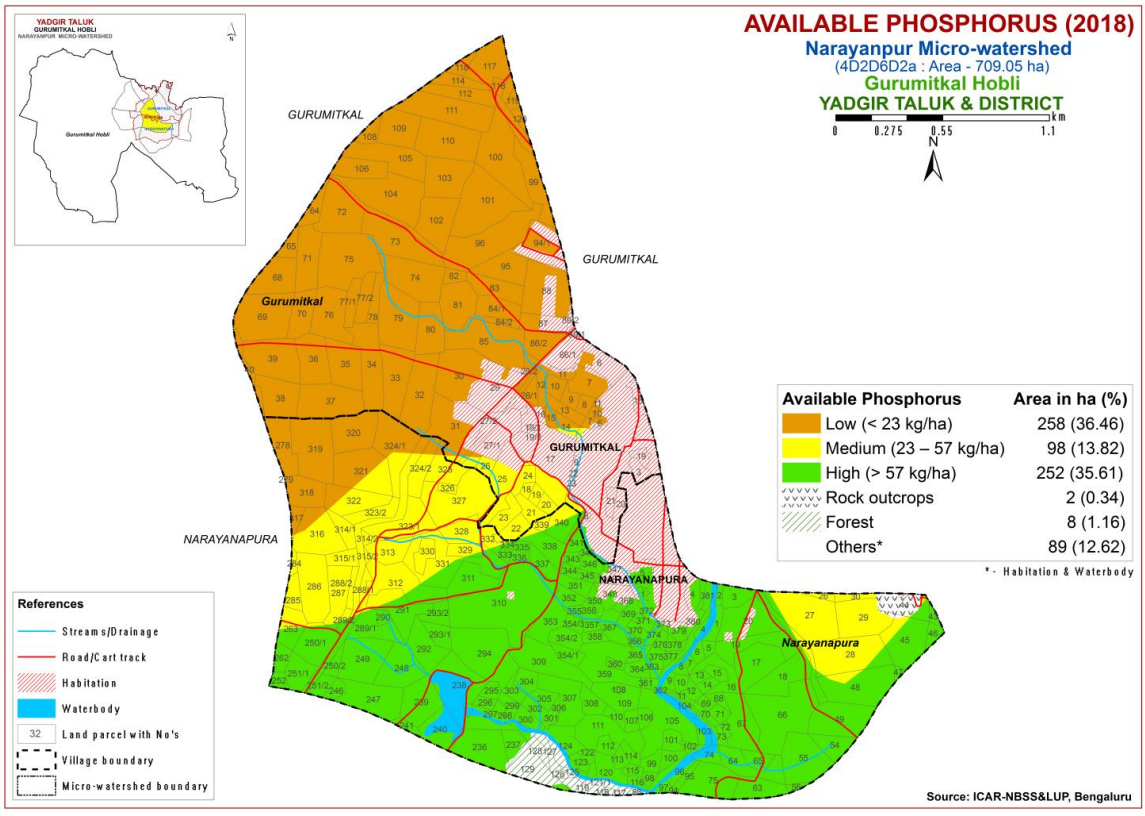

Fig.6.4 Soil Available Phosphorus map of Narayanapur Microwatershed

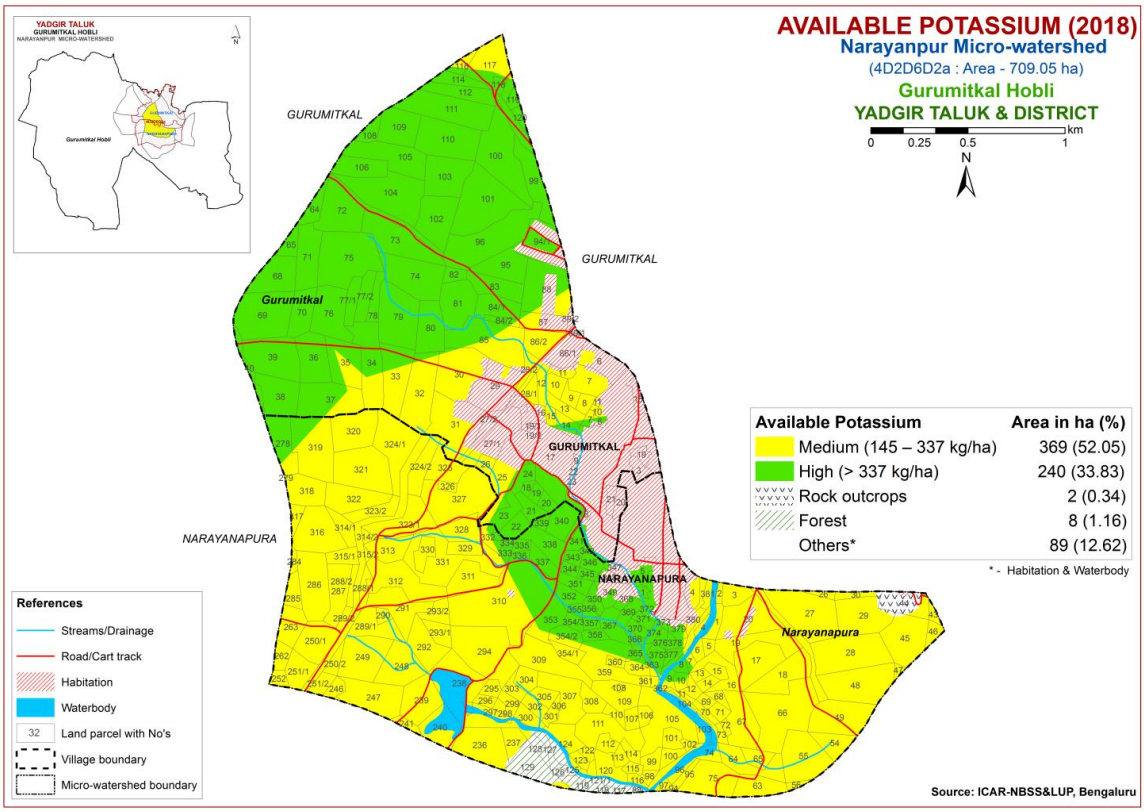

Fig.6.5 Soil Available Potassium map of Narayanapur Microwatershed

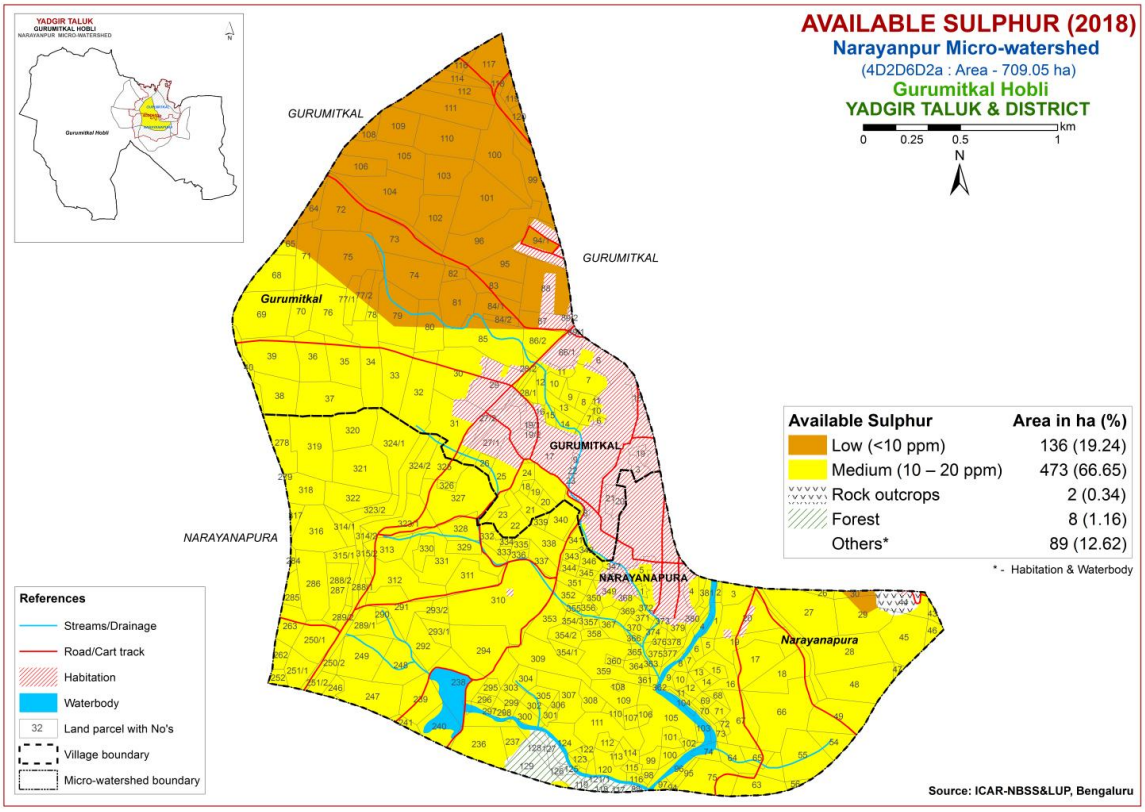

Fig.6.6 Soil Available Sulphur map of Narayanapur Microwatershed

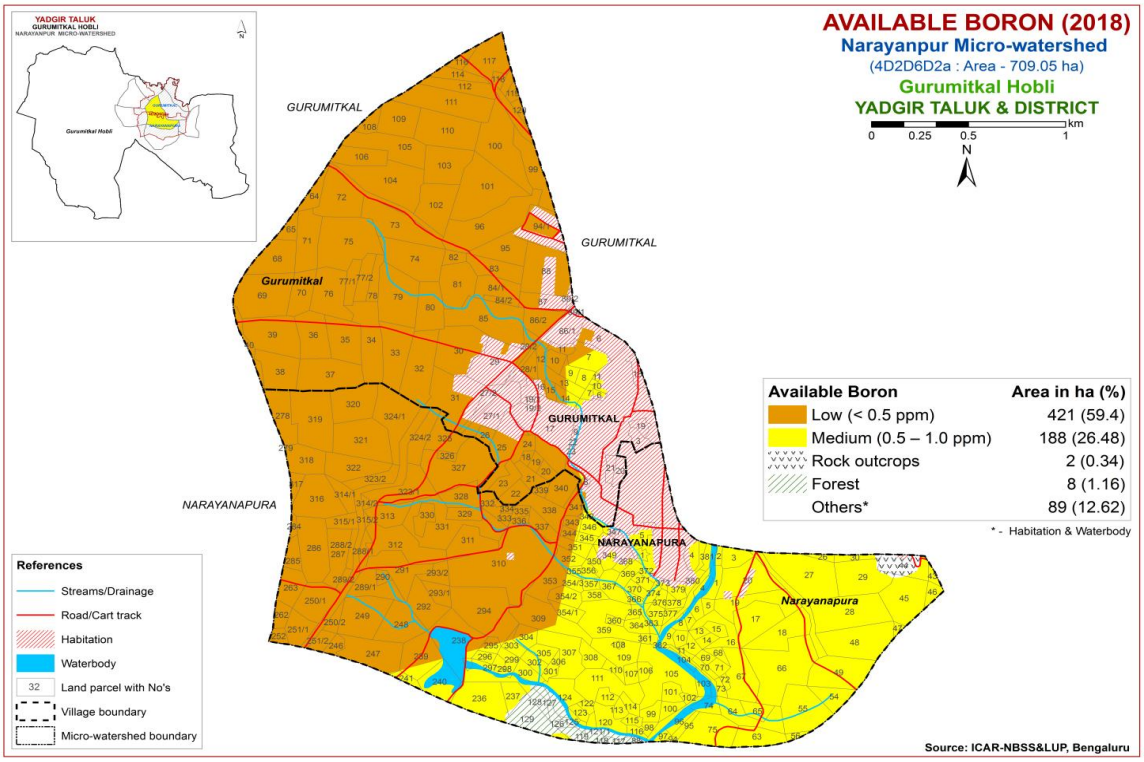

Fig.6.7 Soil Available Boron map of Narayanapur Microwatershed

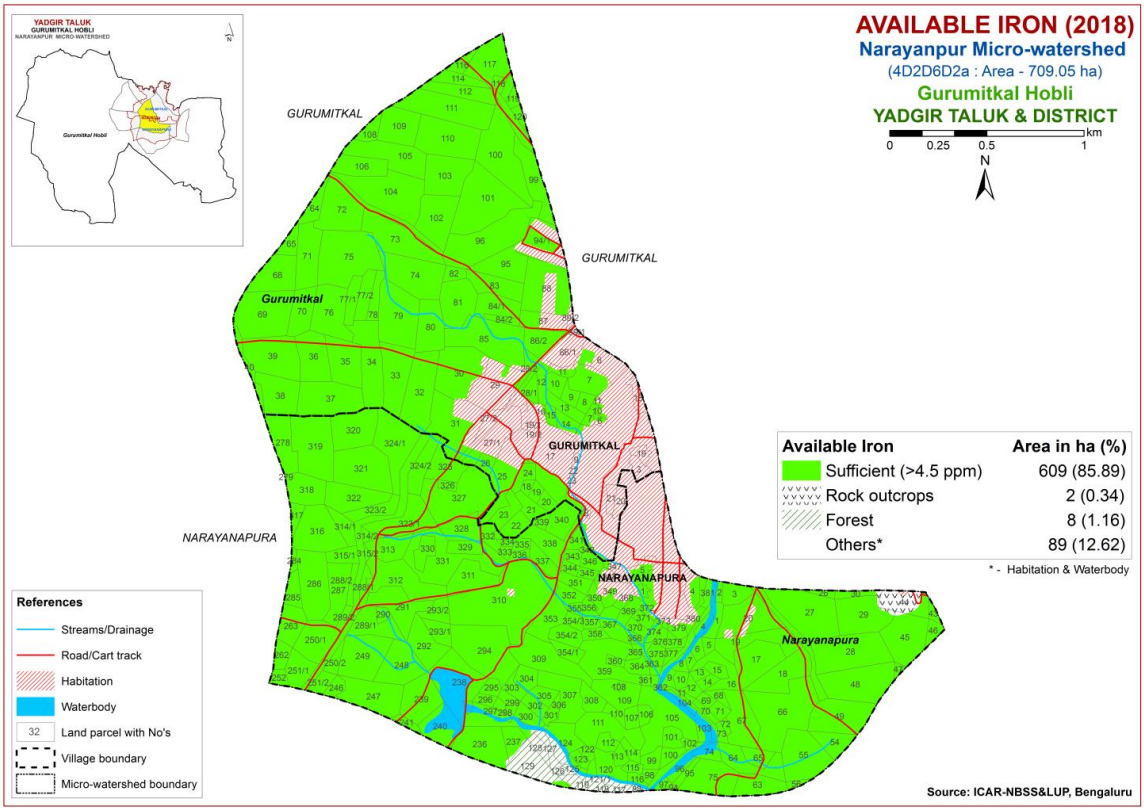

Fig.6.8 Soil Available Iron map of Narayanapur Microwatershed

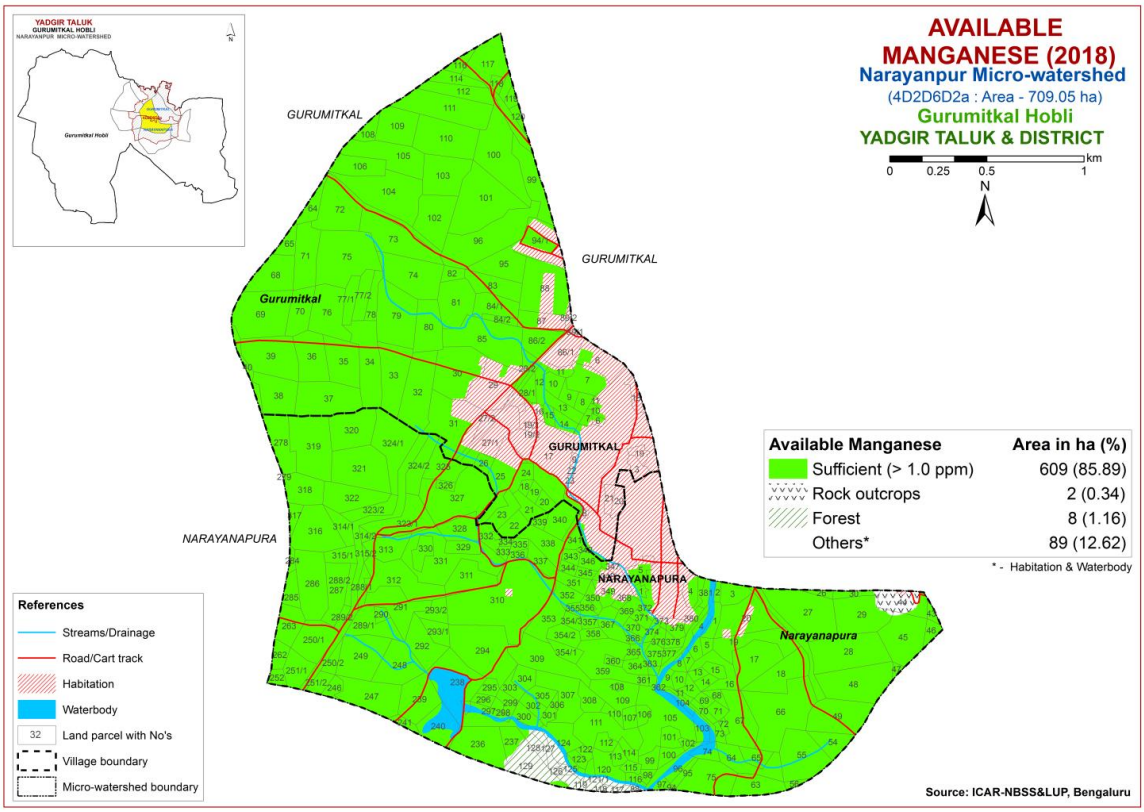

Fig.6.9 Soil Available Manganese map of Narayanapur Microwatershed

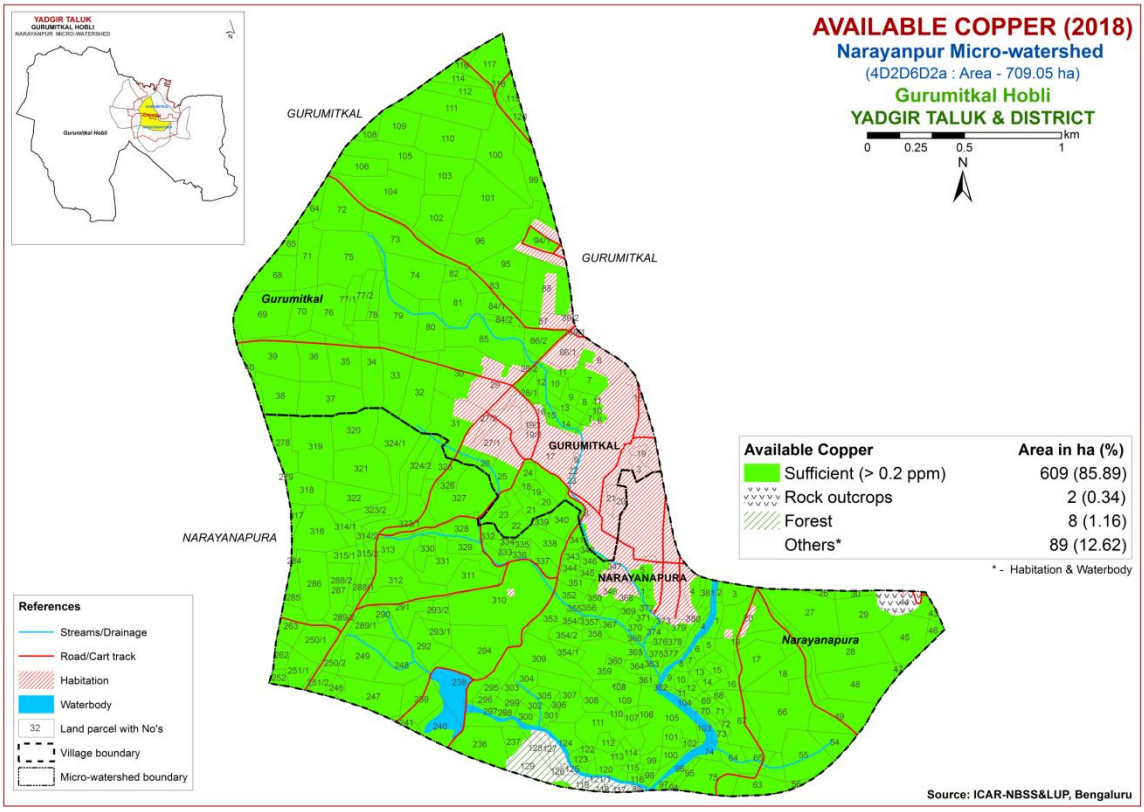

Fig.6.10 Soil Available Copper map of Narayanapur Microwatershed

6.11 Available Zinc

Available zinc content is deficient (<0.6 ppm) which covers a maximum area of about 362 ha (51%) and are distributed in the major part of the microwatershed and sufficient (>0.6 ppm) in an area of 247 ha (35%) and are distributed in the southern and southeastern part of the microwatershed (Fig 6.11).

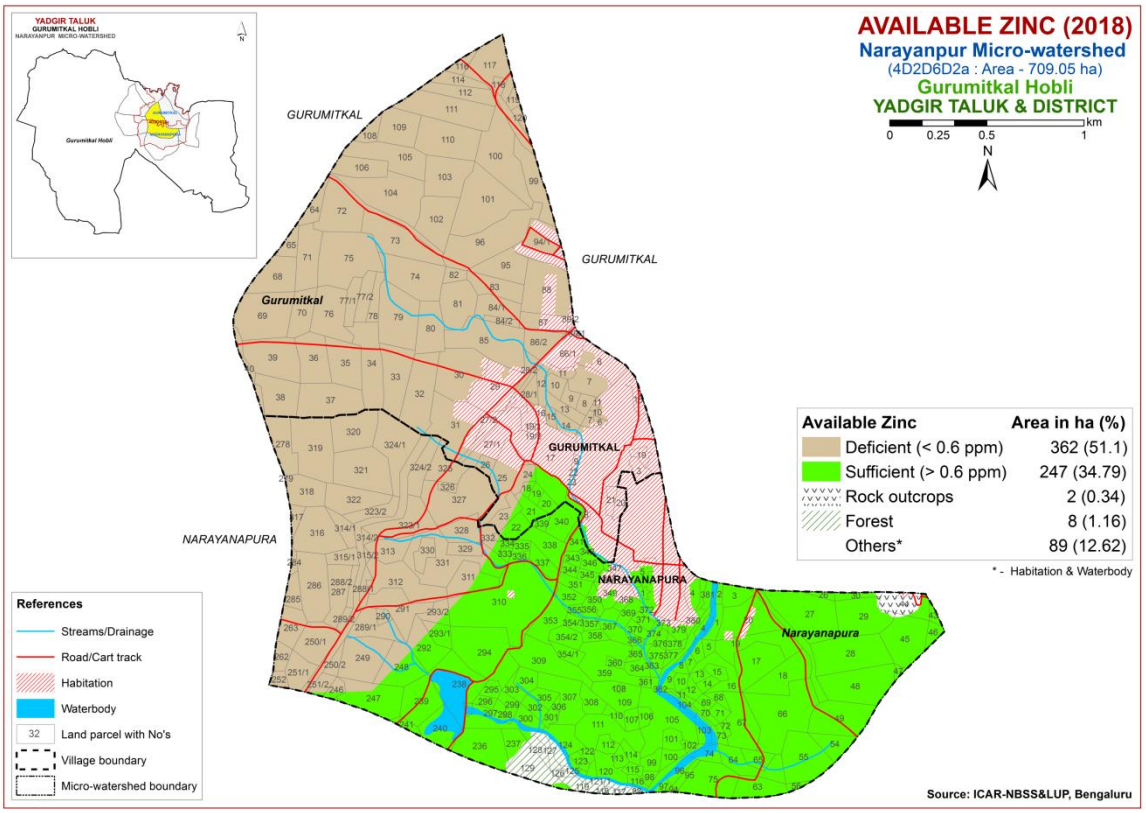

Fig.6.11 Soil Available Zinc map of Narayanapur Microwatershed

Chapter 7

LAND SUITABILITY FOR MAJOR CROPS

The soil and land resource units (soil phases) of Narayanapur microwatershed were assessed for their suitability for growing food, fodder, fibre and other horticulture crops by following the procedure as outlined in FAO, 1976 and 1983. Crop requirements were developed for each of the crop from the available research data and also by referring to Naidu *et. al.* (2006) and Natarajan *et. al* (2015). The soil and land characteristics were matched with the crop requirement to arrive at the crop suitability. The soil and land characteristics (Table 7.1) and crop requirement (Table 7.2 to 7.30) are given at the end of the chapter. In FAO land suitability classification, two orders are recognized. Order S-Suitable and Order N-Not suitable. The orders have classes, subclasses and units. Order-S has three classes, Class S1-Highly Suitable, Class S2-Moderately Suitable and Class S3- Marginally Suitable. Order N has two classes, N1-Currently not Suitable and N2-Permanently not Suitable. There are no subclasses within the Class S1 as they will have very minor or no limitations for crop growth. Classes S2, S3 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 275 ha (39%) is highly suitable (Class S1) for growing sorghum and are distributed in the major part of the microwatershed. An area of about 244 ha (34%) is moderately suitable (Class S2) for growing sorghum and are distributed in the central, southern and southeastern part of the microwatershed. They have minor limitations of

rooting depth, drainage, gravelliness, texture and calcareousness. An area of about 90 ha (13%) is marginally suitable (Class S3) for growing sorghum and are distributed in the southern, southwestern and southeastern part of the microwatershed with moderate limitations of rooting depth, nutrient availability and calcareousness.

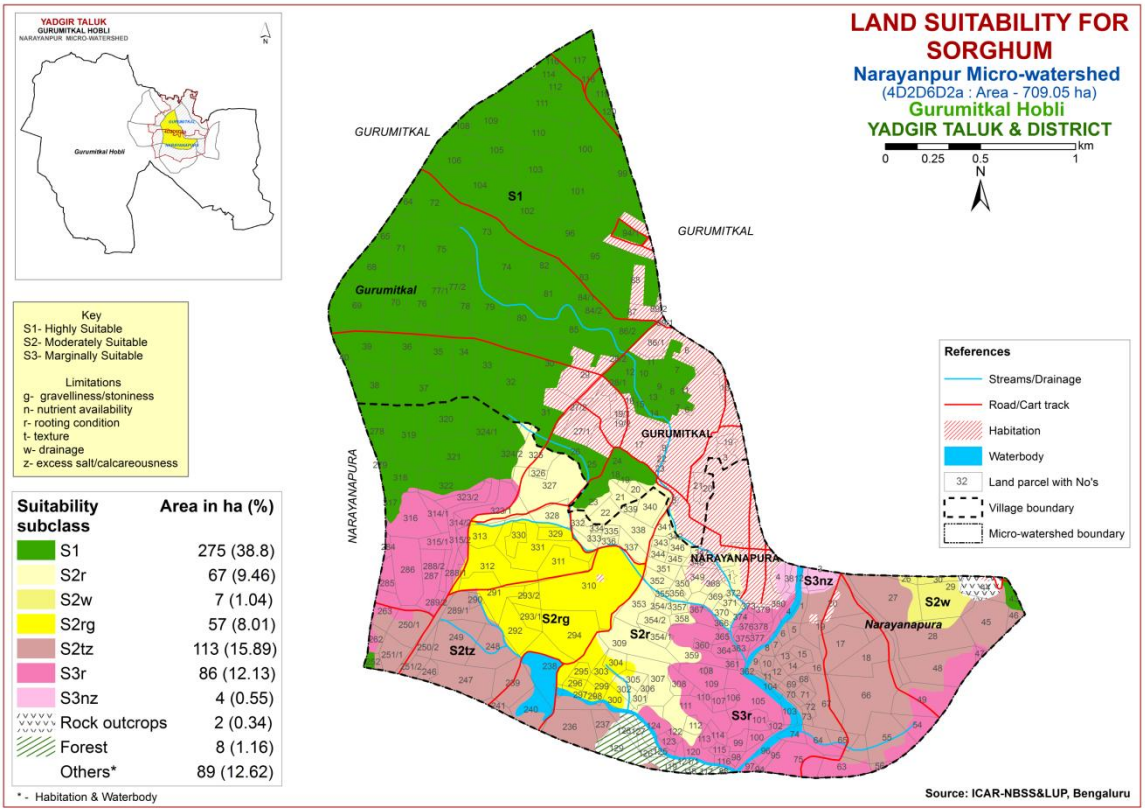

Fig. 7.1 Land Suitability map of Sorghum

7.2 Land Suitability for Maize (*Zea mays*)

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

Moderately suitable (Class S2) lands for growing maize cover a maximum area of about 520 ha (73%) and occur in the major part of the microwatershed. They have minor limitations of texture, gravelliness and calcareousness. An area of about 90 ha (13%) is marginally suitable (Class S3) for growing maize and are distributed in the southern, southwestern and southeastern part of the microwatershed with moderate limitations of rooting depth, nutrient availability, texture and calcareousness.

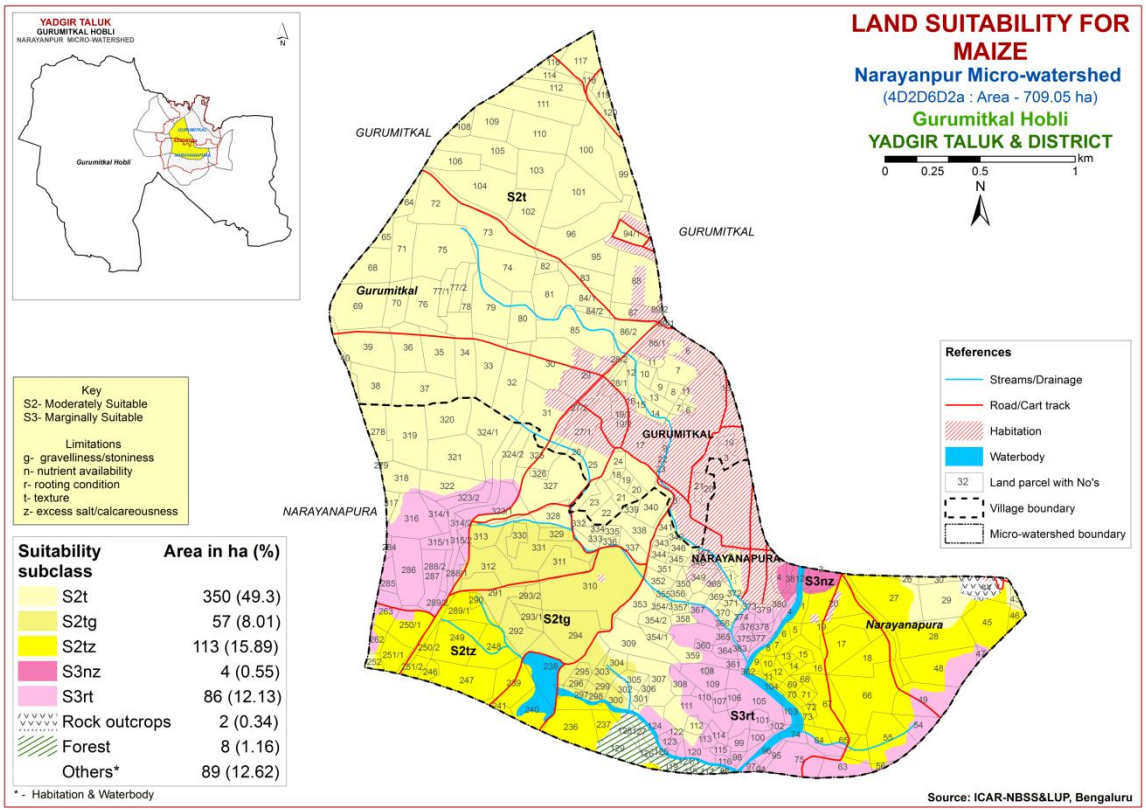

Fig. 7.2 Land Suitability map of Maize

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.

Moderately suitable (Class S2) lands for growing bajra cover an area of about 519 ha (73%) and occur in the major part of the microwatershed. They have minor limitations of texture, rooting depth, drainage and calcareousness. An area of about 90 ha (13%) is marginally suitable (Class S3) for growing bajra and are distributed in the southwestern, southern and southeastern part of the microwatershed with moderate limitations of rooting depth, nutrient availability, texture and calcareousness.

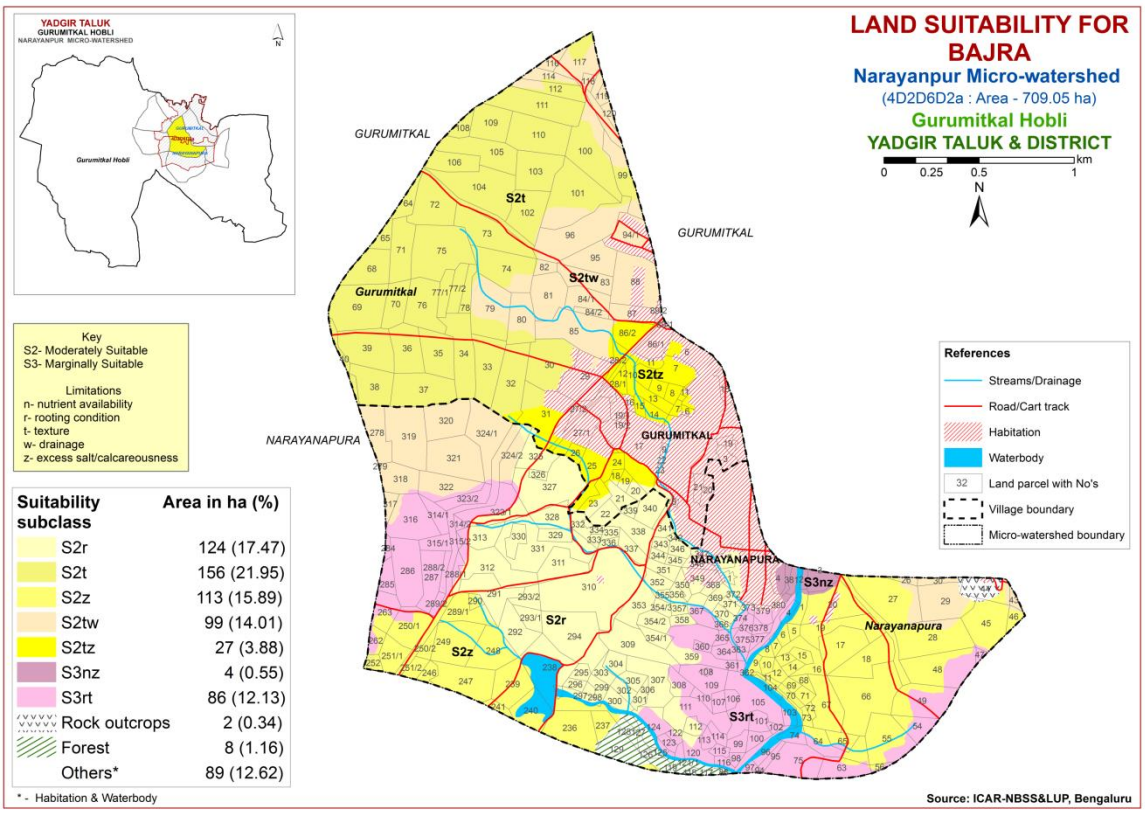

Fig. 7.3 Land Suitability map of Bajra

7.4 Land Suitability for Groundnut (*Arachis hypogaea*)

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

Moderately suitable (Class S2) lands for growing groundnut cover an area of about 113 ha (16%) and occur in the southern, southwestern and southeastern part of the microwatershed. They have minor limitation of calcareousness. Marginally suitable lands (Class S3) for growing groundnut occupy a maximum area of about 492 ha (69%) and are distributed in the major part of the microwatershed. They have moderate limitations of texture, rooting depth and drainage. Currently not suitable (Class N1) lands occur in an area of 4 ha (<1%) and are distributed in the southeastern part of the microwatershed with severe limitation of nutrient availability.

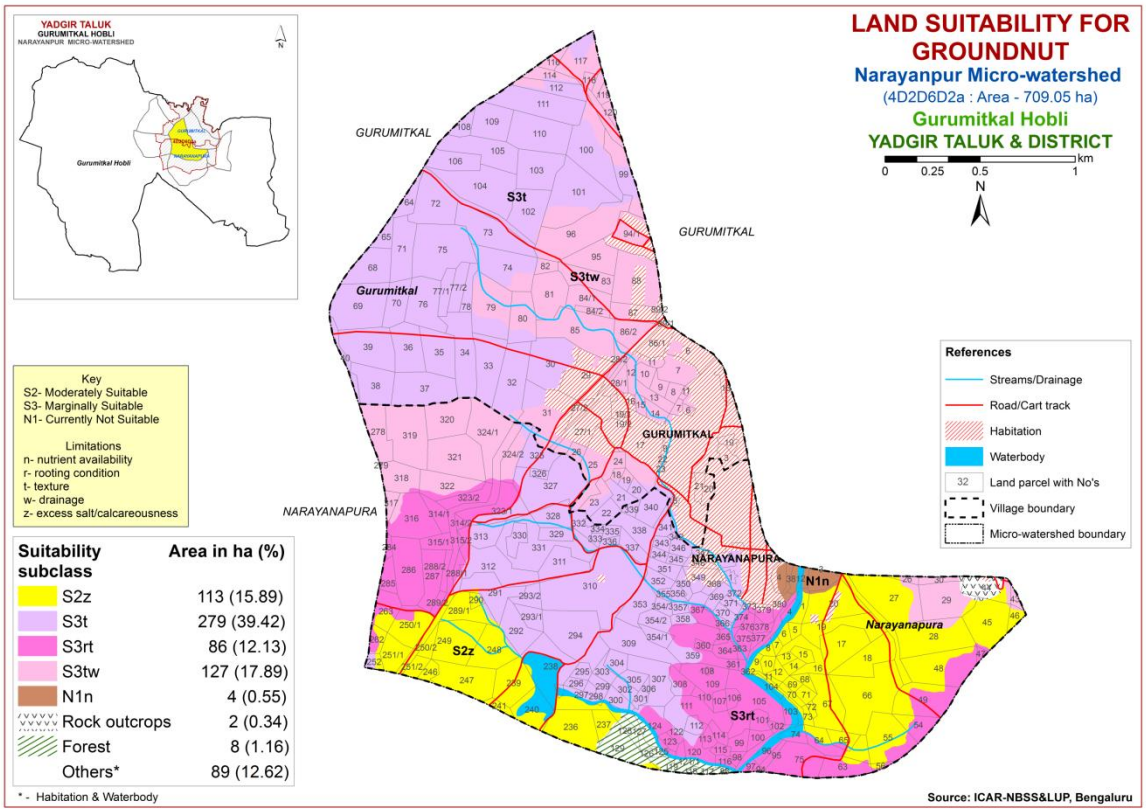

Fig. 7.4 Land Suitability map of Groundnut

7.5 Land Suitability for Sunflower (*Helianthus annus*)

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

An area of about 119 ha (17%) is highly suitable (Class S1) for growing sunflower and are distributed in the western, northern and northeastern part of the microwatershed. An area of about 276 ha (39%) is moderately suitable (Class S2) for sunflower and are distributed in the major part of the microwatershed. They have minor limitations of drainage, calcareousness and rooting depth. Marginally suitable lands (Class S3) for growing sunflower occupy an area of about 124 ha (17%) and are distributed in the southern part of the microwatershed. They have moderate limitation of rooting depth. Currently not suitable (Class N1) lands occur in an area of 90 ha (13%) and are distributed in the southern, southwestern and southeastern part of the microwatershed with severe limitations of rooting depth and nutrient availability.

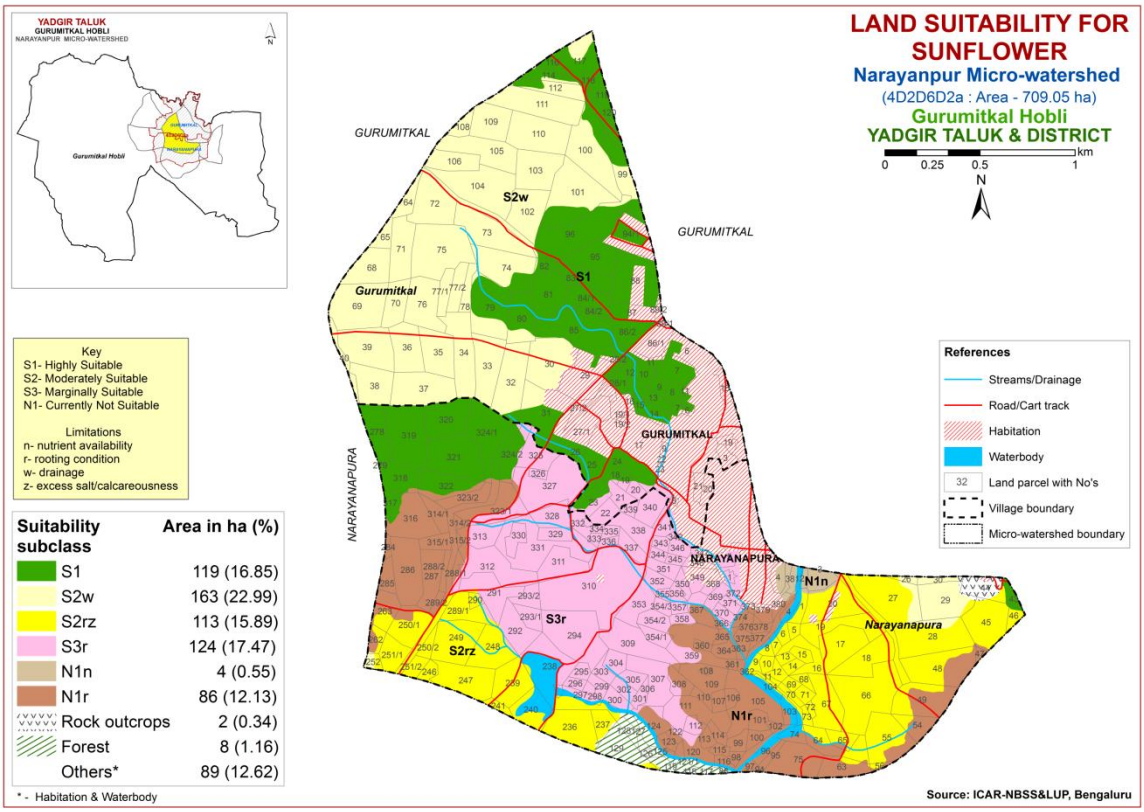

Fig. 7.5 Land Suitability map of Sunflower

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

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

Moderately suitable (Class S2) lands for growing redgram cover an area of about 396 ha (56%) and occur in the major part of the microwatershed. They have minor limitations of texture, rooting depth, calcareousness and drainage. Marginally suitable lands (Class S3) for growing redgram occupy an area about 214 ha (30%) and occur in the southern, southwestern and southeastern part of the microwatershed. They have moderate limitations of rooting depth, texture, calcareousness and nutrient availability.

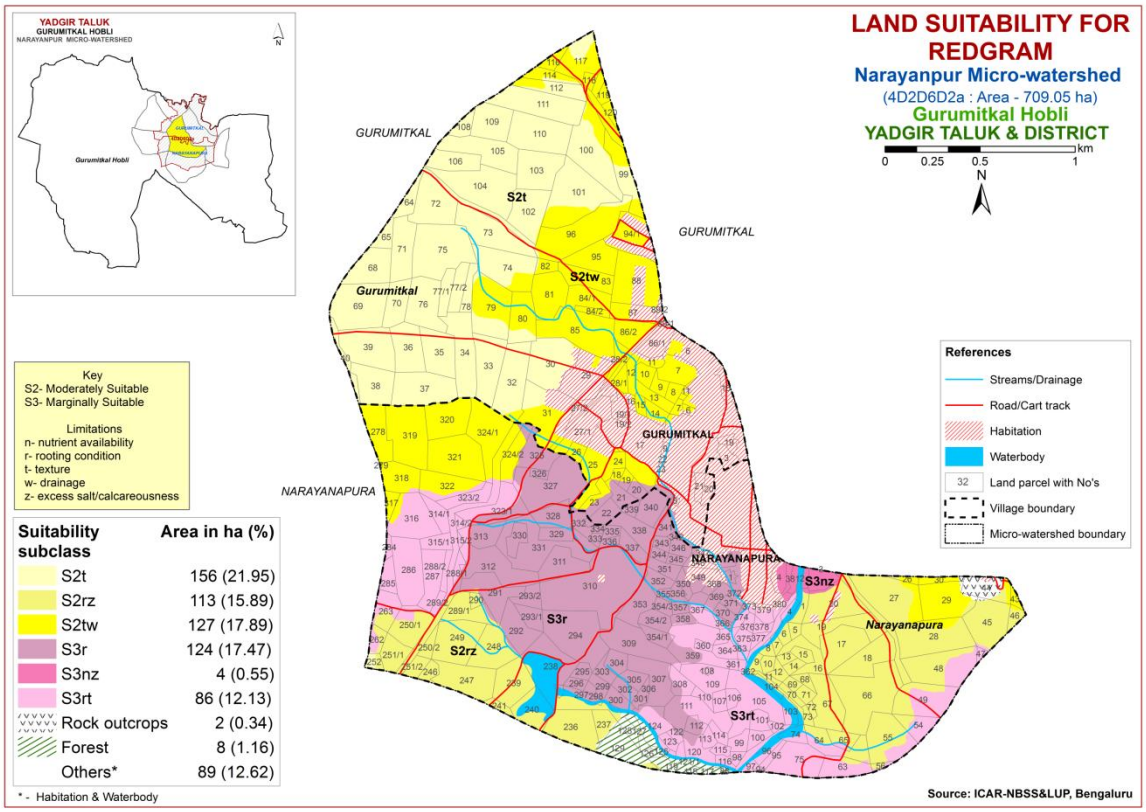

Fig. 7.6 Land Suitability map of Redgram

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 282 ha (40%) and are distributed in the major part of the microwatershed. An area of about 161 ha (23%) is moderately suitable (Class S2) for growing bengal gram and are distributed in the central, southern, southwestern and southeastern part of the microwatershed. They have minor limitations of rooting depth, gravelliness, texture and calcareousness. Marginally suitable lands (Class S3) for growing bengalgram occupy an area of about 165 ha (23%) and occur in the southwestern, southern and southeastern part of the microwatershed. They have moderate limitations of rooting depth, nutrient availability, texture and calcareousness.

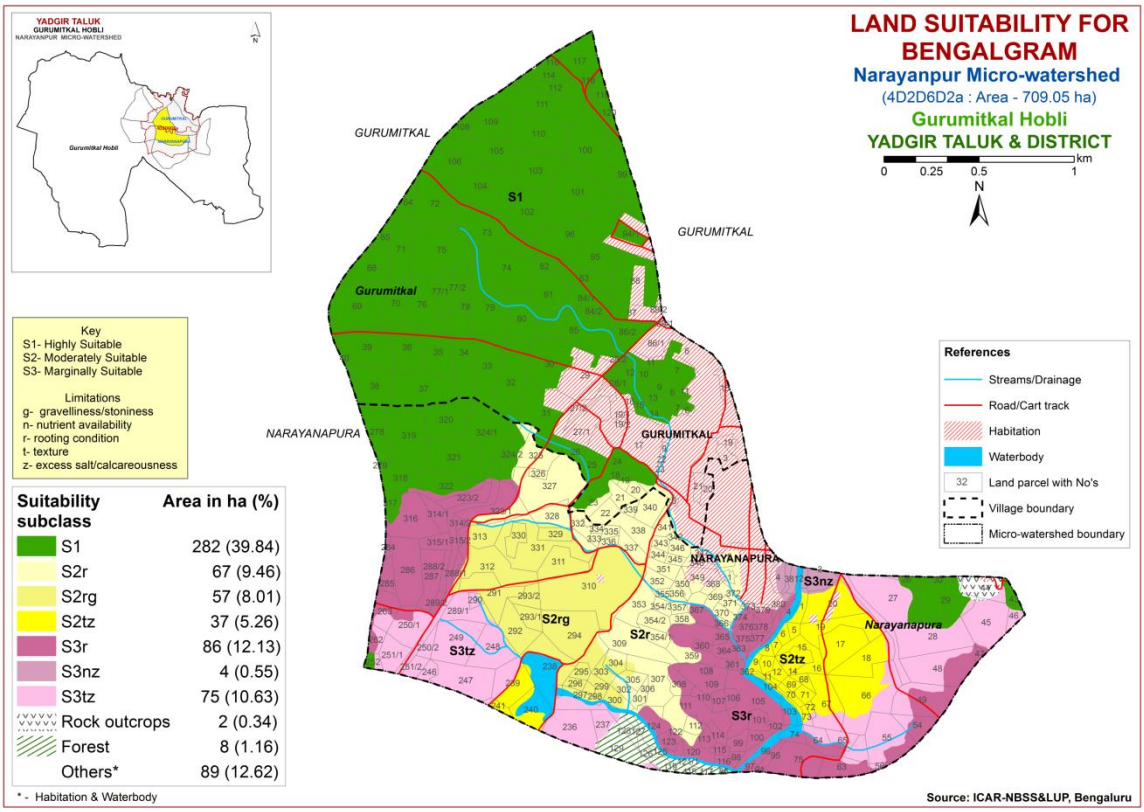

Fig. 7.7 Land Suitability map of Bengal gram.

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 282 ha (40%) and are distributed in the major part of the microwatershed. An area of about 161 ha (23%) is moderately suitable (Class S2) for growing cotton and are distributed in the southern, southwestern and southeastern part of the microwatershed. They have minor limitations of rooting depth, gravelliness, calcareousness and texture. Marginally suitable lands (Class S3) for growing cotton occupy an area of about 165 ha (23%) and occur in the southern, southeastern and southwestern part of the microwatershed. They have moderate limitations of rooting depth, nutrient availability, calcareousness and texture.

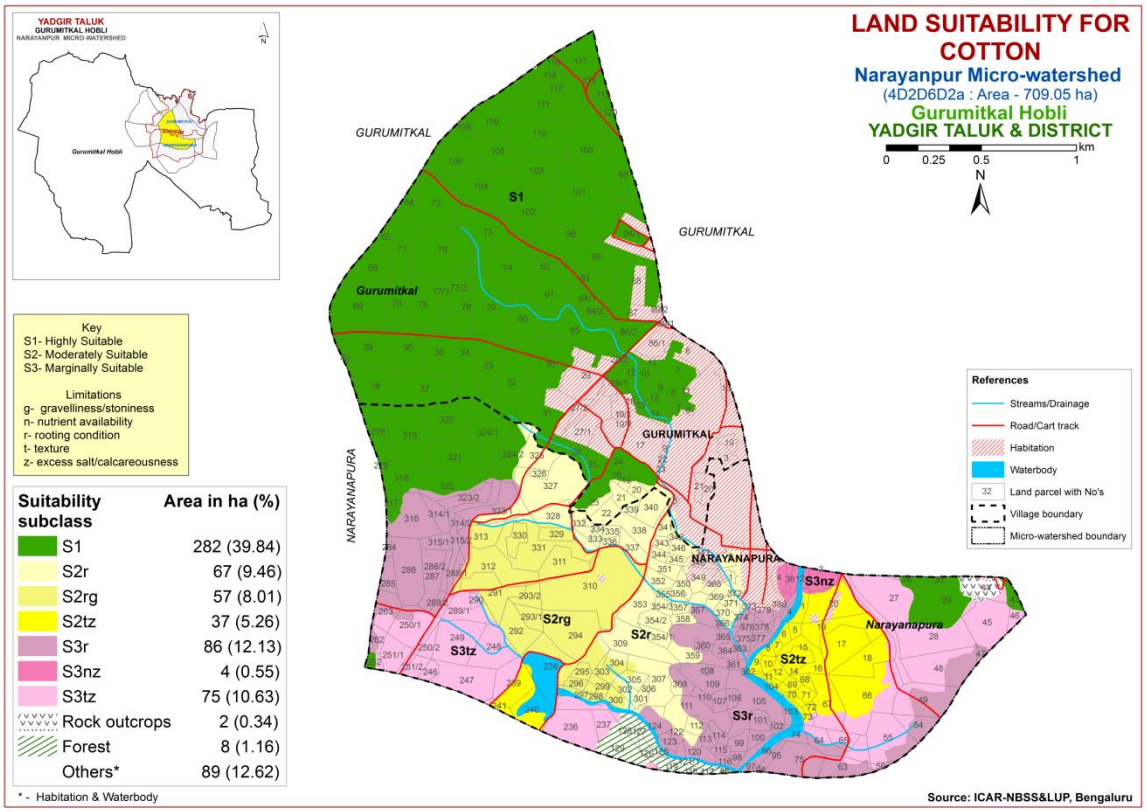

Fig. 7.8 Land Suitability map of Cotton

7.9 Land Suitability for Chilli (*Capsicum annuum)*

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

An area of about 356 ha (50%) is moderately suitable (Class S2) for growing chilli and are distributed in the major part of the microwatershed. They have minor limitations of texture, drainage, gravelliness, rooting depth and calcareousness. Marginally suitable lands (Class S3) occupy an area of about 249 ha (35%) and are distributed in the southern, southwestern and southeastern part of the microwatershed. They have moderate limitations of rooting depth, drainage and texture. Currently not suitable (Class N1) lands occur in an area of 4 ha (<1%) and are distributed in the southeastern part of the microwatershed with severe limitation of nutrient availability.

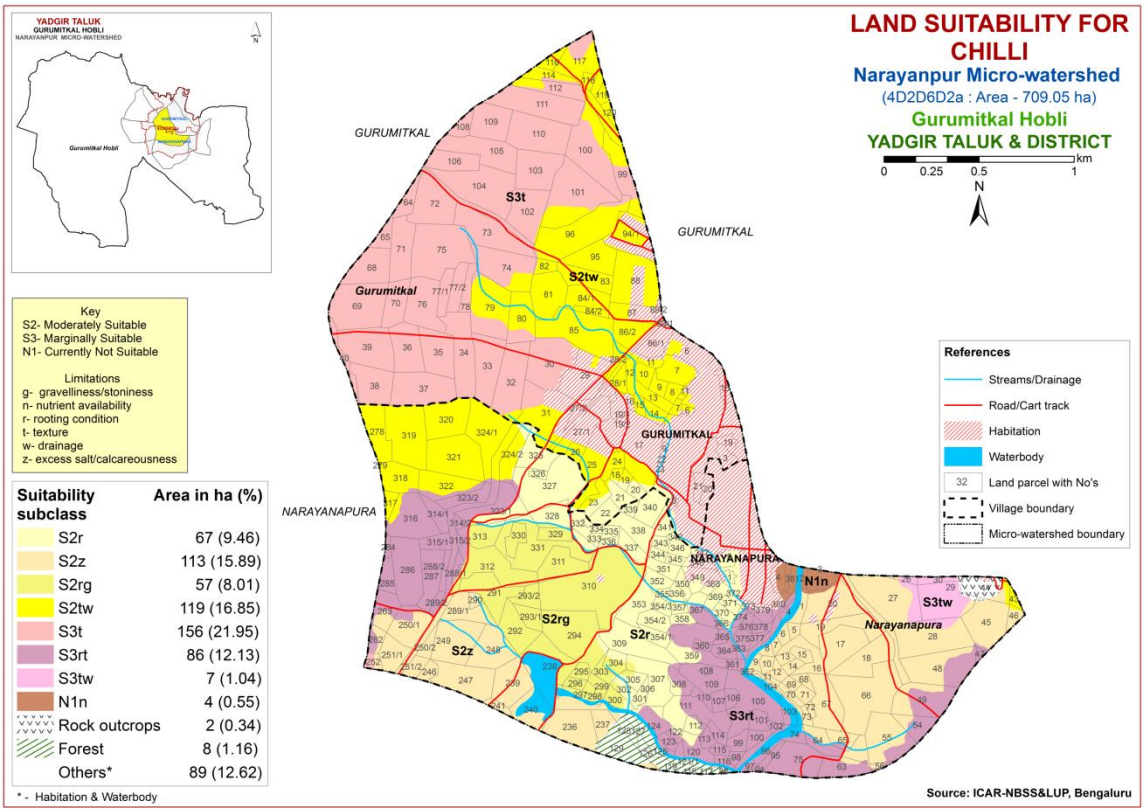

Fig 7.9 Land Suitability map of Chilli

7.10 Land Suitability for Tomato *(Lycopersicon esculentum)*

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

An area of about 356 ha (50%) is moderately suitable (Class S2) for growing tomato and are distributed in the major part of the microwatershed. They have minor limitations of texture, drainage, rooting depth, gravelliness and calcareousness. Marginally suitable lands (Class S3) occupy an area of about 249 ha (35%) and are distributed in the southern, southwestern and southeastern part of the microwatershed. They have moderate limitations of rooting depth, drainage and texture. Currently not suitable (Class N1) lands occur in an area of 4 ha (<1%) and are distributed in the southeastern part of the microwatershed with severe limitation of nutrient availability.

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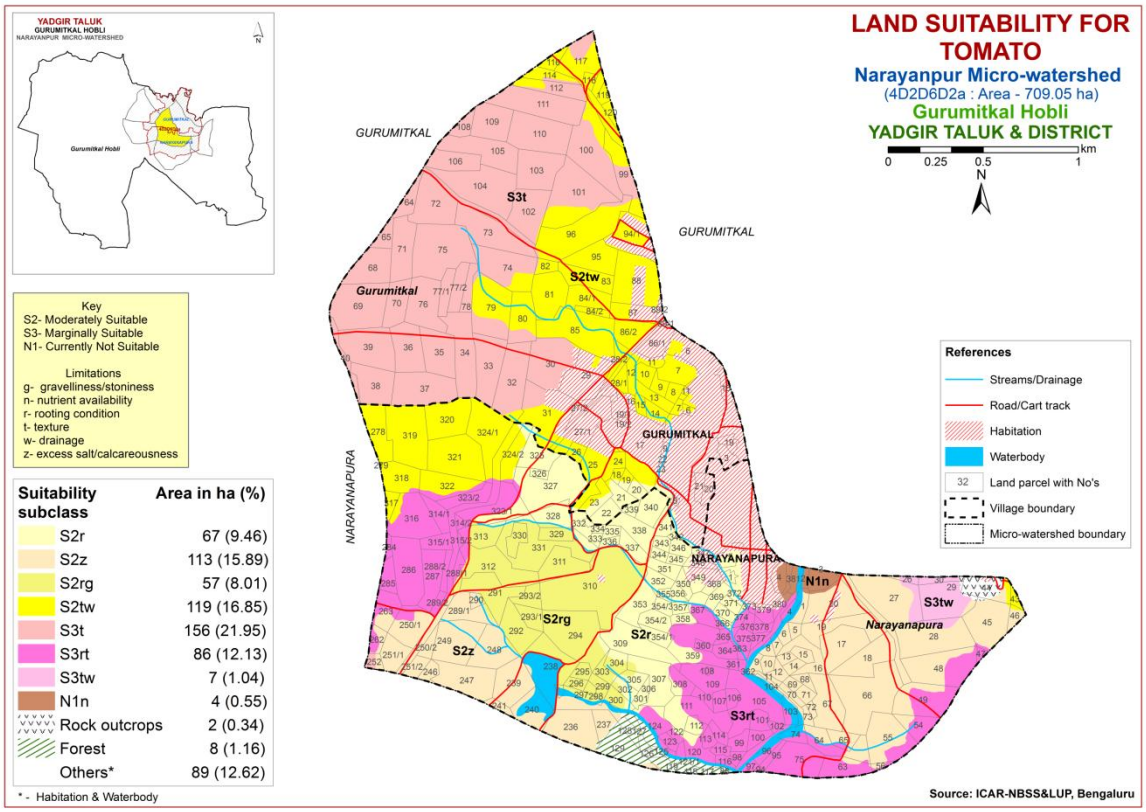

Fig 7.10 Land Suitability map of Tomato

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.

Moderately suitable (Class S2) lands for growing brinjal cover an area of about 519 ha (73%) and occur in the major part of the microwatershed. They have minor limitations of texture and rooting depth. Marginally suitable lands (Class S3) occupy an area of about 86 ha (12%) and are distributed in the southern, southwestern and southeastern part of the microwatershed. They have moderate limitation of rooting depth. Currently not suitable (Class N1) lands occur in an area of 4 ha (<1%) and are distributed in the southeastern part of the microwatershed with severe limitation of nutrient availability.

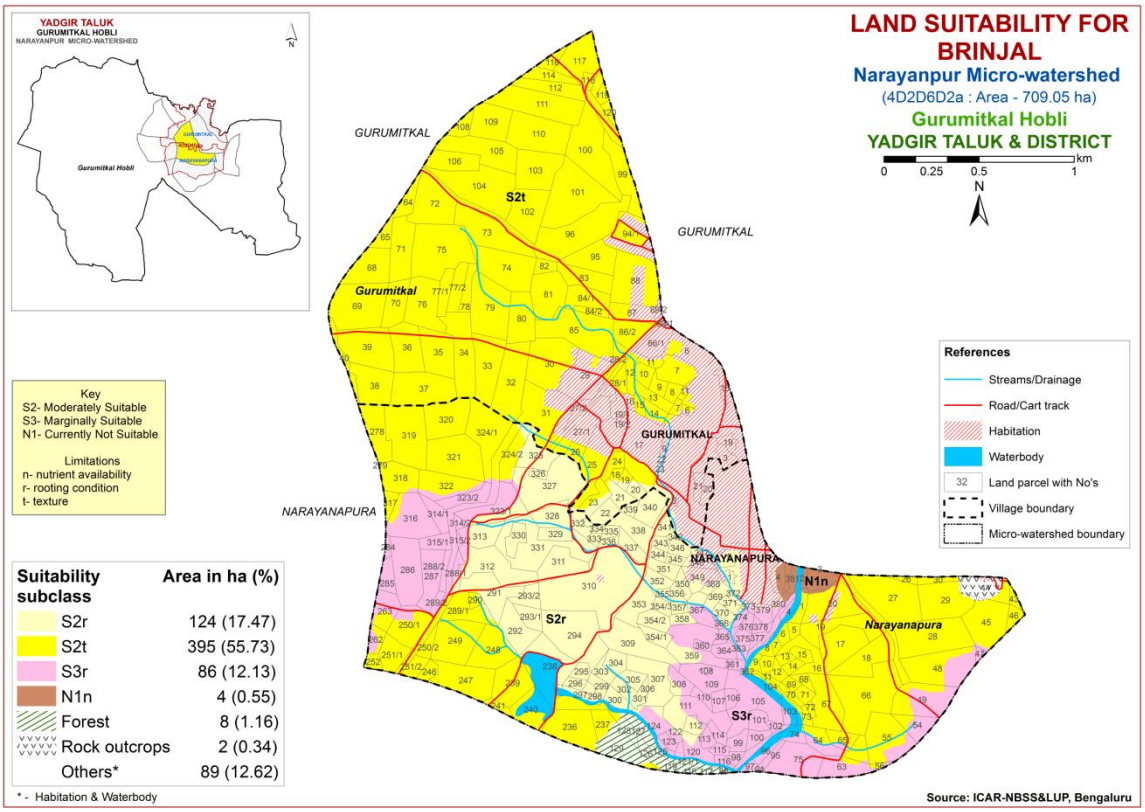

Fig 7.11 Land Suitability map of Brinjal

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

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

Highly (Class S1) suitable lands for growing onion occur in an area of 21 ha (3%) and are distributed in the southern and southeastern part of the microwatershed. Moderately suitable lands (Class S2) for growing onion occupy an area of about 215 ha (30%) and are distributed in the southern, southwestern and southeastern part of the microwatershed. They have minor limitations of rooting depth, drainage and gravelliness. Marginally (Class S3) suitable lands for growing onion occur in an area of 368 ha (52%) and are distributed in the major part of the microwatershed and have moderate limitations of rooting depth and texture. Currently not suitable (Class N1) lands occur in an area of 4 ha (<1%) and are distributed in the southeastern part of the microwatershed with severe limitations of nutrient availability.

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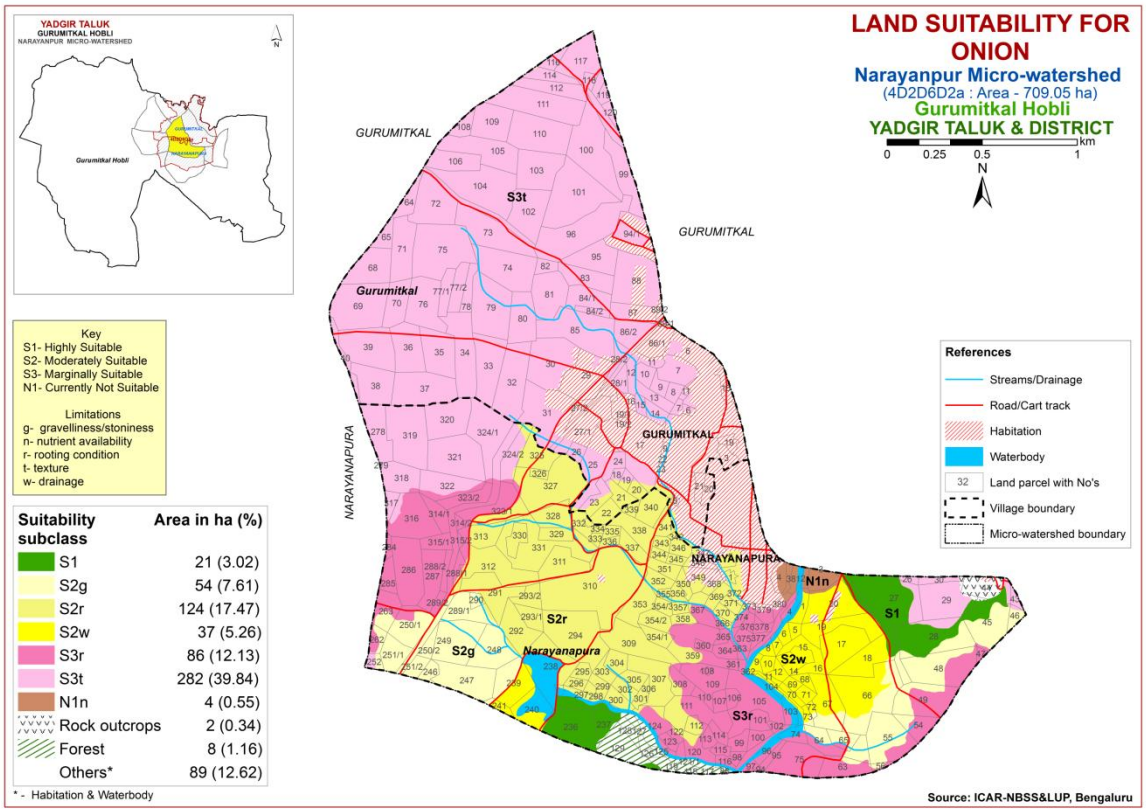

Fig 7.12 Land Suitability map of Onion

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 21 ha (3%) and are distributed in the southern and southeastern part of the microwatershed. Moderately suitable lands (Class S2) for growing bhendi occupy an area of about 497 ha (69%) and are distributed in the major part of the microwatershed. They have minor limitations of rooting depth, drainage, texture and gravelliness. Marginally (Class S3) suitable lands for growing bhendi occur in an area of 86 ha (12%) and are distributed in the southern, southeastern and southwestern part of the microwatershed and have moderate limitation of rooting depth. Currently not suitable (Class N1) lands occur in an area of 4 ha (<1%) and are distributed in the southeastern part of the microwatershed with severe limitation of nutrient availability.

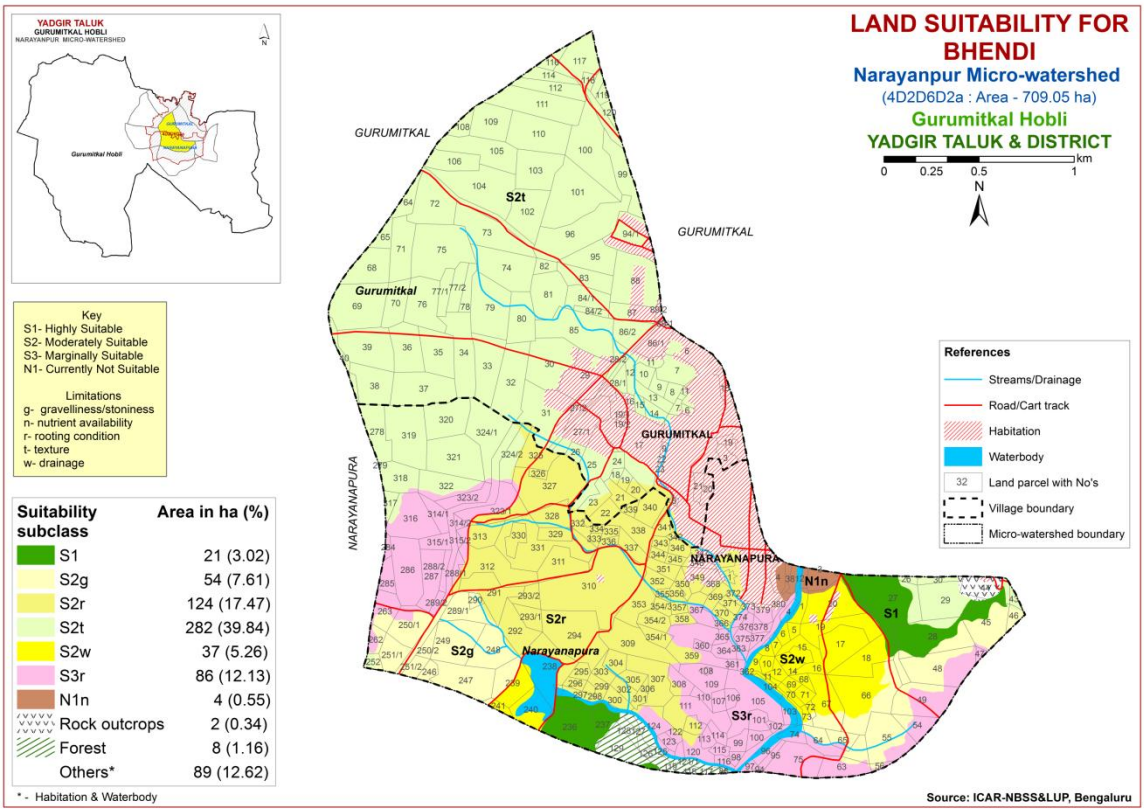

Fig 7.13 Land Suitability map of Bhendi

7.14 Land Suitability for Drumstick (*Moringa oleifera*)

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

Moderately suitable (Class S2) lands for growing drumstick cover an area of about 396 ha (56%) and occur in the major part of the microwatershed. They have minor limitations of texture, rooting depth, calcareousness and drainage. An area of about 124 ha (17%) is marginally suitable (Class S3) for growing drumstick and is distributed in the southern part of the microwatershed. They have moderate limitation of rooting depth. Currently not suitable (Class N1) lands occur in an area of 90 ha (13%) and are distributed in the southern, southwestern and southeastern part of the microwatershed with severe limitations of nutrient availability, rooting depth and texture.

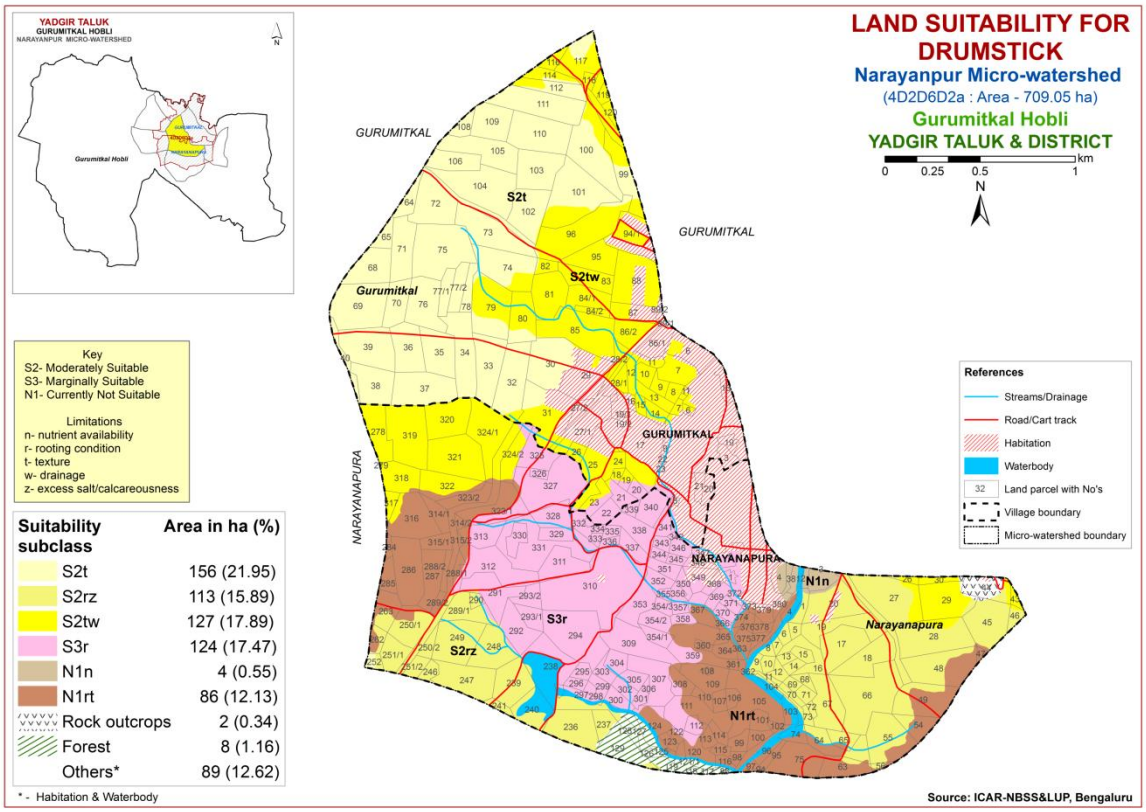

Fig 7.14 Land Suitability map of Drumstick

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.

Marginally suitable (Class S3) lands for growing mango cover an area of about 395 ha (56%) and occur in the major part of the microwatershed. They have moderate limitations of rooting depth, calcareousness and texture. Currently not suitable (Class N1) for growing mango occupy an area about 214 ha (30%) and occur in the southern, southwestern and southeastern part of the microwatershed. They have severe limitations of rooting depth and nutrient availability.

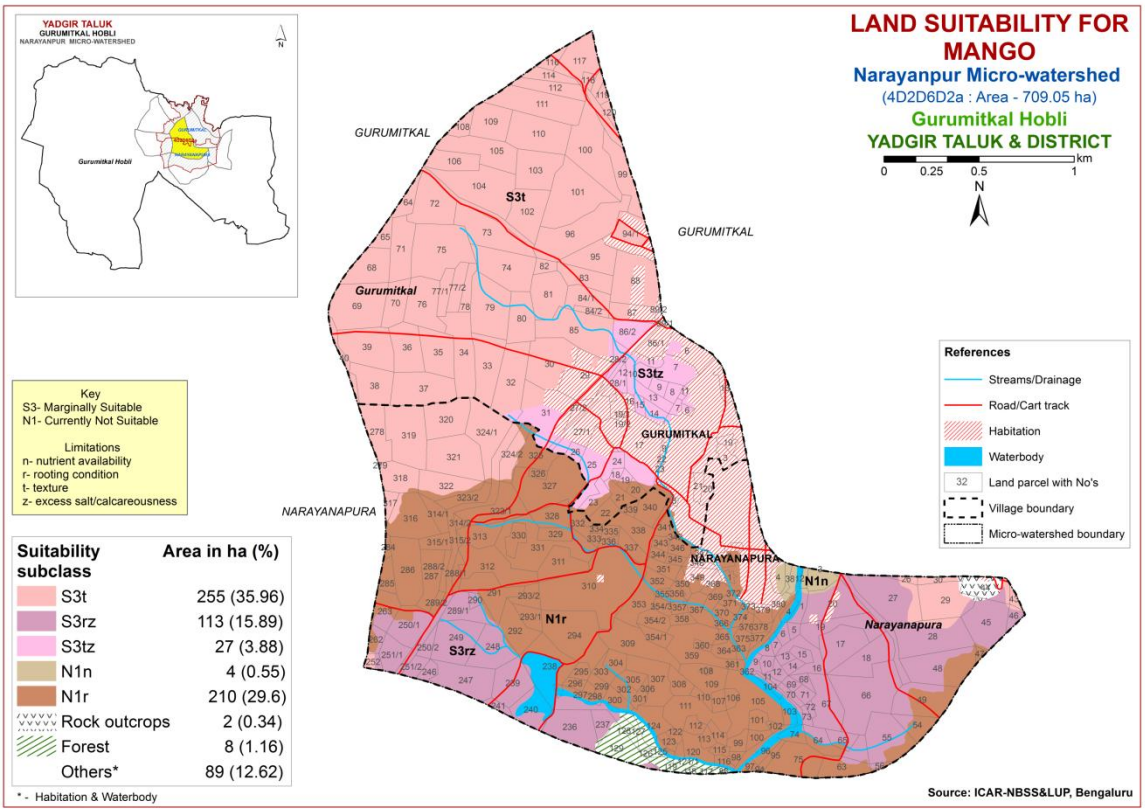

Fig. 7.15 Land Suitability map of Mango

7.16 Land Suitability for Guava (*Psidium guajava*)

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

Moderately suitable (Class S2) lands for growing guava cover an area of about 269 ha (38%) and occur in the major part of the microwatershed. They have minor limitations of rooting depth, texture and calcareousness. Marginally suitable (Class S3) lands for growing guava cover an area of about 251 ha (35%) and occur in the western, southern, northeastern and northern part of the microwatershed. They have moderate limitations of rooting depth and texture. Currently not suitable (Class N1) lands occur in an area of 90 ha (13%) and are distributed in the southern, southwestern and southeastern part of the microwatershed with severe limitations of nutrient availability, rooting depth and texture.

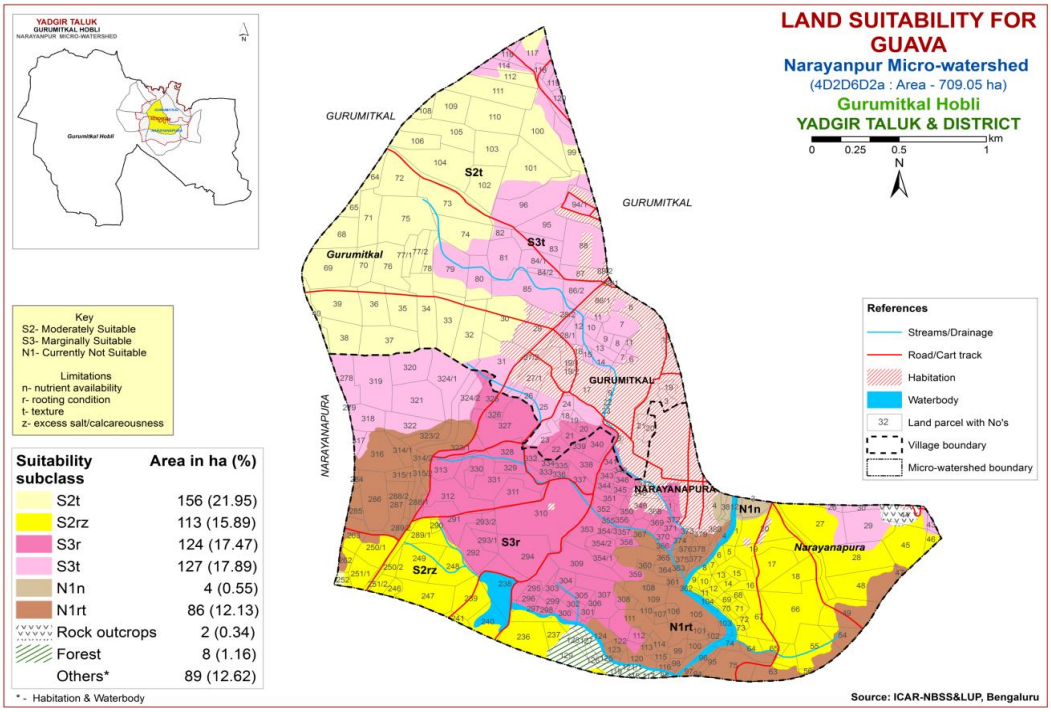

Fig. 7.16 Land Suitability map of Guava

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.

Moderately suitable (Class S2) lands for growing sapota cover an area of about 113 ha (16%) and occur in the southwestern, southern and southeastern part of the microwatershed. They have minor limitations of rooting depth and calcareousness. Marginally suitable (Class S3) lands for growing sapota cover an area of about 406 ha (57%) and occur in the major part of the microwatershed. They have moderate limitation of rooting depth and texture. Currently not suitable (Class N1) lands occur in an area of 90 ha (13%) and are distributed in the southern, southwestern and southeastern part of the microwatershed with severe limitations of nutrient availability and rooting depth.

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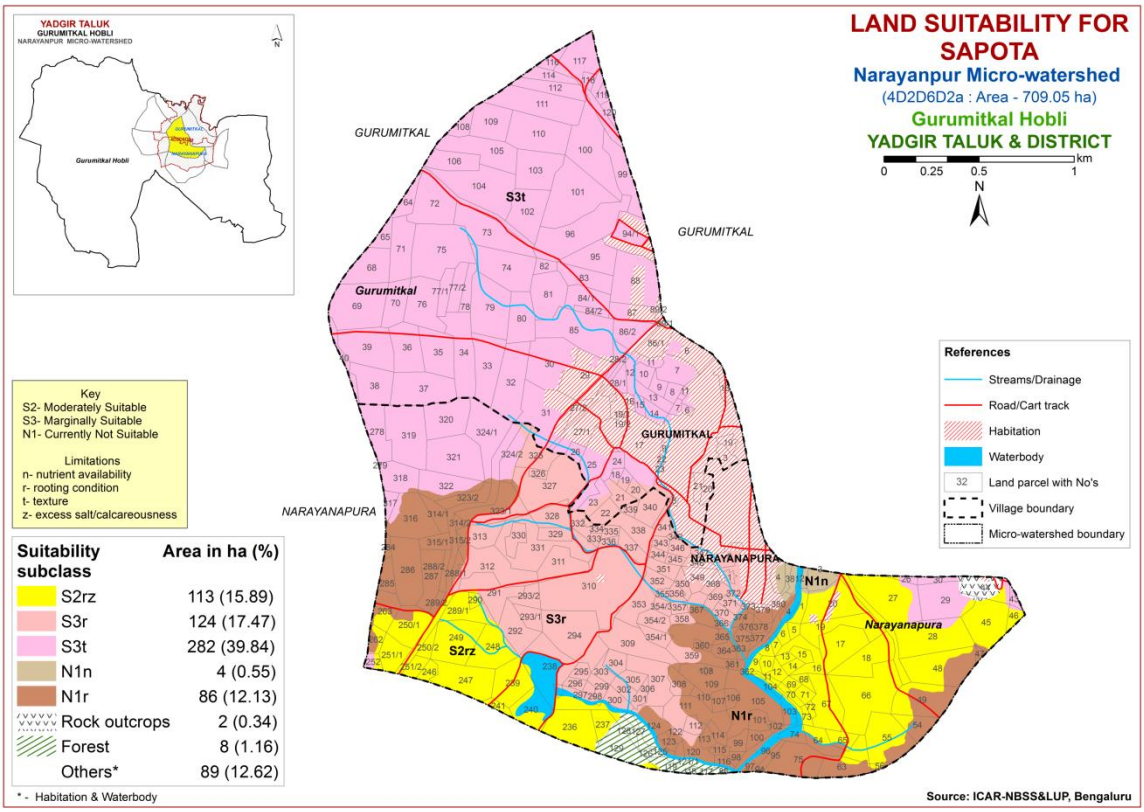

Fig. 7.17 Land Suitability map of Sapota

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.

Moderately suitable (Class S2) lands for growing pomegranate cover an area of about 395 ha (56%) and occur in the major part of the microwatershed. They have minor limitations of texture, rooting depth and calcareousness. An area of about 124 ha (17%) is marginally suitable (Class S3) for growing pomegranate and is distributed in the southern part of the microwatershed. They have moderate limitation of rooting depth. Currently not suitable (Class N1) lands occur in an area of 90 ha (13%) and are distributed in the southern, southwestern and southeastern part of the microwatershed with severe limitations of nutrient availability and rooting depth.

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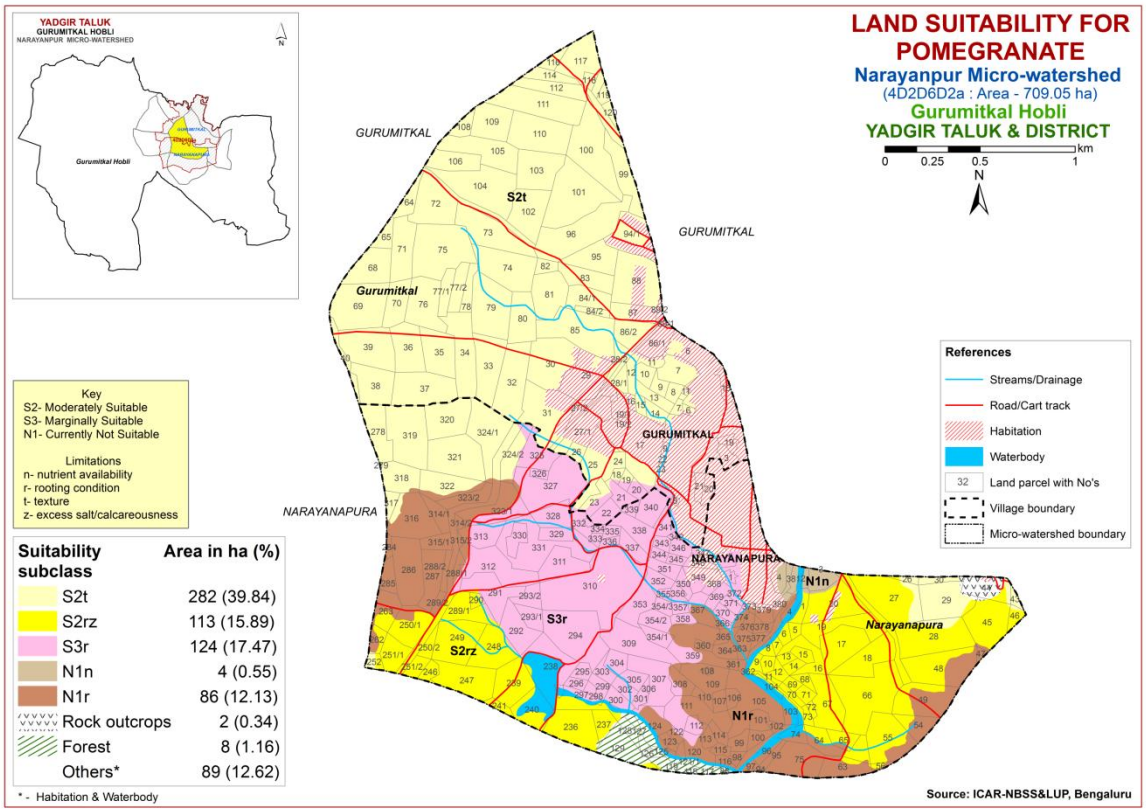

Fig 7.18 Land Suitability map of Pomegranate

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.

Highly suitable (Class S1) lands for growing musambi cover an area of about 127 ha (18%) and occur in the northern, western, northeastern and southeastern part of the microwatershed. An area of about 269 ha (38%) is moderately suitable (Class S2) for growing musambi and are distributed in the major part of the microwatershed. They have moderate limitations of texture, rooting depth and calcareousness. An area of about 124 ha (17%) is marginally suitable (Class S3) for growing musambi and is distributed in the southern part of the microwatershed. They have moderate limitation of rooting depth. Currently not suitable (Class N1) lands occur in an area of 90 ha (13%) and are distributed in the southern, southwestern and southeastern part of the microwatershed with severe limitations of nutrient availability and rooting depth.

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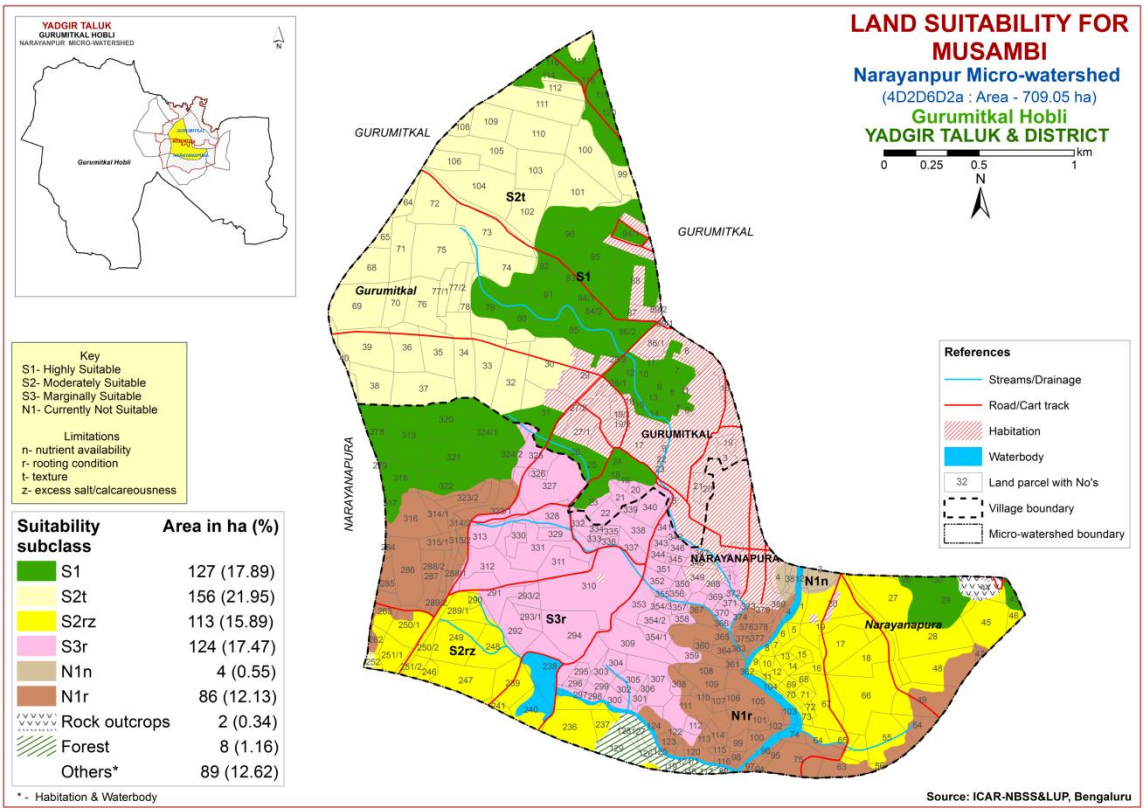

Fig. 7.19 Land Suitability map of Musambi

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.

Highly suitable (Class S1) lands for growing lime cover an area of about 127 ha (18%) and occur in the northern, western and northeastern part of the microwatershed. An area of about 269 ha (38%) is moderately suitable (Class S2) for growing lime and are distributed in the major part of the microwatershed. They have moderate limitations of texture, rooting depth and calcareousness. An area of about 124 ha (17%) is marginally suitable (Class S3) for growing lime and is distributed in the southern part of the microwatershed. They have moderate limitation of rooting depth. Currently not suitable (Class N1) lands occur in an area of 90 ha (13%) and are distributed in the southern, southwestern and southeastern part of the microwatershed with severe limitations of nutrient availability and rooting depth.

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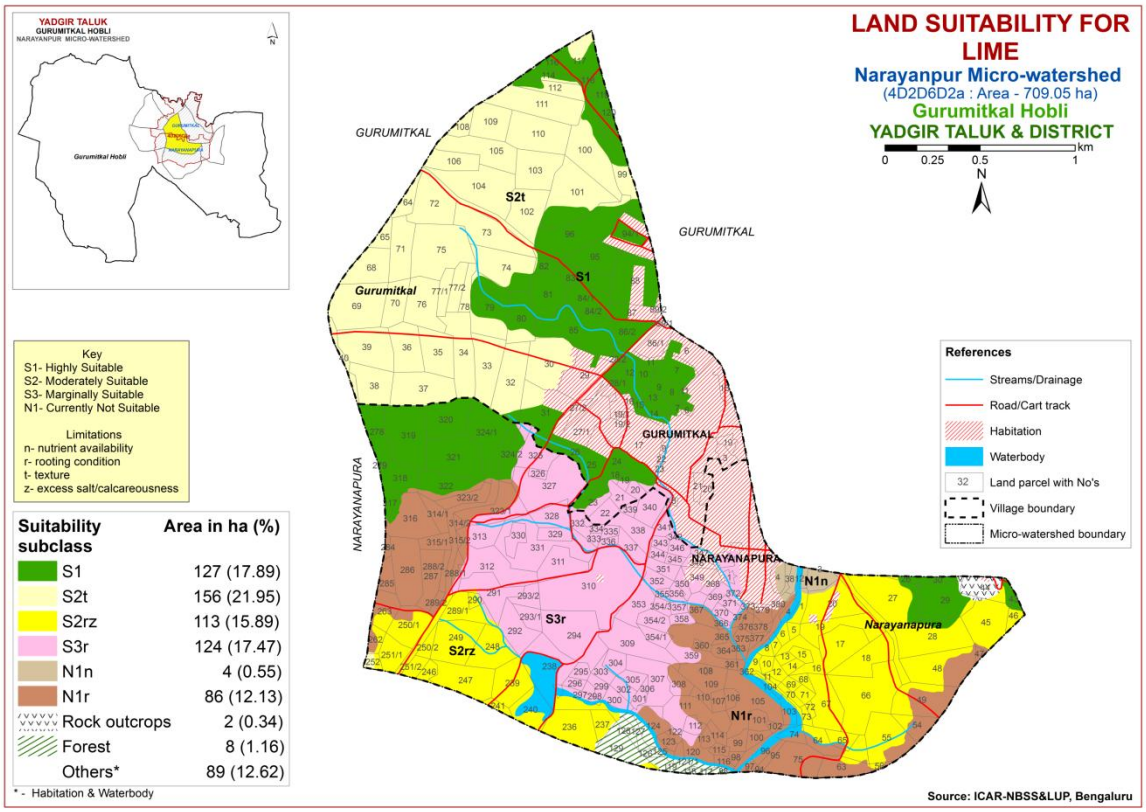

Fig. 7.20 Land Suitability map of Lime

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.

Moderately suitable (Class S2) lands for growing amla cover an area of about 519 ha (73%) and occur in the major part of the microwatershed. They have minor limitations of texture, calcareousness and rooting depth. Marginally suitable lands (Class S3) occupy an area of about 86 ha (12%) and are distributed in the southern, southwestern and southeastern part of the microwatershed. They have moderate limitations of rooting depth and texture. Currently not suitable (Class N1) lands occur in an area of 4 ha (<1%) and are distributed in the southeastern part of the microwatershed with severe limitation of nutrient availability.

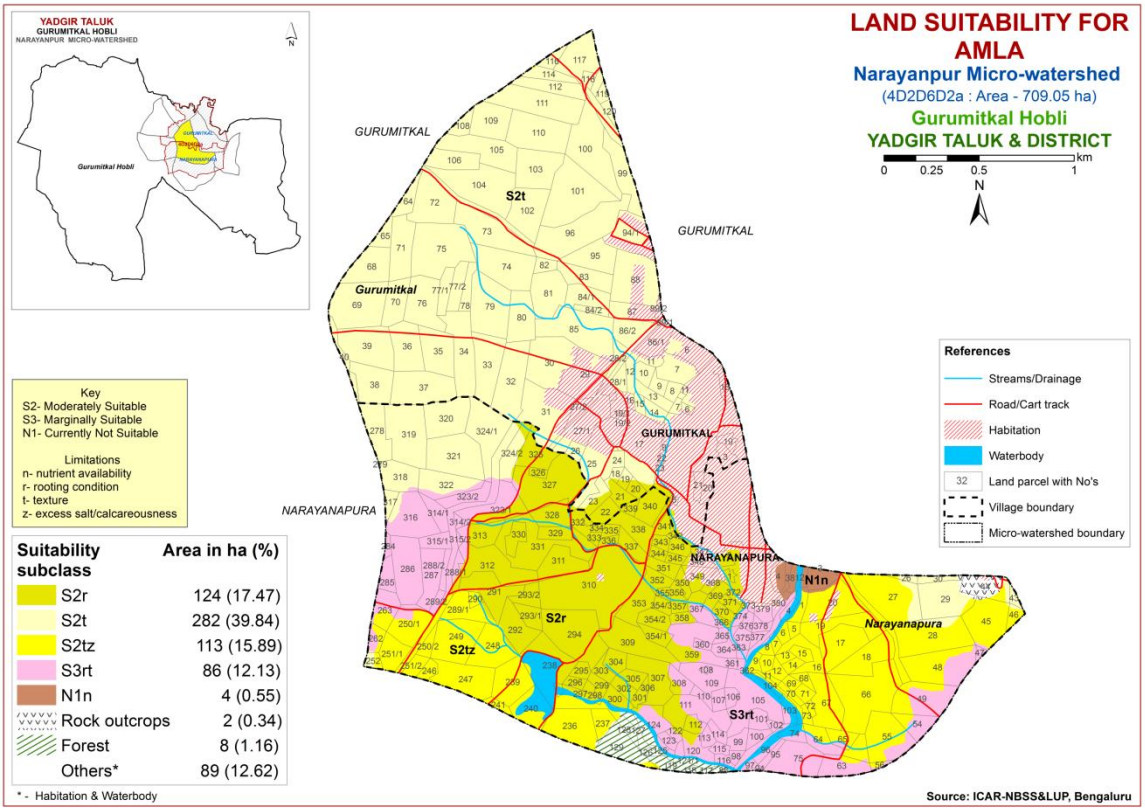

Fig. 7.21 Land Suitability map of Amla

7.22 Land Suitability for Cashew (*Anacardium occidentale)*

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

Currently not suitable (Class N1) lands for growing cashew occur in an entire cultivated area of 609 ha (84%) of the microwatershed with severe limitations of rooting depth, texture, nutrient availability and calcareousness.

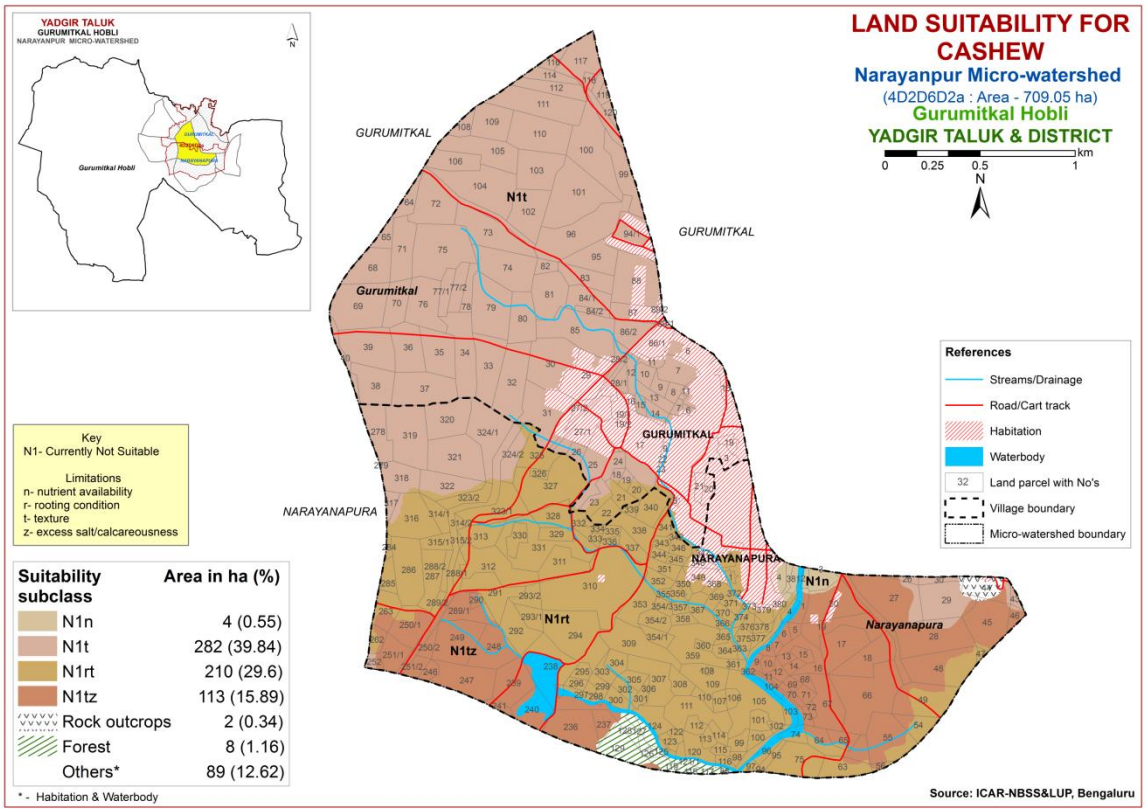

Fig. 7.22 Land Suitability map of Cashew

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.

Moderately suitable (Class S2) lands for growing jackfruit cover an area of about 113 ha (16%) and occur in the southwestern, southern and southeastern part of the microwatershed. They have minor limitations of rooting depth and calcareousness. Marginally suitable (Class S3) lands for growing jackfruit cover an area of about 406 ha (57%) and occur in the major part of the microwatershed. They have moderate limitation of rooting depth and texture. Currently not suitable (Class N1) lands occur in an area of 90 ha (13%) and are distributed in the southern, southwestern and southeastern part of the microwatershed with severe limitations of nutrient availability, texture and rooting depth.

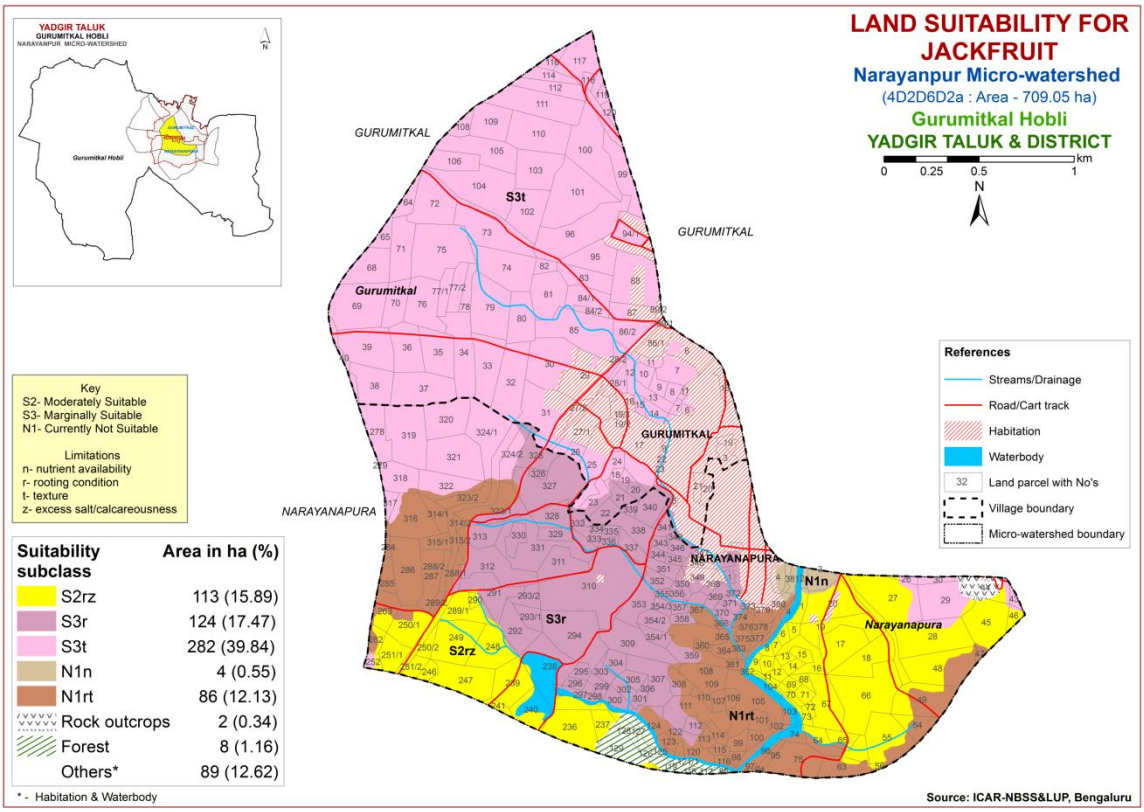

Fig. 7.23 Land Suitability map of Jackfruit

7.24 Land Suitability for Jamun (*Syzygium cumini*)

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

Moderately suitable (Class S2) lands for growing jamun cover an area of about 282 ha (40%) and occur in the major part of the microwatershed. They have minor limitation of texture. An area of about 237 ha (33%) is marginally suitable (Class S3) for growing jamun and are distributed in the southern, southwestern and southeastern part of the microwatershed. They have moderate limitations of rooting depth and calcareousness. Currently not suitable (Class N1) lands occur in an area of 90 ha (13%) and are distributed in the southern, southwestern and southeastern part of the microwatershed with severe limitations of nutrient availability, texture and rooting depth.

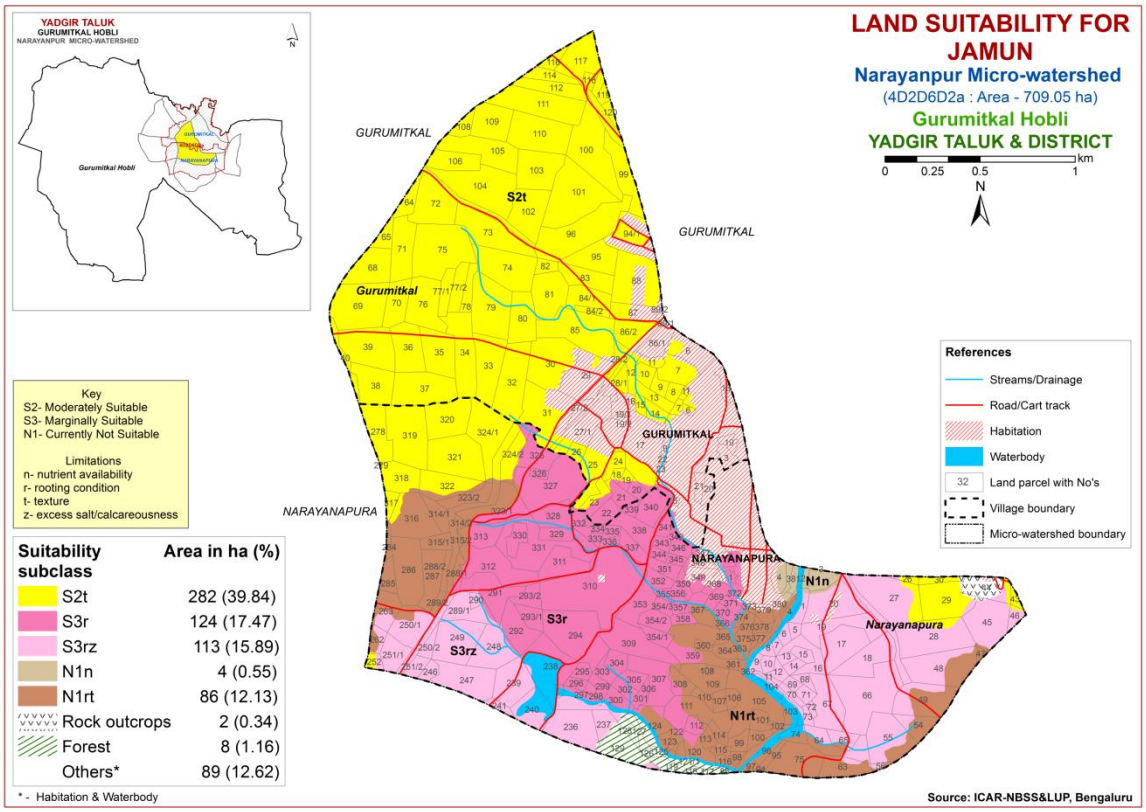

Fig. 7.24 Land Suitability map of Jamun

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 186 ha (26%) and are distributed in the northern, northeastern, western, southeastern and southern part of the microwatershed. An area of about 334 ha (47%) is moderately suitable (Class S2) for growing custard apple and are distributed in the major part of the microwatershed. They have minor limitations of rooting depth, texture and gravelliness. Marginally suitable lands (Class S3) occupy an area of about 86 ha (12%) and are distributed in the southern and southwestern part of the microwatershed. They have moderate limitation of rooting depth. Currently not suitable (Class N1) lands occur in an area of 4 ha (<1%) and are distributed in the southeastern part of the microwatershed with severe limitation of nutrient availability.

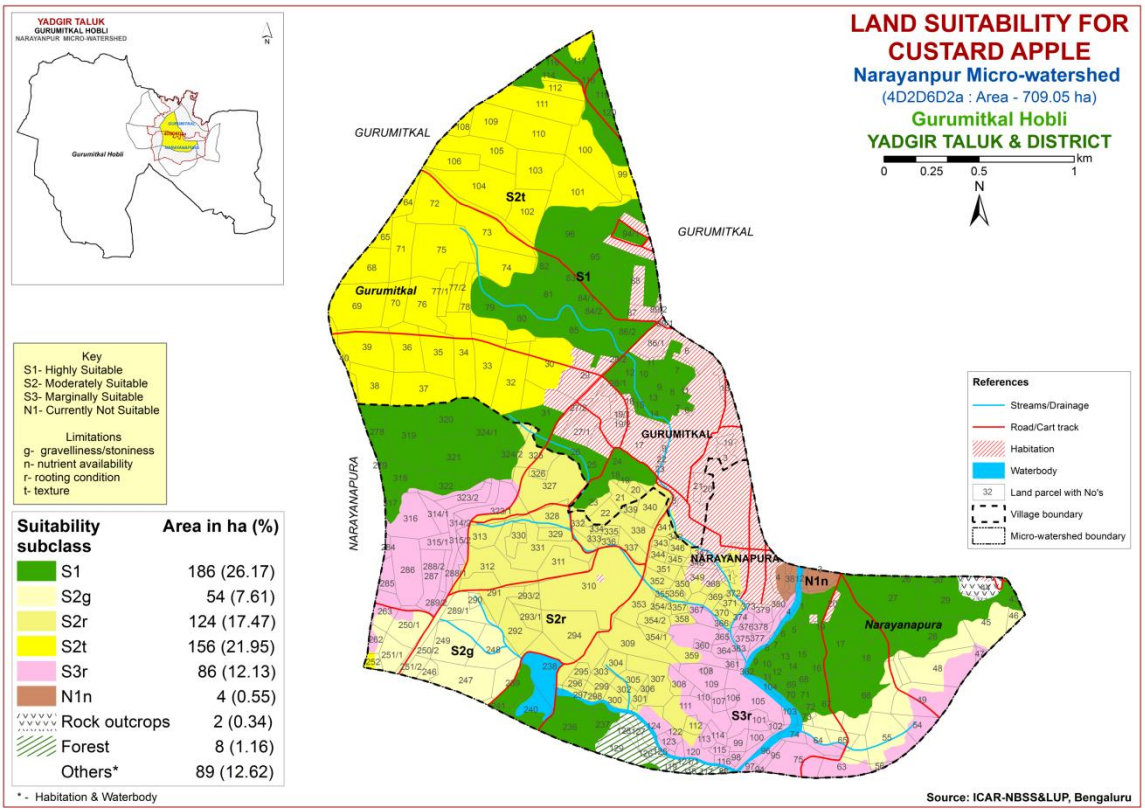

Fig. 7.25 Land Suitability map of Custard Apple

7.26 Land Suitability for Tamarind (*Tamarindus indica*)

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

Moderately suitable (Class S2) lands for growing tamarind cover an area of about 282 ha (40%) and occur in the major part of the microwatershed. They have minor limitation of texture. Marginally suitable lands (Class S3) for growing tamarind occupy an area of about 113 ha (16%) and occur in the southeastern, southern and southwestern part of the microwatershed. They have moderate limitations of rooting depth and calcareousness. Currently not suitable lands (Class N1) for occur in an area about 214 ha (30%) and occur in the southern, southwestern and southeastern part of the microwatershed. They have severe limitations of rooting depth, nutrient availability and texture.

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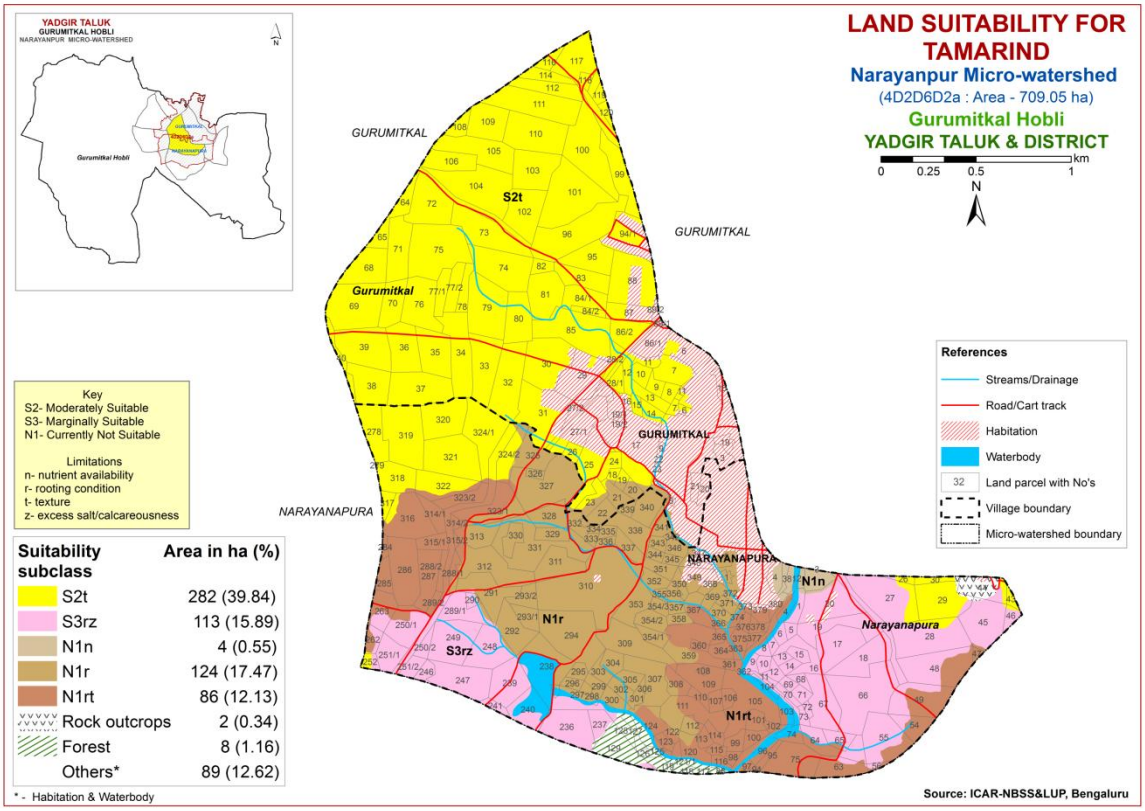

Fig. 7.26 Land Suitability map of Tamarind

7.27 Land Suitability for Mulberry (*Morus nigra*)

Mulberry is the important leaf crop grown for rearing of 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.

Moderately suitable (Class S2) lands for growing mulberry cover an area of about 113 ha (16%) and occur in the southwestern, southern and southeastern part of the microwatershed. They have minor limitations of rooting depth and calcareousness. Marginally suitable (Class S3) lands for growing mulberry cover an area of about 407 ha (57%) and occur in the major part of the microwatershed. They have moderate limitation of rooting depth, drainage and texture. Currently not suitable (Class N1) lands occur in an area of 90 ha (13%) and are distributed in the southern, southwestern and southeastern part of the microwatershed with severe limitations of nutrient availability, texture and rooting depth.

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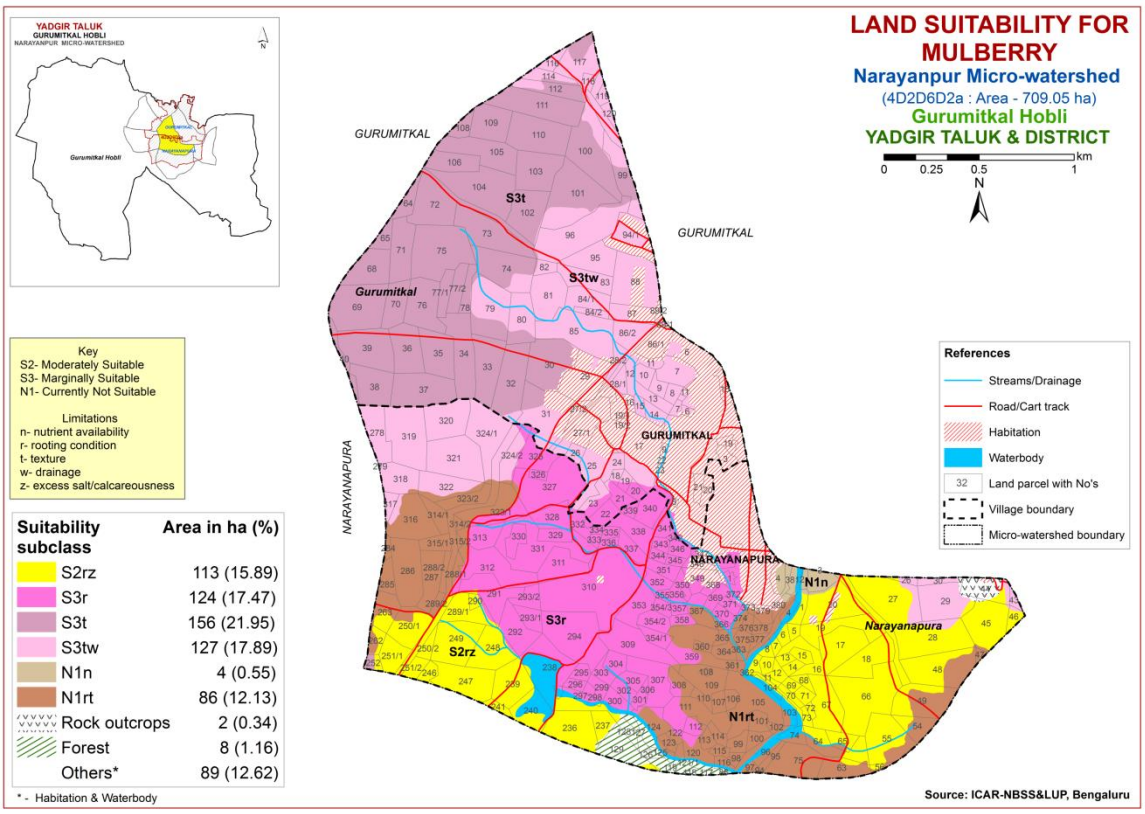

Fig 7.27 Land Suitability map of Mulberry

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.

Moderately suitable (Class S2) lands for growing marigold cover an area of about 520 ha (73%) and occur in the major part of the microwatershed. They have minor limitations of texture, calcareousness, gravelliness, drainage and rooting depth. Marginally suitable lands (Class S3) occupy an area of about 86 ha (12%) and are distributed in the southern, southwestern and southeastern part of the microwatershed. They have moderate limitations of texture and rooting depth. Currently not suitable (Class N1) lands occur in an area of 4 ha (<1%) and are distributed in the southeastern part of the microwatershed with severe limitation of nutrient availability.

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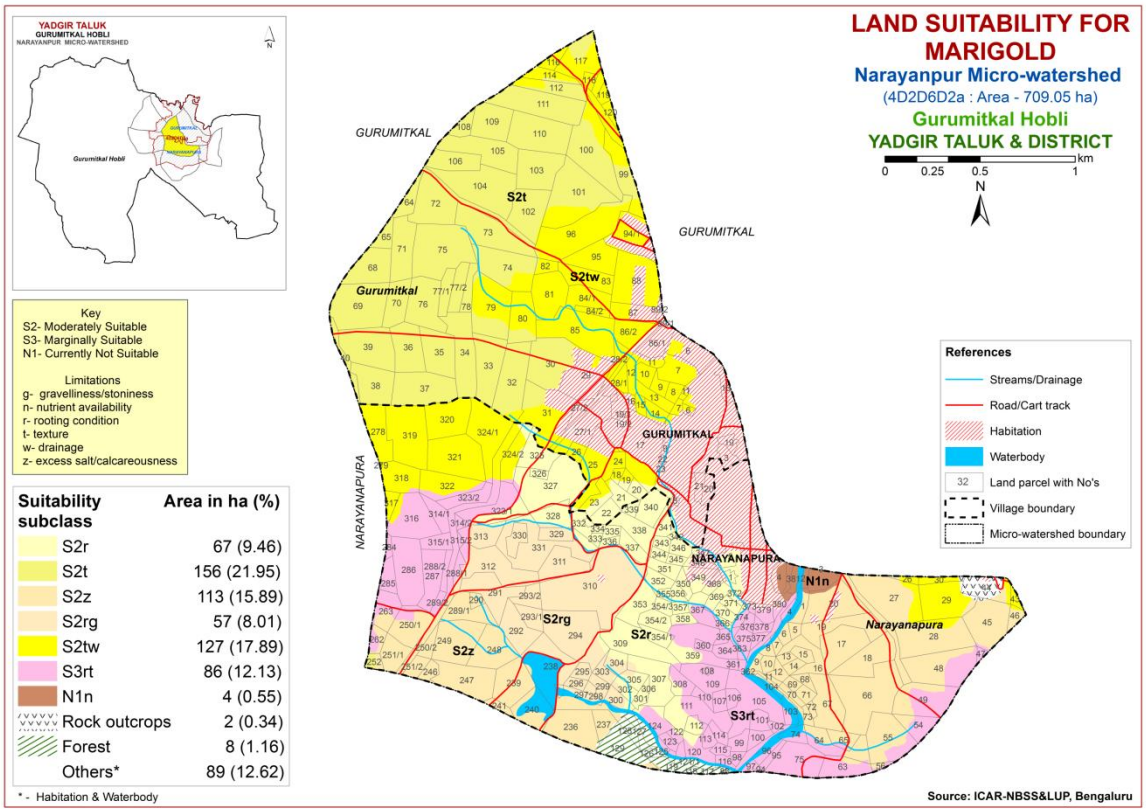

Fig. 7.28 Land Suitability map of Marigold

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.

Moderately suitable (Class S2) lands for growing chrysanthemum cover an area of about 520 ha (73%) and occur in the major part of the microwatershed. They have minor limitations of texture, calcareousness, gravelliness, drainage and rooting depth. Marginally suitable lands (Class S3) occupy an area of about 86 ha (12%) and are distributed in the southern, southwestern and southeastern part of the microwatershed. They have moderate limitations of texture and rooting depth. Currently not suitable (Class N1) lands occur in an area of 4 ha (<1%) and are distributed in the southeastern part of the microwatershed with severe limitation of nutrient availability.

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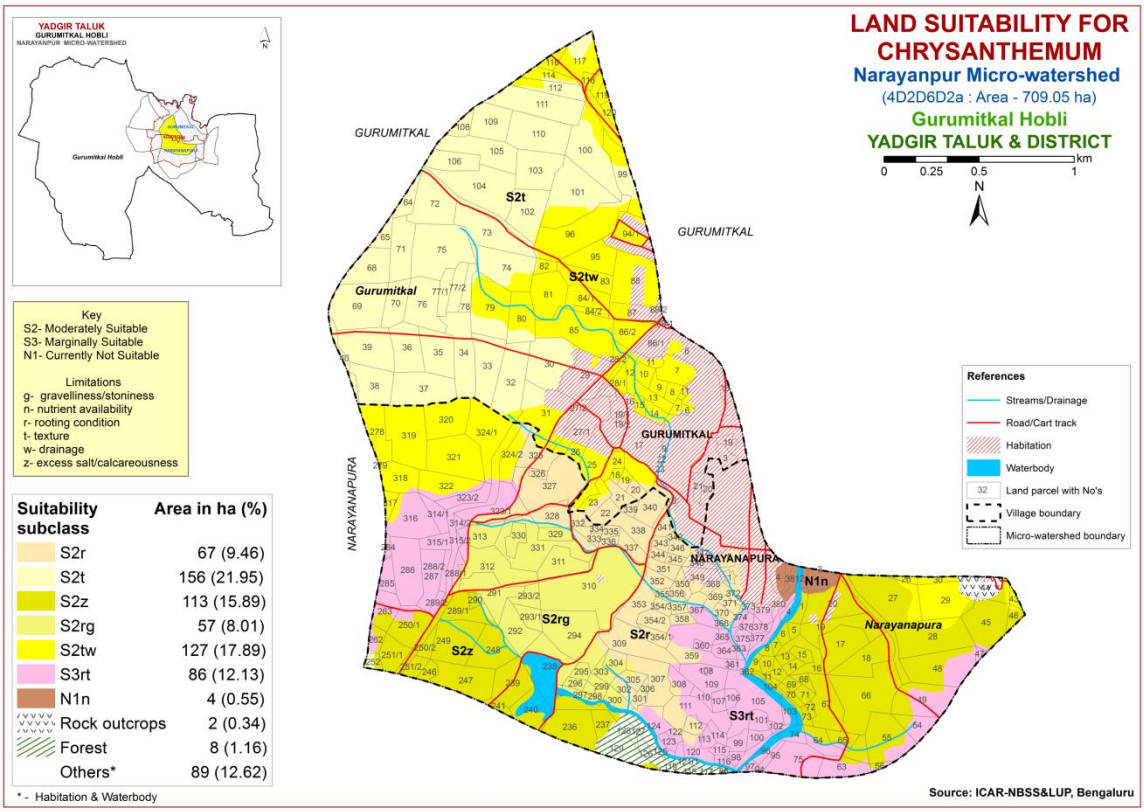


Fig. 7.29 Land Suitability map of Chrysanthemum

7.30 Land Management Units (LMUs)

The 21 soil map units identified in Narayanapur microwatershed have been grouped into 5 Land Management Units (LMUs) for the purpose of preparing a Proposed Crop Plan. Land Management Units are grouped based on the similarities in respect of the type of soil, the depth of the soil, the surface soil texture, gravel content, AWC, slope, erosion etc. and a Land Management Units map (Fig. 7.30) 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 5 Land Management Units along with brief description of soil and site characteristics are given below.

LMU	Soil map units	Soil and site characteristics
1	150.GWDiB2g1	Moderately deep, sodic, sandy clay loam soils (75 – 100 cm), 1-3 % slopes, gravelly (15-35 %), moderate erosion.
2	53.ANRhB2 159.BMNmA1 62.BMNmB2 63.BMNmB2g1 49.NGPmB2 146.NGPmB2g1	Deep to very deep, black calcareous, clay soils (100 - >150 cm), 0-3 % slopes, non-gravelly to gravelly (<15-35%), slight to moderate erosion.

3	160.HSLcB2g1 176.HSLcB2g2 33.HSLiB2 173.HSLiB2g1	Moderately deep, black clay soils (75-100 cm), 1- 3% slopes, non-gravelly to very gravelly (<15 to 60%), moderate erosion.
4	21.JNKcB2g1 110.JNKhB2 22.JNKiB2 24.JNKiB3g1 152.JNKmB2	Moderately shallow, sandy clay loam soils (50-75 cm), 1-3 % slopes, non-gravelly to gravelly (15-35%), moderate erosion.
5	174.BDLcB2g2 4.BDLhB2 162.BDLhB2g1 5.BDLiB2 6.BDLiB3	Shallow, sandy loam soils (25-50 cm), 1-3 % slopes, non-gravelly to very gravelly (<15 to 60%), moderate erosion

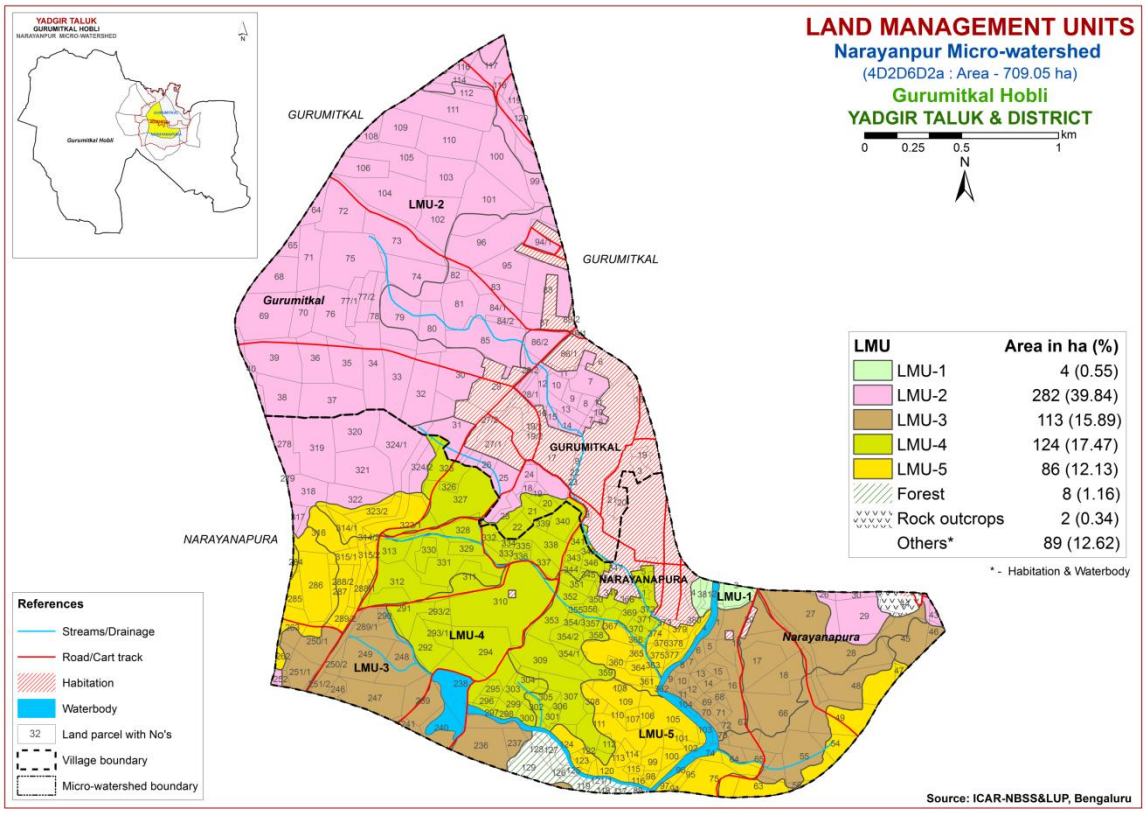


Fig. 7.30 Land Management Units Map Narayanapur Microwatershed

7.31 Proposed Crop Plan for Narayanapur Microwatershed

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

Table 7.1 Soil-Site Characteristics of Narayanapur 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 (%)								
BDLcB2g2	866	150	WD	25-50	sl	sl	35-60	<15	<50	1-3	moderate	6.20	0.074	0.20	4.20	93
BDLhB2	866	150	WD	25-50	scl	sl	<15	<15	<50	1-3	moderate	6.20	0.074	0.20	4.20	93
BDLhB2g1	866	150	WD	25-50	scl	sl	15-35	<15	<50	1-3	moderate	6.20	0.074	0.20	4.20	93
BDLiB2	866	150	WD	25-50	sc	sl	<15	<15	<50	1-3	moderate	6.20	0.074	0.20	4.20	93
BDLiB3	866	150	WD	25-50	sc	sl	<15	<15	<50	1-3	moderate	6.20	0.074	0.20	4.20	93
JNKcB2g1	866	150	W	50-75	sl	scl	15-35	<15	51-100	1-3	moderate	8.42	0.148	0.18	14.50	100
JNKhB2	866	150	W	50-75	scl	scl	<15	<15	51-100	1-3	moderate	8.42	0.148	0.18	14.50	100
JNKiB2	866	150	W	50-75	sc	scl	<15	<15	51-100	1-3	moderate	8.42	0.148	0.18	14.50	100
JNKiB3g1	866	150	W	50-75	sc	scl	15-35	<15	51-100	1-3	moderate	8.42	0.148	0.18	14.50	100
JNKmB2	866	150	W	50-75	c	scl	<15	<15	51-100	1-3	moderate	8.42	0.148	0.18	14.50	100
GWDiB2g1	866	150	MWD	75-100	sc	scl	15-35	<15	101-150	1-3	moderate	9.89	0.74	17.40	8.35	100
HSLcB2g1	866	150	MWD	75-100	sl	sc	15-35	<15	101-150	1-3	moderate	7.16	0.117	5.94	4.90	97
HSLcB2g2	866	150	MWD	75-100	sl	sc	35-60	<15	101-150	1-3	moderate	7.16	0.117	5.94	4.90	97
HSLiB2	866	150	MWD	75-100	sc	sc	<15	<15	101-150	1-3	moderate	7.16	0.117	5.94	4.90	97
HSLiB2g1	866	150	MWD	75-100	sc	sc	15-35	<15	101-150	1-3	moderate	7.16	0.117	5.94	4.90	97
NGPmB2	866	150	MWD	100-150	c	c	<15	<15	>200	1-3	moderate	7.42	0.24	0.22	67.10	100
NGPmB2g1	866	150	MWD	100-150	c	c	15-35	<15	>200	1-3	moderate	7.42	0.24	0.22	67.10	100
ANRhB2	866	150	MWD	100-150	scl	c	<15	<15	>200	1-3	moderate	10.17	0.365	7.08	19.90	100
BMNmA1	866	150	MWD	>150	c	c	<15	<15	>200	0-1	slight	8.20	0.284	0.65	52.70	100
BMNmB2	866	150	MWD	>150	c	c	<15	<15	>200	1-3	moderate	8.20	0.284	0.65	52.70	100
BMNmB2g1	866	150	MWD	>150	c	c	15-35	<15	>200	1-3	moderate	8.20	0.284	0.65	52.70	100

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

Table 7.2 Land suitability criteria for Sorghum

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

Table 7.3 Land suitability criteria for Maize

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

Table 7.4 Land suitability criteria for Bajra

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

Table 7.5 Land suitability criteria for Groundnut

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

Table 7.6 Land suitability criteria for Sunflower

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

Table 7.7 Land suitability criteria for Redgram

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

Table 7.8 Land suitability criteria for Bengal gram

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

Table 7.9 Land suitability criteria for Cotton

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

Table 7.10 Land suitability criteria for Chilli

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

Table 7.11 Land suitability criteria for Tomato

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

Table 7.12 Land suitability criteria for Brinjal

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

Table 7.13 Land suitability criteria for Onion

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

Table 7.14 Land suitability criteria for Bhendi

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

Table 7.15 Land suitability criteria for Drumstick

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

Table 7.16 Land suitability criteria for Mango

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

Table 7.17 Land suitability criteria for Guava

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

Table 7.18 Land suitability criteria for Sapota

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

Table 7.19 Land suitability criteria for Pomegranate

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

Table 7.20 Land suitability criteria for Musambi

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

Table 7.21 Land suitability criteria for Lime

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

Table 7.22 Land suitability criteria for Amla

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

Table 7.23 Land suitability criteria for Cashew

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

Table 7.24 Land suitability criteria for Jackfruit

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

Table 7.25 Land suitability criteria for Jamun

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

Table 7.26 Land suitability criteria for Custard apple

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

Table 7.27 Land suitability criteria for Tamarind

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

Table 7.28 Land suitability criteria for Mulberry

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

Table 7.29 Land suitability criteria for Marigold

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

Table 7.30 Land suitability criteria for Chrysanthemum

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

Table 7.31 Proposed Crop Plan for Narayanapur Microwatershed

LMU	Soil Map Units	Survey Number	Soil and site characteristics	Field Crops/ Commercial crops	Horticulture Crops (Rainfed/Irrigated)	Suitable Interventions
1	150.GWDiB2g1	**Narayanapura:** 2,3,4,381	Moderately deep, sodic sandy clay loam soils (75 – 100 cm), 1-3 % slopes, gravelly (15-35 %), moderate erosion.	-	**Agri-Silvi-Pasture** Ber, Aonla, Acacia sp. Dhaincha, Rhodes grass, Para grass ,Bermuda grass	Application of gypsum, iron pyrites and elemental sulphur. Addition of farm yard manure, green manure and providing subsurface drainage
2	53.ANRhB2 159.BMNmA1 62.BMNmB2 63.BMNmB2g1 49.NGPmB2 146.NGPmB2g1	**Gurumitkal:**7,8,9,10,11,12,13,14,18,23,24,25,26,28/1,28/2,30,31,32,33,34,35,36,37,38,39,40,64,65,68,69,70,71,72,73,74,75,76,77/1,77/2,78,79,80,81,82,83,84/1,84/2,85,86/2,88,95,96,99,100,101,102,103,104,105,106,108,109,110,111,112,114,116,117,118 ,119,120 **Narayanapura:**26,29,30,43,252,278,279,317,318,319,320,321,322,324/1,324/2	Deep to very deep, black calcareous clay soils (100->150 cm), 0-3 % slopes, non-gravelly to gravelly (15-35%), slight to moderate erosion.	Maize, Sorghum, Sunflower, Cotton, Red gram, Bengalgram, Bajra	**Fruit crops:** Lime, Musambi, Custard apple, Pomegranate **Vegetables:** Chilli, Bhendi **Flowers:** Marigold, Chrysanthemum	Application of FYM, Biofertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices
3	160.HSLcB2g1 176.HSLcB2g2 33.HSLiB2 173.HSLiB2g1	**Narayanapura:**1,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,27,28,45,46,48,55,56,64,65,66,67,68,69,70,71,72,73,236,237,239,240,241,246,247,248,249	Moderately deep black clay soils (75-100 cm), 1- 3% slopes, non-gravelly to very gravelly	Sorghum, Maize, Sunflower, Groundnut, Red gram, Bajra, Bengal gram, Safflower,	**Fruit crops:** Musambi, Sapota, Pomegranate, Amla, Custard apple, Guava, Jackfruit, Lime **Vegetables:** Tomato,	Application of FYM, Biofertilizers and micronutrients, drip irrigation,

LMU	Soil Map Units	Survey Number	Soil and site characteristics	Field Crops/ Commercial crops	Horticulture Crops (Rainfed/Irrigated)	Suitable Interventions
		,250/1,250/2,251/1,251/2,289/1,290	(<15 to 60%), moderate erosion.	Linseed	Onion**,** Bhendi, Chilli, Brinjal, Drumstick, Coriander **Flowers:** Marigold, Chrysanthemum	mulching, suitable soil and water conservation practices
4	21.JNKcB2g1 110.JNKhB2 22.JNKiB2 24.JNKiB3g1 152.JNKmB2	**Gurumitkal :** 21,22 **Narayanapura:**5,112,291,292,293/1,293/2,294,295,296,297,298,299,300,301,302,303,304,305,306,307,309,310,311,312,313,325,326,327,328,329,330,331,332,333,334,335,336,337,338,339,340,341,342,343,344,345,346,350,351,352,353,354/1,354/2,354/3,355,356,357,358,366,369,370,371,372	Moderately shallow, sandy clay loam soils (50-75 cm), 1-3 % slopes, non-gravelly to gravelly (15-35%), moderate erosion.	Maize, Sorghum Groundnut, Bajra	**Fruit crops:** Amla, Custard apple **Vegetables:** Tomato, Chilli, Brinjal, Bhendi, Onion **Flowers:** Marigold, Chrysanthemum	Application of FYM, Biofertilizers and micronutrients, drip irrigation, mulching, suitable soil and water conservation practices
5	174.BDLcB2g2 4.BDLhB2 162.BDLhB2g1 5.BDLiB2 6.BDLiB3	**Narayanapura:**47,49,54,63,75,94,95, 97,98,99,100,101,102,105,106,107,108,109,110,111,113,114,115,116,120,121/1,122,123,124,125,262,263,284,285,286,287,288/1,288/2,289/2,308,314/1,314/2,315/1,315/2,316,323/1,323/2,359,360,361,362,363,364,365,367,374,375,376,377,378,379	Shallow, sandy loam soils (25-50 cm), 1-3 % slopes, non-gravelly to very gravelly (<15 to 60%), moderate erosion	-	**Agri-Silvi-Pasture:** Hybrid Napier, *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 Narayanapur Microwatershed

- The soil phases identified in the microwatershed belonged to the soil series, of NGP series occupies maximum area of 163 ha (23%) followed by JNK 124 ha (17%), HSL ha 113 ha (16%), BMN 92 ha (13%), BDL 86 ha (12%), ANR 27 ha (4%) and GWD 4 ha (<1%)
- As per land capability classification an area of 609 ha in the microwatershed falls under arable land category (Class II, III &IV). The major limitations identified in the arable lands were soil, drainage and erosion.

- On the basis of soil reaction an area of 12 ha (2%) is slightly acid (pH 6.0 -6.5), about 547 ha (77%) is neutral (ph 6.5 -7.3) and 49 ha (7%) is slightly alkaline (pH 7.3-7.8) in the microwatershed.

Soil Health Management

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

Acid soils

An area of 12 ha is under acid soils

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

Slightly alkaline soils cover an area of about 49 ha in the microwatershed

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

Neutral soils

About 547 ha is under neutral soils.

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 factors affecting the soil health in the microwatershed. Out of total 709 ha area in the microwatershed, about 575 ha (81%) is suffering from moderate to severe erosion. These areas need immediate soil and water conservation and, other land development and land husbandry practices for restoring soil health.

Dissemination of Information and Communication of Benefits

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

Inputs for Net Planning (Saturation Plan) and Interventions needed

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

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

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

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

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

- **Gravelliness:** More gravel content is favorable for run-off harvesting but poor in soil moisture storage and nutrient availability. It is a significant parameter that decides the kind of crop to be raised.
- **Land Capability Classification:** The land capability map shows the areas suitable and not suitable for agriculture and the major constraints in each of the plot/survey number. Hence, one can decide what kind of enterprise is possible in each of these units. In general, erosion and soil are the major constraints in Narayanapur microwatershed.
- **Organic Carbon:** The OC content (an index of available Nitrogen), high (>0.75%) in the entire cultivated area of the microwatershed.
- **Available Phosphorus**: Available Phosphorus in high (>57 kg/ha) which covers an area of 252 ha (36%), medium (23-57 kg/ha) which covers an area of 98 ha (14%) and low (<23 kg/ha) which is about 258 ha (36%) in the microwatershed. For all the crops 25% additional P needs to be applied where available P is medium and low areas.
- **Available Potassium:** Available potassium is medium (145-337 kg/ha) in an area of about 369 ha (52%) and high (>337 kg/ha) in an area of about 240 ha (34%) in the microwatershed. All the plots, where available potassium is medium, for all the crops, additional 25% potassium may be applied.
- **Available Sulphur:** Available sulphur is a very critical nutrient for oilseed crops, it is medium (10-20 ppm) in an area of about 473 ha (67%) and low (<10ppm) is about 136 ha (19%) in the microwatershed. 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 421 ha (59%) is low and 188 ha (<26%) is medium in available boron. For these areas, application of sodium borate @ 10 kg/ha as soil application or 0.2 % borax as foliar spray is recommended.
- **Available Iron:** Available iron is sufficient (>4.5ppm) in the entire cultivated area of the microwatershed.
- **Available Manganese:** Entire cultivated area of the microwatershed is sufficient in available manganese content**.**
- **Available Copper:** Entire cultivated area of the microwatershed is sufficient in available copper content.
- **Available Zinc:** Available zinc content is deficient (<0.6 ppm) in an area of about 362 ha (51%) and sufficient (>0.6 ppm) in an area of about 247 ha (35%) of the microwatershed. Application of zinc sulphate 25 kg/ha is recommended for the deficient areas.
- **Land Suitability for various crops:** Areas that are highly, moderately and marginally suitable for growing various crops are indicated. Along with the

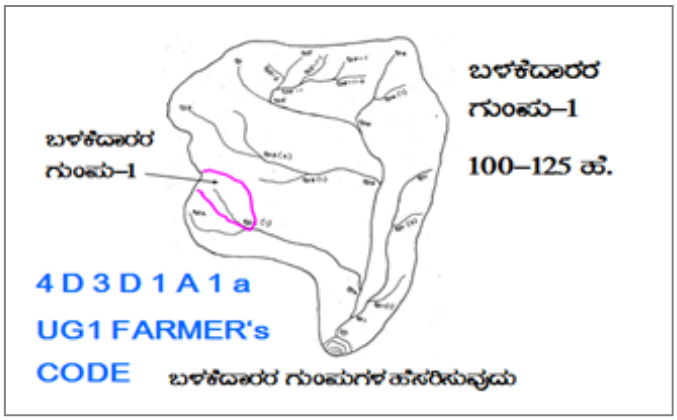
suitability, various constraints that are limiting the productivity are also indicated. For example, in case of cotton, gravel content, rooting depth and salinity/alkalinity are the major constraints in various plots. With suitable management interventions, the productivity can be enhanced. In order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

Chapter 9

SOIL AND WATER CONSERVATION TREATMENT PLAN

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

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



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

Steps for Survey and Preparation of Treatment Plan

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

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

9.1 Treatment Plan

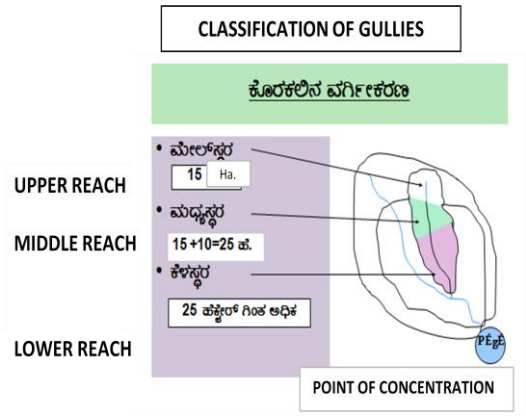
The treatment plan recommended for arable lands is briefly described below

9.1.1 Arable Land Treatment

A. BUNDING

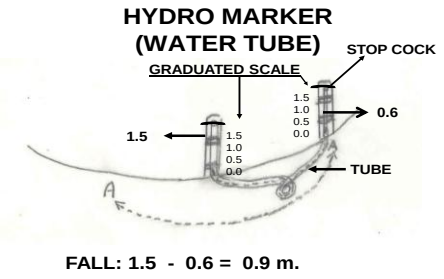
Steps for Survey and Preparation of Treatment Plan	
• Cadastral map (1:7920 scale) is enlarged to a scale of 1:2500 scale • Existing network of waterways, pothissa boundaries, grass belts, natural drainage lines/ watercourse, cut ups/ terraces are marked on the cadastral map to the scale • Drainage lines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

USER GROUP-1



Measurement of Land Slope

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



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

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

Note: (i) The above intervals are maximum.

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

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

Section of the Bund

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

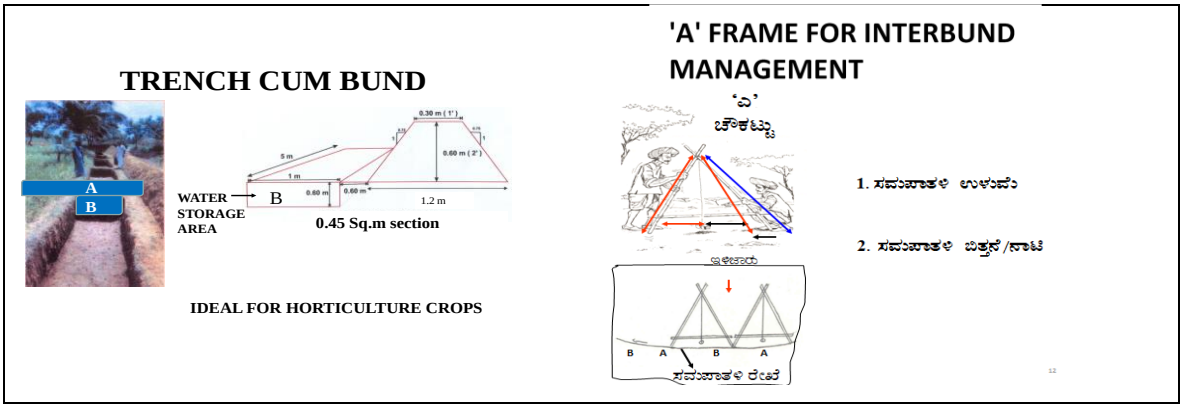
Recommended Bund Section

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

Formation of Trench cum Bund

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

Details of Borrow Pit dimensions are given below:



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

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

B. Water Ways

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

C. Farm Ponds

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

D. Diversion Channel

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

9.1.2 Non-Arable Land Treatment

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

9.1.3 Treatment of Natural Water Course/ Drainage Lines

a) The cadastral map has to be updated as regards the network of drainage lines (gullies/ *nalas/ hallas*) and existing structures are marked to the scale and storage capacity of the existing water bodies are documented.
b) The drainage line will be demarcated into Upper Reach, Middle Reach and Lower Reach.
c) Considering the Catchment, *Nala* bed and bank conditions, suitable structures are decided.
d) Number of storage structures (Check dam/ *Nala* bund/ Percolation tank) will be decided considering the commitments and available runoff from water budgeting and quality of water in the wells and site suitability.
e) Detailed Leveling Survey using Dumpy Level / Total Station has to be carried out to arrive at the site-specific designs as shown in the Manual.
f) The location of ground water recharge structures are decided by examining the lineaments and fracture zones from geological maps.
g) Rainfall intensity data of the nearest Rain Gauge Station is considered for Hydrologic Designs.
h) Silt load to the Storage/Recharge structures is reduced by providing vegetative, boulder and 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. Maximum area of about 575 ha (81%) needs Graded bunding and 34 ha (5%) requires 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.

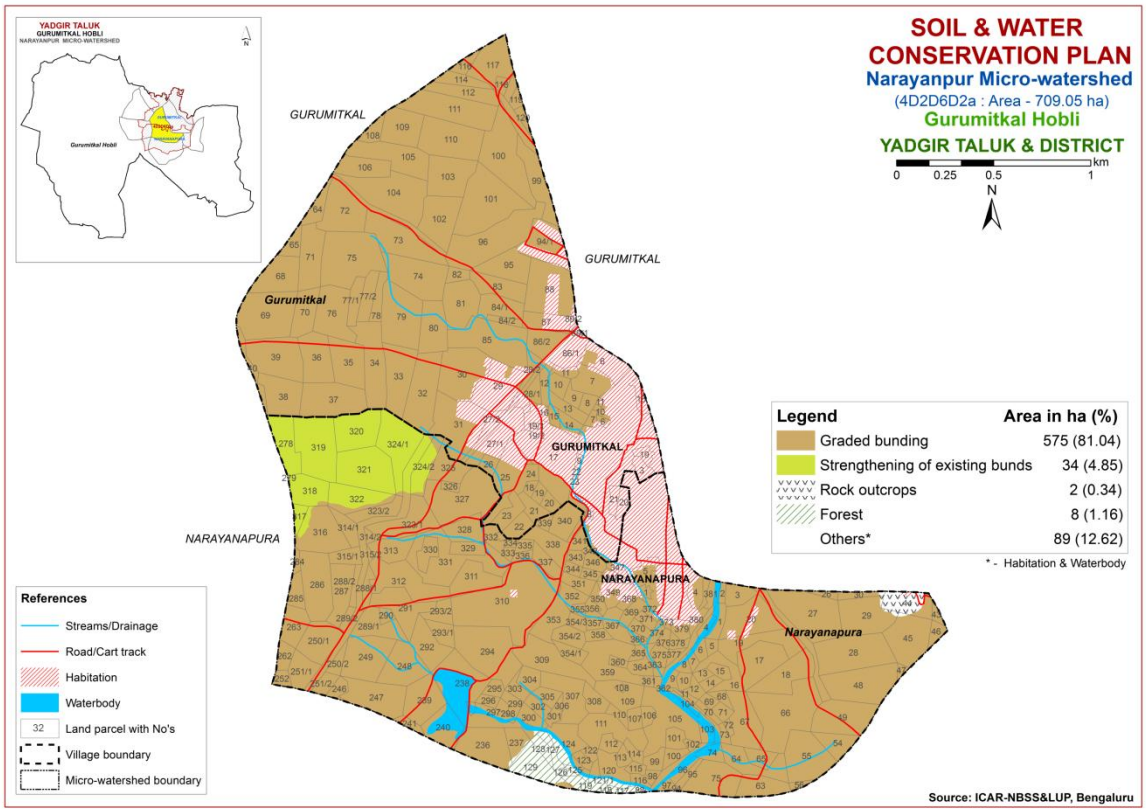


Fig. 9.1 Soil and Water Conservation Plan map of Narayanapur Microwatershed

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

Narayanpur (6D2a) 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
Gurumitkal	3	0.85	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Gurumitkal	6	3.11	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Gurumitkal	7	2.84	ANRhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Habitation	Not Available	IIes	Graded bunding
Gurumitkal	8	0.89	ANRhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Habitation	Not Available	IIes	Graded bunding
Gurumitkal	9	0.99	ANRhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Habitation	Not Available	IIes	Graded bunding
Gurumitkal	10	1.13	ANRhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Habitation	Not Available	IIes	Graded bunding
Gurumitkal	11	0.8	ANRhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Habitation	Not Available	IIes	Graded bunding
Gurumitkal	12	0.96	ANRhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Habitation	Not Available	IIes	Graded bunding
Gurumitkal	13	1.24	ANRhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Habitation	Not Available	IIes	Graded bunding
Gurumitkal	14	0.98	ANRhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Habitation	Not Available	IIes	Graded bunding
Gurumitkal	15	1.44	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Gurumitkal	16	0.43	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Gurumitkal	17	8.02	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Gurumitkal	18	0.4	ANRhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Gurumitkal	19	1.17	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Gurumitkal	19/1	0.15	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Gurumitkal	19/2	0.12	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Gurumitkal	20	1.53	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Gurumitkal	21	1.83	JNKiB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Gurumitkal	22	1.45	JNKiB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	23	1.61	ANRhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	24	1.04	ANRhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	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
Gurumitkal	25	4.05	ANRhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIes	Graded bunding
Gurumitkal	26	0.73	ANRhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIes	Graded bunding
Gurumitkal	27/1	3.38	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Gurumitkal	27/2	0.68	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Gurumitkal	28/1	1.13	ANRhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Habitation	Not Available	IIes	Graded bunding
Gurumitkal	28/2	0.93	ANRhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Gurumitkal	29	4.68	Habitation	Others	Others	Others	Others	Others	Others	Others	Not Available (NA)	Not Available	Others	Others
Gurumitkal	30	5.72	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIes	Graded bunding
Gurumitkal	31	6.52	ANRhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIes	Graded bunding
Gurumitkal	32	5.63	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	33	4.65	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	34	5.18	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	35	3.89	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	36	3.87	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	37	5.38	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	38	3.77	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	39	5.37	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	40	1.06	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	64	1.36	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	65	1.07	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	68	3.63	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	69	6.49	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	70	2.68	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	71	3.78	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	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
Gurumitkal	72	4.72	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	73	5.29	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	74	5.52	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	75	7.66	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	76	4.51	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	77/1	1.4	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	77/2	1.67	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	78	1.21	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	79	5.98	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	80	3.5	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	81	3.96	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	82	0.78	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	83	2.69	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIes	Graded bunding
Gurumitkal	84/1	2.41	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIes	Graded bunding
Gurumitkal	84/2	0.62	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Gurumitkal	85	6.95	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	86/1	1.93	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Gurumitkal	86/2	2.11	ANRhB2	LMU-2	Deep (100-150 cm)	Sandy clay loam	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Gurumitkal	87	2.11	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Gurumitkal	88	6.13	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Habitation	Not Available	IIes	Graded bunding
Gurumitkal	89/1	0.05	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Gurumitkal	89/2	0.27	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Gurumitkal	94/1	4.09	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Gurumitkal	95	3.25	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	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
Gurumitkal	96	7.64	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIes	Graded bunding
Gurumitkal	99	3.34	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	100	6.87	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	101	7.89	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	102	4.33	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	103	4.41	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	104	7.07	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	105	4.74	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	106	2.61	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	108	1.03	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	109	3.52	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	110	5.68	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	111	5.99	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Blackgram+Redgram (Bg+Rg)	Not Available	IIes	Graded bunding
Gurumitkal	112	2.44	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	114	1.39	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	116	0.81	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	117	3.78	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Scrub land (Rg+Sl)	Not Available	IIes	Graded bunding
Gurumitkal	118	0.5	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIes	Graded bunding
Gurumitkal	119	0.5	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Gurumitkal	120	0.49	BMNmB2g1	LMU-2	Very deep (>150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	1	1.42	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	2	0.36	GWDiB2g1	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Gravelly (15-35%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	3	1.42	GWDiB2g1	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Gravelly (15-35%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	4	1.65	GWDiB2g1	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Gravelly (15-35%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	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
Narayanapura	5	1.63	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	6	0.66	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	7	0.43	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	8	0.52	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	9	0.54	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	10	0.59	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIes	Graded bunding
Narayanapura	11	0.19	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	12	0.67	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	13	0.46	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	14	0.57	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	15	0.71	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	16	2.06	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	17	4.11	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Jowar (Rg+Jw)	Not Available	IIes	Graded bunding
Narayanapura	18	3.92	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Paddy (Pd)	Not Available	IIes	Graded bunding
Narayanapura	19	3.6	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	20	4.71	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Scrub land (Sl)	Not Available	IIes	Graded bunding
Narayanapura	26	0.42	NGPmB2	LMU-2	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	27	6.72	HSLiB2g1	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Gravelly (15-35%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	28	6.53	HSLiB2g1	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Gravelly (15-35%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	29	4.79	NGPmB2	LMU-2	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
Narayanapura	30	0.76	NGPmB2	LMU-2	Deep (100-150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	43	0.41	BMNmB2	LMU-2	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	44	2.86	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Redgram (Rg)	Not Available	Ro	Ro
Narayanapura	45	4.74	HSLcB2g2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Very gravelly (35-60%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	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
Narayanapura	46	0.77	HSLcB2g2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Very gravelly (35-60%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	47	0.28	BDLcB2g2	LMU-5	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	48	5.98	HSLcB2g2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Very gravelly (35-60%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	49	4.96	BDLcB2g2	LMU-5	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	1 Bore wells	IIIes	Graded bunding
Narayanapura	54	1.89	BDLcB2g2	LMU-5	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	55	5.09	HSLcB2g2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Very gravelly (35-60%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	1 Bore wells	IIes	Graded bunding
Narayanapura	56	0.36	HSLcB2g2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Very gravelly (35-60%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	63	2.48	BDLcB2g2	LMU-5	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Jowar (Rg+Jw)	Not Available	IIIes	Graded bunding
Narayanapura	64	3.06	HSLcB2g2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Very gravelly (35-60%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	1 Bore wells	IIes	Graded bunding
Narayanapura	65	1.2	HSLcB2g2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Very gravelly (35-60%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	66	8.43	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Jowar (Rg+Jw)	1 Bore wells	IIes	Graded bunding
Narayanapura	67	3.88	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	1 Bore wells	IIes	Graded bunding
Narayanapura	68	0.56	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	69	0.47	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	70	0.5	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	71	0.67	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	72	0.27	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	73	0.43	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	74	1.01	Waterbody	Others	Others	Others	Others	Others	Others	Others	Redgram (Rg)	Not Available	Others	Others
Narayanapura	75	4.16	BDLcB2g2	LMU-5	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut+Jowar+ Redgram (Gn+Jw+Rg)	Not Available	IIIes	Graded bunding
Narayanapura	88	0.11	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Not Available (NA)	Not Available	Forest	Forest
Narayanapura	94	0.13	BDLcB2g2	LMU-5	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIIes	Graded bunding
Narayanapura	95	0.54	BDLcB2g2	LMU-5	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIIes	Graded bunding
Narayanapura	96	0.82	Waterbody	Others	Others	Others	Others	Others	Others	Others	Not Available (NA)	Not Available	Others	Others

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Narayanapura	97	0.4	BDLcB2g2	LMU-5	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIIes	Graded bunding
Narayanapura	98	0.4	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	99	0.93	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	100	0.83	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	101	1.03	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Groundnut (Gn)	Not Available	IIIes	Graded bunding
Narayanapura	102	0.32	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIIes	Graded bunding
Narayanapura	103	0.98	Waterbody	Others	Others	Others	Others	Others	Others	Others	Not Available (NA)	Not Available	Others	Others
Narayanapura	104	0.4	Waterbody	Others	Others	Others	Others	Others	Others	Others	Redgram (Rg)	Not Available	Others	Others
Narayanapura	105	5.93	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	106	0.65	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	107	0.79	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	108	0.17	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	109	2.76	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	110	0.58	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	111	4.02	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	112	0.86	JNKhB2	LMU-4	Moderately shallow (50-75 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
Narayanapura	113	0.61	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	114	0.66	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	115	0.54	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	116	0.64	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	117	0.47	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Redgram (Rg)	Not Available	Forest	Forest
Narayanapura	118	0.08	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Not Available (NA)	Not Available	Forest	Forest
Narayanapura	119	1.21	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Not Available (NA)	Not Available	Forest	Forest
Narayanapura	120	2.25	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Jowar (Rg+Jw)	Not Available	IIIes	Graded bunding

Village	Survey No	Area (ha)	Soil Phase	LMU	Soil Depth	Surface Soil Texture	Soil Gravelliness	Available Water Capacity	Slope	Soil Erosion	Current Land Use	Wells	Land Capability	Conservation Plan
Narayanapura	121/1	0.45	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIIes	Graded bunding
Narayanapura	121/2	0.25	Waterbody	Others	Others	Others	Others	Others	Others	Others	Not Available (NA)	Not Available	Others	Others
Narayanapura	122	0.4	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	123	0.53	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	124	2.72	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	125	0.46	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIIes	Graded bunding
Narayanapura	126	0.35	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Jowar (Jw)	Not Available	Forest	Forest
Narayanapura	127	0.76	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Redgram (Rg)	Not Available	Forest	Forest
Narayanapura	128	0.76	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Jowar (Jw)	Not Available	Forest	Forest
Narayanapura	129	3.26	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Not Available (NA)	Not Available	Forest	Forest
Narayanapura	236	4.49	HSLcB2g1	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Gravelly (15-35%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	237	1.4	HSLcB2g1	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Gravelly (15-35%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	238	7.91	Waterbody	Others	Others	Others	Others	Others	Others	Others	Not Available (NA)	Not Available	Others	Others
Narayanapura	239	3.82	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	240	3.07	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	241	0.6	HSLiB2	LMU-3	Moderately deep (75-100 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	246	0.79	HSLcB2g2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Very gravelly (35-60%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	247	4.66	HSLcB2g2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Very gravelly (35-60%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	248	3.92	HSLcB2g2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Very gravelly (35-60%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	249	4.91	HSLcB2g2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Very gravelly (35-60%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	250/1	3.46	HSLcB2g2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Very gravelly (35-60%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	250/2	0.81	HSLcB2g2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Very gravelly (35-60%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	251/1	2.11	HSLcB2g2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Very gravelly (35-60%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	251/2	0.95	HSLcB2g2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Very gravelly (35-60%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	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
Narayanapura	252	0.67	NGPmB2g1	LMU-2	Deep (100-150 cm)	Clay	Gravelly (15-35%)	Very high (>200 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	262	1.03	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	263	2.28	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	278	3.16	BMNmA1	LMU-2	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIsw	Graded bunding
Narayanapura	279	0.04	BMNmA1	LMU-2	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIsw	Graded bunding
Narayanapura	284	0.38	BDLiB2	LMU-5	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	285	1.26	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	286	5.08	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	287	3.06	BDLcB2g2	LMU-5	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	288/1	0.85	BDLcB2g2	LMU-5	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	288/2	0.66	BDLcB2g2	LMU-5	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	289/1	2.79	HSLcB2g2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Very gravelly (35-60%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	289/2	0.49	BDLcB2g2	LMU-5	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIIes	Graded bunding
Narayanapura	290	0.5	HSLcB2g2	LMU-3	Moderately deep (75-100 cm)	Sandy loam	Very gravelly (35-60%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	291	3.93	JNKcB2g1	LMU-4	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	292	3.04	JNKcB2g1	LMU-4	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	293/1	1.33	JNKcB2g1	LMU-4	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	293/2	1.31	JNKcB2g1	LMU-4	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	294	7.28	JNKcB2g1	LMU-4	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	295	0.73	JNKcB2g1	LMU-4	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	296	0.58	JNKcB2g1	LMU-4	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	297	0.73	JNKcB2g1	LMU-4	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	298	0.34	JNKcB2g1	LMU-4	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	299	0.85	JNKcB2g1	LMU-4	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	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
Narayanapura	300	1.1	JNKcB2g1	LMU-4	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	301	0.54	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	302	0.91	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	303	0.84	JNKcB2g1	LMU-4	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	304	1.23	JNKcB2g1	LMU-4	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	305	1	JNKhB2	LMU-4	Moderately shallow (50-75 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
Narayanapura	306	0.22	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	307	3.69	JNKhB2	LMU-4	Moderately shallow (50-75 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
Narayanapura	308	1.35	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	309	4.61	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	310	13.43	JNKcB2g1	LMU-4	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	311	3.03	JNKcB2g1	LMU-4	Moderately shallow (50-75 cm)	Sandy loam	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	312	5.09	JNKiB3g1	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Severe	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	313	2.31	JNKiB3g1	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Severe	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	314/1	1.33	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	314/2	0.35	BDLcB2g2	LMU-5	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	315/1	1.24	BDLcB2g2	LMU-5	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	315/2	0.17	BDLcB2g2	LMU-5	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	316	4.82	BDLcB2g2	LMU-5	Shallow (25-50 cm)	Sandy loam	Very gravelly (35-60%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	317	0.74	BMNmA1	LMU-2	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIsw	Graded bunding
Narayanapura	318	2.89	BMNmA1	LMU-2	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Jowar (Jw)	Not Available	IIsw	Graded bunding
Narayanapura	319	6.31	BMNmA1	LMU-2	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram+Jowar (Rg+Jw)	Not Available	IIsw	Graded bunding
Narayanapura	320	4.25	BMNmA1	LMU-2	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIsw	Graded bunding
Narayanapura	321	5.82	BMNmA1	LMU-2	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Jowar (Jw)	Not Available	IIsw	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
Narayanapura	322	3.62	BMNmA1	LMU-2	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Jowar (Jw)	Not Available	IIsw	Graded bunding
Narayanapura	323/1	4.12	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	323/2	1.71	BDLhB2g1	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Gravelly (15-35%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	324/1	5.1	BMNmA1	LMU-2	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Redgram (Rg)	Not Available	IIsw	Graded bunding
Narayanapura	324/2	2.27	BMNmA1	LMU-2	Very deep (>150 cm)	Clay	Non gravelly (<15%)	Very high (>200 mm/m)	Nearly level (0-1%)	Slight	Not Available (NA)	Not Available	IIsw	Graded bunding
Narayanapura	325	2.49	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	326	0.44	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	327	7.22	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	328	2.21	JNKiB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	329	1.23	JNKiB3g1	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Severe	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	330	1.32	JNKiB3g1	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Severe	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	331	6.39	JNKiB3g1	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Gravelly (15-35%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Severe	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	332	1.03	JNKiB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	333	0.35	JNKiB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	334	0.28	JNKiB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	335	0.55	JNKiB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	336	0.45	JNKiB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	337	1.35	JNKiB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	338	2.4	JNKiB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram+Jowar (Rg+Jw)	Not Available	IIes	Graded bunding
Narayanapura	339	0.51	JNKiB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	340	2.15	JNKiB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	341	0.75	JNKiB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	342	0.15	JNKiB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	343	0.61	JNKiB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	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
Narayanapura	344	0.51	JNKiB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	345	0.5	JNKhB2	LMU-4	Moderately shallow (50-75 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
Narayanapura	346	0.91	JNKiB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIes	Graded bunding
Narayanapura	347	0.54	Habitation	Others	Others	Others	Others	Others	Others	Others	Redgram (Rg)	Not Available	Others	Others
Narayanapura	348	0.78	Habitation	Others	Others	Others	Others	Others	Others	Others	Jowar (Jw)	Not Available	Others	Others
Narayanapura	349	1.54	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Narayanapura	350	0.68	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Habitation	Not Available	IIes	Graded bunding
Narayanapura	351	1.13	JNKhB2	LMU-4	Moderately shallow (50-75 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
Narayanapura	352	1.17	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	353	2.56	JNKhB2	LMU-4	Moderately shallow (50-75 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
Narayanapura	354/1	1.11	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	354/2	1.47	JNKhB2	LMU-4	Moderately shallow (50-75 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
Narayanapura	354/3	0.68	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	355	0.4	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	356	0.63	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	357	0.56	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIes	Graded bunding
Narayanapura	358	0.72	JNKhB2	LMU-4	Moderately shallow (50-75 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
Narayanapura	359	4.68	BDLiB3	LMU-5	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Redgram (Rg)	Not Available	IVes	Graded bunding
Narayanapura	360	0.41	BDLiB3	LMU-5	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Not Available (NA)	Not Available	IVes	Graded bunding
Narayanapura	361	0.27	BDLiB3	LMU-5	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Not Available (NA)	Not Available	IVes	Graded bunding
Narayanapura	362	0.24	BDLiB3	LMU-5	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Not Available (NA)	Not Available	IVes	Graded bunding
Narayanapura	363	0.68	BDLiB3	LMU-5	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Not Available (NA)	Not Available	IVes	Graded bunding
Narayanapura	364	0.99	BDLiB3	LMU-5	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Not Available (NA)	Not Available	IVes	Graded bunding
Narayanapura	365	0.46	BDLiB3	LMU-5	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Not Available (NA)	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
Narayanapura	366	0.43	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	367	1.64	BDLiB3	LMU-5	Shallow (25-50 cm)	Sandy clay	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Severe	Redgram+Jowar (Rg+Jw)	Not Available	IVes	Graded bunding
Narayanapura	368	0.7	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Narayanapura	369	1.03	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	370	0.67	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	371	0.6	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	372	0.31	JNKhB2	LMU-4	Moderately shallow (50-75 cm)	Sandy clay loam	Non gravelly (<15%)	Low (51-100 mm/m)	Very gently sloping (1-3%)	Moderate	Not Available (NA)	Not Available	IIes	Graded bunding
Narayanapura	373	0.29	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Narayanapura	374	0.55	BDLhB2	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	375	0.81	BDLhB2	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	376	0.48	BDLhB2	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	377	0.44	BDLhB2	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	378	0.59	BDLhB2	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Jowar (Jw)	Not Available	IIIes	Graded bunding
Narayanapura	379	0.86	BDLhB2	LMU-5	Shallow (25-50 cm)	Sandy clay loam	Non gravelly (<15%)	Very low (<50 mm/m)	Very gently sloping (1-3%)	Moderate	Redgram (Rg)	Not Available	IIIes	Graded bunding
Narayanapura	380	0.59	Habitation	Others	Others	Others	Others	Others	Others	Others	Habitation	Not Available	Others	Others
Narayanapura	381	0.58	GWDiB2g1	LMU-1	Moderately deep (75-100 cm)	Sandy clay	Gravelly (15-35%)	Medium (101-150 mm/m)	Very gently sloping (1-3%)	Moderate	Habitation	Not Available	IIes	Graded bunding

Appendix II

Narayanpur (6D2a) Microwatershed

Soil Fertility Information

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Gurumitkal	3	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	6	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	7	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Gurumitkal	8	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Gurumitkal	9	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Gurumitkal	10	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Gurumitkal	11	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Gurumitkal	12	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Gurumitkal	13	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Gurumitkal	14	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	15	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	16	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	17	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	18	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Gurumitkal	19	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	19/1	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	19/2	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	20	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	21	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Gurumitkal	22	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Gurumitkal	23	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	24	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	25	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	26	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Gurumitkal	27/1	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	27/2	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	28/1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Gurumitkal	28/2	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Gurumitkal	29	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	30	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Gurumitkal	31	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Gurumitkal	32	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Gurumitkal	33	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Gurumitkal	34	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	35	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	36	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	37	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	38	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	39	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	40	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	64	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	65	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	68	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	69	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	70	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	71	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	72	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	73	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	74	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Gurumitkal	75	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	76	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	77/1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	77/2	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	78	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	79	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	80	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	81	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	82	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	83	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	84/1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	84/2	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	85	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Gurumitkal	86/1	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	86/2	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Gurumitkal	87	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	88	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	89/1	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	89/2	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	94/1	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	95	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	96	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	99	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	100	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	101	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Gurumitkal	102	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	103	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	104	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	105	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	106	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	108	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	109	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	110	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	111	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	112	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	114	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	116	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	117	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	118	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	119	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Gurumitkal	120	Slightly alkaline (pH 7.3 – 7.8)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Low (<10 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	2	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	3	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	4	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	5	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	6	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	7	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	8	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Narayanapura	9	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	10	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	11	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	12	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	13	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	14	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	15	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	16	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	17	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	18	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	19	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	20	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	26	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	27	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	28	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	29	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	30	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Low (<10 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	43	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	44	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Narayanapura	45	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	46	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	47	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	48	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	49	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	54	Neutral (pH 6.5 –	Non saline	High (>	High (> 57	Medium (145 –	Medium (10 –	Medium (0.5 –	Sufficient	Sufficient (>	Sufficient (>	Sufficient (>

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
		7.3)	(<2 dsm)	0.75 %)	kg/ha)	337 kg/ha)	20 ppm)	1.0 ppm)	(>4.5 ppm)	1.0 ppm)	0.2 ppm)	0.6 ppm)
Narayanapura	55	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	56	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	63	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	64	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	65	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	66	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	67	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	68	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	69	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	70	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	71	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	72	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	73	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	74	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	75	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	88	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest
Narayanapura	94	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	95	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	96	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	97	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	98	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	99	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	100	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	101	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Narayanapura	102	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	103	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	104	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	105	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	106	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	107	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	108	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	109	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	110	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	111	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	112	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	113	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	114	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	115	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	116	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	117	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest
Narayanapura	118	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest
Narayanapura	119	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest
Narayanapura	120	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	121/1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	121/2	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	122	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	123	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	124	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	125	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	126	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Narayanapura	127	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest
Narayanapura	128	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest
Narayanapura	129	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest
Narayanapura	236	Slightly acid (pH 6.0 – 6.5)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	237	Slightly acid (pH 6.0 – 6.5)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	238	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	239	Neutral (pH 6.5 – 7.3)	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)	Sufficient (> 0.6 ppm)
Narayanapura	240	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	241	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	246	Neutral (pH 6.5 – 7.3)	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)
Narayanapura	247	Neutral (pH 6.5 – 7.3)	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)	Sufficient (> 0.6 ppm)
Narayanapura	248	Neutral (pH 6.5 – 7.3)	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)	Sufficient (> 0.6 ppm)
Narayanapura	249	Neutral (pH 6.5 – 7.3)	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)
Narayanapura	250/1	Neutral (pH 6.5 – 7.3)	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)
Narayanapura	250/2	Neutral (pH 6.5 – 7.3)	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)
Narayanapura	251/1	Neutral (pH 6.5 – 7.3)	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)
Narayanapura	251/2	Neutral (pH 6.5 – 7.3)	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)
Narayanapura	252	Neutral (pH 6.5 – 7.3)	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)
Narayanapura	262	Neutral (pH 6.5 – 7.3)	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)
Narayanapura	263	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	278	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Low (< 23 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	279	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Narayanapura	284	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	285	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	286	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Narayanapura	287	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	288/1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	288/2	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	289/1	Neutral (pH 6.5 – 7.3)	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)
Narayanapura	289/2	Neutral (pH 6.5 – 7.3)	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)
Narayanapura	290	Neutral (pH 6.5 – 7.3)	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)
Narayanapura	291	Neutral (pH 6.5 – 7.3)	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)
Narayanapura	292	Neutral (pH 6.5 – 7.3)	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)	Sufficient (> 0.6 ppm)
Narayanapura	293/1	Neutral (pH 6.5 – 7.3)	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)	Sufficient (> 0.6 ppm)
Narayanapura	293/2	Neutral (pH 6.5 – 7.3)	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)
Narayanapura	294	Neutral (pH 6.5 – 7.3)	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)	Sufficient (> 0.6 ppm)
Narayanapura	295	Slightly acid (pH 6.0 – 6.5)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	296	Slightly acid (pH 6.0 – 6.5)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	297	Slightly acid (pH 6.0 – 6.5)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	298	Slightly acid (pH 6.0 – 6.5)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	299	Slightly acid (pH 6.0 – 6.5)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	300	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	301	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	302	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	303	Slightly acid (pH 6.0 – 6.5)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	304	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	305	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	306	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	307	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Narayanapura	308	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	309	Neutral (pH 6.5 – 7.3)	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)	Sufficient (> 0.6 ppm)
Narayanapura	310	Neutral (pH 6.5 – 7.3)	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)	Sufficient (> 0.6 ppm)
Narayanapura	311	Neutral (pH 6.5 – 7.3)	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)
Narayanapura	312	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	313	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	314/1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	314/2	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	315/1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	315/2	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	316	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	317	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Narayanapura	318	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Narayanapura	319	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Narayanapura	320	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Narayanapura	321	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Narayanapura	322	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	323/1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	323/2	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	324/1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)
Narayanapura	324/2	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	325	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	326	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	327	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Narayanapura	328	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	329	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	330	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	331	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	332	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	Medium (145 – 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Deficient (< 0.6 ppm)
Narayanapura	333	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	334	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	335	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	336	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	337	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	338	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	339	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	Medium (23 – 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	340	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	341	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	342	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	343	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	344	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	345	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	346	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	347	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	348	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	349	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	350	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	351	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	352	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Narayanapura	353	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Low (< 0.5 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	354/1	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	354/2	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	354/3	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	355	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	356	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	357	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	358	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	359	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	360	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	361	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	362	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	363	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	364	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)
Narayanapura	365	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	366	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	367	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	368	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	369	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	370	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	371	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	372	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	373	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	374	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	375	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)

Village	Survey No	Soil Reaction	Salinity	Organic Carbon	Available Phosphorus	Available Potassium	Available Sulphur	Available Boron	Available Iron	Available Manganese	Available Copper	Available Zinc
Narayanapura	376	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	377	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	378	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	379	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 0.75 %)	High (> 57 kg/ha)	High (> 337 kg/ha)	Medium (10 – 20 ppm)	Medium (0.5 – 1.0 ppm)	Sufficient (>4.5 ppm)	Sufficient (> 1.0 ppm)	Sufficient (> 0.2 ppm)	Sufficient (> 0.6 ppm)
Narayanapura	380	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	381	Neutral (pH 6.5 – 7.3)	Non saline (<2 dsm)	High (> 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)	Sufficient (> 0.6 ppm)

Appendix III

Narayanpur (6D2a) 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
Gurumitkal	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
Gurumitkal	6	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	7	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S2t	S2tw	S3tw
Gurumitkal	8	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S2t	S2tw	S3tw
Gurumitkal	9	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S2t	S2tw	S3tw
Gurumitkal	10	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S2t	S2tw	S3tw
Gurumitkal	11	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S2t	S2tw	S3tw
Gurumitkal	12	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S2t	S2tw	S3tw
Gurumitkal	13	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S2t	S2tw	S3tw
Gurumitkal	14	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S2t	S2tw	S3tw
Gurumitkal	15	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	16	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	17	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	18	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S2t	S2tw	S3tw
Gurumitkal	19	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	19/1	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
Gurumitkal	19/2	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
Gurumitkal	20	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	21	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Gurumitkal	22	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Gurumitkal	23	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S2t	S2tw	S3tw
Gurumitkal	24	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S2t	S2tw	S3tw
Gurumitkal	25	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S2t	S2tw	S3tw
Gurumitkal	26	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S2t	S2tw	S3tw

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
Gurumitkal	27/1	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
Gurumitkal	27/2	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
Gurumitkal	28/1	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S2t	S2tw	S3tw
Gurumitkal	28/2	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S2t	S2tw	S3tw
Gurumitkal	29	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	30	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	31	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S2t	S2tw	S3tw
Gurumitkal	32	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	33	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	34	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	35	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	36	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	37	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	38	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	39	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	40	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	64	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	65	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	68	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	69	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	70	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	71	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	72	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	73	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	74	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	75	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	76	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	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
Gurumitkal	77/1	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	77/2	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	78	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	79	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Gurumitkal	80	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Gurumitkal	81	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Gurumitkal	82	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Gurumitkal	83	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Gurumitkal	84/1	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Gurumitkal	84/2	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Gurumitkal	85	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Gurumitkal	86/1	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
Gurumitkal	86/2	S3tz	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tz	S2t	S2t	S2tw	S3tw
Gurumitkal	87	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Gurumitkal	88	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Gurumitkal	89/1	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
Gurumitkal	89/2	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
Gurumitkal	94/1	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
Gurumitkal	95	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Gurumitkal	96	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Gurumitkal	99	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Gurumitkal	100	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	101	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	102	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	103	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	104	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	105	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	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
Gurumitkal	106	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	108	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	109	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	110	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	111	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	112	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Gurumitkal	114	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Gurumitkal	116	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Gurumitkal	117	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Gurumitkal	118	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Gurumitkal	119	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Gurumitkal	120	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Narayanapura	1	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	2	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Narayanapura	3	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Narayanapura	4	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n
Narayanapura	5	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	6	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	7	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	8	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	9	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	10	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	11	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	12	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz

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
Narayanapura	13	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	14	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	15	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	16	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	17	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	18	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	19	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	20	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	26	S3t	S2t	S3t	S2w	S3t	S1	S2t	S1	S1	S2w	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S3tw	S3tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Narayanapura	27	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S1	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S1	S2rz	S2rz
Narayanapura	28	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S1	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S1	S2rz	S2rz
Narayanapura	29	S3t	S2t	S3t	S2w	S3t	S1	S2t	S1	S1	S2w	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S3tw	S3tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Narayanapura	30	S3t	S2t	S3t	S2w	S3t	S1	S2t	S1	S1	S2w	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S3tw	S3tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Narayanapura	43	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Narayanapura	44	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro	Ro
Narayanapura	45	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S2g	N1tz	S3rz	S2rz	S2z	S2g	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2g	S2rz	S2rz
Narayanapura	46	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S2g	N1tz	S3rz	S2rz	S2z	S2g	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2g	S2rz	S2rz
Narayanapura	47	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	48	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S2g	N1tz	S3rz	S2rz	S2z	S2g	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2g	S2rz	S2rz
Narayanapura	49	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	54	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapu	55	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S2g	N1tz	S3rz	S2rz	S2z	S2g	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2g	S2rz	S2rz

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
ra																														
Narayanapura	56	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S2g	N1tz	S3rz	S2rz	S2z	S2g	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2g	S2rz	S2rz
Narayanapura	63	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	64	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S2g	N1tz	S3rz	S2rz	S2z	S2g	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2g	S2rz	S2rz
Narayanapura	65	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S2g	N1tz	S3rz	S2rz	S2z	S2g	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2g	S2rz	S2rz
Narayanapura	66	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	67	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	68	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	69	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	70	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	71	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	72	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	73	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	74	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	75	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	88	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest
Narayanapura	94	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	95	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	96	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	97	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	98	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	99	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt

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
Narayanapura	100	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	101	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	102	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	103	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	104	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	105	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	106	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	107	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	108	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	109	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	110	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	111	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	112	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	113	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	114	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	115	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	116	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	117	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest
Narayanapura	118	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest
Narayanapura	119	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest
Narayanapura	120	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapu	121/	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt

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
ra	1																													
Narayanapura	121/2	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
Narayanapura	122	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	123	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	124	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	125	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	126	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest
Narayanapura	127	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest
Narayanapura	128	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest
Narayanapura	129	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest	Forest
Narayanapura	236	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S1	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S1	S2rz	S2rz
Narayanapura	237	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S1	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S1	S2rz	S2rz
Narayanapura	238	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	239	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	240	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	241	S3rz	S2tz	S2rz	S2tz	S2rz	S2tz	S3rz	S2rz	S2tz	S2rz	S2rz	S2tz	S2rz	S1	N1tz	S3rz	S2rz	S2z	S2w	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2w	S2rz	S2rz
Narayanapura	246	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S2g	N1tz	S3rz	S2rz	S2z	S2g	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2g	S2rz	S2rz
Narayanapura	247	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S2g	N1tz	S3rz	S2rz	S2z	S2g	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2g	S2rz	S2rz
Narayanapura	248	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S2g	N1tz	S3rz	S2rz	S2z	S2g	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2g	S2rz	S2rz
Narayanapura	249	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S2g	N1tz	S3rz	S2rz	S2z	S2g	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2g	S2rz	S2rz
Narayanapura	250/1	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S2g	N1tz	S3rz	S2rz	S2z	S2g	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2g	S2rz	S2rz
Narayanapura	250/2	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S2g	N1tz	S3rz	S2rz	S2z	S2g	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2g	S2rz	S2rz

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
Narayanapura	251/1	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S2g	N1tz	S3rz	S2rz	S2z	S2g	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2g	S2rz	S2rz
Narayanapura	251/2	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S2g	N1tz	S3rz	S2rz	S2z	S2g	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2g	S2rz	S2rz
Narayanapura	252	S3t	S2t	S3t	S1	S2t	S1	S2t	S2t	S1	S2w	S2t	S2t	S3t	S2t	N1t	S2t	S2t	S3t	S3t	S3t	S3t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S2t	S3t
Narayanapura	262	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	263	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	278	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Narayanapura	279	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Narayanapura	284	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	285	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	286	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	287	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	288/1	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	288/2	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	289/1	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S2g	N1tz	S3rz	S2rz	S2z	S2g	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2g	S2rz	S2rz
Narayanapura	289/2	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	290	S3rz	S2tz	S2rz	S2tz	S2rz	S3tz	S3rz	S2rz	S3tz	S2rz	S2rz	S2tz	S2rz	S2g	N1tz	S3rz	S2rz	S2z	S2g	S2z	S2z	S2z	S2z	S2rz	S2z	S2t	S2g	S2rz	S2rz
Narayanapura	291	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	292	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	293/1	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	293/2	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	294	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapu	295	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
ra																														
Narayanapura	296	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	297	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	298	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	299	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	300	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	301	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	302	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	303	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	304	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	305	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	306	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	307	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	308	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	309	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	310	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	311	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	312	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	313	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	314/1	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	314/2	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	315/1	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt

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
Narayanapura	315/2	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	316	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	317	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Narayanapura	318	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Narayanapura	319	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Narayanapura	320	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Narayanapura	321	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Narayanapura	322	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Narayanapura	323/1	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	323/2	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	324/1	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Narayanapura	324/2	S3t	S2t	S3t	S1	S3t	S1	S2t	S1	S1	S1	S2tw	S2t	S3t	S1	N1t	S2t	S1	S3tw	S3t	S2tw	S2tw	S2tw	S2tw	S2t	S2tw	S2t	S2t	S2tw	S3tw
Narayanapura	325	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	326	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	327	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	328	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	329	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	330	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	331	N1r	S2tg	S3r	S2rg	S3r	S2rg	N1r	S3r	S2rg	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2rg	S2rg	S2rg	S2rg	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	332	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	333	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapu	334	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
ra																														
Narayanapura	335	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	336	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	337	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	338	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	339	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	340	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	341	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	342	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	343	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	344	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	345	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	346	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	347	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	348	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	349	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	350	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	351	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	352	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	353	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	354/1	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	354/2	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r

Village	Survey Number	Mango	Maize	Sapota	Sorghum	Guava	Cotton	Tamarind	Lime	Bengal gram	Sunflower	Red gram	Amla	Jackfruit	Custard-apple	Cashew	Jamun	Musambi	Groundnut	Onion	Chilly	Tomato	Marigold	Chrysanthemum	Pomegranate	Bajra	Brinjal	Bhendi	Drumstick	Mulberry
Narayanapura	354/3	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	355	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	356	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	357	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	358	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	359	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	360	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	361	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	362	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	363	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	364	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	365	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	366	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	367	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	368	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	369	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	370	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	371	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	372	N1r	S2t	S3r	S2r	S3r	S2r	N1r	S3r	S2r	S3r	S3r	S2r	S3r	S2r	N1rt	S3r	S3r	S3t	S2r	S2r	S2r	S2r	S2r	S3r	S2r	S2r	S2r	S3r	S3r
Narayanapura	373	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	374	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapu	375	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt

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
ra																														
Narayanapura	376	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	377	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	378	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	379	N1r	S3rt	N1r	S3r	N1rt	S3r	N1rt	N1r	S3r	N1r	S3rt	S3rt	N1rt	S3r	N1rt	N1rt	N1r	S3rt	S3r	S3rt	S3rt	S3rt	S3rt	N1r	S3rt	S3r	S3r	N1rt	N1rt
Narayanapura	380	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others	Others
Narayanapura	381	N1n	S3nz	N1n	S3nz	N1n	S3nz	N1n	N1n	S3nz	N1n	S3nz	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	N1n	S3nz	N1n	N1n	N1n	N1n

Ro-Rock outcrops

PART-B

SOCIO-ECONOMIC STATUS OF FARM HOUSEHOLDS

CONTENTS

LIST OF TABLES

Chapter 1

SALIENT FINDINGS OF THE SURVEY

- *The data indicated that there were 98 (59.04%) men and 68 (40.96%) women among the sampled households.*
- *The average family size of landless farmers' was 4, marginal farmers' was 4.88, small farmers' was 4.36, semi medium farmers' was 4, medium farmers' was 4.67 and large farmers' was 6.*
- *The data indicated that, 25 (15.06%) people were in 0-15 years of age, 80 (48.19%) were in 16-35 years of age, 52 (31.33%) were in 36-60 years of age and 9 (5.42%) were above 61 years of age.*
- *The results indicated that Narayanpura had 42.77 per cent illiterates, 17.47 per cent of them had primary school education, 1.20 per cent of them had middle school education, 7.83 per cent of them had high school education, 13.86 per cent of them had PUC education, 9.04 per cent of them had degree education, 0.60 per cent of them did ITI, 0.60 per cent of the population had diploma and 1.81 per cent of them did masters.*
- *The results indicate that, 86.11 per cent of households were practicing agriculture, 5.56 per cent of the households were agricultural labourers, 2.78 per cent of the households were general labours, 2.86 per cent of them were in private service and 2.78 per cent of the population was involved in trade and business.*
- *The results indicate that agriculture was the major occupation for 67.47 per cent of the household members, 1.81 per cent were agricultural laborers, 2.41 per cent were general labourers, 0.60 per cent were in government service, 6.63 per cent were in private service, 0.60 per cent were into trade and business, 15.06 per cent were students, 0.60 per cent were housewives and 4.22 per cent were children.*
- *The results show that 100 per cent of the population in the micro watershed has not participated in any local institutions.*
- *The results indicate that 19.44 per cent of the households possess katcha house and 80.56 per cent of them possess pucca house.*
- *The results show that 75 per cent of the households possess TV, 44.44 per cent of the households possess Mixer grinder, 11.11 per cent of the households possess refrigerator, 5.56 per cent of them had bicycle, 50 per cent of the households possess motor cycle, 5.56 per cent of them had car/four wheeler and 91.67 per cent of the households possess mobile phones.*
- *The results show that the average value of television was Rs.5370, mixer grinder was Rs.1637, refrigerator was Rs.9250, bicycle was Rs.1500, motor cycle was Rs.19300, car/four wheeler was Rs.200000 and mobile phone was Rs.2073.*
- *About 5.56 per cent of the households possess bullock cart, 44.44 per cent of them possess plough, 2.78 per cent of them had seed/fertilizer drill, 8.33 per cent of them had irrigation pump, 5.56 per cent of the households possess tractor, 11.11*

per cent of them possess sprayer, 52.78 per cent of them possess weeder and 8.33 per cent of them possess harvester.

- *The results show that the average value of bullock cart was Rs.25000, plough was Rs.1663, seed/fertilizer drill was Rs.6000, irrigation pump was Rs.20000, the average value of tractor was Rs.200000, the average value of sprayer was Rs.4500 and the average value of harvester was Rs.103333.*
- *The results indicate that, 33.33 per cent of the households possess bullocks, 30.56 per cent of the households possess local cow, 2.78 per cent had crossbred cow, 11.11 per cent had buffalo, 13.89 per cent had sheep, 2.78 per cent had goat and 13.89 per cent had poultry birds.*
- *The results indicate that, average own labour men available in the micro watershed was 1.94, average own labour (women) available was 1.69, average hired labour (men) available was 10.19 and average hired labour (women) available was 10.27.*
- *The results indicate that, 88.89 per cent of the households opined that the hired labour was adequate.*
- *The results indicate that, households of the Narayanpura micro-watershed possess 50.62 ha (97.66%) of dry land and 1.21 ha (2.34%) of irrigated land. Marginal farmers possess 7.52 ha (100%) of dry land. Small farmers possess 15.03 ha (100%) of dry land. Semi medium farmers possess 2.17 ha (64.07%) of dry land and 1.21 ha (35.93%) of irrigated land. Medium farmers possess 15.78 ha (100%) of dry land and large farmers possess 10.12 ha (100%) of dry land.*
- *The results indicate that, the average value of dry land was Rs. 1289400 and average value of irrigated land was Rs. 1482000. In case of marginal famers, the average land value was Rs. 1335315 for dry land. In case of small famers, the average land value was Rs. 847712 for dry land. In case of semi medium famers, the average land value was Rs. 1615888 for dry land and Rs. 1482000 for irrigated land. In case of medium farmers, the average land value was Rs. 1203333 for dry land and it was Rs.1976000 in case of large farmers.*
- *The results indicate that, there were 2 functioning bore wells in the micro watershed.*
- *The results indicate that, bore well was the major irrigation source in the micro water shed for 5.56 per cent of the farmers.*
- *The results indicate that, the depth of bore well was found to be 3.56 meters.*
- *The results indicate that, semi medium and large farmers had an irrigated area of 1.12 ha and 10.12 ha.*
- *The results indicate that, farmers have grown cotton (1.42 ha), red gram (35.74 ha), sorghum (0.58 ha), paddy (1.21 ha), black gram (0.92 ha) and greengram (12.09 ha). Marginal farmers have grown redgram, greengram, blackgram and sorghum. Small farmers have grown redgram, Greengram and cotton. Semi*

medium farmers have grown redgram and paddy. Medium farmers have grown redgram and greengram. Large farmers have grown redgram.

- *The results indicate that, the cropping intensity in Narayanpura micro-watershed was found to be 87.70 per cent.*
- *The results indicate that, 50 per cent of the households have bank account and savings.*
- *The results indicate that, 50 per cent of the households have availed credit from different sources.*
- *The results indicate that, the total cost of cultivation for cotton was Rs. 44545.04. The gross income realized by the farmers was Rs. 142907.14. The net income from Cotton cultivation was Rs. 98362.11, thus the benefit cost ratio was found to be 1:3.21.*
- *The total cost of cultivation for red gram was Rs. 69659.14. The gross income realized by the farmers was Rs. 70728.20. The net income from red gram cultivation was Rs. 1069.06. Thus the benefit cost ratio was found to be 1:1.02.*
- *The total cost of cultivation for green gram was Rs. 27759.54. The gross income realized by the farmers was Rs. 36556.26. The net income from green gram cultivation was Rs. 8796.72. Thus the benefit cost ratio was found to be 1:1.32.*
- *The total cost of cultivation for paddy was Rs. 35377.88. The gross income realized by the farmers was Rs. 87273.33. The net income from paddy cultivation was Rs. 51895.46. Thus the benefit cost ratio was found to be 1:2.47.*
- *The total cost of cultivation for blackgram was Rs. 31639.50. The gross income realized by the farmers was Rs. 52108.33. The net income from blackgram cultivation was Rs. 20468.83. Thus the benefit cost ratio was found to be 1:1.65.*
- *The total cost of cultivation for sorghum was Rs. 77663.85. The gross income realized by the farmers was Rs. 81916.09. The net income from sorghum cultivation was Rs. 4252.23. Thus the benefit cost ratio was found to be 1:1.05.*
- *The results indicate that, 36.11 per cent of the households opined that dry fodder was adequate, 13.89 per cent of the households opined that green fodder was adequate and 2.78 per cent of the households opined that green fodder was inadequate.*
- *The results indicate that the average annual gross income was Rs. 90,000 for landless farmers, for marginal farmers it was Rs. 90,000, for small farmers it was Rs. 63,875, for semi medium farmers it was Rs. 1,56,809, for medium farmers it was Rs. 1,28,000 and for large farmers it was Rs. 3,28,667.*
- *The results indicate that the average annual expenditure is Rs. 55,031. For landless households it was Rs. 58,000, for marginal farmers it was Rs. 15,836, for small farmers it was Rs. 42,293, for semi medium farmers it was Rs. 31,250, for medium farmers it was Rs. 1,18,667 and for large farmers it was Rs. 6,70,000.*

- *The results indicate that, sampled households have grown 5 custard apple trees in their field and 6 in their backyard; 7 mango trees in their field and 1 in their backyard; and 2 pomegranate trees in their trees.*
- *The results indicate that, households have planted 18 teak, 125 neem and 1 tamarind tree in their field.*
- *The results indicate that, households have an average investment capacity of Rs. 6,130.56 for land development and Rs. 291.67 for improved crop production.*
- *The results indicate that, asset selling was the source of additional investment for 2.78 per cent for land development. Loan from bank was the major source of investment for 13.89 per cent of households for land development and for 2.78 per cent for improved crop production. Own funds were the source of additional investment for 2.78 per cent for land development. Soft loan was the source of additional investment for 72.22 per cent for land development and for 5.56 per cent for improved crop production.*
- *The results indicated that, blackgram was sold to the extent of 61.54 per cent, cotton was sold to the extent of 100 per cent, greengram was sold to the extent of 78.07 per cent, paddy was sold to the extent of 50 per cent, redgram was sold to the extent of 72.60 per cent and sorghum was sold to the extent of 50 per cent.*
- *The results indicated that, about 94.44 per cent of the farmers sold their produce to local/village merchants.*
- *The results indicated that, 83.33 per cent of the households have used tractor as a mode of transportation for their agricultural produce and 11.11 per cent have used cart as a mode of transportation.*
- *The results indicated that, 88.89 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, 80.56 per cent of the households used firewood and 44.44 per cent used LPG as a source of fuel.*
- *The results indicated that, piped supply was the major source of drinking water for 97.22 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, 63.89 per cent of the households possess sanitary toilet.*
- *The results indicated that, 100 per cent of the sampled households possessed BPL card and 2.86 per cent of the households did not possess any PDS card.*
- *The results indicated that, 100 per cent of the households participated in NREGA programme.*
- *The results indicated that, cereals were adequate for 100 per cent of the households, pulses were adequate for 97.22 per cent, oilseeds were adequate for 11.11 per cent, vegetables were adequate for 61.11 per cent, fruits were adequate*

for 5.56 per cent, milk was adequate for 72.22 per cent, eggs were adequate for 37.14 per cent and meat was adequate for 25 per cent.

- *The results indicated that, pulses were inadequate for 2.78 per cent of the households, oilseeds were inadequate for 86.11 per cent, vegetables were inadequate for 36.11 per cent, fruits were inadequate for 91.67 per cent, milk was inadequate for 16.67 per cent, eggs were inadequate for 61.11 per cent and meat was inadequate for 72.22 per cent of the households.*
- *The results indicated that, oilseeds were market surplus for 2.78 per cent, vegetables were market surplus for 2.78 per cent, fruits were market surplus for 2.78 per cent, milk was market surplus for 11.11 per cent and meat was market surplus for 2.78 per cent of the households.*
- *The results indicated that, lower fertility status of the soil was the constraint experienced by 91.67 per cent of the households, wild animal menace on farm field (91.67%), frequent incidence of pest and diseases (77.78%), inadequacy of irrigation water (36.11%), high cost of fertilizers and plant protection chemicals (69.44%), low price for the agricultural commodities (80.56%), lack of marketing facilities in the area (75%), lack of transport for safe transport of the agricultural produce to the market (44.44%) and inadequate extension services (19.44%).*

Chapter 2

INTRODUCTION

Soil and water are the two precious natural resources which are essential for crop production and existence of life on earth. Rainfed agriculture is under severe stress due to various constraints related to agriculture like uneven and erratic distribution of rainfall, indiscriminate use of fertilizers, chemicals and pesticides, adoption of improper land management practices, soil erosion, decline in soil fertility, decline in ground water resources leading to low crop productivity. The area under rainfed agriculture has to be managed effectively using the best available practices to enhance the production of food, fodder and fuel. This is possible if the land resources are characterized at each parcel of land through detailed land resource inventory using the best available techniques of remote sensing, GPS and GIS. The watershed development programs are aimed at the sustainable distribution of its resources and the process of creating and implementing plans, programs, and projects to sustain and enhance watershed functions that affect the plant, animal and human communities within a watershed boundary.

World Bank funded KWDP II, SUJALA III project was implemented in with Broad objective of demonstrating more effective watershed management through greater integration of programmes related to rain-fed agriculture, innovative and science based approaches and strengthen institutional capacities and If successful, it is expected that the systems and tools could be mainstreamed into the overall IWMP in the State of Karnataka and in time, throughout other IWMP operations in India. With this background the socio-economic survey has been carried out with following specific objectives:

1. To understand the demographic features of the households in the micro-watershed
2. To understand the extent of family labour available and additional employment opportunities available within the village.
3. To know the status of assets of households in the micro-watershed for suggesting possible improvements.
4. To study the cropping pattern, cropped area and productivity levels of different households in micro-watershed.
5. To determine the type and extent of livestock owned by different categories of HHs
6. Availability of fodder and level of livestock management.

Scope and importance of survey

Survey helps in identification of different socio-economic and resource use-patterns of farmers at the Micro watershed. Household survey provides demographic features, labour force, and levels of education; land ownership and asset position (including livestock and other household assets) of surveyed households; and cropping patterns, input intensities, and average crop yields from farmers' fields. It also discusses crop utilization and the degree of commercialization of production in the areas; farmers' access to and utilization of credit from formal and informal sources; and the level of adoption and use of soil, water,and pest management technologies.

Chapter 3

METHODOLOGY

The description of the methods, components selected for the survey and procedures followed in conducting the baseline survey are furnished under the following heads.

Description of the study area

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

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

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

Description of the micro watershed

Narayanpura micro-watershed in Gurumitkal sub-watershed (Yadgir taluk and district) is located in between $16^0$53’8.758’’ to 16^0 51’2.334” North latitudes and 77^0 24’18.916’’ to $77^0$22’21.148’’ East longitudes, covering an area of about 708.65 ha, bounded by Gurumitkal and Narayanapura 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 analyse 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 Narayanpura micro-watershed is presented in Table 1 and it indicated that 36 farmers were sampled in Narayanpura micro-watershed among them 3 (8.33%) were landless, 16 (44.44%) were marginal farmers, 11 (30.56%) were small farmers, 2 (5.56%) were semi medium farmers, 3 (8.33%) medium farmers and 1 (2.78%) large farmer.

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

Sl.No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Farmers	3	8.33	16	44.44	11	30.56	2	5.56	3	8.33	1	2.78	36	100.00

Population characteristics: The population characteristics of households sampled for socio-economic survey in Narayanpura micro-watershed is presented in Table 2. The data indicated that there were 98 (59.04%) men and 68 (40.96%) women among the sampled households. The average family size of landless farmers' was 4, marginal farmers' was 4.88, small farmers' was 4.36, semi medium farmers' was 4, medium farmers' was 4.67 and large farmers' was 6.

Table 2: Population characteristics of Narayanpura micro-watershed

Sl. No.	Particulars	LL (12)		MF (78)		SF (48)		SMF (8)		MDF (14)		LF (6)		All (166)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Men	8	66.67	46	58.97	24	50.00	6	75.00	9	64.29	5	83.33	98	59.04
2	Women	4	33.33	32	41.03	24	50.00	2	25.00	5	35.71	1	16.67	68	40.96
Total		12	100.00	78	100.00	48	100.00	8	100.00	14	100.00	6	100.00	166	100.00
Average		4.00		4.88		4.36		4.00		4.67		6.00		4.61	

Age wise classification of population: The age wise classification of household members in Narayanpura micro-watershed is presented in Table 3. The data indicated that, 25 (15.06%) people were in 0-15 years of age, 80 (48.19%) were in 16-35 years of age, 52 (31.33%) were in 36-60 years of age and 9 (5.42%) were above 61 years of age.

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

Sl. No.	Particulars	LL (12)		MF (78)		SF (48)		SMF (8)		MDF (14)		LF (6)		All (166)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	0-15 years of age	2	16.67	18	23.08	5	10.42	0	0.00	0	0.00	0	0.00	25	15.06
2	16-35 years of age	8	66.67	34	43.59	26	54.17	4	50.00	6	42.86	2	33.33	80	48.19
3	36-60 years of age	2	16.67	23	29.49	15	31.25	4	50.00	5	35.71	3	50.00	52	31.33
4	> 61 years	0	0.00	3	3.85	2	4.17	0	0.00	3	21.43	1	16.67	9	5.42
Total		12	100.00	78	100.00	48	100.00	8	100.00	14	100.00	6	100.00	166	100.00

Education level of household members: Education level of household members in Narayanpura micro-watershed is presented in Table 4. The results indicated that Narayanpura had 42.77 per cent illiterates, 17.47 per cent of them had primary school education, 1.20 per cent of them had middle school education, 7.83 per cent of them had high school education, 13.86 per cent of them had PUC education, 9.04 per cent of them had degree education, 0.60 per cent of them did ITI, 0.60 per cent of the population had diploma and 1.81 per cent of them did masters.

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

Sl. No.	Particulars	LL (12)		MF (78)		SF (48)		SMF (8)		MDF (14)		LF (6)		All (166)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Illiterate	4	33.33	34	43.59	22	45.83	5	62.50	4	28.57	2	33.33	71	42.77
2	Primary School	1	8.33	22	28.21	3	6.25	1	12.50	1	7.14	1	16.67	29	17.47
3	Middle School	0	0.00	0	0.00	2	4.17	0	0.00	0	0.00	0	0.00	2	1.20
4	High School	2	16.67	6	7.69	3	6.25	0	0.00	2	14.29	0	0.00	13	7.83
5	PUC	1	8.33	6	7.69	12	25.00	1	12.50	2	14.29	1	16.67	23	13.86
6	Diploma	0	0.00	1	1.28	0	0.00	0	0.00	0	0.00	0	0.00	1	0.60
7	ITI	0	0.00	0	0.00	1	2.08	0	0.00	0	0.00	0	0.00	1	0.60
8	Degree	3	25.00	3	3.85	3	6.25	1	12.50	4	28.57	1	16.67	15	9.04
9	Masters	0	0.00	1	1.28	0	0.00	0	0.00	1	7.14	1	16.67	3	1.81
10	Others	1	8.33	5	6.41	2	4.17	0	0.00	0	0.00	0	0.00	8	4.82
Total		12	100.00	78	100.00	48	100.00	8	100.00	14	100.00	6	100.00	166	100.00

Occupation of household heads: The data regarding the occupation of the household heads in Narayanpura micro-watershed is presented in Table 5. The results indicate that, 86.11 per cent of households were practicing agriculture, 5.56 per cent of the households were agricultural labourers, 2.78 per cent of the households were general labours, 2.86 per cent of them were in private service and 2.78 per cent of the population was involved in trade and business.

Table 5: Occupation of household heads in Narayanpura micro-watershed

Sl. No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Agriculture	0	0.00	15	93.75	10	90.91	2	100.00	3	100.00	1	100.00	31	86.11
2	Agricultural Labour	2	66.67	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	5.56
3	General Labour	1	33.33	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	2.78
4	Private Service	0	0.00	1	6.25	0	0.00	0	0.00	0	0.00	0	0.00	1	2.78
5	Trade & Business	0	0.00	0	0.00	1	9.09	0	0.00	0	0.00	0	0.00	1	2.78
Total		3	100.00	16	100.00	11	100.00	2	100.00	3	100.00	1	100.00	36	100.00

Occupation of the household members: The data regarding the occupation of the household members in Narayanpura micro-watershed is presented in Table 6. The results indicate that agriculture was the major occupation for 67.47 per cent of the household members, 1.81 per cent were agricultural laborers, 2.41 per cent were general labourers, 0.60 per cent were in government service, 6.63 per cent were in private service, 0.60 per

cent were into trade and business, 15.06 per cent were students, 0.60 per cent were housewives and 4.22 per cent were children.

Table 6: Occupation of family members in Narayanpura micro-watershed

Sl. No.	Particulars	LL (12)		MF (78)		SF (48)		SMF (8)		MDF(14)		LF (6)		All (166)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Agriculture	0	0.00	54	69.23	36	75.00	8	100.00	10	71.43	4	66.67	112	67.47
2	Agricultural Labour	3	25.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	3	1.81
3	General Labour	3	25.00	1	1.28	0	0.00	0	0.00	0	0.00	0	0.00	4	2.41
4	Government Service	0	0.00	0	0.00	0	0.00	0	0.00	1	7.14	0	0.00	1	0.60
5	Private Service	2	16.67	3	3.85	1	2.08	0	0.00	3	21.43	2	33.33	11	6.63
6	Trade & Business	0	0.00	0	0.00	1	2.08	0	0.00	0	0.00	0	0.00	1	0.60
7	Student	2	16.67	15	19.23	8	16.67	0	0.00	0	0.00	0	0.00	25	15.06
8	Others	1	8.33	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.60
9	Housewife	0	0.00	0	0.00	1	2.08	0	0.00	0	0.00	0	0.00	1	0.60
10	Children	1	8.33	5	6.41	1	2.08	0	0.00	0	0.00	0	0.00	7	4.22
Total		12	100.00	78	100.00	48	100.00	8	100.00	14	100.00	6	100.00	166	100.00

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

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

Sl. No.	Particulars	LL (12)		MF (78)		SF (48)		SMF (8)		MDF (14)		LF (6)		All (166)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	No Participation	12	100.00	78	100.00	48	100.00	8	100.00	14	100.00	6	100.00	166	100.00
Total		12	100.00	78	100.00	48	100.00	8	100.00	14	100.00	6	100.00	166	100.00

Type of house owned: The data regarding the type of house owned by the households in Narayanpura micro-watershed is presented in Table 8. The results indicate that 19.44 per cent of the households possess katcha house and 80.56 per cent of them possess pucca house.

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

Sl.No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Katcha	1	33.33	2	12.50	2	18.18	0	0.00	1	33.33	1	100.00	7	19.44
2	Pucca/RCC	2	66.67	14	87.50	9	81.82	2	100.00	2	66.67	0	0.00	29	80.56
Total		3	100.00	16	100.00	11	100.00	2	100.00	3	100.00	1	100.00	36	100.00

Durable Assets owned by the households: The data regarding the Durable Assets owned by the households in Narayanpura micro-watershed is presented in Table 9. The results show that 75 per cent of the households possess TV, 44.44 per cent of the households possess Mixer grinder, 11.11 per cent of the households possess refrigerator, 5.56 per cent of them had bicycle, 50 per cent of the households possess motor cycle, 5.56

per cent of them had car/four wheeler and 91.67 per cent of the households possess mobile phones.

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

Sl. No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Television	3	100.00	12	75.00	7	63.64	1	50.00	3	100.00	1	100.00	27	75.00
2	Mixer/Grinder	0	0.00	6	37.50	6	54.55	0	0.00	3	100.00	1	100.00	16	44.44
3	Refrigerator	0	0.00	3	18.75	1	9.09	0	0.00	0	0.00	0	0.00	4	11.11
4	Bicycle	0	0.00	1	6.25	1	9.09	0	0.00	0	0.00	0	0.00	2	5.56
5	Motor Cycle	0	0.00	7	43.75	8	72.73	0	0.00	2	66.67	1	100.00	18	50.00
6	Car/Four Wheeler	0	0.00	0	0.00	0	0.00	0	0.00	1	33.33	1	100.00	2	5.56
7	Mobile Phone	3	100.00	14	87.50	10	90.91	2	100.00	3	100.00	1	100.00	33	91.67
8	Blank	0	0.00	1	6.25	1	9.09	0	0.00	0	0.00	0	0.00	2	5.56

Average value of durable assets: The data regarding the average value of durable assets owned by the households in Narayanpura micro-watershed is presented in Table 10. The results show that the average value of television was Rs.5370, mixer grinder was Rs.1637, refrigerator was Rs.9250, bicycle was Rs.1500, motor cycle was Rs.19300, car/four wheeler was Rs.200000 and mobile phone was Rs.2073.

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

Average value (Rs.)

Sl.No.	Particulars	LL (3)	MF (16)	SF (11)	SMF (2)	MDF (3)	LF (1)	All (36)
1	Television	2,000	5,333	5,000	5,000	8,333	10,000	5,370
2	Mixer/Grinder	0	1,450	1,666	0	1,833	2,000	1,637
3	Refrigerator	0	10,000	7,000	0	0	0	9,250
4	Bicycle	0	2,000	1,000	0	0	0	1,500
5	Motor Cycle	0	17,333	15,625	0	30,000	45,000	19,300
6	Car/Four Wheeler	0	0	0	0	2,00,000	2,00,000	2,00,000
7	Mobile Phone	2,000	2,076	2,868	1,333	1,700	300	2,073

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

Sl. No.	Particulars	LL (3)		MF (16)		SF (11)		SMF(2)		MDF(3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Bullock Cart	0	0.00	0	0.00	1	9.09	1	50.00	0	0.00	0	0.00	2	5.56
2	Plough	0	0.00	6	37.50	7	63.64	1	50.00	1	33.33	1	100.00	16	44.44
3	Seed/Fertilizer Drill	0	0.00	0	0.00	1	9.09	0	0.00	0	0.00	0	0.00	1	2.78
4	Irrigation Pump	0	0.00	0	0.00	2	18.18	1	50.00	0	0.00	0	0.00	3	8.33
5	Tractor	0	0.00	0	0.00	0	0.00	0	0.00	1	33.33	1	100.00	2	5.56
6	Sprayer	0	0.00	0	0.00	2	18.18	1	50.00	1	33.33	0	0.00	4	11.11
7	Weeder	0	0.00	11	68.75	7	63.64	0	0.00	1	33.33	0	0.00	19	52.78
8	Harvester	0	0.00	2	12.50	0	0.00	1	50.00	0	0.00	0	0.00	3	8.33
9	Blank	3	100.00	2	12.50	2	18.18	1	50.00	1	33.33	0	0.00	9	25.00

Farm Implements owned: The data regarding the farm implements owned by the households in Narayanpura micro-watershed is presented in Table 11. About 5.56 per

cent of the households possess bullock cart, 44.44 per cent of them possess plough, 2.78 per cent of them had seed/fertilizer drill, 8.33 per cent of them had irrigation pump, 5.56 per cent of the households possess tractor, 11.11 per cent of them possess sprayer, 52.78 per cent of them possess weeder and 8.33 per cent of them possess harvester.

Average value of farm implements: The data regarding the average value of farm Implements owned by the households in Narayanpura micro-watershed is presented in Table 12. The results show that the average value of bullock cart was Rs.25000, plough was Rs.1663, seed/fertilizer drill was Rs.6000, irrigation pump was Rs.20000, the average value of tractor was Rs.200000, the average value of sprayer was Rs.4500 and the average value of harvester was Rs.103333.

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

Average Value (Rs.)

Sl.No.	Particulars	MF (16)	SF (11)	SMF (2)	MDF (3)	LF (1)	All (36)
1	Bullock Cart	0	30,000	20,000	0	0	25,000
2	Plough	2,250	2,428	2,000	525	500	1,663
3	Seed/Fertilizer Drill	0	6,000	0	0	0	6,000
4	Irrigation Pump	0	15,000	30,000	0	0	20,000
5	Tractor	0	0	0	200,000	200,000	200,000
6	Sprayer	0	7,000	2,000	2,000	0	4,500
7	Harvester	140,000	0	30,000	0	0	103,333

Livestock possession by the households: The data regarding the Livestock possession by the households in Narayanpura micro-watershed is presented in Table 13. The results indicate that, 33.33 per cent of the households possess bullocks, 30.56 per cent of the households possess local cow, 2.78 per cent had crossbred cow, 11.11 per cent had buffalo, 13.89 per cent had sheep, 2.78 per cent had goat and 13.89 per cent had poultry birds.

Table 13. Livestock possession by households in Narayanpura micro-watershed

Sl.No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Bullock	0	0.00	2	12.50	7	63.64	1	50.00	1	33.33	1	100.00	12	33.33
2	Local cow	0	0.00	1	6.25	7	63.64	0	0.00	2	66.67	1	100.00	11	30.56
3	Crossbred cow	0	0.00	0	0.00	0	0.00	0	0.00	1	33.33	0	0.00	1	2.78
4	Buffalo	0	0.00	1	6.25	1	9.09	0	0.00	1	33.33	1	100.00	4	11.11
5	Sheep	0	0.00	2	12.50	1	9.09	0	0.00	1	33.33	1	100.00	5	13.89
6	Goat	0	0.00	0	0.00	1	9.09	0	0.00	0	0.00	0	0.00	1	2.78
7	Poultry birds	0	0.00	1	6.25	1	9.09	0	0.00	2	66.67	1	100.00	5	13.89
8	blank	3	100.00	10	62.50	3	27.27	1	50.00	0	0.00	0	0.00	17	47.22

Average Labour availability: The data regarding the average labour availability in Narayanpura micro-watershed is presented in Table 14. The results indicate that, average own labour men available in the micro watershed was 1.94, average own labour (women) available was 1.69, average hired labour (men) available was 10.19 and average hired labour (women) available was 10.27.

In case of marginal farmers, average own labour men available was 1.63, average own labour (women) was 1.88, average hired labour (men) was 4.75 and average hired labour (women) available was 4.27. In case of small farmers, average own labour men available was 2, average own labour (women) was 1.60, average hired labour (men) was 7.90 and average hired labour (women) available was 8.30. In case of semi medium farmers, average own labour men available was 3, average own labour (women) was 1.50, average hired labour (men) was 8 and average hired labour (women) available was 6. In case of medium farmers, average own labour men available was 2.33, average own labour (women) was 1.33, average hired labour (men) was 31.67 and average hired labour (women) available was 31.67. In case of large farmers, average own labour men available was 3, average own labour (women) was 1, average hired labour (men) was 60 and average hired labour (women) available was 60.

Table 14. Average Labour availability in Narayanpura micro-watershed

Sl.No.	Particulars	MF (16)	SF (11)	SMF (2)	MDF (3)	LF (1)	All (36)
		N	N	N	N	N	N
1	Hired labour Female	4.27	8.30	6.00	31.67	60.00	10.27
2	Own Labour Female	1.88	1.60	1.50	1.33	1.00	1.69
3	Own labour Male	1.63	2.00	3.00	2.33	3.00	1.94
4	Hired labour Male	4.75	7.90	8.00	31.67	60.00	10.19

Adequacy of Hired Labour: The data regarding the adequacy of hired labour in Narayanpura 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.

Table 15. Adequacy of Hired Labour in Narayanpura micro-watershed

Sl.No.	Particulars	MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Adequate	16	100.00	10	90.91	2	100.00	3	100.00	1	100.00	32	88.89

Distribution of land (ha): The data regarding the distribution of land (ha) in Narayanpura micro-watershed is presented in Table 16. The results indicate that, households of the Narayanpura micro-watershed possess 50.62 ha (97.66%) of dry land and 1.21 ha (2.34%) of irrigated land. Marginal farmers possess 7.52 ha (100%) of dry land. Small farmers possess 15.03 ha (100%) of dry land. Semi medium farmers possess 2.17 ha (64.07%) of dry land and 1.21 ha (35.93%) of irrigated land. Medium farmers possess 15.78 ha (100%) of dry land and large farmers possess 10.12 ha (100%) of dry land.

Table 16. Distribution of land (Ha) in Narayanpura micro-watershed

Sl. No.	Particulars	MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		ha	%	ha	%	ha	%	ha	%	ha	%	ha	%
1	Dry	7.52	100	15.03	100	2.17	64.07	15.78	100	10.12	100	50.62	97.66
2	Irrigated	0	0	0	0	1.21	35.93	0	0	0	0	1.21	2.34
Total		100	7.52	100	15.03	100	3.38	100	15.78	100	10.12	100	51.84

Average land value (Rs./ha): The data regarding the average land value (Rs./ha) in Narayanpura micro-watershed is presented in Table 17. The results indicate that, the average value of dry land was Rs. 1289400 and average value of irrigated land was Rs. 1482000. In case of marginal famers, the average land value was Rs. 1335315 for dry land. In case of small famers, the average land value was Rs. 847712 for dry land. In case of semi medium famers, the average land value was Rs. 1615888 for dry land and Rs. 1482000 for irrigated land. In case of medium farmers, the average land value was Rs. 1203333 for dry land and it was Rs.1976000 in case of large farmers.

Table 17. Average land value (Rs./ha) in Narayanpura micro-watershed

Sl. No.	Particulars	MF (16)	SF (11)	SMF (2)	MDF (3)	LF (1)	All (36)
1	Dry	1335315	847712	1615888	1203333	1976000	1289400
2	Irrigated	0	0	1482000	0	0	1482000

Status of bore wells: The data regarding the status of bore wells in Narayanpura micro-watershed is presented in Table 18. The results indicate that, there were 2 functioning bore wells in the micro watershed.

Table 18. Status of bore wells in Narayanpura micro-watershed

Sl.No.	Particulars	LL (3)	MF (16)	SF (11)	SMF (2)	MDF (3)	LF (1)	All (36)
		N	N	N	N	N	N	N
1	Functioning	0	0	0	1	0	1	2

Source of irrigation: The data regarding the source of irrigation in Narayanpura micro-watershed is presented in Table 19. The results indicate that, bore well was the major irrigation source in the micro water shed for 5.56 per cent of the farmers.

Table 19. Source of irrigation in Narayanpura micro-watershed

Sl.No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Bore Well	0	0.00	0	0.00	0	0.00	1	50.00	0	0.00	1	100.00	2	5.56

Depth of water (Avg in meters): The data regarding the depth of water in Narayanpura micro-watershed is presented in Table 20. The results indicate that, the depth of bore well was found to be 3.56 meters.

Table 20. Depth of water (Avg in meters) in Narayanpura micro-watershed

Sl.No.	Particulars	LL (3)	MF (16)	SF (11)	SMF (2)	MDF (3)	LF (1)	All (36)
1	Bore Well	0.00	0.00	0.00	33.53	0.00	60.96	3.56

Irrigated Area (ha): The data regarding the irrigated area (ha) in Narayanpura micro-watershed is presented in Table 21. The results indicate that, semi medium and large farmers had an irrigated area of 1.12 ha and 10.12 ha.

Table 21. Irrigated Area (ha) in Narayanpura micro-watershed

Sl.No.	Particulars	LL (3)	MF (16)	SF (11)	SMF (2)	MDF (3)	LF (1)	All (36)
1	Kharif	0.00	0.00	0.00	1.21	0.00	10.12	11.34

Cropping pattern: The data regarding the cropping pattern in Narayanpura micro-watershed is presented in Table 22. The results indicate that, farmers have grown cotton (1.42 ha), red gram (35.74 ha), sorghum (0.58 ha), paddy (1.21 ha), black gram (0.92 ha) and greengram (12.09 ha). Marginal farmers have grown redgram, greengram, blackgram and sorghum. Small farmers have grown redgram, Greengram and cotton. Semi medium farmers have grown redgram and paddy. Medium farmers have grown redgram and greengram. Large farmers have grown redgram.

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

Sl.No.	Particulars	MF (16)	SF (11)	SMF (2)	MDF (3)	LF (1)	All (36)
1	Kharif - Red gram (togari)	3.76	12.41	2.17	7.29	10.12	35.74
2	Kharif - Greengram	2.37	1.21	0	8.5	0	12.09
3	Kharif - Cotton	0	1.42	0	0	0	1.42
4	Kharif - Paddy	0	0	1.21	0	0	1.21
5	Kharif - Black gram	0.92	0	0	0	0	0.92
6	Kharif - Sorghum	0.58	0	0	0	0	0.58
Total		7.63	15.04	3.38	15.79	10.12	51.96

Cropping intensity: The data regarding the cropping intensity in Narayanpura micro-watershed is presented in Table 23. The results indicate that, the cropping intensity in Narayanpura micro-watershed was found to be 87.70 per cent.

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

Sl.No.	Particulars	LL (3)	MF (16)	SF (11)	SMF (2)	MDF (3)	LF (1)	All (36)
1	Cropping Intensity	0.00	100.00	100.00	100.00	68.42	100.00	87.70

Possession of Bank account and savings: The data regarding the cropping intensity in Narayanpura micro-watershed is presented in Table 24. The results indicate that, 50 per cent of the households have bank account and savings.

Table 24. Possession of Bank account and savings in Narayanpura micro-watershed

Sl.No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Account	1	33.33	6	37.50	8	72.73	1	50.00	1	33.33	1	100.00	18	50.00

Borrowing status: The data regarding the cropping intensity in Narayanpura micro-watershed is presented in Table 25. The results indicate that, 50 per cent of the households have availed credit from different sources.

Table 25. Borrowing status in Narayanpura micro-watershed

Sl.No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Credit Availed	1	33.33	6	37.50	8	72.73	1	50.00	1	33.33	1	100.00	18	50.00

Cost of Cultivation of Cotton: The data regarding the cost of cultivation of cotton in Narayanpura micro-watershed is presented in Table 26. The results indicate that, the total cost of cultivation for cotton was Rs. 44545.04. The gross income realized by the farmers was Rs. 142907.14. The net income from Cotton cultivation was Rs. 98362.11, thus the benefit cost ratio was found to be 1:3.21.

Table 26. Cost of Cultivation of cotton in Narayanpura micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	41.64	7798.14	17.51
2	Bullock		Pairs/day	0.00	0.00	0.00
3	Tractor		Hours	16.23	12173.57	27.33
4	Machinery		Hours	0.00	0.00	0.00
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	7.06	6704.29	15.05
6	Seed Inter Crop		Kgs.	0.00	0.00	0.00
7	FYM		Quintal	21.17	2964.00	6.65
8	Fertilizer + micronutrients		Quintal	1.41	1693.71	3.80
9	Pesticides (PPC)		Kgs / liters	1.41	1411.43	3.17
10	Irrigation		Number	0.00	0.00	0.00
11	Repairs			0.00	0.00	0.00
12	Msc. Charges (Marketing costs etc)			0.00	0.00	0.00
13	Depreciation charges			0.00	29.64	0.07
14	Land revenue and Taxes			0.00	4.94	0.01
II	**Cost B1**					
16	Interest on working capital				1532.81	3.44
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				34312.53	77.03
III	**Cost B2**					
18	Rental Value of Land				466.67	1.05
19	**Cost B2 = (Cost B1 + Rental value)**				34779.20	78.08
IV	**Cost C1**					
20	Family Human Labour			28.23	5716.29	12.83
21	**Cost C1 = (Cost B2 + Family Labour)**				40495.49	90.91
V	**Cost C2**					
22	Risk Premium				0.00	0.00
23	**Cost C2 = (Cost C1 + Risk Premium)**				40495.49	90.91
VI	**Cost C3**					
24	Managerial Cost				4049.55	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				44545.04	100.00
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		31.76	142907.14	
		b) Main Crop Sales Price (Rs.)			4500.00	
b.	Gross Income (Rs.)				142907.14	
c.	Net Income (Rs.)				98362.11	
d.	Cost per Quintal (Rs./q.)				1402.68	
e.	Benefit Cost Ratio (BC Ratio)				1:3.21	

Cost of cultivation of Red gram: The data regarding the cost of cultivation of red gram in Narayanpura micro-watershed is presented in Table 27. The results indicate that, the total cost of cultivation for red gram was Rs. 69659.14. The gross income realized by the farmers was Rs. 70728.20. The net income from red gram cultivation was Rs. 1069.06. Thus the benefit cost ratio was found to be 1:1.02.

Table 27. Cost of Cultivation of red gram in Narayanpura micro-watershed

Sl.No	Particulars	Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**				
1	Hired Human Labour	Man days	51.73	9669.06	13.88
2	Bullock	Pairs/day	6.06	3410.08	4.90
3	Tractor	Hours	4.66	3495.28	5.02
4	Machinery	Hours	0.00	0.00	0.00
5	Seed Main Crop (Establishment and Maintenance)	Kgs (Rs.)	12.51	1342.66	1.93
6	Seed Inter Crop	Kgs.	0.00	0.00	0.00
7	FYM	Quintal	50.99	22619.78	32.47
8	Fertilizer + micronutrients	Quintal	3.84	4457.78	6.40
9	Pesticides (PPC)	Kgs / liters	2.68	2682.48	3.85
10	Irrigation	Number	0.00	0.00	0.00
11	Repairs		0.00	0.00	0.00
12	Msc. Charges (Marketing costs etc)		0.00	0.00	0.00
13	Depreciation charges		0.00	167.51	0.24
14	Land revenue and Taxes		0.00	4.72	0.01
II	**Cost B1**				
16	Interest on working capital			3732.32	5.36
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**			51581.66	74.05
III	**Cost B2**				
18	Rental Value of Land			454.55	0.65
19	**Cost B2 = (Cost B1 + Rental value)**			52036.21	74.70
IV	**Cost C1**				
20	Family Human Labour		55.75	11290.28	16.21
21	**Cost C1 = (Cost B2 + Family Labour)**			63326.49	90.91
V	**Cost C2**				
22	Risk Premium			0.00	0.00
23	**Cost C2 = (Cost C1 + Risk Premium)**			63326.49	90.91
VI	**Cost C3**				
24	Managerial Cost			6332.65	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**			69659.14	100.00
VII	**Economics of the Crop**				
a.	Main Product	a) Main Product (q)	14.26	70728.20	
		b) Main Crop Sales Price (Rs.)		4959.09	
b.	Gross Income (Rs.)			70728.20	
c.	Net Income (Rs.)			1069.06	
d.	Cost per Quintal (Rs./q.)			4884.13	
e.	Benefit Cost Ratio (BC Ratio)			1:1.02	

Cost of Cultivation of Green gram: The data regarding the cost of cultivation of green gram in Narayanpura micro-watershed is presented in Table 28. The results indicate that, the total cost of cultivation for green gram was Rs. 27759.54. The gross income realized by the farmers was Rs. 36556.26. The net income from green gram cultivation was Rs. 8796.72. Thus the benefit cost ratio was found to be 1:1.32.

Table 28. Cost of Cultivation of greengram in Narayanpura micro-watershed

Sl.No	Particulars	Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**				
1	Hired Human Labour	Man days	39.13	7241.18	26.09
2	Bullock	Pairs/day	2.12	1061.04	3.82
3	Tractor	Hours	3.21	2251.14	8.11
4	Machinery	Hours	2.25	1684.09	6.07
5	Seed Main Crop (Establishment and Maintenance)	Kgs (Rs.)	12.77	1224.87	4.41
6	Seed Inter Crop	Kgs.	0.00	0.00	0.00
7	FYM	Quintal	22.17	2988.26	10.76
8	Fertilizer + micronutrients	Quintal	2.22	2026.87	7.30
9	Pesticides (PPC)	Kgs / liters	1.07	1071.93	3.86
10	Irrigation	Number	0.00	0.00	0.00
11	Repairs		0.00	0.00	0.00
12	Msc. Charges (Marketing costs etc)		0.00	0.00	0.00
13	Depreciation charges		0.00	629.23	2.27
14	Land revenue and Taxes		0.00	4.80	0.02
II	**Cost B1**				
16	Interest on working capital			877.43	3.16
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**			21060.83	75.87
III	**Cost B2**				
18	Rental Value of Land			422.22	1.52
19	**Cost B2 = (Cost B1 + Rental value)**			21483.06	77.39
IV	**Cost C1**				
20	Family Human Labour		19.01	3752.89	13.52
21	**Cost C1 = (Cost B2 + Family Labour)**			25235.95	90.91
V	**Cost C2**				
22	Risk Premium			0.00	0.00
23	**Cost C2 = (Cost C1 + Risk Premium)**			25235.95	90.91
VI	**Cost C3**				
24	Managerial Cost			2523.59	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**			27759.54	100.00
VII	**Economics of the Crop**				
a.	Main Product	a) Main Product (q)	9.79	36556.26	
		b) Main Crop Sales Price (Rs.)		3733.33	
b.	Gross Income (Rs.)			36556.26	
c.	Net Income (Rs.)			8796.72	
d.	Cost per Quintal (Rs./q.)			2834.96	
e.	Benefit Cost Ratio (BC Ratio)			1:1.32	

Cost of Cultivation of paddy: The data regarding the cost of cultivation of paddy in Narayanpura micro-watershed is presented in Table 29. The results indicate that, the total cost of cultivation for paddy was Rs. 35377.88. The gross income realized by the farmers was Rs. 87273.33. The net income from paddy cultivation was Rs. 51895.46. Thus the benefit cost ratio was found to be 1:2.47.

Table 29. Cost of Cultivation of paddy in Narayanpura micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	51.87	9180.17	25.95
2	Bullock		Pairs/day	6.59	4940.00	13.96
3	Tractor		Hours	3.29	2470.00	6.98
4	Machinery		Hours	0.00	0.00	0.00
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	61.75	2161.25	6.11
6	Seed Inter Crop		Kgs.	0.00	0.00	0.00
7	FYM		Quintal	24.70	3458.00	9.77
8	Fertilizer + micronutrients		Quintal	1.65	658.67	1.86
9	Pesticides (PPC)		Kgs / liters	0.82	823.33	2.33
10	Irrigation		Number	4.94	0.00	0.00
11	Repairs			0.00	0.00	0.00
12	Msc. Charges (Marketing costs etc)			0.00	0.00	0.00
13	Depreciation charges			0.00	1383.20	3.91
14	Land revenue and Taxes			0.00	4.94	0.01
II	**Cost B1**					
16	Interest on working capital				852.15	2.41
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				25931.71	73.30
III	**Cost B2**					
18	Rental Value of Land				466.67	1.32
19	**Cost B2 = (Cost B1 + Rental value)**				26398.37	74.62
IV	**Cost C1**					
20	Family Human Labour			26.35	5763.33	16.29
21	**Cost C1 = (Cost B2 + Family Labour)**				32161.71	90.91
V	**Cost C2**					
22	Risk Premium				0.00	0.00
23	**Cost C2 = (Cost C1 + Risk Premium)**				32161.71	90.91
VI	**Cost C3**					
24	Managerial Cost				3216.17	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				35377.88	100.00
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		49.40	79040.00	
		b) Main Crop Sales Price (Rs.)			1600.00	
	By Product	e) Main Product (q)		82.33	8233.33	
		f) Main Crop Sales Price (Rs.)			100.00	
b.	Gross Income (Rs.)				87273.33	
c.	Net Income (Rs.)				51895.46	
d.	Cost per Quintal (Rs./q.)				716.15	
e.	Benefit Cost Ratio (BC Ratio)				1:2.47	

Cost of cultivation of blackgram: The data regarding the cost of cultivation of blackgram in Narayanpura micro-watershed is presented in Table 30. The results indicate that, the total cost of cultivation for blackgram was Rs. 31639.50. The gross income realized by the farmers was Rs. 52108.33. The net income from blackgram cultivation was Rs. 20468.83. Thus the benefit cost ratio was found to be 1:1.65.

Table 30. Cost of Cultivation of blackgram in Narayanpura micro-watershed

Sl.No	Particulars	Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**				
1	Hired Human Labour	Man days	47.67	8450.00	26.71
2	Bullock	Pairs/day	2.17	1083.33	3.42
3	Tractor	Hours	4.33	3250.00	10.27
4	Machinery	Hours	0.00	0.00	0.00
5	Seed Main Crop (Establishment and Maintenance)	Kgs (Rs.)	16.25	32.50	0.10
6	Seed Inter Crop	Kgs.	0.00	0.00	0.00
7	FYM	Quintal	21.67	3033.33	9.59
8	Fertilizer + micronutrients	Quintal	2.17	2600.00	8.22
9	Pesticides (PPC)	Kgs / liters	1.08	1083.33	3.42
10	Irrigation	Number	0.00	0.00	0.00
11	Repairs		0.00	0.00	0.00
12	Msc. Charges (Marketing costs etc)		0.00	0.00	0.00
13	Depreciation charges		0.00	3087.50	9.76
14	Land revenue and Taxes		0.00	4.12	0.01
II	**Cost B1**				
16	Interest on working capital			809.90	2.56
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**			23434.02	74.07
III	**Cost B2**				
18	Rental Value of Land			400.00	1.26
19	**Cost B2 = (Cost B1 + Rental value)**			23834.02	75.33
IV	**Cost C1**				
20	Family Human Labour		22.75	4929.17	15.58
21	**Cost C1 = (Cost B2 + Family Labour)**			28763.18	90.91
V	**Cost C2**				
22	Risk Premium			0.00	0.00
23	**Cost C2 = (Cost C1 + Risk Premium)**			28763.18	90.91
VI	**Cost C3**				
24	Managerial Cost			2876.32	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**			31639.50	100.00
VII	**Economics of the Crop**				
a.	Main Product	a) Main Product (q)	14.08	52108.33	
		b) Main Crop Sales Price (Rs.)		3700.00	
b.	Gross Income (Rs.)			52108.33	
c.	Net Income (Rs.)			20468.83	
d.	Cost per Quintal (Rs./q.)			2246.59	
e.	Benefit Cost Ratio (BC Ratio)			1:1.65	

Cost of cultivation of sorghum: The data regarding the cost of cultivation of sorghum in Narayanpura micro-watershed is presented in Table 31. The results indicate that, the total cost of cultivation for sorghum was Rs. 77663.85. The gross income realized by the farmers was Rs. 81916.09. The net income from sorghum cultivation was Rs. 4252.23. Thus the benefit cost ratio was found to be 1:1.05.

Table 31. Cost of Cultivation of sorghum in Narayanpura micro-watershed

Sl.No	Particulars		Units	Phy Units	Value(Rs.)	% to C3
I	**Cost A1**					
1	Hired Human Labour		Man days	94.45	17055.56	21.96
2	Bullock		Pairs/day	13.02	6509.92	8.38
3	Tractor		Hours	0.00	0.00	0.00
4	Machinery		Hours	0.00	0.00	0.00
5	Seed Main Crop (Establishment and Maintenance)		Kgs (Rs.)	28.13	2387.95	3.07
6	Seed Inter Crop		Kgs.	0.00	0.00	0.00
7	FYM		Quintal	119.73	14367.86	18.50
8	Fertilizer + micronutrients		Quintal	3.14	2930.51	3.77
9	Pesticides (PPC)		Kgs / liters	5.99	5986.61	7.71
10	Irrigation		Number	0.00	0.00	0.00
11	Repairs			0.00	0.00	0.00
12	Msc. Charges (Marketing costs etc)			0.00	0.00	0.00
13	Depreciation charges			0.00	17.96	0.02
14	Land revenue and Taxes			0.00	4.94	0.01
II	**Cost B1**					
16	Interest on working capital				3080.75	3.97
17	**Cost B1 = (Cost A1 + sum of 15 and 16)**				52342.06	67.40
III	**Cost B2**					
18	Rental Value of Land				400.00	0.52
19	**Cost B2 = (Cost B1 + Rental value)**				52742.06	67.91
IV	**Cost C1**					
20	Family Human Labour			91.14	17861.45	23.00
21	**Cost C1 = (Cost B2 + Family Labour)**				70603.50	90.91
V	**Cost C2**					
22	Risk Premium				0.00	0.00
23	**Cost C2 = (Cost C1 + Risk Premium)**				70603.50	90.91
VI	**Cost C3**					
24	Managerial Cost				7060.35	9.09
25	**Cost C3 = (Cost C2 + Managerial Cost)**				77663.85	100.00
VII	**Economics of the Crop**					
a.	Main Product	a) Main Product (q)		48.19	81916.09	
		b) Main Crop Sales Price (Rs.)			1700.00	
b.	Gross Income (Rs.)				81916.09	
c.	Net Income (Rs.)				4252.23	
d.	Cost per Quintal (Rs./q.)				1611.75	
e.	Benefit Cost Ratio (BC Ratio)				1:1.05	

Adequacy of fodder: The data regarding the adequacy of fodder in Narayanpura micro-watershed is presented in Table 32. The results indicate that, 36.11 per cent of the households opined that dry fodder was adequate, 13.89 per cent of the households opined that green fodder was adequate and 2.78 per cent of the households opined that green fodder was inadequate.

Table 32. Adequacy of fodder in Narayanpura micro-watershed

Sl. No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Adequate-Dry Fodder	0	0.00	4	25.00	6	54.55	1	50.00	2	66.67	0	0.00	13	36.11
2	Adequate-Green Fodder	0	0.00	1	6.25	2	18.18	1	50.00	1	33.33	0	0.00	5	13.89
3	Inadequate-Green Fodder	0	0.00	1	6.25	0	0.00	0	0.00	0	0.00	0	0.00	1	2.78

Annual gross income: The data regarding the annual gross income in Narayanpura micro-watershed is presented in Table 33. The results indicate that the annual gross income was Rs. 90,000 for landless farmers, for marginal farmers it was Rs. 90,000, for small farmers it was Rs. 63,875, for semi medium farmers it was Rs. 1,56,809, for medium farmers it was Rs. 1,28,000 and for large farmers it was Rs. 3,28,667.

Table 33. Annual gross income in Narayanpura micro-watershed

(Avg value in Rs.)

Sl.No.	Particulars	LL (3)	MF (16)	SF (11)	SMF (2)	MDF (3)	LF (1)	All (36)
1	Service/salary	33,333	0	36,364	0	66,667	0	19,444
2	Business	0	12,500	0	0	0	0	5,556
3	Wage	56,667	25,938	22,727	60,000	1,10,333	50,000	37,111
4	Agriculture	0	25,438	97,718	68,000	1,50,000	2,50,000	64,386
5	Dairy Farm	0	0	0	0	1,667	0	139
Income(Rs.)		90,000	90,000	63,875	1,56,809	1,28,000	3,28,667	3,00,000

Average annual expenditure: The data regarding the average annual expenditure in Narayanpura micro-watershed is presented in Table 34. The results indicate that the average annual expenditure is Rs. 55,031. For landless households it was Rs. 58,000, for marginal farmers it was Rs. 15,836, for small farmers it was Rs. 42,293, for semi medium farmers it was Rs. 31,250, for medium farmers it was Rs. 1,18,667 and for large farmers it was Rs. 6,70,000.

Table 34. Average annual expenditure in Narayanpura micro-watershed

(Avg value in Rs.)

Sl.No.	Particulars	LL (3)	MF (16)	SF (11)	SMF (2)	MDF(3)	LF (1)	All (36)
1	Service/salary	95,000	0	3,50,000	0	1,80,000	0	17,361
2	Business	0	1,80,000	0	0	0	0	5,000
3	Wage	79,000	61,750	77,500	22,500	84,000	40,000	22,583
4	Agriculture	0	11,625	37,727	40,000	90,000	6,30,000	41,417
5	Dairy Farm	0	0	0	0	2,000	0	56
Total		1,74,000	2,53,375	4,65,227	62,500	3,56,000	6,70,000	19,81,102
Average		58,000	15,836	42,293	31,250	1,18,667	6,70,000	55,031

Horticulture species grown: The data regarding horticulture species grown in Narayanpura micro-watershed is presented in Table 35. The results indicate that, sampled households have grown 5 custard apple trees in their field and 6 in their backyard; 7 mango trees in their field and 1 in their backyard; and 2 pomegranate trees in their trees.

Table 35. Horticulture species grown in Narayanpura micro-watershed

Sl.No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		F	B	F	B	F	B	F	B	F	B	F	B	F	B
1	Custard apple	0	0	2	0	0	6	0	0	3	0	0	0	5	6
2	Mango	0	0	2	0	0	1	1	0	0	0	4	0	7	1
3	Pomegranate	0	0	0	0	0	0	0	0	0	0	2	0	2	0

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

Forest species grown: The data regarding forest species grown in Narayanpura micro-watershed is presented in Table 36. The results indicate that, households have planted 18 teak, 125 neem and 1 tamarind tree in their field.

Table 36: Forest species grown in Narayanpura micro-watershed

Sl.No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		F	B	F	B	F	B	F	B	F	B	F	B	F	B
1	Teak	0	0	0	0	0	0	0	0	0	0	18	0	18	0
2	Neem	0	0	2	0	3	0	0	0	0	0	120	0	125	0
3	Tamarind	0	0	1	0	0	0	0	0	0	0	0	0	1	0

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

Average Additional investment capacity: The data regarding average additional investment capacity in Narayanpura micro watershed is presented in Table 37. The results indicate that, households have an average investment capacity of Rs. 6,130.56 for land development and Rs. 291.67 for improved crop production.

Table 37. Average additional investment capacity of households in Narayanpura micro watershed

Sl. No.	Particulars	MF (16)	SF (11)	SMF (2)	MDF (3)	LF (1)	All (36)
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1	Land development	2,106.25	6,727.27	5,000.00	17,666.67	50,000.00	6,130.56
2	Improved crop production	125.00	772.73	0.00	0.00	0.00	291.67

Table 38. Source of additional investment of households in Narayanpura micro watershed

Sl.No	Item	Land development		Improved crop production	
		N	%	N	%
1	Asset selling	1	2.78	0	0.0
2	Loan from bank	5	13.89	1	2.78
3	Own funds	1	2.78	0	0.0
4	Soft loan	26	72.22	2	5.56

Source of additional investment: The data regarding source of additional investment in Narayanpura micro watershed is presented in Table 38. The results indicate that, asset selling was the source of additional investment for 2.78 per cent for land development.

Loan from bank was the major source of investment for 13.89 per cent of households for land development and for 2.78 per cent for improved crop production. Own funds were the source of additional investment for 2.78 per cent for land development. Soft loan was the source of additional investment for 72.22 per cent for land development and for 5.56 per cent for improved crop production.

Marketing of the agricultural produce: The data regarding marketing of the agricultural produce in Narayanpura micro-watershed is presented in Table 39. The results indicated that, blackgram was sold to the extent of 61.54 per cent, cotton was sold to the extent of 100 per cent, greengram was sold to the extent of 78.07 per cent, paddy was sold to the extent of 50 per cent, redgram was sold to the extent of 72.60 per cent and sorghum was sold to the extent of 50 per cent.

Table 39. Marketing of the agricultural produce in Narayanpura micro-watershed

Sl.No	Crops	Output obtained (q)	Output retained (q)	Output sold (q)	Output sold (%)	Avg. Price obtained (Rs/q)
1	Blackgram	13	5	8	61.54	3700.0
2	Cotton	45	0	45	100.00	4500.0
3	Greengram	114	25	89	78.07	3733.33
4	Paddy	60	30	30	50.00	1600.0
5	Redgram	438	120	318	72.60	4960.87
6	Sorghum	20	10	10	50.00	1700.0

Marketing Channels used for sale of agricultural produce: The data regarding marketing channels used for sale of agricultural produce in Narayanpura micro-watershed is presented in Table 40. The results indicated that, about 94.44 per cent of the farmers sold their produce to local/village merchants.

Table 40. Marketing Channels used for sale of agricultural produce in Narayanpura micro-watershed

Sl.No.	Particulars	MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Local/village Merchant	16	100.00	11	100.00	2	100.00	4	133.33	1	100.00	34	94.44

Mode of transport of agricultural produce: The data regarding mode of transport of agricultural produce in Narayanpura micro-watershed is presented in Table 41. The results indicated that, 83.33 per cent of the households have used tractor as a mode of transportation for their agricultural produce and 11.11 per cent have used cart as a mode of transportation.

Table 41. Mode of transport of agricultural produce in Narayanpura micro-watershed

Sl.No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Cart	0	0.00	3	18.75	1	9.09	0	0.00	0	0.00	0	0.00	4	11.11
2	Tractor	0	0.00	13	81.25	10	90.91	2	100.00	4	133.33	1	100.00	30	83.33

Incidence of soil and water erosion problems: The data regarding incidence of soil and water erosion problems in Narayanpura micro-watershed is presented in Table 42. The results indicated that, 88.89 per cent of the households have experienced soil and water erosion problems in the farm.

Table 42. Incidence of soil and water erosion problems in Narayanpura micro-watershed

Sl.No.	Particulars	MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Soil and water erosion problems in the farm	16	100.00	11	100.00	2	100.00	3	100.00	0	0.00	32	88.89

Interest shown towards soil testing: The data regarding Interest shown towards soil testing in Narayanpura micro-watershed is presented in Table 43. The results indicated that, 91.67 per cent have shown interest in soil test.

Table 43. Interest shown towards soil testing in Narayanpura micro-watershed

Sl. No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Interest in soil test	0	0.00	16	100.00	11	100.00	2	100.00	3	100.00	1	100.00	33	91.67

Usage pattern of fuel for domestic use: The data regarding usage pattern of fuel for domestic use in Narayanpura micro-watershed is presented in Table 44. The results indicated that, 80.56 per cent of the households used firewood and 44.44 per cent used LPG as a source of fuel.

Table 44. Usage pattern of fuel for domestic use in Narayanpura micro-watershed

Sl.No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Fire Wood	1	33.33	13	81.25	9	81.82	2	100.00	3	100.00	1	100.00	29	80.56
2	LPG	2	66.67	7	43.75	4	36.36	1	50.00	1	33.33	1	100.00	16	44.44

Source of drinking water: The data regarding source of drinking water in Narayanpura micro-watershed is presented in Table 45. The results indicated that, piped supply was the major source of drinking water for 97.22 per cent of the households in the micro watershed.

Table 45. Source of drinking water in Narayanpura micro-watershed

Sl.No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Piped supply	3	100.00	16	100.00	11	100.00	2	100.00	3	100.00	0	0.00	35	97.22

Table 46. Source of light in Narayanpura micro-watershed

Sl.No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Electricity	3	100.00	16	100.00	11	100.00	2	100.00	3	100.00	1	100.00	36	100.00

Source of light: The data regarding source of light in Narayanpura micro-watershed is presented in Table 46. The results indicated that, Electricity was the major source of light for 100 per cent of the households in micro watershed.

Existence of Sanitary toilet facility: The data regarding existence of sanitary toilet facility in Narayanpura micro-watershed is presented in Table 47. The results indicated that, 63.89 per cent of the households possess sanitary toilet.

Table 47. Existence of Sanitary toilet facility in Narayanpura micro-watershed

Sl. No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Sanitary toilet facility	1	33.33	11	68.75	7	63.64	1	50.00	2	66.67	1	100.00	23	63.89

Possession of PDS card: The data regarding possession of PDS card in Narayanpura micro-watershed is presented in Table 48. The results indicated that, 100 per cent of the sampled households possessed BPL card and 2.86 per cent of the households did not possess any PDS card.

Table 48. Possession of PDS card in Narayanpura micro-watershed

Sl.No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	BPL	4	133.33	16	100.00	10	90.91	2	100.00	3	100.00	1	100.00	36	100.00
2	Not Possessed	0	0.00	0	0.00	1	9.09	0	0.00	0	0.00	0	0.00	1	2.78

Participation in NREGA program: The data regarding participation in NREGA programme in Narayanpura micro-watershed is presented in Table 49. The results indicated that, 100 per cent of the households participated in NREGA programme.

Table 49. Participation in NREGA programme in Narayanpura micro-watershed

Sl. No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Participation in NREGA Programme	3	100	16	100	11	100	2	100	3	100	1	100	36	100

Table 50. Adequacy of food items in Narayanpura micro-watershed

Sl.No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Cereals	3	100.00	16	100.00	11	100.00	2	100.00	3	100.00	1	100.00	36	100.00
2	Pulses	3	100.00	16	100.00	11	100.00	1	50.00	3	100.00	1	100.00	35	97.22
3	Oilseed	0	0.00	1	6.25	0	0.00	1	50.00	2	66.67	0	0.00	4	11.11
4	Vegetables	2	66.67	12	75.00	7	63.64	0	0.00	1	33.33	0	0.00	22	61.11
5	Fruits	0	0.00	0	0.00	1	9.09	0	0.00	1	33.33	0	0.00	2	5.56
6	Milk	2	66.67	11	68.75	8	72.73	2	100.00	2	66.67	1	100.00	26	72.22
7	Egg	1	33.33	4	25.00	6	54.55	1	50.00	1	33.33	0	0.00	13	36.11
8	Meat	1	33.33	3	18.75	3	27.27	1	50.00	1	33.33	0	0.00	9	25.00

Adequacy of food items: The data regarding adequacy of food items in Narayanpura micro-watershed is presented in Table 50. The results indicated that, cereals were adequate for 100 per cent of the households, pulses were adequate for 97.22 per cent,

oilseeds were adequate for 11.11 per cent, vegetables were adequate for 61.11 per cent, fruits were adequate for 5.56 per cent, milk was adequate for 72.22 per cent, eggs were adequate for 37.14 per cent and meat was adequate for 25 per cent.

Response on Inadequacy of food items: The data regarding inadequacy of food items in Narayanpura micro-watershed is presented in Table 51. The results indicated that, pulses were inadequate for 2.78 per cent of the households, oilseeds were inadequate for 86.11 per cent, vegetables were inadequate for 36.11 per cent, fruits were inadequate for 91.67 per cent, milk was inadequate for 16.67 per cent, eggs were inadequate for 61.11 per cent and meat was inadequate for 72.22 per cent of the households.

Table 51. Response on Inadequacy of food items in Narayanpura micro-watershed

Sl.No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Pulses	0	0.00	0	0.00	0	0.00	1	50.00	0	0.00	0	0.00	1	2.78
2	Oilseed	3	100.00	15	93.75	10	90.91	1	50.00	1	33.33	1	100.00	31	86.11
3	Vegetables	1	33.33	4	25.00	3	27.27	2	100.00	2	66.67	1	100.00	13	36.11
4	Fruits	3	100.00	15	93.75	10	90.91	2	100.00	2	66.67	1	100.00	33	91.67
5	Milk	1	33.33	4	25.00	1	9.09	0	0.00	0	0.00	0	0.00	6	16.67
6	Egg	2	66.67	11	68.75	5	45.45	1	50.00	2	66.67	1	100.00	22	61.11
7	Meat	2	66.67	13	81.25	7	63.64	1	50.00	2	66.67	1	100.00	26	72.22

Response on Market Surplus of food items: The data regarding market surplus of food items in Narayanpura micro-watershed is presented in Table 52. The results indicated that, oilseeds were market surplus for 2.78 per cent, vegetables were market surplus for 2.78 per cent, fruits were market surplus for 2.78 per cent, milk was market surplus for 11.11 per cent and meat was market surplus for 2.78 per cent of the households.

Table 52. Response on Market surplus of food items in Narayanpura micro-watershed

Sl.No.	Particulars	LL (3)		MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	Oilseed	0	0.00	0	0.00	1	9.09	0	0.00	0	0.00	0	0.00	1	2.78
2	Vegetables	0	0.00	0	0.00	1	9.09	0	0.00	0	0.00	0	0.00	1	2.78
3	Fruits	0	0.00	1	6.25	0	0.00	0	0.00	0	0.00	0	0.00	1	2.78
4	Milk	0	0.00	1	6.25	2	18.18	0	0.00	1	33.33	0	0.00	4	11.11
5	Meat	0	0.00	0	0.00	1	9.09	0	0.00	0	0.00	0	0.00	1	2.78

Farming constraints: The data regarding farming constraints experienced by households in Narayanpura micro-watershed is presented in Table 53. The results indicated that, lower fertility status of the soil was the constraint experienced by 91.67 per cent of the households, wild animal menace on farm field (91.67%), frequent incidence of pest and diseases (77.78%), inadequacy of irrigation water (36.11%), high cost of fertilizers and plant protection chemicals (69.44%), low price for the agricultural commodities (80.56%), lack of marketing facilities in the area (75%), lack of transport for safe transport of the agricultural produce to the market (44.44%) and inadequate extension services (19.44%).

Table 53. Farming constraints Experienced in Narayanpura micro-watershed

Sl. No.	Particulars	MF (16)		SF (11)		SMF (2)		MDF (3)		LF (1)		All (36)	
		N	%	N	%	N	%	N	%	N	%	N	%
1	Lower fertility status of the soil	16	100	11	100	2	100	3	100	1	100	33	91.67
2	Wild animal menace on farm field	16	100	11	100	2	100	3	100	1	100	33	91.67
3	Frequent incidence of pest and diseases	14	87.50	9	81.82	1	50	3	100	1	100	28	77.78
4	Inadequacy of irrigation water	8	50	3	27.27	0	0	0	0	2	200	13	36.11
5	High cost of Fertilizers and plant protection chemicals	14	87.50	7	63.64	1	50	3	100	0	0	25	69.44
6	High rate of interest on credit	12	75	8	72.73	1	50	3	100	1	100	25	69.44
7	Low price for the agricultural commodities	13	81.25	10	90.91	2	100	3	100	1	100	29	80.56
8	Lack of marketing facilities in the area	16	100	6	54.55	2	100	2	66.67	1	100	27	75
9	Inadequate extension services	2	12.50	4	36.36	0	0	1	33.33	0	0	7	19.44
10	Lack of transport for safe transport of the Agril produce to the market.	6	37.50	6	54.55	1	50	2	66.67	1	100	16	44.44

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 98 (59.04%) men and 68 (40.96%) women among the sampled households. The average family size of landless farmers' was 4, marginal farmers' was 4.88, small farmers' was 4.36, semi medium farmers' was 4, medium farmers' was 4.67 and large farmers' was 6.

The data indicated that, 25 (15.06%) people were in 0-15 years of age, 80 (48.19%) were in 16-35 years of age, 52 (31.33%) were in 36-60 years of age and 9 (5.42%) were above 61 years of age.

The results indicated that Narayanpura had 42.77 per cent illiterates, 17.47 per cent of them had primary school education, 1.20 per cent of them had middle school education, 7.83 per cent of them had high school education, 13.86 per cent of them had PUC education, 9.04 per cent of them had degree education, 0.60 per cent of them did ITI, 0.60 per cent of the population had diploma and 1.81 per cent of them did masters.

The results indicate that, 86.11 per cent of households were practicing agriculture, 5.56 per cent of the households were agricultural labourers, 2.78 per cent of the households were general labours, 2.86 per cent of them were in private service and 2.78 per cent of the population was involved in trade and business.

The results indicate that agriculture was the major occupation for 67.47 per cent of the household members, 1.81 per cent were agricultural laborers, 2.41 per cent were general labourers, 0.60 per cent were in government service, 6.63 per cent were in private service, 0.60 per cent were into trade and business, 15.06 per cent were students, 0.60 per cent were housewives and 4.22 per cent were children.

The results show that 100 per cent of the population in the micro watershed has not participated in any local institutions. The results indicate that 19.44 per cent of the households possess katcha house and 80.56 per cent of them possess pucca house.

The results show that 75 per cent of the households possess TV, 44.44 per cent of the households possess Mixer grinder, 11.11 per cent of the households possess refrigerator, 5.56 per cent of them had bicycle, 50 per cent of the households possess motor cycle, 5.56 per cent of them had car/four wheeler and 91.67 per cent of the

households possess mobile phones. The results show that the average value of television was Rs.5370, mixer grinder was Rs.1637, refrigerator was Rs.9250, bicycle was Rs.1500, motor cycle was Rs.19300, car/four wheeler was Rs.200000 and mobile phone was Rs.2073.

About 5.56 per cent of the households possess bullock cart, 44.44 per cent of them possess plough, 2.78 per cent of them had seed/fertilizer drill, 8.33 per cent of them had irrigation pump, 5.56 per cent of the households possess tractor, 11.11 per cent of them possess sprayer, 52.78 per cent of them possess weeder and 8.33 per cent of them possess harvester. The results show that the average value of bullock cart was Rs.25000, plough was Rs.1663, seed/fertilizer drill was Rs.6000, irrigation pump was Rs.20000, the average value of tractor was Rs.200000, the average value of sprayer was Rs.4500 and the average value of harvester was Rs.103333.

The results indicate that, 33.33 per cent of the households possess bullocks, 30.56 per cent of the households possess local cow, 2.78 per cent had crossbred cow, 11.11 per cent had buffalo, 13.89 per cent had sheep, 2.78 per cent had goat and 13.89 per cent had poultry birds.

The results indicate that, average own labour men available in the micro watershed was 1.94, average own labour (women) available was 1.69, average hired labour (men) available was 10.19 and average hired labour (women) available was 10.27. The results indicate that, 88.89 per cent of the households opined that the hired labour was adequate.

The results indicate that, households of the Narayanpura micro-watershed possess 50.62 ha (97.66%) of dry land and 1.21 ha (2.34%) of irrigated land. Marginal farmers possess 7.52 ha (100%) of dry land. Small farmers possess 15.03 ha (100%) of dry land. Semi medium farmers possess 2.17 ha (64.07%) of dry land and 1.21 ha (35.93%) of irrigated land. Medium farmers possess 15.78 ha (100%) of dry land and large farmers possess 10.12 ha (100%) of dry land.

The results indicate that, the average value of dry land was Rs. 1289400 and average value of irrigated land was Rs. 1482000. In case of marginal famers, the average land value was Rs. 1335315 for dry land. In case of small famers, the average land value was Rs. 847712 for dry land. In case of semi medium famers, the average land value was Rs. 1615888 for dry land and Rs. 1482000 for irrigated land. In case of medium farmers, the average land value was Rs. 1203333 for dry land and it was Rs.1976000 in case of large farmers.

The results indicate that, there were 2 functioning bore wells in the micro watershed. The results indicate that, bore well was the major irrigation source in the

micro water shed for 5.56 per cent of the farmers. The results indicate that, the depth of bore well was found to be 3.56 meters.

The results indicate that, semi medium and large farmers had an irrigated area of 1.12 ha and 10.12 ha. The results indicate that, farmers have grown cotton (1.42 ha), red gram (35.74 ha), sorghum (0.58 ha), paddy (1.21 ha), black gram (0.92 ha) and greengram (12.09 ha). Marginal farmers have grown redgram, greengram, blackgram and sorghum. Small farmers have grown redgram, Greengram and cotton. Semi medium farmers have grown redgram and paddy. Medium farmers have grown redgram and greengram. Large farmers have grown redgram. The results indicate that, the cropping intensity in Narayanpura micro-watershed was found to be 87.70 per cent.

The results indicate that, 50 per cent of the households have bank account and savings. The results indicate that, 50 per cent of the households have availed credit from different sources.

The results indicate that, the total cost of cultivation for cotton was Rs. 44545.04. The gross income realized by the farmers was Rs. 142907.14. The net income from Cotton cultivation was Rs. 98362.11, thus the benefit cost ratio was found to be 1:3.21. The total cost of cultivation for red gram was Rs. 69659.14. The gross income realized by the farmers was Rs. 70728.20. The net income from red gram cultivation was Rs. 1069.06. Thus the benefit cost ratio was found to be 1:1.02. The total cost of cultivation for green gram was Rs. 27759.54. The gross income realized by the farmers was Rs. 36556.26. The net income from green gram cultivation was Rs. 8796.72. Thus the benefit cost ratio was found to be 1:1.32. The total cost of cultivation for paddy was Rs. 35377.88. The gross income realized by the farmers was Rs. 87273.33. The net income from paddy cultivation was Rs. 51895.46. Thus the benefit cost ratio was found to be 1:2.47. The total cost of cultivation for blackgram was Rs. 31639.50. The gross income realized by the farmers was Rs. 52108.33. The net income from blackgram cultivation was Rs. 20468.83. Thus the benefit cost ratio was found to be 1:1.65. The total cost of cultivation for sorghum was Rs. 77663.85. The gross income realized by the farmers was Rs. 81916.09. The net income from sorghum cultivation was Rs. 4252.23. Thus the benefit cost ratio was found to be 1:1.05.

The results indicate that, 36.11 per cent of the households opined that dry fodder was adequate, 13.89 per cent of the households opined that green fodder was adequate and 2.78 per cent of the households opined that green fodder was inadequate.

The results indicate that the average annual gross income was Rs. 90,000 for landless farmers, for marginal farmers it was Rs. 90,000, for small farmers it was Rs. 63,875, for semi medium farmers it was Rs. 1,56,809, for medium farmers it was Rs. 1,28,000 and for large farmers it was Rs. 3,28,667. The results indicate that the average annual expenditure is Rs. 55,031. For landless households it was Rs. 58,000, for marginal

farmers it was Rs. 15,836, for small farmers it was Rs. 42,293, for semi medium farmers it was Rs. 31,250, for medium farmers it was Rs. 1,18,667 and for large farmers it was Rs. 6,70,000.

The results indicate that, sampled households have grown 5 custard apple trees in their field and 6 in their backyard; 7 mango trees in their field and 1 in their backyard; and 2 pomegranate trees in their trees. The results indicate that, households have planted 18 teak, 125 neem and 1 tamarind tree in their field.

The results indicate that, households have an average investment capacity of Rs. 6,130.56 for land development and Rs. 291.67 for improved crop production.

The results indicate that, asset selling was the source of additional investment for 2.78 per cent for land development. Loan from bank was the major source of investment for 13.89 per cent of households for land development and for 2.78 per cent for improved crop production. Own funds were the source of additional investment for 2.78 per cent for land development. Soft loan was the source of additional investment for 72.22 per cent for land development and for 5.56 per cent for improved crop production.

The results indicated that, blackgram was sold to the extent of 61.54 per cent, cotton was sold to the extent of 100 per cent, greengram was sold to the extent of 78.07 per cent, paddy was sold to the extent of 50 per cent, redgram was sold to the extent of 72.60 per cent and sorghum was sold to the extent of 50 per cent.

The results indicated that, about 94.44 per cent of the farmers sold their produce to local/village merchants. The results indicated that, 83.33 per cent of the households have used tractor as a mode of transportation for their agricultural produce and 11.11 per cent have used cart as a mode of transportation.

The results indicated that, 88.89 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, 80.56 per cent of the households used firewood and 44.44 per cent used LPG as a source of fuel. The results indicated that, piped supply was the major source of drinking water for 97.22 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, 63.89 per cent of the households possess sanitary toilet. The results indicated that, 100 per cent of the sampled households possessed BPL card and 2.86 per cent of the households did not possess any PDS card. The results indicated that, 100 per cent of the households participated in NREGA programme.

The results indicated that, cereals were adequate for 100 per cent of the households, pulses were adequate for 97.22 per cent, oilseeds were adequate for 11.11 per cent, vegetables were adequate for 61.11 per cent, fruits were adequate for 5.56 per cent, milk was adequate for 72.22 per cent, eggs were adequate for 37.14 per cent and meat was adequate for 25 per cent.

The results indicated that, pulses were inadequate for 2.78 per cent of the households, oilseeds were inadequate for 86.11 per cent, vegetables were inadequate for 36.11 per cent, fruits were inadequate for 91.67 per cent, milk was inadequate for 16.67 per cent, eggs were inadequate for 61.11 per cent and meat was inadequate for 72.22 per cent of the households.

The results indicated that, oilseeds were market surplus for 2.78 per cent, vegetables were market surplus for 2.78 per cent, fruits were market surplus for 2.78 per cent, milk was market surplus for 11.11 per cent and meat was market surplus for 2.78 per cent of the households.

The results indicated that, lower fertility status of the soil was the constraint experienced by 91.67 per cent of the households, wild animal menace on farm field (91.67%), frequent incidence of pest and diseases (77.78%), inadequacy of irrigation water (36.11%), high cost of fertilizers and plant protection chemicals (69.44%), low price for the agricultural commodities (80.56%), lack of marketing facilities in the area (75%), lack of transport for safe transport of the agricultural produce to the market (44.44%) and inadequate extension services (19.44%).