ICAR-NBSS&LUP Sujala MWS Publ.202

हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद

Agrisearch with a human touch

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

## SOWRASHTRAHALLI (4D5B1Q1a) MICROWATERSHED

**Sydhapur 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.

**Citation:** Rajendra Hegde, Ramesh Kumar, S.C., B.A. Dhanorkar, S. Srinivas, M. Lalitha, K.V. Niranjana, R.S. Reddy and S.K. Singh (2019), "Land Resource Inventory and Socio-Economic Status of Farm Households for Watershed Planning and Development of Sowrashtrahalli (4D5B1Q1a) Microwatershed, Sydhapura Hobli, Yadgir Taluk & District, Karnataka", ICAR-NBSS&LUP Sujala MWS Publ.202, ICAR – NBSS & LUP, RC, Bangalore. P.121 & 36.

**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

ICAR-NBSS&LUP Sujala MWS Publ.202

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

## SOWRASHTRAHALLI (4D5B1Q1a) MICROWATERSHED

**Sydhapur 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**

**WATERSHED DEVELOPMENT DEPARTMENT, GOVT. OF KARNATAKA, BANGALORE**

## PREFACE

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

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

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

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

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

ICAR-NBSS&LUP, Regional Centre, Bangalore has taken up a project sponsored by the Karnataka Watershed Development Project-II, (Sujala-III), Government of Karnataka funded by the World Bank under Component-1 Land Resource Inventry. This study was taken up to demonstrate the utility of such a database in reviewing, monitoring and evaluating all the land based watershed development programs on a scientific footing. To meet the requirements of various land use planners at grassroots level, the present study on "Land Resource Inventory and Socio-Economic Status of Farm Households for Watershed Planning and Development of Sowrashtrahalli Microwatershed, Yadgir Taluk, Yadgir 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:22.05.2019

**S.K. SINGH**
Director, ICARNBSS&LUP, Nagpur

# Contributors

| | |
|---|---|
| **Dr. Rajendra Hegde**<br>Principal Scientist, Head &<br>Project Leader, Sujala-III Project<br>ICAR-NBSS&LUP, Regional Centre<br>Bangalore | **Dr. S.K. Singh**<br>Director, ICAR-NBSS&LUP<br>Coordinator, Sujala-III Project<br>Nagpur |
| **Soil Survey, Mapping & Report Preparation** | |
| Dr. B.A. Dhanorkar | Sh.R.S.Reddy |
| Dr. K.V. Niranjana | Sh. Venkata Giriyappa |
| | Sh. Somashekar, T. N. |
| | Smt. Chaitra, S. P. |
| | Sh. Nagendra, B. R. |
| | Dr. H. R. Savitha |
| | Dr. B. Gayathri |
| | Dr. Gopali Bardhan |
| **Field Work** | |
| Sh. C. Bache Gowda | Sh. Mahesh, D.B. |
| Sh. Somashekar | Sh. Ashok, S. Sindagi |
| Sh. M. Jayaramaiah | Sh. Veerabhadrappa |
| Sh. Paramesha, K. | Sh. Kailash. |
| Sh. B. M. Narayana Reddy | Sh. Yogesh, H.N. |
| | Sh. Kamalesh, Avate. |
| | Sh. Sharan Kumar Uppar |
| | Sh. Kalaveerachari, Kammar |
| | Sh. Arun, N. Kambar |
| | Sh. Anand |
| | Sh. Manohar, Y. Hosamane |
| | Sh. Pramod, Navale |
| | Sh. Ramesh Hangargi |
| | Sh. Santhosha |
| | Sh. Prasanna kumar, N. S. |
| | Sh. Rakesh, Achalkar |
| **GIS Work** | |
| Dr. S.Srinivas | Sh. A.G.Devendra Prasad |
| Dr. M.Ramesh | Sh. Abhijith Sastry, N.S. |
| Sh. D.H.Venkatesh | Sh. Nagendra Babu Kolukondu |
| Smt.K.Sujatha | Sh. Avinash, K.N. |
| Smt. K.V.Archana | Sh. Amar Suputhra, S. |
| Sh. N.Maddileti | Sh. Deepak, M.J. |
| | Smt. K.Karunya Lakshmi |
| | Ms. Seema, K.V. |
| | Ms. Ramireddy Lakshmi Silpa |
| | Ms. Bhanu Rekha, T. |
| | Ms. Rajata Bhat |

| | |
|---|---|
| **Laboratory Analysis** | |
| Dr. K.M.Nair | Ms. Thara, V.R |
| Smt. ArtiKoyal | Ms. Roopa, G. |
| Smt. Parvathy, S. | Ms. Mamatha, D. |
| | Sh. Vindhya, N.G. |
| | Ms. Shwetha, N.K. |
| | Smt. Ishrat Haji |
| | Ms. P. Pavanakumari, P. |
| | Ms. Padmaja, S. |
| | Ms. Veena, M. |
| | Ms. Rashmi, N. |
| | Ms. Leelavathy, K.V. |
| **Socio-economic Analysis** | |
| Dr. Ramesh Kumar, S.C. | Sh. Prakashanaik, M.K. |
| | Ms. Karuna V. Kulkarni |
| | Mrs. Sowmya A.N |
| | Sh. Vinod R, |
| | Sh. Basavaraja |
| | 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<br>Project Director & Commissioner, WDD | Dr. A. Natarajan<br>NRM Consultant, Sujala-III Project |
| Dr. S.D. Pathak IFS<br>Executive Director &<br>Chief Conservator of Forests, WDD | |

# PART-A

## LAND RESOURCE INVENTORY

# Contents

## LIST OF TABLES

## LIST OF FIGURES

## *EXECUTIVE SUMMARY*

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

*The present study covers an area of 614 ha in Sowrashtrahalli microwatershed in Yadgir taluk and 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 about 94 per cent is covered by soils, 6 per cent by rock lands, habitation and water bodies. The salient findings from the land resource inventory are summarized briefly below.*

- *The soils belong to 14 soil series and 19 soil phases (management units) and 5 Land Management Units.*
- *The length of crop growing period is 120-150 days starting from the 1$^{st}$ week of June to 4$^{th}$ 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 26 major agricultural and horticultural crops were assessed and maps showing the degree of suitability along with constraints were generated.*
- *Entire land area of the microwatershed is suitable for agriculture.*
- *About 26 per cent soils are shallow (25-50 cm), 10 per cent soils are moderately shallow (50-75 cm), 21 per cent are moderately deep (75-100 cm) and about 37 per cent soils are deep (100-150 cm) to very deep (>150 cm).*
- *About 64 per cent of the area has clayey soils, 20 per cent loamy soils and 10 per cent sandy soils at the surface.*
- *Entire area of about 94 per cent has non-gravelly soils.*
- *About 33 per cent of the area has soils that are very high (>200 mm/m), 10 per cent medium (101-150 mm/m), 24 per cent low (51-100 mm/m) and about 26 per cent very low (<50 mm/m) in available water capacity.*

- *Entire area of 94 per cent of the microwatershed has very gently sloping (1-3%) lands.*
- *About 90 per cent has soils that are moderately eroded (e2) and 3 per cent has severely eroded (e3) soils.*
- *An area of about <1 per cent is slightly acid (ph 6.0-6.5), 10 per cent is neutral (pH 6.5-7.3), 13 per cent is slightly alkaline (pH 7.3-7.8), 40 per cent soils that are moderately alkaline (pH 7.8 to 8.4), 26 per cent soils that are strongly alkaline (pH 8.4 – 9.0) and about 4 per cent are very strongly alkaline (pH>9.0) in soil reaction.*
- *The Electrical Conductivity (EC) of the soils are non-saline (<2 $dSm^{-1}$) in about 527 ha (86%) and low (2-4 $dSm^{-1}$) in about 47 ha (8%) soils.*
- *About 39 per cent medium (0.5-0.75%) and 55 per cent high (>0.75%) in organic carbon.*
- *An area of 33 per cent has soils that are low (<23 kg/ha) and 61 per cent medium (23-57 kg/ha) in available phosphorus.*
- *About 20 per cent medium (145-337 kg/ha) and 73 per cent high (>337 kg/ha) in available potassium.*
- *Available sulphur is low (<10 ppm) in about 25 per cent area, medium (10-20 ppm) in 41 per cent and high (>20 ppm) in about 27 per cent area of the microwatershed.*
- *Available boron is low (<0.5 ppm) in 22 per cent, 40 per cent medium (0.5-1.0 ppm) and high (>1.0 ppm) in about 32 per cent area of the microwatershed.*
- *About 12 per cent area has soils that are deficient (<4.5 ppm) in available iron and 82 per cent sufficient (>4.5 ppm).*
- *Available manganese and copper are sufficient in all the soils of the microwatershed.*
- *Entire area of the microwatershed is deficient (<0.6 ppm) in available zinc.*
- *The land suitability for 26 major agricultural and horticultural crops grown in the microwatershed was assessed and the areas that are highly suitable (S1) and moderately suitable (S2) are given below. It is however to be noted that a given soil may be suitable for various crops but what specific crop to be grown may be decided by the farmer looking to his capacity to invest on various inputs, marketing infrastructure, market price and finally the demand and supply position.*

***Land suitability for various crops in the Sowrashtrahalli microwatershed***

| ***Crop*** | ***Suitability Area in ha (%)*** | | | ***Crop*** | ***Suitability Area in ha (%)*** | |
|---|---|---|---|---|---|---|
| | ***Highly suitable (S1)*** | ***Moderately suitable (S2)*** | | | ***Highly suitable (S1)*** | ***Moderately suitable (S2)*** |
| *Sorghum* | *12 (2)* | *380 (62)* | | *Sapota* | *-* | *107 (17)* |
| *Maize* | *12 (2)* | *129 (21)* | | *Guava* | *-* | *107 (17)* |
| *Red gram* | *-* | *332 (54)* | | *Pomegranate* | *-* | *332 (54)* |
| *Bajra* | *12 (2)* | *377(62)* | | *Jackfruit* | *-* | *107 (17)* |
| *Ground nut* | *-* | *118 (19)* | | *Jamun* | *-* | *205 (33)* |
| *Sunflower* | *-* | *332 (54)* | | *Musambi* | *-* | *332 (54)* |
| *Cotton* | *-* | *389 (63)* | | *Lime* | *-* | *332 (54)* |
| *Bengalgram* | *-* | *389 (63)* | | *Cashew* | *-* | *104 (17)* |
| *Chilli* | *-* | *369 (60)* | | *Custard apple* | *-* | *380 (62)* |
| *Tomato* | *12 (2)* | *132 (22)* | | *Amla* | *12 (2)* | *380 (62)* |
| *Drumstick* | *-* | *332 (54)* | | *Tamarind* | *-* | *205 (33)* |
| *Mulberry* | *-* | *107 (17)* | | *Marigold* | *-* | *392 (64)* |
| *Mango* | *-* | *353 (57)* | | *Chrysanthemum* | *-* | *392 (64)* |

*Apart from the individual crop suitability, a proposed crop plan has been prepared for the 5 identified LMUs by considering only the highly and moderately suitable lands for different crops and cropping systems with food, fodder, fibre and other horticulture crops that helps in maintaining the ecological balance in the microwatershed.*

- *Maintaining soil-health is vital for crop production and conserve soil and land resource base for maintaining ecological balance and to mitigate climate change. For this, several ameliorative measures have been suggested for these problematic soils like saline/alkali, highly eroded, sandy soils etc.,*
- *Soil and water conservation treatment plan has been prepared that would help in identifying the sites to be treated and also the type of structures required.*
- *As part of the greening programme, several tree species have been suggested to be planted in marginal and submarginal lands, field bunds and also in the hillocks, mounds and ridges. This would help in supplementing the farm income, provide fodder and fuel, and generate lot of biomass which in turn would help in maintaining the ecological balance and contribute to mitigating the climate change.*

*Chapter 1*

# INTRODUCTION

Soil being a vital natural resource on whose proper use depends the life supporting systems of a country and the socioeconomic development of its people. Soils provide food, fodder, fibre and fuel for meeting the basic human and animal needs. With the ever increasing growth in human and animal population, the demand on soil for more food and fodder production is on the increase. The area available for agriculture is about 51 per cent of the total geographical area and more than 60 per cent of the people are still dependant on agriculture for their livelihood. However, the capacity of a soil to produce is limited and the limits to the production are set by its intrinsic characteristics, agro-climatic setting, and, use and management. There is, therefore, tremendous pressure on land and water resources, which is causing decline in soil-health and stagnation in productivity. The soils have been degrading at an estimated rate of one million hectares per year and ground water levels have been receding at an alarming rate resulting in decline in the ground water resource. Further, land degradation has emerged as a serious problem which has already affected about 38 lakh ha of cultivated area in the State. Soil erosion alone has degraded about 35 lakh ha. Almost all the uncultivated areas are facing various degrees of degradation, particularly soil erosion; salinity and alkalinity has emerged as a major problem in more than 3.5 lakh ha in the irrigated areas of the State. Nutrient depletion and declining factor productivity is common in both rainfed and irrigated areas. The degradation is continuing at an alarming rate and there appears to be no systematic effort among the stakeholders to contain this process. In recent times, an aberration of weather due to climate change phenomenon has added another dimension leading to unpredictable situation to be tackled by the farmers.

In this critical juncture, the challenge before us is not only to increase the productivity per unit area which is steadily declining and showing a fatigue syndrome, but also to prevent or at least reduce the severity of degradation. If the situation is not reversed at the earliest, then the sustainability of the already fragile crop production system and the overall ecosystem will be badly affected in the state. Added to this, every year there is a significant diversion of farm lands and water resources for non-agricultural purposes. Thus, developing strategies to slow down the degradation process or reclaim the soils to normal condition and ensure sustainability of production system are the major issues today. These demands a systematic appraisal of our soil and land resources with respect to their extent, geographic distribution, characteristics, behaviour and use potential, which is very important for developing an effective land use and cropping systems for augmenting agricultural production on a sustainable basis.

The soil and land resource inventories made so far in Karnataka had limited utility because the surveys were of different types, scales and intensities carried out at different times with specific objectives. Hence, there is an urgent need to generate detailed site-

specific farm level database on various land resources for all the villages/watersheds in a time bound manner that would help to protect the valuable soil and land resources and also to stabilize the farm production. Therefore, the land resource inventory required for farm level planning is the one which investigates all the parameters which are critical for productivity *viz.*, soils, site characteristics like slope, erosion, gravelliness and stoniness, climate, water, topography, geology, hydrology, vegetation, crops, land use pattern, animal population, socio-economic conditions, infrastructure, marketing facilities and various schemes and developmental works of the government etc. From the data collected at farm level, the specific problems and potentials of the area can be identified and highlighted, conservation measures required for the area can be planned on a scientific footing, suitability of the area for various uses can be worked out and finally viable and sustainable land use options suitable for each and every land holding can be prescribed.

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

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

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

*Chapter 2*

# GEOGRAPHICAL SETTING

## 2.1 Location and Extent

The Sowrashtrahalli micro-watershed is located in the northeastern part of Karnataka in Yadgir Taluk and District, Karnataka State (Fig. 2.1). It comprises parts of Baddepalli, Kadechoora and Sowarashtrahalli villages. It lies between $16^0$ 31' and $16^0$ 34' north latitudes and $77^0$ 19' and $77^0$ 21' east longitudes and covers an area of 614 ha. It is about 36 km from Yadgir town and is surrounded by Baddepalli village on the north and northeast, Kadechoora village on the south, southwest and Sowarashtrahalli village on the northwestern side.

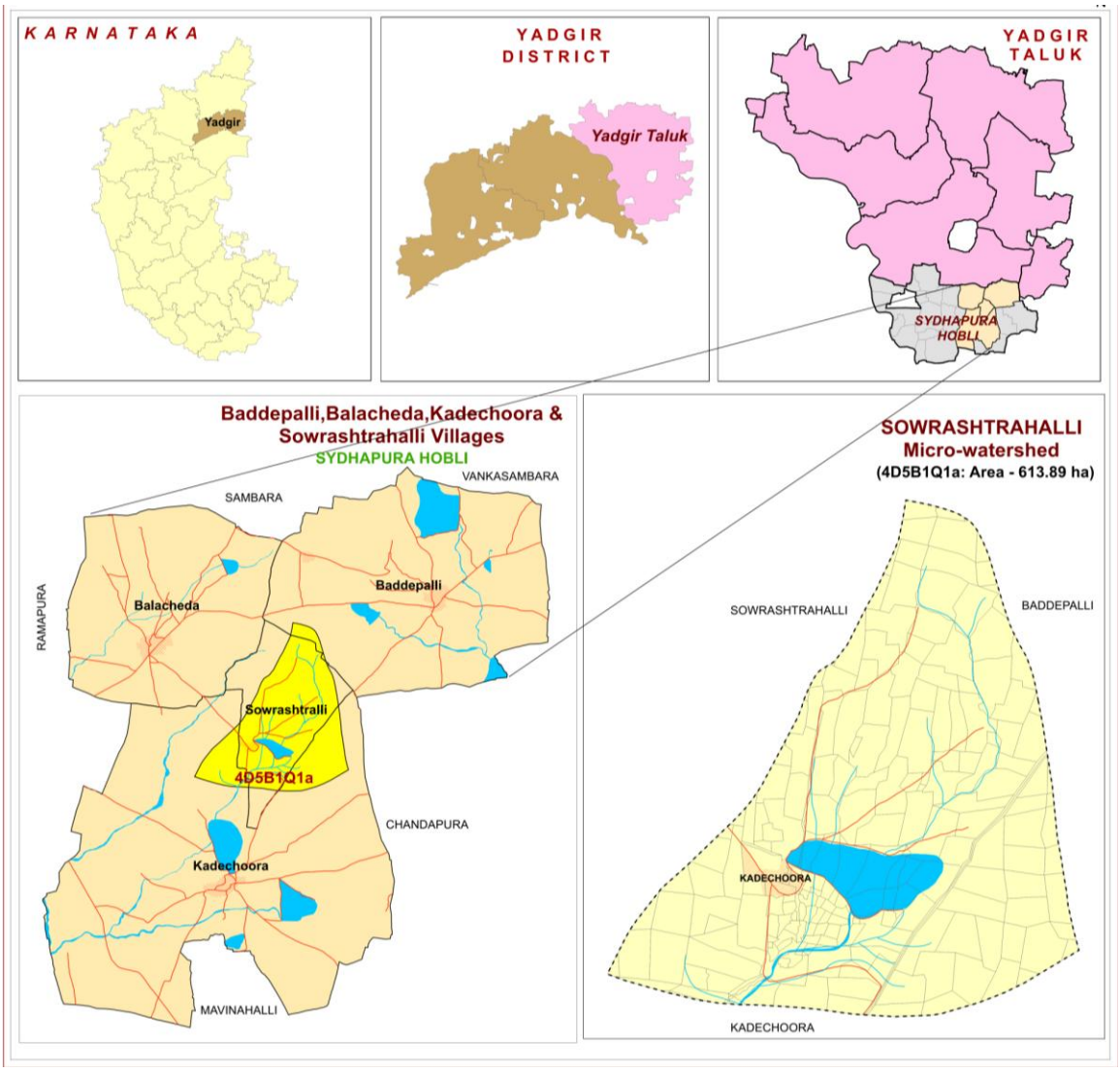



Fig. 2.1 Location map of Sowrashtrahalli Microwatershed

## 2.2 Geology

Major rock formations observed in the microwatershed are granite gneiss and alluvium (Figs. 2.2a and b). Granite gneisses are essentially pink to gray and are coarse to medium grained. They consist primarily of quartz, feldspar, biotite and hornblende. The gray granite gneisses are highly weathered, fractured and fissured upto a depth of about 10 m. Dolerite dykes and quartz veins are common with variable width and found to occur in the village. The thickness of the alluvium generally is limited to less than a meter, except in river valleys where it is very deep extending to tens of meters. Such soils are transported and represent palaeo black soils originally formed at higher elevation, but now occupying river valleys.

Fig. 2.2 a Granite and granite gneiss rocks

Fig. 2.2 b Alluvium

## 2.3 Physiography

Physiographically, the area has been identified as granite gneiss and alluvial landscapes based on geology. The microwatershed area has been further divided into mounds/ridges, summits, very gently sloping uplands, plains and valleys based on slope and its relief features. The elevation ranges from 365-382 m above MSL.

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

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

| 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** | **141.4** | |

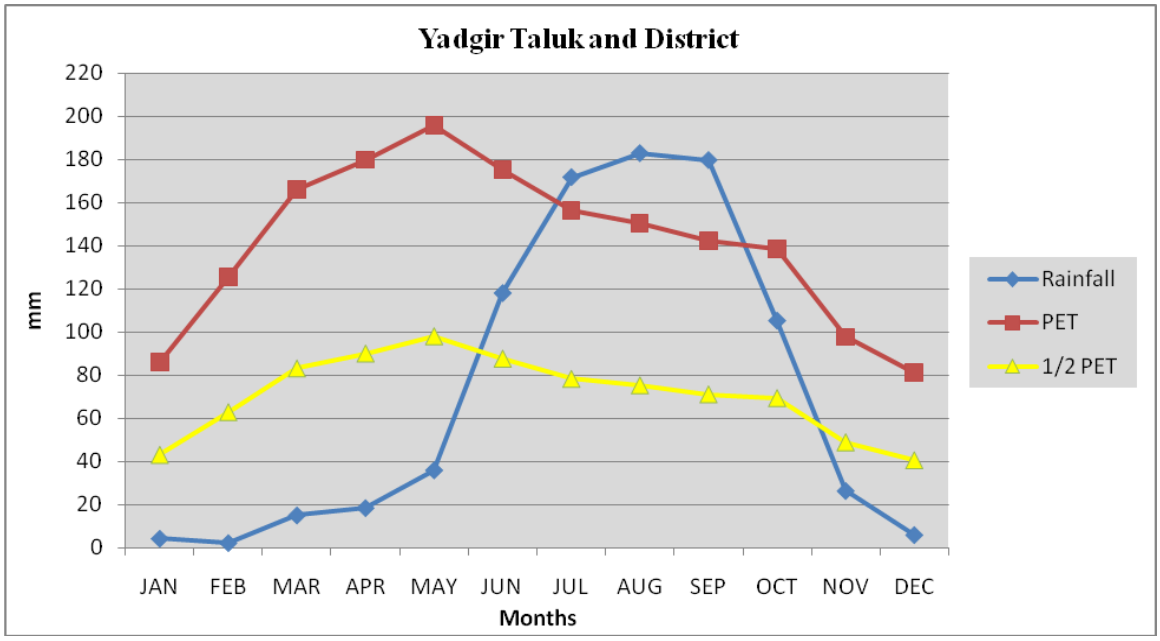



Fig 2.3 Rainfall distribution in Yadgir Taluk

## 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.

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.

## 2.7 Land Utilization

About 72 per cent area (Table 2.2) in Yadgir taluk 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, mango, pomegranate and marigold. The different crops and cropping systems adopted in the microwatershed is presented in the Figures 2.4 a & b. 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 Sowrashtrahalli microwatershed is presented in Fig. 2.5. Simultaneously, enumeration of wells (bore wells and open wells) and other conservation structures in the microwatershed was made and their location in different survey numbers is marked on the cadastral map. Map showing the location of conservation structures, wells and other water bodies in the Sowrashtrahalli microwatershed is given in Fig. 2.6.

**Table 2.2 Land Utilization in Yadgir Taluk**

| 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. | Trees and grooves | 737 | 0.14 |
| 5. | Forest | 33773 | 6.54 |
| 6. | Cultivable wasteland | 2385 | 0.46 |
| 7. | Permanent Pasture land | 11755 | 2.28 |
| 8. | Barren land | 27954 | 5.41 |
| 9. | Non- Agriculture land | 29623 | 5.73 |
| 10. | Current Fallows | 105212 | 20.4 |

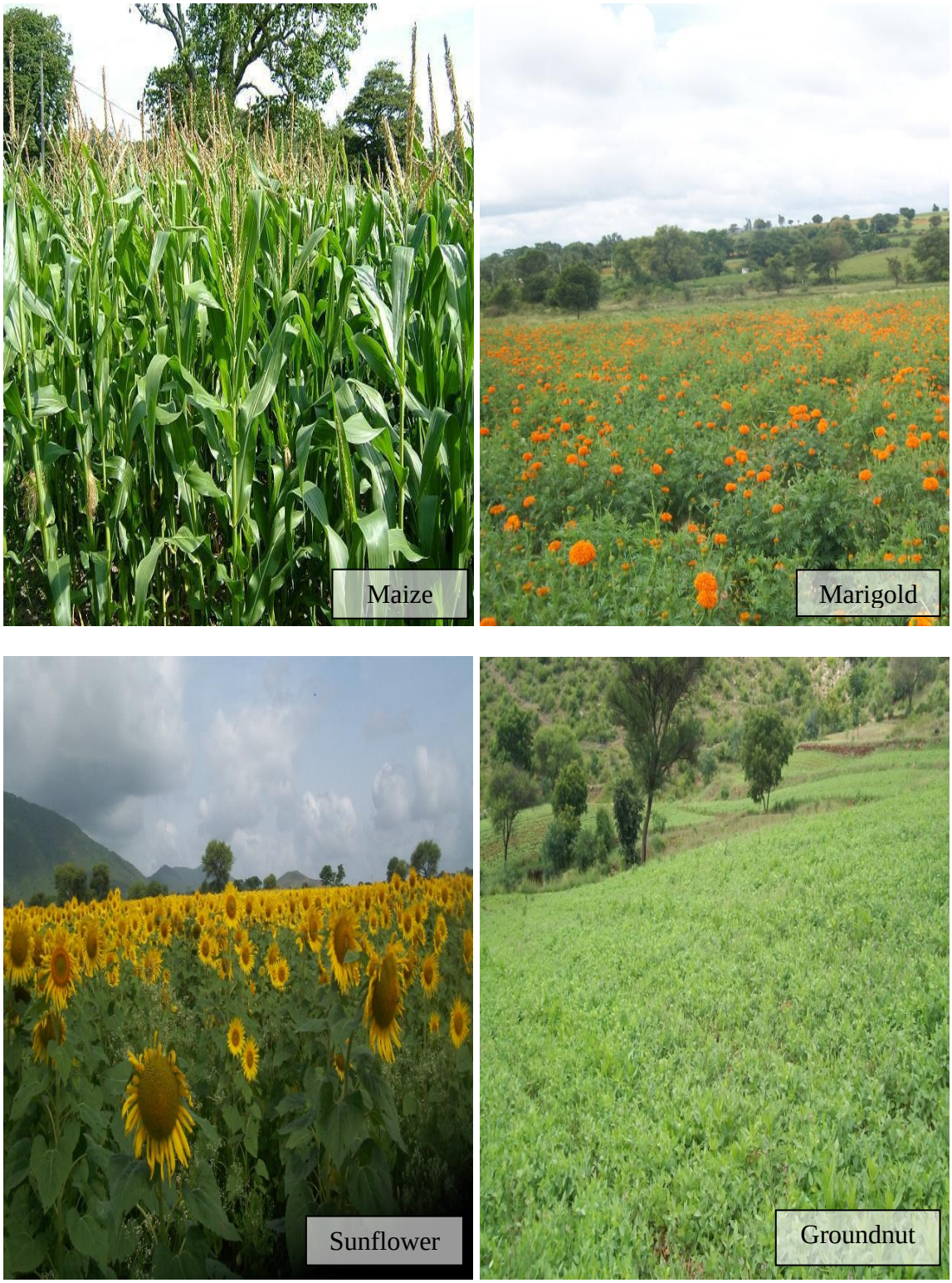


Fig. 2.4 a. Different Crops and Cropping Systems in Sowrashtrahalli Microwatershed

Fig. 2.4 b. Different Crops and Cropping Systems in Sowrashtrahalli Microwatershed

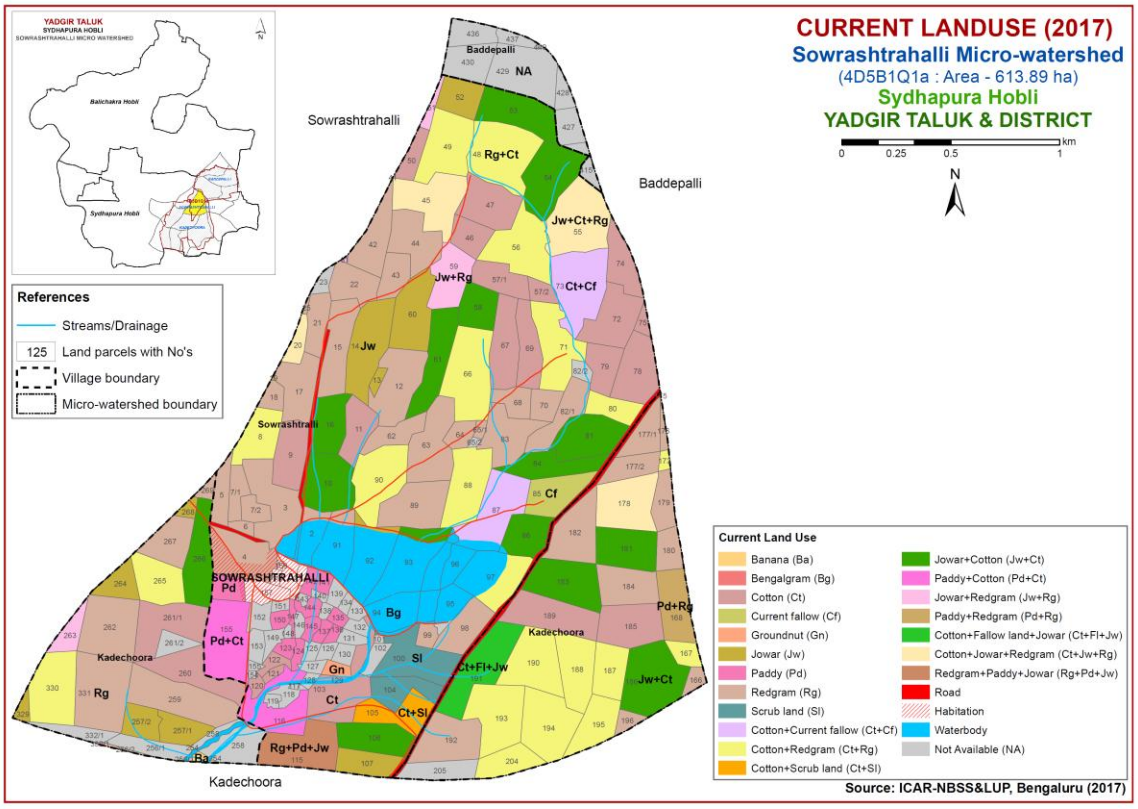



Fig. 2.5 Current Land Use map of Sowrashtrahalli Microwatershed

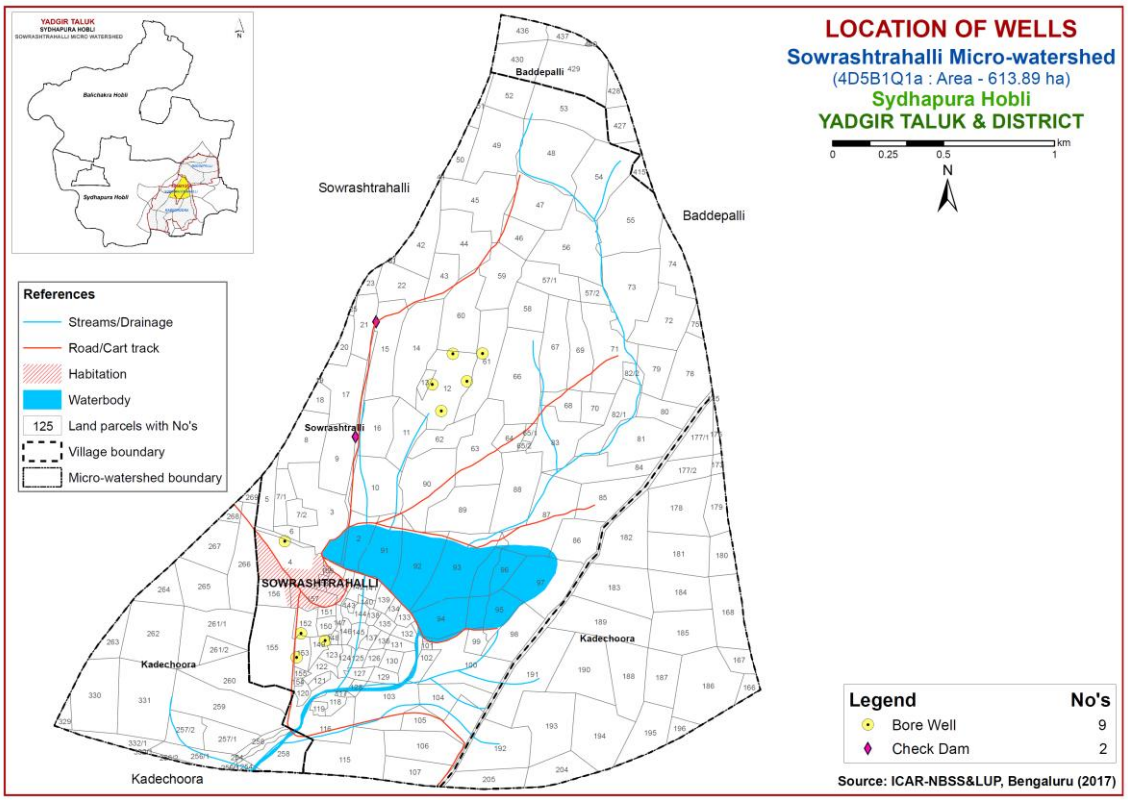



Fig. 2.6 Location of wells and conservation structures - Sowrashtrahalli Microwatershed

*Chapter 3*

# SURVEY METHODOLOGY

The purpose of land resource inventory is to delineate similar areas (soil series and phases), which respond or expected to respond similarly for a given level of management. This was achieved in Sowrashtrahalli 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 area extent and their geographic distribution on the microwatershed cadastral map. The detailed survey at 1:7920 scale was carried out in 614 ha area. The methodology followed for carrying out land resource inventory was as per the guidelines given in Soil Survey Manual (IARI, 1971; Soil Survey Staff, 2006; Natarajan *et al.,* 2015) which is briefly described below.

## 3.1 Base Maps

The detailed survey of the land resources occurring in the microwatershed was carried out by using digitized cadastral map and satellite imagery as base supplied by the KSRSAC. The cadastral map shows field boundaries with their survey numbers, location of tanks, streams and other permanent features of the area (Fig. 3.1). Apart from the cadastral map, remote sensing data products from Cartosat-1 and LISS-IV merged at the scale of 1:7920 were used in conjunction with the cadastral map to identify the rock types, 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 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 and alluvial landscapes and is divided into mouds/ridges, summits 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)
- G3 Valleys/ lowlands
  - G31 Valleys, pink tones
  - G32 Valleys gray mixed with pink tones

**DSe Alluvial landscape**

**DSe 1 Summit**

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

**DSe 2 Very genetly sloping**

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

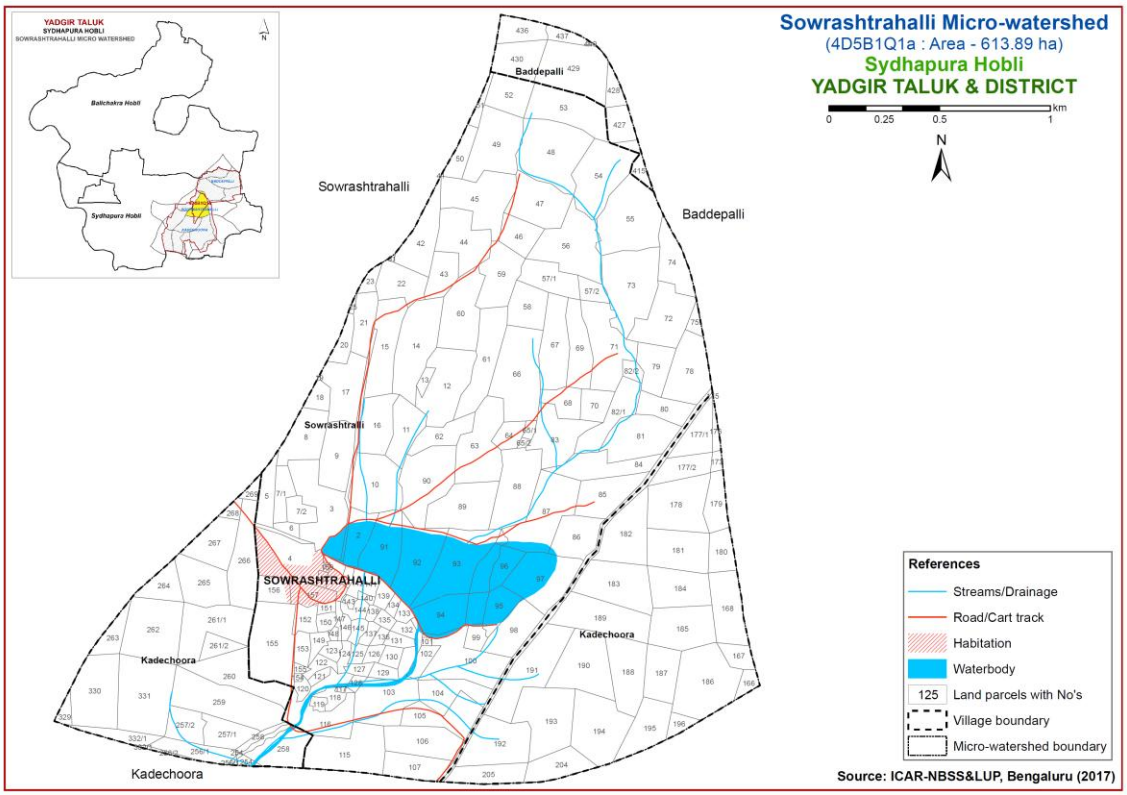



Fig 3.1 Scanned and Digitized Cadastral map of Sowrashtrahalli Microwatershed

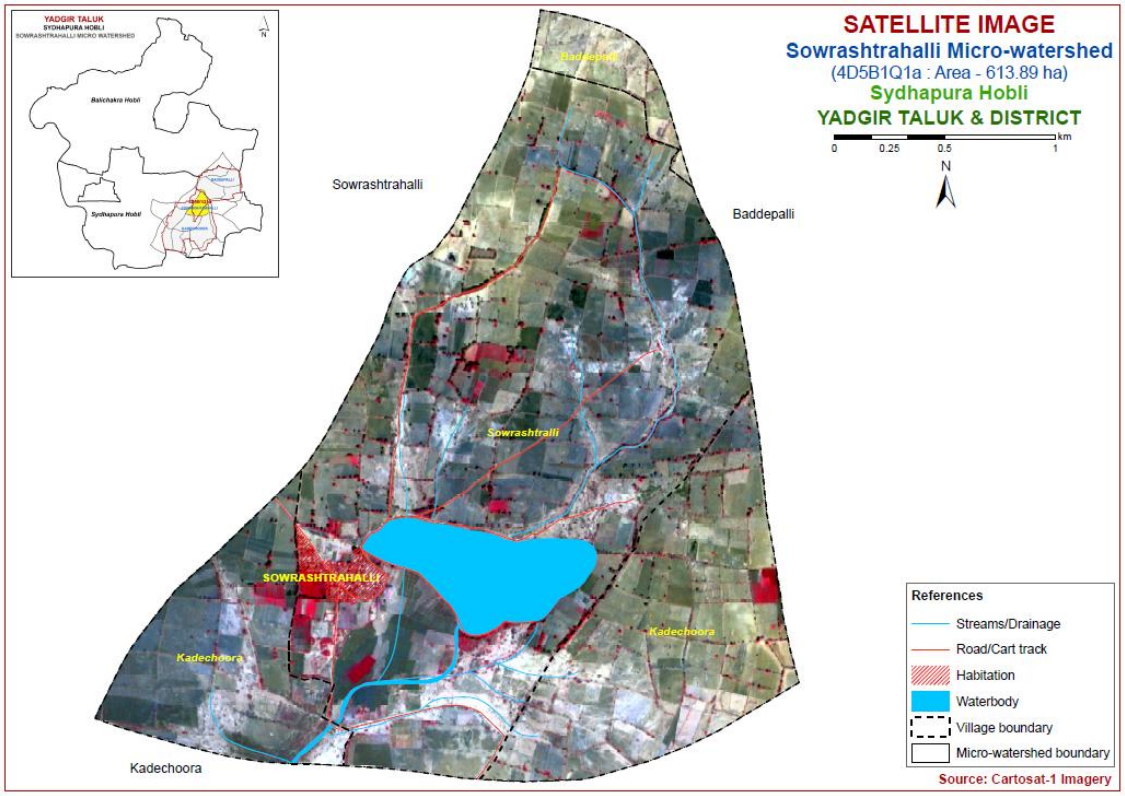



Fig.3.2 Satellite Image of Sowrashtrahalli Microwatershed

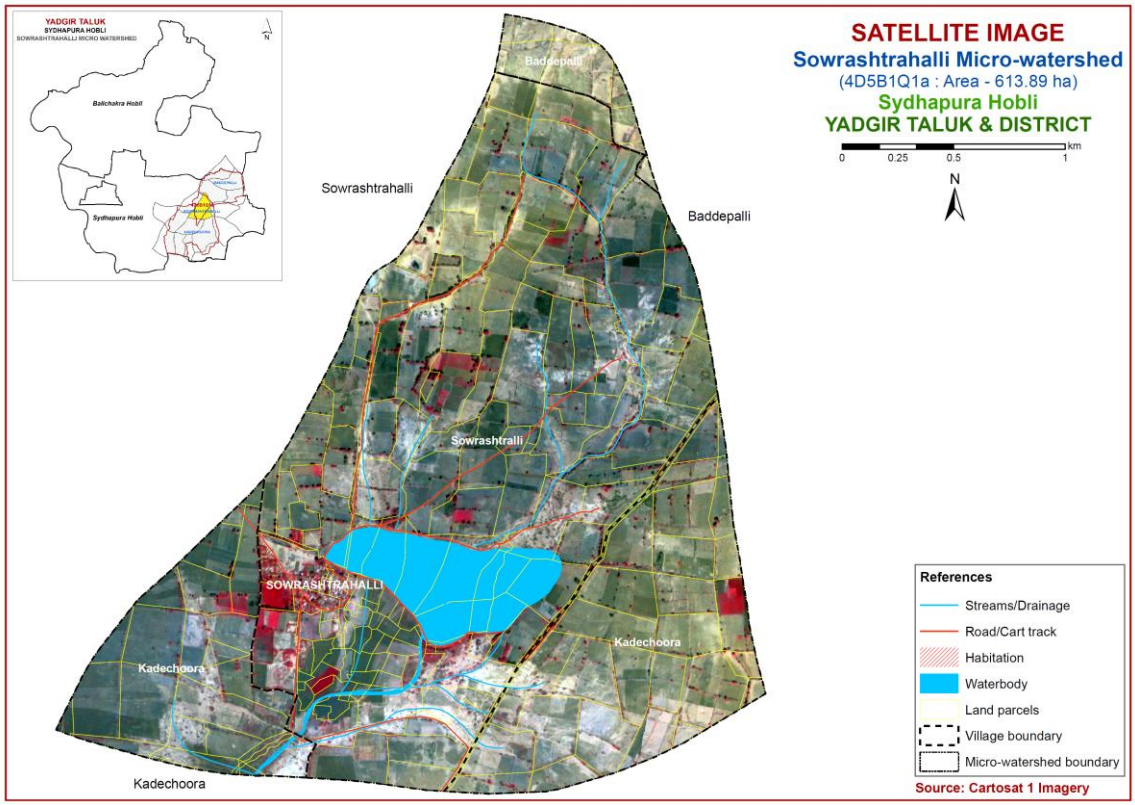



Fig.3.3 Cadastral map overlaid on IRS PAN+LISS IV merged imagery of Sowrashtrahalli Microwatershed

### 3.3 Field Investigation

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

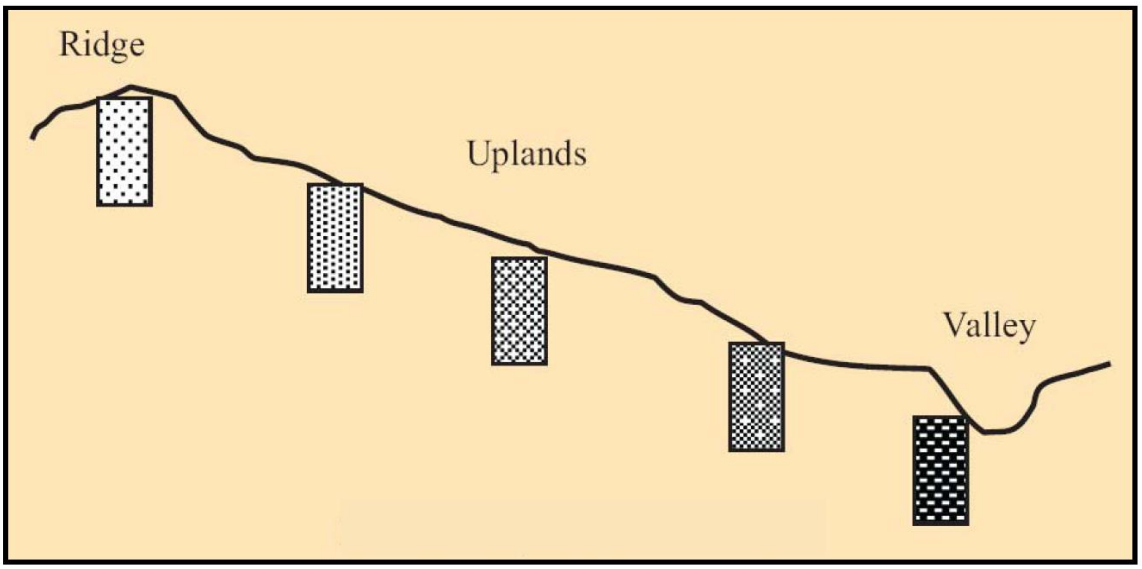



Fig: 3.4. Location of profiles in a transect

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

Based on the soil-site characteristics, the soils were grouped into different soil series (soil series is the most homogeneous unit having similar horizons and properties and behaves similarly for a given level of management). Soil depth, texture, colour, kind of horizon and horizon sequence, amount and nature of gravel present, 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 soil series are given in Table 3.1. Based on the above characteristics, 14 soil series were identified in the Sowrashtrahalli microwatershed.

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

| SOILS OF GRANITE AND GRANITE GNEISS LANDSCAPE | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Sl. No.** | **Soil Series** | **Depth (cm)** | **Colour (moist)** | **Texture** | **Gravel (%)** | **Horizon sequence** | **Calcare ousness** |
| 1 | Badiyala (BDL) | 25-50 | 7.5YR 2.5/3,2.5/2,3/3 **10YR 3/4,4/3** | sl | - | Ap-Bw | e |
| 2 | Halagera (HLG) | 50-75 | 10YR 3/2,4/4 **7.5YR 4/3,4/2** | scl | - | Ap-Bw | es |
| 3 | Jinkera (JNK) | 50-75 | 10YR 3/1,3/2 **7.5YR 3/4** | scl | - | Ap-Bw | e |
| 4 | Balichakra (BLC) | 75-100 | 2.5YR 5/3,2.5/4 **5YR 4/3,3/3** | scl | - | Ap-Bt | e |
| 5 | Poglapur (PGP) | 100-150 | 5YR 4/6,3/3 **7.5YR 4/4** | sc | - | Ap-Bt | - |
| 6 | Belagundi (BGD) | 100-150 | 10 YR 5/4,4/4 **7.5YR 4/4** | c | - | Ap-Bw | - |
| 7 | Anur (ANR) | 100-150 | 10YR 4/3,4/1 | c | - | Ap-Bw | es |
| 8 | Dastharabad (DSB) | 25-50 | 7.5YR 3/3 | g c | 35-60 | Ap-Bt-Cr | - |
| 9 | Hosalli (HSL) | 75-100 | 10YR 5/4,4/4,4/6 | sc | - | Ap-Bw | e |
| **Soils of Alluvial Landscape** | | | | | | | |
| 10 | Rampur (RMP) | 50-75 | 10 YR 3/1,5/4 | scl | - | Ap-Bt | - |
| 11 | Rachanalli (RHN) | 75-100 | 10 YR 3/2,4/3 | scl | - | Ap-Bw | e |
| 12 | Kudlura (KDR) | 100-150 | 10YR 3/1,3/2,4/1,5/2 | c | - | Ap-Bw | es |
| 13 | Sowrashtrahalli (SWR) | 100-150 | 10YR 4/1,3/2,3/1 | c | - | Ap-Bss | es |
| 14 | Hegganakera (HGN) | >150 | 10 YR 4/2,4/1,3/1,4/1 | c | - | Ap-BA-Bss | e |

### 3.4 Soil Mapping

The area under each soil series was further separated into 19 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 soil map (Fig. 3.5) in the form of symbols. During the survey many soil profile pits, few minipits and a few auger bores representing different landforms occurring in the microwatershed were studied. In addition to the profile study, spot observations in the form of minipits, road cuts, terrace cuts etc., were studied to validate the soil boundaries on the soil map.

The soil map shows the geographic distribution of 19 mapping units representing 14 soil series occurring in the microwatershed. The soil map unit (soil legend) description is presented in Table 3.2. The soil phase map (management units) shows the distribution of 19 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 Laboratory Characterization

Soil samples for each soil series were collected from representative master profiles for laboratory characterization by following the methods outlined in the Laboratory Manual (Sarma *et al*, 1987). Surface soil samples collected in the year 2017 from farmer's fields (61 samples) for fertility status (major and micronutrients) at 320 m grid interval were analyzed in the laboratory (Katyal and Rattan, 2003). By linking the soil fertility data to the survey numbers through GIS, soil fertility maps for the 11 elements including pH and EC were generated for the microwatershed.

**Table 3.2 Soil Map Unit description of Sowrashtrahalli microwatershed**

| Soil Map unit No. | Soil Series | Soil phase | Soil Map Unit | Mapping Unit Description | Area in ha (%) |
|---|---|---|---|---|---|
| | **Soil 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 | | | **120 (19.45)** |
| 2 | | BDLbB2 | Loamy sand surface, slope 1-3%, moderate erosion | | 17 (2.7) |
| 5 | | BDLiB2 | Sandy clay surface, slope 1-3%, moderate erosion | | 103 (16.75) |
| | HLG | Halagera soils are moderately shallow (50-75 cm), moderately well drained, have dark brown to dark yellowish brown and dark grayish brown, calcareous sandy clay loam black soils occurring on very gently sloping uplands under cultivation | | | **11 (1.8)** |
| 17 | | HLGiB2 | Sandy clay surface, slope 1-3%, moderate erosion | | 11 (1.8) |
| | JNK | Jinkera soils are moderately shallow (50-75 cm), well drained, have dark brown to very dark grayish brown, slightly calcareous, sandy clay loam black soils occurring on very gently sloping uplands under cultivation | | | **26 (4.26)** |
| 20 | | JNKcB2 | Sandy loam surface, slope 1-3%, moderate erosion | | 26 (4.26) |
| | BLC | Balichakra soils are moderately deep (75-100 cm), well drained, have reddish brown to dark reddish brown, | | | **92 (14.98)** |

| | | | | |
|---|---|---|---|---|
| | | slightly calcareous sandy clay loam red soils occurring on very gently sloping uplands under cultivation | | |
| 37 | | BLCcB2 | Sandy loam surface, slope 1-3%, moderate erosion | 55 (8.93) |
| 38 | | BLCiB2 | Sandy clay surface, slope 1-3%, moderate erosion | 37 (6.05) |
| | PGP | Poglapur soils are moderately deep (75-100 cm), well drained, have brown to dark reddish brown and yellowish red, sandy clay red soils occurring on very gently sloping uplands under cultivation | | **12 (1.89)** |
| 41 | | PGPiB2 | Sandy clay surface, slope 1-3%, moderate erosion | 12 (1.89) |
| | BGD | Belagundi soils are deep (100-150 cm), well drained, have brown to dark yellowish brown, clayey soils occurring on very gently sloping uplands under cultivation | | **20 (3.3)** |
| 50 | | BGDbB2 | Loamy sand surface, slope 1-3%, moderate erosion | 20 (3.3) |
| | ANR | Anur soils are deep (100-150 cm), moderately well drained, have dark gray to brown, calcareous clayey soils occurring on very gently sloping uplands under cultivation | | **38 (6.29)** |
| 52 | | ANRbB3 | Loamy sand surface, slope 1-3%, severe erosion | 21 (3.46) |
| 55 | | ANRiB2 | Sandy clay surface, slope 1-3%, moderate erosion | 17 (2.83) |
| | DSB | Dastharabad soils are shallow (25-50 cm), well drained, have dark brown to very dark brown, gravelly clay soils occurring on very gently to gently sloping uplands under cultivation | | **42 (6.85)** |
| 108 | | DSBiB2 | Sandy clay surface, slope 1-3%, Moderate erosion | 42 (6.85) |
| | HSL | Hosalli soils are moderately deep (75-100 cm), well drained, have yellowish brown to dark yellowish brown, slightly calcareous sandy clay black soils occurring on very gently sloping uplands under cultivation | | **3 (0.57)** |
| 111 | | HSLbB2 | Loamy sand surface, slope 1-3%, moderate erosion | 3 (0.57) |
| **Soil of Alluvial Landscape** | | | | |
| | RMP | Rampur soils are moderately shallow (50-75 cm), moderately well drained, have yellowish brown to very dark gray, sandy clay loam alluvial soils occurring on very gently sloping plains under cultivation | | **23 (3.75)** |
| 70 | | RMPcB2 | Sandy loam surface, slope 1-3%, moderate erosion | 23 (3.75) |
| | RHN | Rachanalli soils are moderately deep (75-100 cm), moderately well drained, have brown to very dark grayish brown, slightly calcareous cracking sandy clay loam alluvial soils occurring on very gently sloping plains | | **20 (3.25)** |

| | | | | |
|---|---|---|---|---|
| | | under cultivation | | |
| 79 | | RHNmB2 | Clay surface, slope 1-3%, moderate erosion | 20 (3.25) |
| | KDR | Kudlura soils are deep (100-150 cm), moderately well drained, have dark gray to very dark grayish brown, calcareous cracking clay alluvial soils occurring on nearly level to very gently sloping plains under cultivation | | **55 (8.97)** |
| 87 | | KDRiB2 | Sandy clay surface, slope 1-3%, moderate erosion | 53 (8.65) |
| 89 | | KDRmB2 | Clay surface, slope 1-3%, moderate erosion | 2 (0.32) |
| | SWR | Sowrashtrahalli soils are deep (100-150 cm), moderately well drained, have dark gray to very dark grayish brown, calcareous cracking clay black soils occurring on very gently sloping plains under cultivation | | **77 (12.49)** |
| 90 | | SWRcB2 | Sandy loam surface, slope 1-3%, moderate erosion | 20 (3.28) |
| 91 | | SWRmB2 | Clay surface, slope 1-3%, moderate erosion | 57 (9.21) |
| | HGN | Hegganakera soils are very deep (>150 cm), moderately well drained, have dark gray to very dark grayish brown and brown, slightly calcareous cracking clay black soils occurring on very gently sloping plains under cultivation | | **35 (5.66)** |
| 95 | | HGNmB2 | Clay surface, slope 1-3%, moderate erosion | 35 (5.66) |
| | Rock outcrops | Rock lands with little or no soil | | **0.4 (0.06)** |
| 1000 | Others | Habitation and Water bodies | | **39 (6.43)** |

### 3.6 Land Management Units (LMU's)

The 19 soil phases identified and mapped in the microwatershed were grouped into 5 Land Management Units (LMU's) for the purpose of preparing a Proposed Crop Plan for sustained development of the microwatershed. The database (soil phases) generated under LRI was utilized for identifying Land Management Units (LMU's) based on the management needs. One or more than one soil site characteristic having influence on the management have been chosen for identification and delineation of LMUs. For Sowrashtrahalli microwatershed, five soil and site characteristics, namely soil depth, soil texture, slope, erosion and gravel content have been considered for defining LMUs. The Land Management Units are expected to behave similarly for a given level of management.

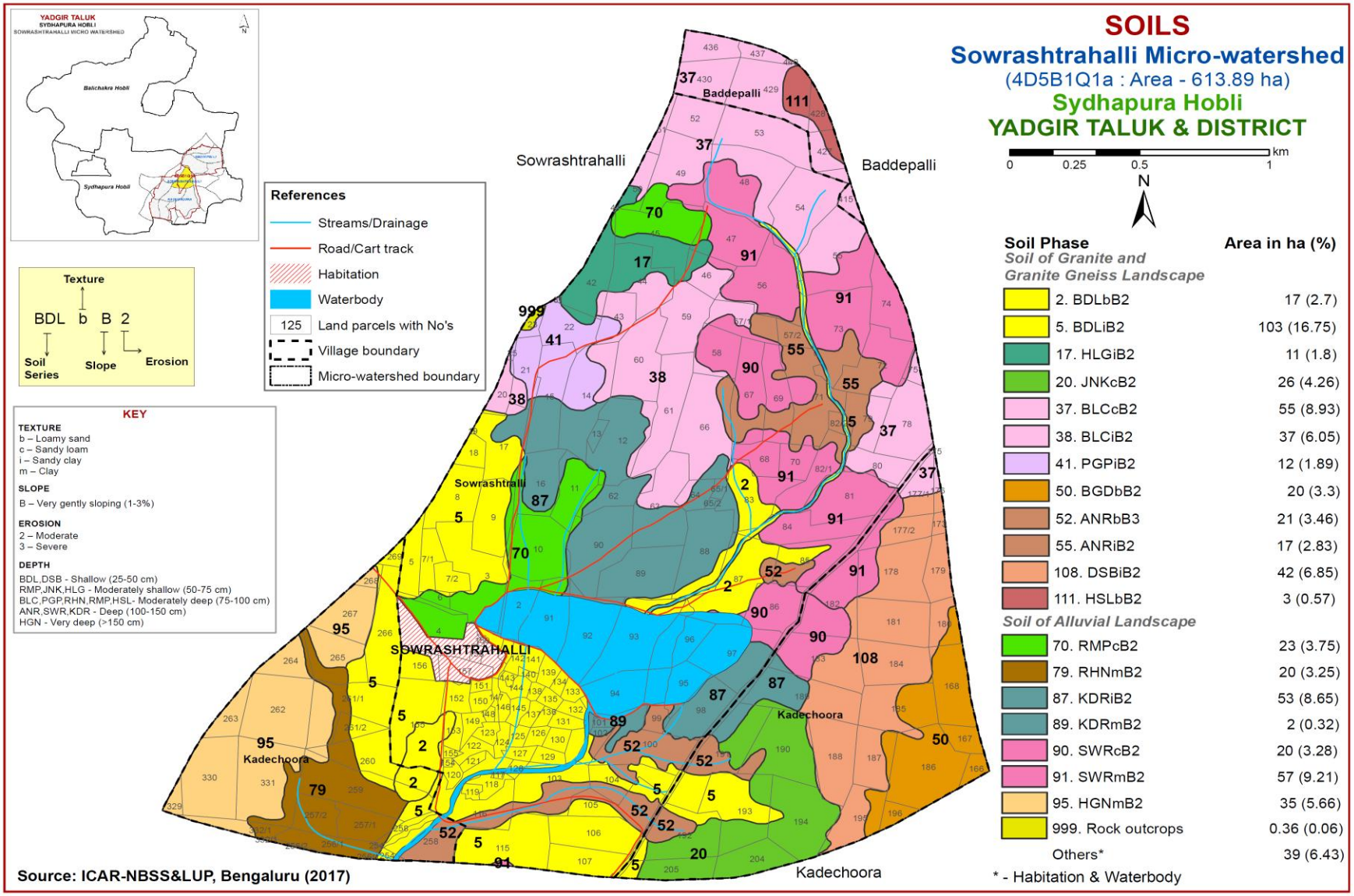



Fig 3.5 Soil phase or management units map of Sowrashtrahalli Microwatershed

*Chapter 4*

# THE SOILS

Detailed information pertaining to the nature, extent and distribution of different kinds of soils occurring in Sowrashtrahalli microwatershed is provided in this chapter. The microwatershed area has been identified as granite gneiss and alluvial landscapes based on geology. In all, 14 soil series were identified in this landscape. Soil formation is the result of the combined effect of environmental and terrain factors that are reflected in soil morphology. In these landscapes, it is by parent material, relief, time and climate.

A brief description of each of the 14 soil series identified followed by 19 soil phases (management units) mapped (Fig. 3.4) are furnished below. The physical and chemical characteristics of soil series identified in Sowrashtrahalli 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 characteristics 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, 9 soil series are identified and mapped. Of these, Badiyala occupies (BDL) 120 ha (19%) followed by Balichakra (BLC) 92 ha (15%), Dastharabad (DSB) 42 ha (7%), Anur (ANR) 38 ha (6%), Jinkera (JNK) 26 ha (4%), Belagundi (BGD) 20 ha (3%), Poglapur (PGP) 12 ha (2%), Halagera (HLG) 11 ha (2%) and Hosalli (HSL) 3 ha (<1%) in the microwatershed. The brief description of these series along with the soil phases identified and mapped is given below.

**4.1.1 Badiyala (BDL) Series:** Badiyala soils are shallow (25-50 cm), well drained, have very dark brown, 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 sandy clay and is slightly calcareous. The available water capacity is very low (<50 mm/m). Two phases were identified and mapped.

Landscape and soil Profile characteristics of Badiyala (BDL) Series

**4.1.2 Halagera (HLG) Series:** Halagera soils are moderately shallow (50-75 cm), well drained, have very dark grayish brown to dark yellowish brown, calcareous sandy clay loam soils. They are developed from weathered granite gneiss and occur on very gently sloping uplands under cultivation. The Halagera 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 51 to 75 cm. The thickness of A horizon ranges from 9 to 15 cm. Its colour is in 7.5 YR and 10 YR hue with value 3 to 4and chroma 2 to 4. The texture is loamy sand to sandy clay loam. The thickness of B horizon ranges from 44 to 66 cm. Its colour is in 10 YR and 7.5 YR hue with value 3 to 4 and chroma 2 to 3. Its texture varies from sandy clay loam to sandy clay and is calcareous. The available water capacity is low (51-100 mm/m). Only one phase was identified and mapped.

Landscape and soil Profile characteristics of Halagera (HLG) Series

**4.1.3 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). Only one phase was identified and mapped.


Landscape and soil Profile characteristics of Jinkera (JNK) Series

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

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

Landscape and soil Profile characteristics of Balichakra (BLC) Series

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

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

Landscape and soil Profile characteristics of Poglapur (PGP) Series

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

The thickness of the solum ranges from 100 to 145 cm. The thickness of A horizon ranges from 5 to 12 cm. Its colour is in 10 YR and 5 YR hue with value 5 and chroma 2 to 4. The texture varies from sandy to loamy sand. The thickness of B horizon ranges from 95 to 135 cm. Its colour is in 10 YR and 7.5 YR hue with value 4 to 5 and chroma 4. Texture is sandy clay to clay. The available water capacity is very high (>200 mm/m). Only one phase was identified and mapped.


Landscape and soil Profile characteristics of Belagundi (BGD) Series

**4.1.7 Anur (ANR) Series:** Anur soils are deep (100-150 cm), moderately well drained, have dark gray to dark brown, calcareous 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. The available water capacity is very high (>200 mm/m). Two phases were identified and mapped.


Landscape and soil Profile characteristics of Anur (ANR) Series

4.1.8 **Dastharabad (DSB) Series:** Dastharabad soils are shallow (25-50 cm), well drained, have dark brown, gravelly clay soils. They are developed from weathered granite gneiss and occur on very gently to gently sloping uplands under cultivation. The Dastharabad series has been classified as a member of the clayey-skeletal, mixed, isohyperthermic family of Paralithic Haplustalfs.

The thickness of the solum ranges from 28 to 50 cm. The thickness of A horizon ranges from 9 to 14 cm. Its colour is in 10 YR and 7.5 YR hue with value and chroma of 3 to 4. The texture varies from sandy loam to sandy clay. The thickness of B horizon ranges from 28 to 40 cm. Its colour is in 7.5 YR hue with value 3 and chroma 3 to 4. The texture is sandy clay to clay with 35-60 per cent gravel. The available water capacity is very low (<50 mm/m). Only one phase was identified and mapped.


Landscape and soil Profile characteristics of Dastharabad (DSB) Series

4.1.9 **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). Only one phase was identified and mapped.


Landscape and soil Profile characteristics of Hosalli (HSL) Series

**4.2 Soils of Alluvial landscape**

In this landscape, five soil series have been identified and mapped. The Sowrashtrahalli (SWR) series occupies 77 ha (12%) followed by Kudlura (KDR) series 55 ha (9%), Hegganakera (HGN) 35 ha (6%), Rampur (RMP) 23 ha (4%) and Rachanalli (RHN) 20 ha (3%). The brief description of soil series along with the soil phases identified and mapped is given below.

**4.2.1 Rampura (RMP) Series:** Rampura soils are moderately shallow (50-75 cm), well drained, have very dark to yellowish brown, sandy clay loam soils. They have developed from alluvium and occur on very gently sloping plains under cultivation. The Rampura series has been classified as a member of the fine-loamy, mixed, isohyperthermic family of Typic Haplustalfs.

The thickness of the solum ranges from 53 to 75 cm. The thickness of A horizon ranges from 6 to 12 cm. Its colour is in 7. 5 YR and 10 YR hue with value 4 to 5 and

chroma 3 to 6. The texture is sandy loam to sandy clay loam and sandy clay. The thickness of B horizon ranges from 48 to 65 cm. Its colour is in 10 YR and 7.5 YR hue with value 3 to 5 and chroma 1 to 6. Its texture is loamy sandy to sandy clay loam and sandy clay. The available water capacity is medium (101-150 mm/m). Only one phase identified and mapped.


Landscape and soil Profile characteristics of Rampura (RMP) Series

**4.2.2 Rachanalli (RHN) Series:** Rachanalli soils are moderately deep (75-100 cm), well drained, have very dark grayish brown to dark brown, slightly calcareous sandy clay loam soils. They have developed from alluvium and occur on very gently sloping plains under cultivation. The Rachanalli series has been classified as a member of the fine-loamy, 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 13 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 and sandy clay. The thickness of B horizon ranges from 66 to 92 cm. Its colour is in hue 10 YR with value 3 to 4 and chroma 1 to 3. Its texture varies from sandy loam to sandy clay loam and is slightly calcareous. The available water capacity is medium (101-150 mm/m). Only one phase was identified and mapped.


Landscape and soil Profile characteristics of Rachanalli (RHN) Series

**4.2.3 Kudlura (KDR) Series:** Kudlura soils are deep (100-150 cm), moderately well drained, have very dark gray to grayish brown, calcareous cracking clay soils. They have developed from alluvium and occur on nearly level to very gently sloping plains under cultivation. The Kudlura series has been classified as a member of the fine, mixed, (calcareous), isohyperthermic family of Fluventic Haplustepts.

The thickness of the solum ranges from 110 to 149 cm. The thickness of A horizon ranges from 6 to 22 cm. Its colour is in 10 YR hue with value 3 to 4 and chroma 1 to 2. The texture ranges from sandy loam, sandy clay loam, sandy clay and clay. The thickness of B horizon ranges from 115 to 143 cm. Its colour is in 10 YR hue with value 3 to 4 and chroma 1 to 3. Texture is sandy clay loam, sandy clay to clay and is calcareous in nature. The available water capacity is very high (>200 mm/m). Five phases were identified and mapped. Two phases were identified and mapped.

Landscape and soil Profile characteristics of Kudlura (KDR) Series

**4.2.4 Sowrashtrahalli (SWR) Series:** Sowrashtrahalli soils are deep (100-150 cm), moderately well drained, have very dark gray to dark gray, calcareous cracking clay black soils. They have developed from alluvium and occur on very gently sloping plains under cultivation. The Sowrashtrahalli series has been classified as a member of the fine, smectitic, (calcareous), isohyperthermic family of Typic Haplusterts.

The thickness of the solum ranges from 107 to 150 cm. The thickness of A horizon ranges from 7 to 13 cm. Its colour is in 10 YR hue with value 2 to 4 and chroma 1 to 2. The texture varies from sandy clay to clay. The thickness of B horizon ranges from 104 to 142 cm. Its colour is in 10 YR hue with value 2 to 4 and chroma 1 to 2. The 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 Sowrashtrahalli (SWR) Series

**4.2.5 Hegganakera (HGN) Series:** Hegganakera soils are very deep (>150 cm), moderately well drained, have very dark gray to dark grayish brown, slightly calcareous cracking clay black soils. They have developed from alluvium and occur on very gently sloping plains under cultivation. The Hegganakera series has been classified as a member of the fine, smectitic, isohyperthermic family of Typic Haplusterts.

The thickness of the solum is more than 150 cm. The thickness of A horizon ranges from 7 to 9 cm. Its colour is in 10 YR hue with value 3 to 4 and chroma 1 to 3 with clay texture. The thickness of B horizon ranges from 152 to 175 cm. Its colour is in 10 YR hue with value 2 to 4 and chroma 1 to 3. Its texture is clay and is slightly calcareous. The available water capacity is very high (>200 mm/m). Only one phase was identified and mapped.

Landscape and soil Profile characteristics of Hegganakera (HGN) Series

**Table: 4.1 Physical and Chemical Characteristics of Soil Series identified in Sowrashtrahalli 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:** Halagera **(**HLG) **Pedon:** R-4

**Location:** $16^0$44'29.3"N $77^0$13'56.3"E, Halagera village, Yadgir 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 |
| 0-8 | Ap | 81.02 | 8.42 | 10.56 | 10.41 | 24.08 | 18.98 | 19.08 | 8.47 | <15 | ls | 9.10 | 4.79 |
| 8-22 | Bw1 | 61.00 | 11.50 | 27.50 | 8.29 | 9.35 | 21.89 | 14.35 | 7.12 | <15 | scl | 16.91 | 12.28 |
| 22-53 | Bw2 | 61.41 | 13.80 | 24.79 | 15.98 | 15.67 | 12.62 | 11.78 | 5.36 | 15-35 | scl | 17.08 | 11.26 |

| 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 | 8.49 | - | - | 0.185 | 0.30 | 2.99 | - | - | 0.24 | 0.06 | - | 8.80 | 0.83 | 100 | 0.69 |
| 8-22 | 8.57 | - | - | 0.116 | 0.45 | 4.03 | - | - | 0.11 | 0.02 | - | 19.50 | 0.71 | 100 | 0.12 |
| 22-53 | 8.70 | - | - | 0.113 | 0.27 | 7.67 | - | - | 0.11 | 0.05 | - | 15.50 | 0.63 | 100 | 0.33 |

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

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

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

| Depth (cm) | Horizon | Size class and particle diameter (mm) | | | | | | | | Coarse fragments w/w (%) | Texture Class (USDA) | % Moisture | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | | | Sand | | | | | | | | |
| | | Sand (2.0-0.05) | Silt (0.05-0.002) | Clay (<0.002) | Very coarse (2.0-1.0) | Coarse (1.0-0.5) | Medium (0.5-0.25) | Fine (0.25-0.1) | Very fine (0.1-0.05) | | | 1/3 Bar | 15 Bar |
| 0-8 | Ap | 65.46 | 8.38 | 26.16 | 12.51 | 18.72 | 18.82 | 10.44 | 4.96 | - | scl | 15.15 | 8.63 |
| 8-19 | Bt1 | 63.48 | 8.16 | 28.36 | 12.80 | 15.84 | 17.21 | 12.49 | 5.14 | - | scl | 16.45 | 8.81 |
| 19-40 | Bt2 | 52.64 | 11.58 | 35.79 | 13.19 | 13.19 | 14.35 | 8.23 | 3.69 | - | sc | 21.49 | 10.36 |
| 40-75 | BC | 55.14 | 10.71 | 34.15 | 14.10 | 14.42 | 14.63 | 7.53 | 4.45 | - | scl | 17.77 | 8.99 |

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

*Contd...*

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

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

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

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

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

*Contd...*

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

**Location:** $16^0$31'65.3"N $77^0$20'84.9"E, Kadechoora village, Sydhapura hobli, Yadgir taluk and district

**Analysis at:** NBSS&LUP, Regional Centre, Bengaluru **Classification:** Very fine, 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 |
| 0-13 | Ap | 14.90 | 17.83 | 67.27 | 0.77 | 2.10 | 2.65 | 5.96 | 3.42 | - | c | 43.97 | 29.27 |
| 13-40 | Bw1 | 13.07 | 18.32 | 68.61 | 0.80 | 2.05 | 2.61 | 4.20 | 3.41 | - | c | 41.23 | 30.48 |
| 40-80 | Bw2 | 11.68 | 17.18 | 71.13 | 0.80 | 2.06 | 2.29 | 3.32 | 3.21 | - | c | 46.72 | 32.41 |
| 80-113 | Bw3 | 12.17 | 16.53 | 71.30 | 1.95 | 1.61 | 3.21 | 2.41 | 2.99 | - | c | 46.87 | 35.13 |

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

*Contd...*

**Soil Series:** 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 | 17.70 |
| 18-49 | 10.32 | - | - | 1.38 | 0.30 | 6.76 | - | - | 0.21 | 16.03 | - | 24.60 | 0.79 | 100 | 65.17 |
| 49-95 | 10.08 | - | - | 2.55 | 0.17 | 6.11 | - | - | 0.33 | 21.49 | - | 32.60 | 0.77 | 100 | 65.91 |
| 95-123 | 9.92 | - | - | 2.56 | 0.12 | 7.93 | - | - | 0.51 | 26.03 | - | 36.00 | 0.70 | 100 | 72.30 |

*Contd...*

**Soil Series:** Dastharabad **(**DSB) **Pedon:** R-17

**Location:** $16^0$31’ 98.6”N $77^0$22’93.0”E, Duppalli village, Sydhapura hobli, Yadgir taluk and district

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

| Depth (cm) | Horizon | Size class and particle diameter (mm) | | | | | | | | Coarse fragments w/w (%) | Texture Class (USDA) | % Moisture | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | | | Sand | | | | | | | | |
| | | Sand (2.0-0.05) | Silt (0.05-0.002) | Clay (<0.002) | Very coarse (2.0-1.0) | Coarse (1.0-0.5) | Medium (0.5-0.25) | Fine (0.25-0.1) | Very fine (0.1-0.05) | | | 1/3 Bar | 15 Bar |
| 0-6 | Ap | 90.51 | 4.84 | 4.64 | 7.06 | 8.07 | 37.24 | 26.03 | 12.11 | 35 | s | 5.32 | 1.59 |
| 6-17 | Bt1 | 49.11 | 8.08 | 42.81 | 10.67 | 15.44 | 10.00 | 8.44 | 4.56 | 20 | sc | 20.68 | 13.16 |
| 17-43 | Bt2 | 39.54 | 2.84 | 57.63 | 12.89 | 9.14 | 7.71 | 6.83 | 2.97 | 50 | c | 26.69 | 18.50 |

| 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 $kg^{-1}$ | | | | | | | % | % |
| 0-6 | 5.93 | - | - | 0.04 | 0.67 | 0.00 | 2.00 | 0.54 | 0.07 | 0.01 | 2.61 | 3.60 | 0.78 | 73 | 0.14 |
| 6-17 | 7.31 | - | - | 0.110 | 0.91 | 0.91 | 11.19 | 3.37 | 0.12 | 0.49 | 15.00 | 15.20 | 0.36 | 100 | 3.22 |
| 17-43 | 6.64 | - | - | 0.048 | 0.76 | 0.00 | 18.81 | 5.57 | 0.23 | 0.09 | 24.70 | 24.90 | 0.43 | 99 | 0.38 |

*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:** Rampura (RMP) **Pedon:** T1/P1

**Location:** $16^0$33'54.7"N $77^0$20'45.1"E, Sowrashtralli village, Sydhapura hobli, Yadgir taluk and district

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

| Depth (cm) | Horizon | Size class and particle diameter (mm) | | | | | | | | Coarse fragments w/w (%) | Texture Class (USDA) | % Moisture | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | | | Sand | | | | | | | | |
| | | Sand (2.0-0.05) | Silt (0.05-0.002) | Clay (<0.002) | Very coarse (2.0-1.0) | Coarse (1.0-0.5) | Medium (0.5-0.25) | Fine (0.25-0.1) | Very fine (0.1-0.05) | | | 1/3 Bar | 15 Bar |
| 0-7 | Ap | 93.37 | 4.32 | 2.31 | 18.39 | 21.91 | 24.62 | 19.90 | 8.54 | - | s | 3.89 | 1.01 |
| 7-28 | A2 | 83.08 | 7.65 | 9.26 | 14.60 | 18.23 | 21.75 | 20.85 | 7.65 | - | ls | 6.25 | 1.94 |
| 28-70 | Bt1 | 61.88 | 6.38 | 31.74 | 19.17 | 13.54 | 14.17 | 12.29 | 2.71 | - | scl | 15.95 | 8.69 |

| 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 $kg^{-1}$ | | | | | | | % | % |
| 0-7 | 5.97 | - | - | 0.04 | 0.34 | 0.00 | 0.70 | 0.18 | 0.06 | 0.01 | 0.95 | 1.70 | 0.74 | 56 | 0.77 |
| 7-28 | 6.06 | - | - | 0.03 | 0.26 | 0.00 | 1.83 | 0.53 | 0.07 | 0.05 | 2.48 | 3.30 | 0.36 | 75 | 1.58 |
| 28-70 | 6.65 | - | - | 0.20 | 0.26 | 0.00 | 7.05 | 3.19 | 0.15 | 0.95 | 11.34 | 13.00 | 0.41 | 87 | 7.31 |

*Contd...*

**Soil Series:** Rachanalli (RHN) **Pedon:** R-2

**Location: 16$^0$**44'40.9"N 77$^0$17'35.0"E, Gopalpura village, Gurumitkal 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 |
| 0-8 | Ap | 77.72 | 14.09 | 8.19 | 6.31 | 13.12 | 18.82 | 27.16 | 12.31 | - | sl | 10.76 | 3.53 |
| 8-43 | Bw1 | 76.00 | 10.38 | 13.62 | 13.29 | 17.92 | 16.99 | 20.60 | 7.21 | - | sl | 21.48 | 7.91 |
| 43-87 | Bw2 | 52.64 | 19.95 | 27.41 | 2.69 | 4.66 | 16.79 | 16.89 | 11.61 | - | scl | 40.80 | 16.55 |

| 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 | 8.16 | - | - | 0.22 | 0.38 | 1.20 | 5.43 | 2.49 | 0.16 | 0.79 | 8.87 | 8.99 | 1.10 | 99 | 8.81 |
| 8-43 | 9.63 | - | - | 0.26 | 0.19 | 0.60 | 6.25 | 4.72 | 0.09 | 4.31 | 15.37 | 14.66 | 1.08 | 105 | 29.43 |
| 43-87 | 10.09 | - | - | 1.01 | 0.15 | 5.76 | - | - | 0.21 | 11.77 | - | 24.08 | 0.88 | 100 | 48.87 |

*Contd...*

**Soil Series:** Kudlura (KDR) **Pedon:** $T_1/P_2$

**Location:** $16^0$34'03.1"N $77^0$14'71.7"E, Kyathanala village, Sydhapura Hobli, Yadgir taluk and district

**Analysis at:** NBSS&LUP, Regional Centre, Bengaluru **Classification:** Fine, mixed, (calcareous), 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 |
| 0-6 | Ap | 49.52 | 14.58 | 35.90 | 5.71 | 7.41 | 14.81 | 15.66 | 5.93 | - | sc | 26.86 | 12.10 |
| 6-26 | BA | 50.79 | 13.31 | 35.90 | 7.41 | 9.10 | 15.56 | 13.12 | 5.61 | - | sc | 25.65 | 12.24 |
| 26-67 | Bw1 | 43.49 | 15.97 | 40.54 | 5.86 | 7.38 | 13.56 | 10.85 | 5.86 | - | c | 31.22 | 16.48 |
| 67-115 | Bw2 | 37.42 | 18.93 | 43.66 | 6.51 | 6.83 | 10.95 | 8.68 | 4.45 | - | c | 36.13 | 22.34 |
| 115-144 | Bw3 | 39.74 | 18.88 | 41.38 | 8.16 | 7.84 | 10.63 | 8.70 | 4.40 | - | c | 35.83 | 20.57 |

| 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 $kg^{-1}$ | | | | | | | % | % |
| 0-6 | 8.34 | - | - | 0.15 | 0.72 | 3.55 | - | - | 0.42 | 0.07 | - | 33.20 | 0.92 | 100 | 0.22 |
| 6-26 | 8.55 | - | - | 0.11 | 0.85 | 4.90 | - | - | 0.33 | 0.25 | - | 32.70 | 0.91 | 100 | 0.76 |
| 26-67 | 9.08 | - | - | 0.17 | 0.60 | 5.02 | - | - | 0.18 | 1.34 | - | 36.20 | 0.89 | 100 | 3.69 |
| 67-115 | 9.44 | - | - | 0.37 | 0.52 | 6.61 | - | - | 0.25 | 6.72 | - | 39.30 | 0.90 | 100 | 17.09 |
| 115-144 | 9.53 | - | - | 0.43 | 0.56 | 6.10 | - | - | 0.26 | 7.85 | - | 33.70 | 0.81 | 100 | 23.29 |

*Contd...*

**Soil Series:** Sowrastrahalli (SWR) **Pedon:** R-8

**Location:** $16^0$38'49.0"N $77^0$16'56.1"E, Killanakera village, Balichakra 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 |
| 0-9 | Ap | 32.07 | 21.06 | 46.87 | 2.72 | 4.78 | 8.37 | 10.43 | 5.76 | - | c | 33.69 | 16.51 |
| 9_34 | BA | 32.29 | 20.37 | 47.35 | 3.90 | 5.20 | 8.56 | 9.10 | 5.53 | - | c | 37.43 | 16.65 |
| 34-67 | Bss1 | 30.11 | 23.13 | 46.76 | 4.18 | 5.05 | 8.13 | 8.13 | 4.62 | - | c | 38.02 | 19.44 |
| 67-124 | Bss2 | 19.93 | 23.40 | 56.66 | 2.46 | 3.14 | 5.04 | 5.71 | 3.58 | - | c | 42.55 | 23.92 |

| Depth (cm) | pH (1:2.5) | | | E.C. (1:2.5) | O.C. | $CaCO_3$ | Exchangeable bases | | | | | CEC | CEC/ Clay | Base saturation | ESP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Ca | Mg | K | Na | Total | | | | |
| | Water | $CaCl_2$ | M KCl | dS $m^{-1}$ | % | % | cmol $kg^{-1}$ | | | | | | | % | % |
| 0-9 | 8.44 | - | - | 0.18 | 0.77 | 7.47 | - | - | 0.79 | 0.21 | - | 47.70 | 1.02 | 100 | 0.45 |
| 9_34 | 8.57 | - | - | 0.14 | 0.81 | 6.86 | - | - | 0.51 | 0.23 | - | 47.80 | 1.01 | 100 | 0.49 |
| 34-67 | 8.73 | - | - | 0.12 | 0.81 | 6.48 | - | - | 0.28 | 0.44 | - | 50.60 | 1.08 | 100 | 0.88 |
| 67-124 | 8.71 | - | - | 0.16 | 0.77 | 7.56 | - | - | 0.42 | 0.91 | - | 51.20 | 0.90 | 100 | 1.78 |

*Contd...*

**Soil Series:** Hegganakera (HGN) **Pedon:** R-12

**Location:** $16^0$46'19.9"N $77^0$04'34.0"E, Thumakura village, Yadgir hobli, Yadgir taluk and district

**Analysis at:** NBSS&LUP, Regional Centre, Bengaluru **Classification:** Fine, smectitic, 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 | 20.20 | 25.22 | 54.58 | 2.32 | 2.76 | 3.53 | 8.17 | 3.42 | - | c | 42.47 | 25.59 |
| 8-24 | BA | 21.18 | 21.70 | 57.12 | 2.07 | 3.28 | 4.69 | 7.31 | 3.82 | - | c | 41.88 | 24.67 |
| 24-50 | Bss1 | 18.76 | 21.67 | 59.57 | 1.20 | 2.51 | 3.93 | 7.09 | 4.03 | - | c | 40.46 | 23.34 |
| 50-86 | Bss2 | 16.74 | 22.24 | 61.02 | 0.88 | 1.53 | 4.27 | 6.02 | 4.05 | - | c | 42.18 | 24.76 |
| 86-146 | Bss3 | 18.64 | 20.20 | 61.16 | 2.30 | 2.41 | 3.73 | 6.36 | 3.84 | - | c | 40.03 | 28.61 |
| 146-170 | Bss4 | 16.08 | 19.33 | 64.59 | 0.88 | 2.75 | 3.41 | 5.95 | 3.08 | - | c | 40.28 | 29.90 |

| 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 | 8.77 | - | - | 1.33 | 1.16 | 8.19 | - | - | 1.10 | 5.21 | - | 36.23 | 0.66 | 100 | 14.38 |
| 8-24 | 8.93 | - | - | 1.11 | 0.64 | 5.46 | - | - | 0.87 | 4.23 | - | 35.50 | 0.62 | 100 | 11.93 |
| 24-50 | 8.85 | - | - | 0.984 | 0.32 | 3.38 | - | - | 0.71 | 3.78 | - | 36.69 | 0.62 | 100 | 10.30 |
| 50-86 | 8.54 | - | - | 0.562 | 0.24 | 3.38 | - | - | 0.58 | 3.07 | - | 39.16 | 0.64 | 100 | 7.84 |
| 86-146 | 8.45 | - | - | 0.526 | 0.24 | 3.38 | - | - | 0.62 | 2.82 | - | 38.52 | 0.63 | 100 | 7.31 |
| 146-170 | 8.64 | - | - | 0.517 | 0.20 | 4.29 | - | - | 0.60 | 2.99 | - | 36.87 | 0.57 | 100 | 8.12 |

*Chapter 5*

# INTERPRETATION FOR LAND RESOURCE MANAGEMENT

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

## 5.1 Land Capability Classification

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

*Soil characteristics*: Depth, texture, gravel content, 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 severe limitations that reduce the choice of crops or that require very careful management.

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

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

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

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

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

The land capability subclasses have been further subdivided into land capability units based on the kinds of limitations present in each subclass. Ten land capability units are 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 19 soil map units identified in the Sowrashtrahalli microwatershed are grouped under three land capability classes and three land capability subclasses. Entire area in the microwatershed is suitable for agriculture (Fig. 5.1).

An area of 391 ha (64%) is good cultivable lands (Class II) that have minor limitations and require moderate conservation practices and are distributed in the major part of the microwatershed. Moderately good cultivable lands (Class III) cover an area of 141 ha (23%) and are distributed in the central, southern and western part of the microwatershed with moderate problems of erosion and soil that require special conservation practices. Fairly good lands (Class IV) cover an area of 42 ha (7%) and are distributed in the eastern and southeastern part of the microwatershed with severe limitations of soil and erosion. An area of about 39 ha (6%) is under miscellaneous lands comprising rock outcrops, and habitation and water bodies.

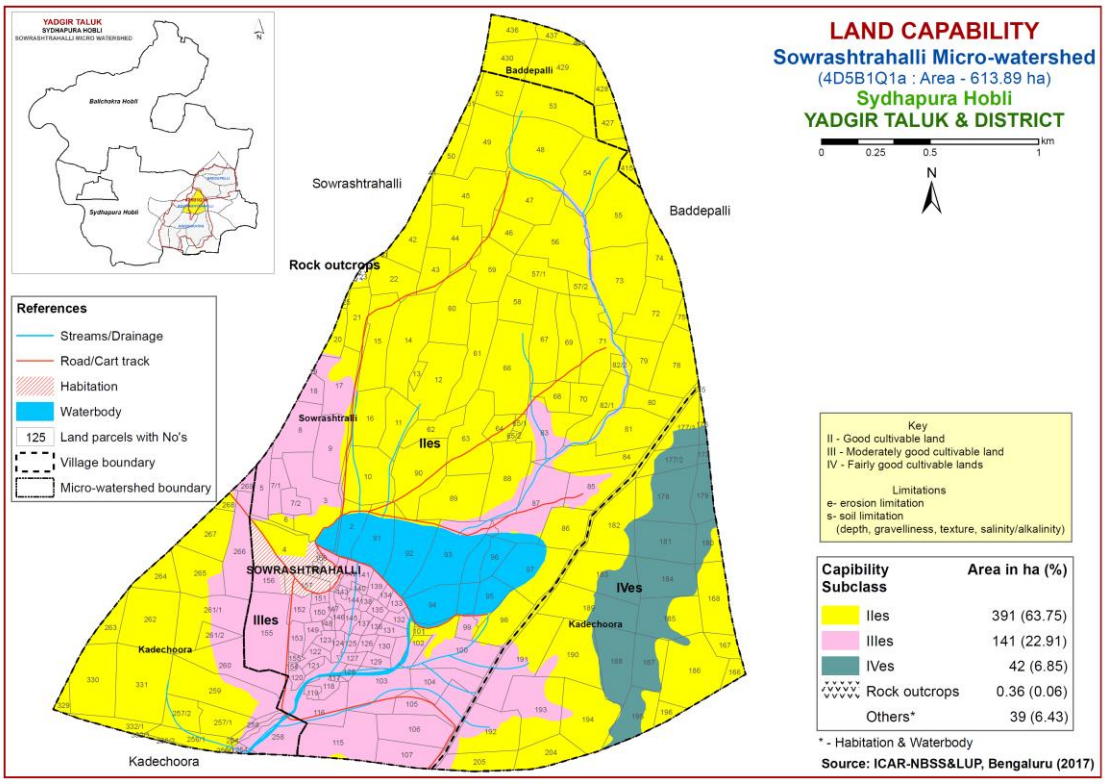



Fig. 5.1 Land Capability map of Sowrashtrahalli Microwatershed

## 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 shown in Figure 5.2.

Shallow (25-50 cm) soils occupy an area of 161 ha (26%) and are distributed in the central, southeastern, southern and western part of the microwatershed. An area of 60 ha (10%) is moderately shallow (50-75 cm) and are distributed in the northwestern, southern and central part of the microwatershed. Moderately deep soils (75-100 cm) occur in an area of 127 ha (21%) and are distributed in the northern, eastern and southwestern part of the microwatershed. Deep (100-150 cm) to very deep (>150 cm) soils cover an area of 226 ha (37%) and are distributed in the major part of the microwatershed.

The most problem lands with an area of about 161 ha (26%) having shallow (25-50 cm) rooting depth. They are suitable for growing short duration agricultural crops but

well suited for pasture, forestry or other recreational purposes. The most productive lands covering about 226 ha (37%) with respect to soil rooting depth where all climatically adapted annual and perennial crops can be grown are deep (100-150 cm) to very deep (>150 cm) occurring in the major part of the microwatershed.

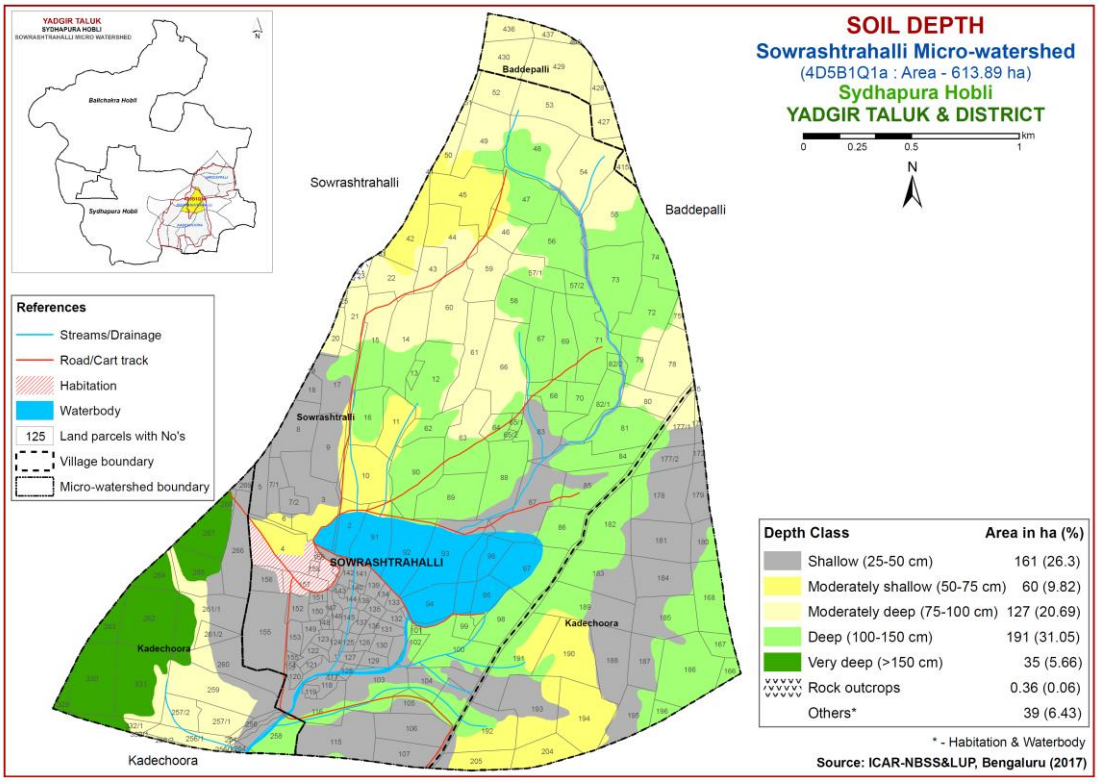



Fig. 5.2 Soil Depth map of Sowrashtrahalli Microwatershed

### 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.

Maximum area of about 388 ha (63%) has clayey soils at the surface and are distributed in the major part of the microwatershed. Loamy soils occupy an area of about 124 ha (20%) and are distributed in the northern, eastern, central and southern part of the microwatershed. Sandy soils occupy an area of about 62 ha (10%) and are distributed in the northeastern, central, southern and southeastern part of the microwatershed.

The most productive lands 388 ha (63%) with respect to surface soil texture are the clayey soils that have high potential for soil-water retention and availability, and nutrient retention and availability, but have problems of drainage, infiltration, workability and other physical problems as compared to loamy soils. The other productive lands (20%) are loamy soils which also have high potential for soil-water retention and nutrient availability but have no drainage or other physical problems. The problem soils cover about 62 ha (10%) that have sandy soils at the surface having problems of poor soil water retention, nutrient retention and availability, but have better rain water retention, less run off and soil moisture conservation, less capillary rise and less evaporation losses.

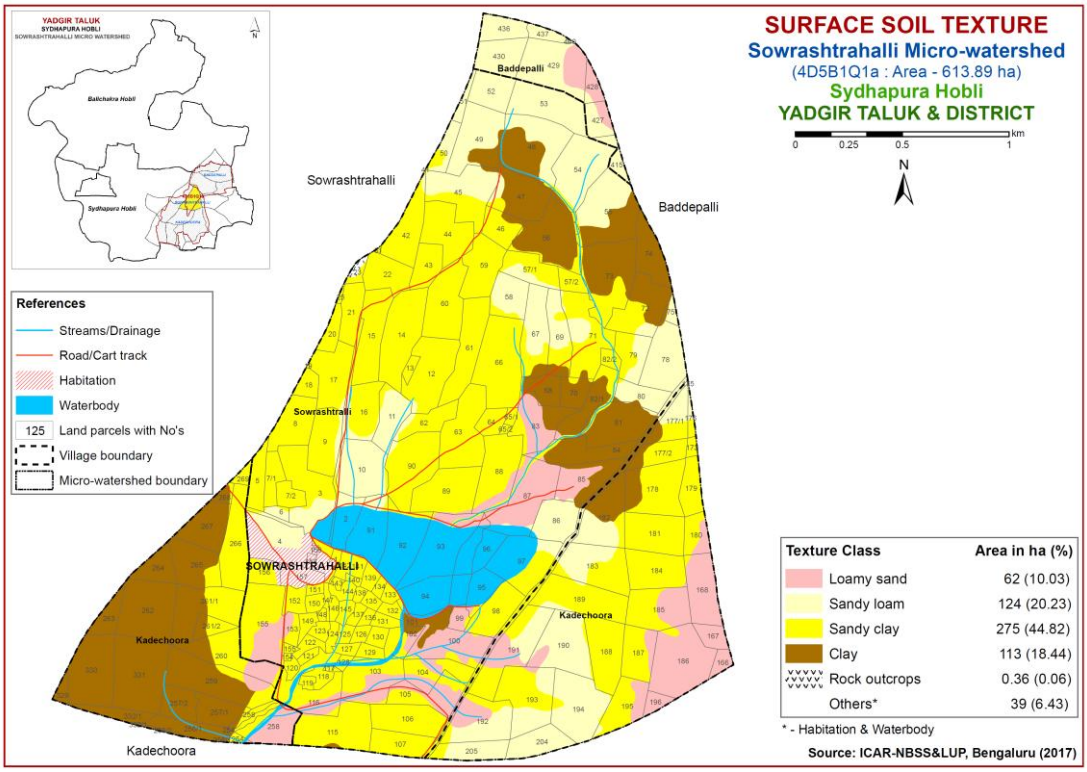



Fig. 5.3 Surface Soil Texture map of Sowrashtrahalli Microwatershed

## 5.4 Soil Gravelliness

Gravel is the term used for describing coarse fragments between 2 mm and 7.5 cm diameter and stones for those between 7.5 cm and 25 cm. The presence of gravel and stones in the 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 geographical distribution in the microwatershed is shown in Figure 5.4.

Entire area of 574 ha (94%) has soils that are non gravelly (<15%) and are distributed in all parts of the microwatershed.

The most productive lands with respect to gravelliness are found to be 94 per cent. They are non gravelly (<15%) and have potential for growing all annual and perennial crops.

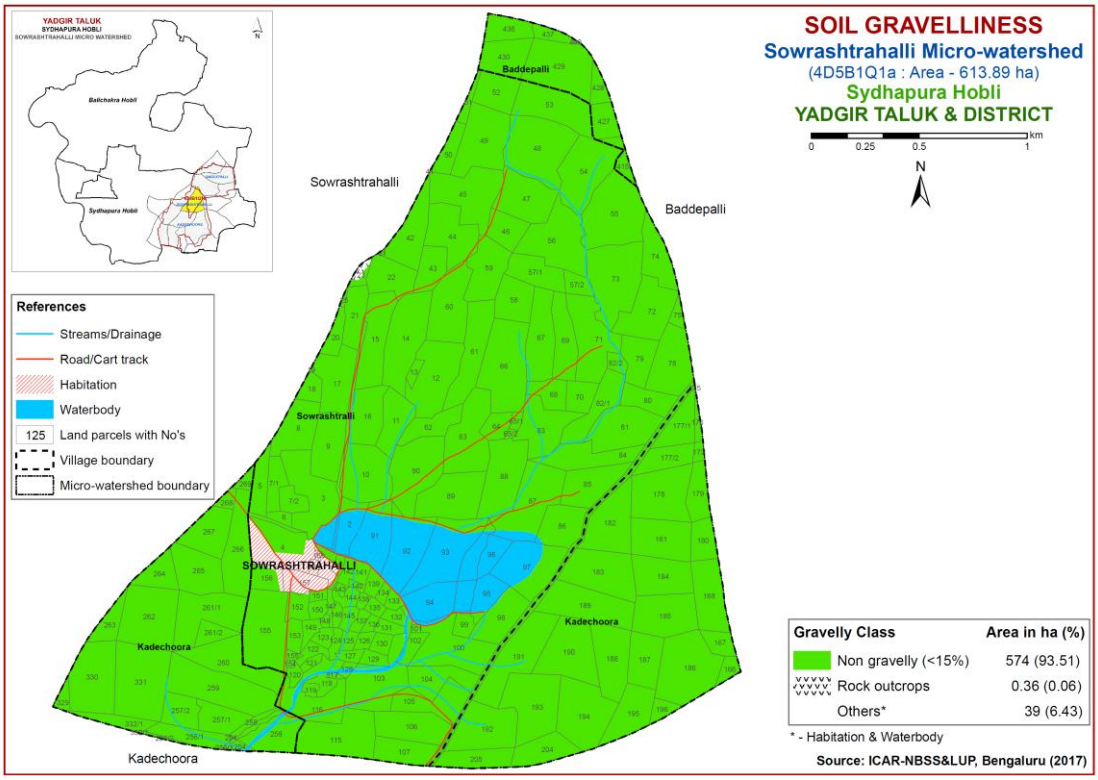



Fig. 5.4 Soil Gravelliness map of Sowrashtrahalli Microwatershed

## 5.5 Available Water Capacity

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

Major area of about 161 ha (26%) has soils that are very low (<50 mm/m) in available water capacity and are distributed in the southeastern, central, western, southern and southwestern part of the microwatershed. An area of about 144 ha (24%) has soils that are low (51-100 mm/m) in available water capacity and are distributed in the northern, central, eastern and southern part of the microwatershed. An area of 63 ha (10%) in the microwatershed has soils that are medium (101-150 mm/m) in available water capacity and are distributed in the northern, southeastern, western and southwestern

part of the microwatershed. The available water capacity is very high in an area of 205 ha (33%) and are distributed in the major part of the microwatershed.

Maximum area of 161 ha (26%) in the microwatershed has soils that are problematic with regard to available water capacity. Here, only the short or medium duration crops can be grown and the probability of crop failure is very high. These areas are best put to other alternative uses. The potential soils with respect to AWC cover about 205 ha (33%) that have very high AWC, where all climatically adapted long duration crops can be grown.

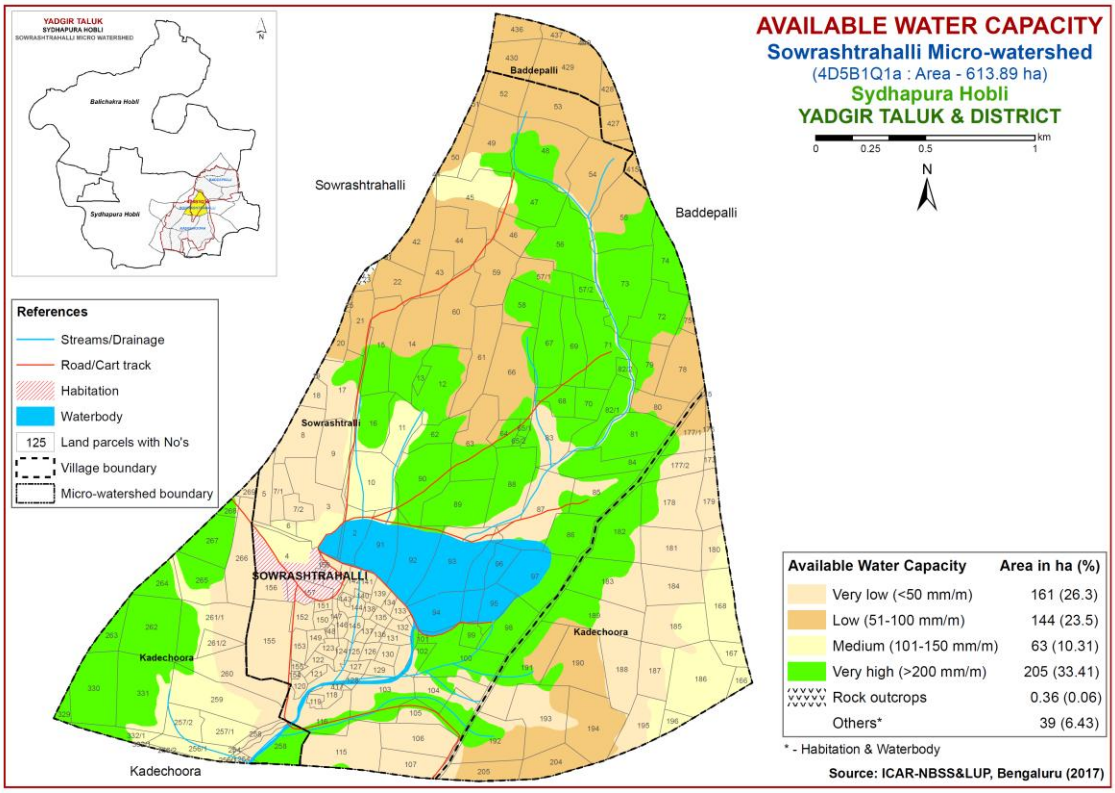



Fig. 5.5 Soil Available Water Capacity map of Sowrashtrahalli Microwatershed

## 5.6 Soil Slope

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

Entire area in the microwatershed falls under very gently sloping (1-3%) slope lands and is distributed in all parts of the microwatershed.

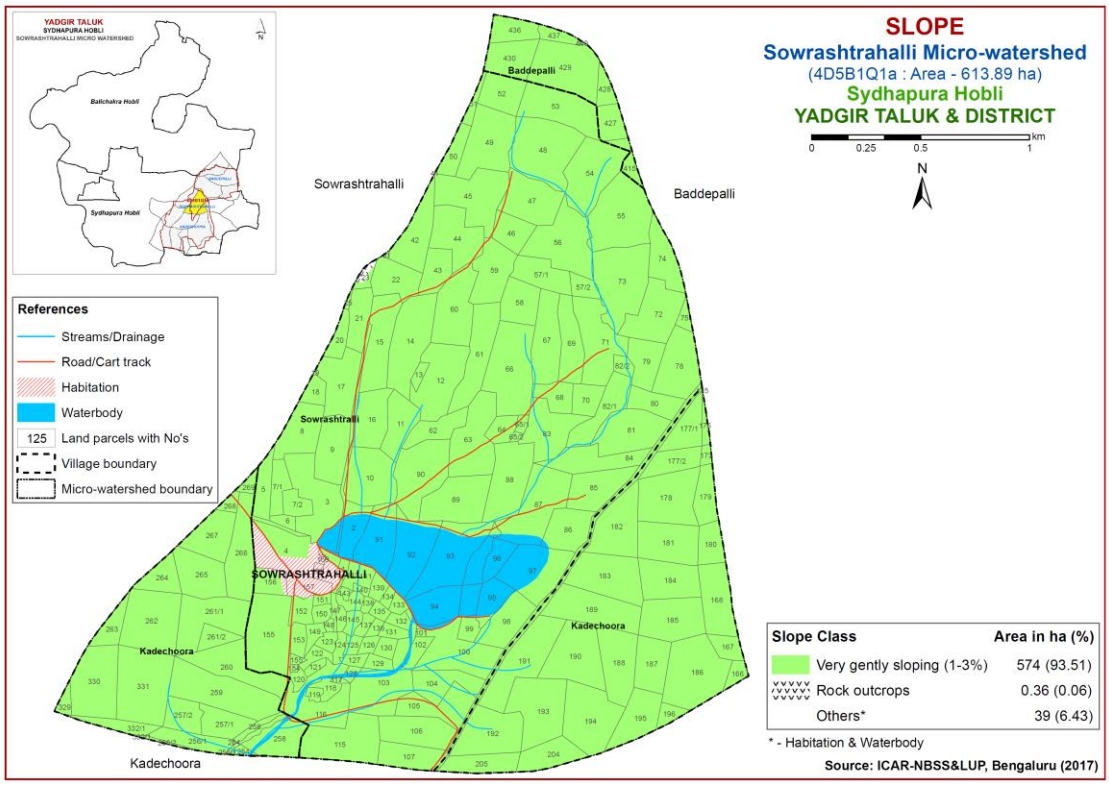



Fig. 5.6 Soil Slope map of Sowrashtrahalli Microwatershed

## 5.7 Soil Erosion

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

Soils that are moderately eroded (e2 class) cover maximum area of 553 ha (90%) of the microwatershed. An area of about 21 ha (3%) is under severe erosion (e4 class) and are distributed in the central and southern part of the microwatershed. Entire area of the microwatershed needs soil and water conservation and other land development measures for restoring the soil health.

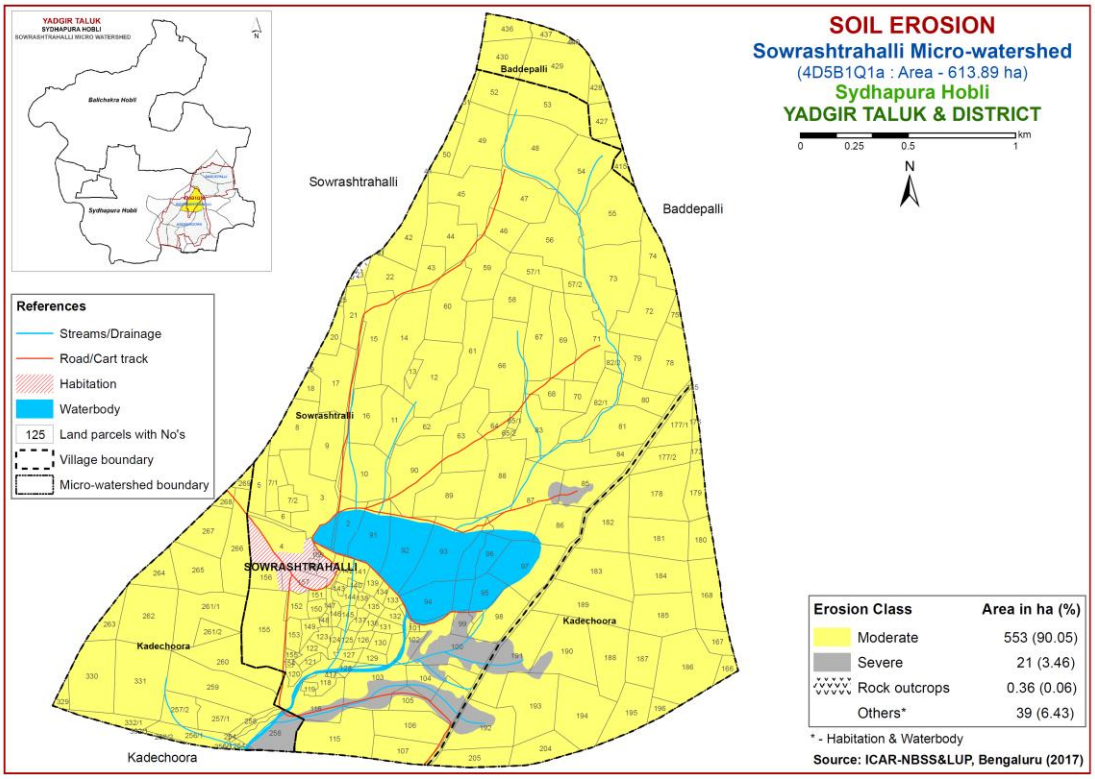



Fig. 5.7 Soil Erosion map of Sowrashtrahalli Microwatershed

*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, 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 fertility analysis of the Sowrashtrahalli microwatershed for soil reaction (pH) showed that an area of 26 ha (4%) is very strongly alkaline (pH >9.0) and is distributed in the southern and northeastern part of the microwatershed. An area of 160 ha (26%) is strongly alkaline (pH 8.4-9.0) and is distributed in the southern, southwestern, central and northeastern part of the microwatershed. Maximum area of 246 ha (40%) is moderately alkaline (pH 7.8-8.4) in reaction and is distributed in the major part of the microwatershed (Fig. 6.1). Slightly alkaline (pH 7.3-7.8) is around 80 ha (13%) area and is distributed in the southeastern, northern and northwestern part of the microwatershed. An area of about 61 ha (10%) is neutral (pH 6.5-7.3) and is distributed in the southeastern and northwestern part of the microwatershed. A minor area of about 0.48 ha (<1%) is slightly acid (pH 6.0-6.5) and is distributed in the southeastern part of the microwatershed. Thus, major soils in the microwatershed are alkaline in reaction.

## 6.2 Electrical Conductivity (EC)

The Electrical Conductivity of the soils is under non-saline (<2 dS $m^{-1}$) in a major area of about 527 ha (86%) and an area of 47 ha (8%) is under low (2-4 dS $m^{-1}$) is distributed in the southern part of the microwatershed (Fig. 6.2).

## 6.3 Organic Carbon

The soil organic carbon content (an index of available nitrogen) (Fig. 6.3) of the soils in the microwatershed is high (>0.75%) in an area of 337 ha (55%) and are distributed in the northern, southwestern and southeastern part of the microwatershed. Medium (0.5-

0.75%) in organic carbon content cover an area of 237 ha (39%) and is distributed in the central, eastern, western and southern part of the microwatershed.

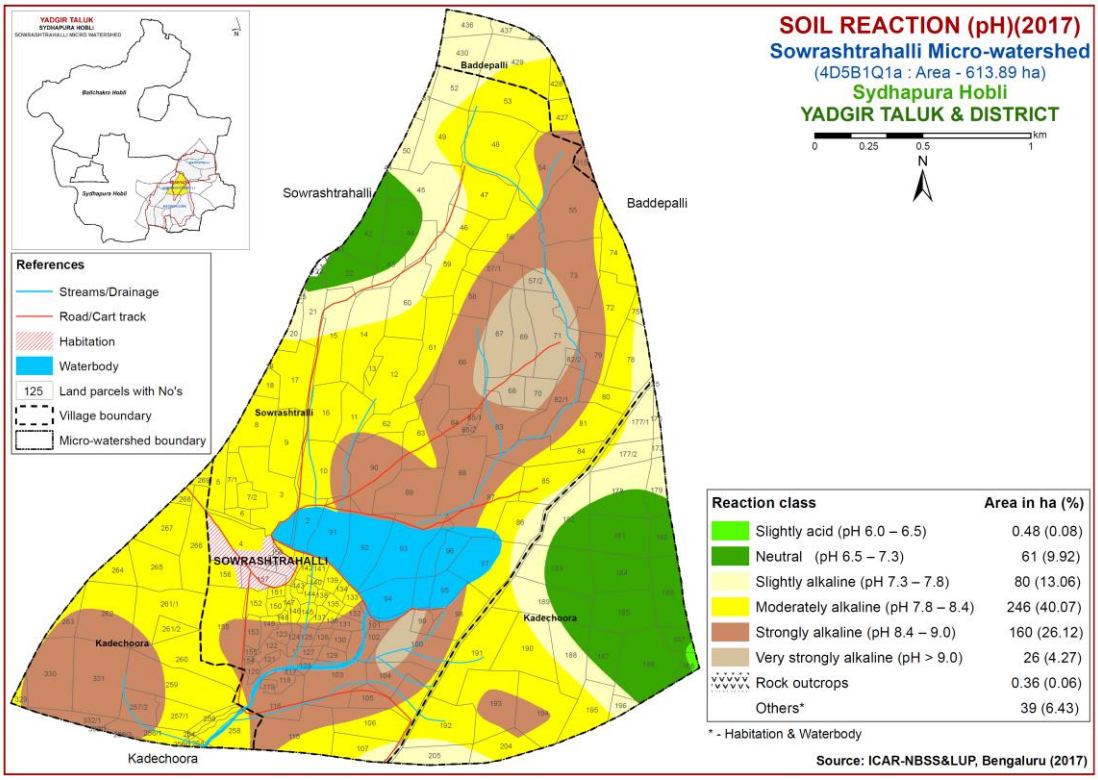



Fig.6.1 Soil Reaction (pH) map of Sowrashtrahalli Microwatershed

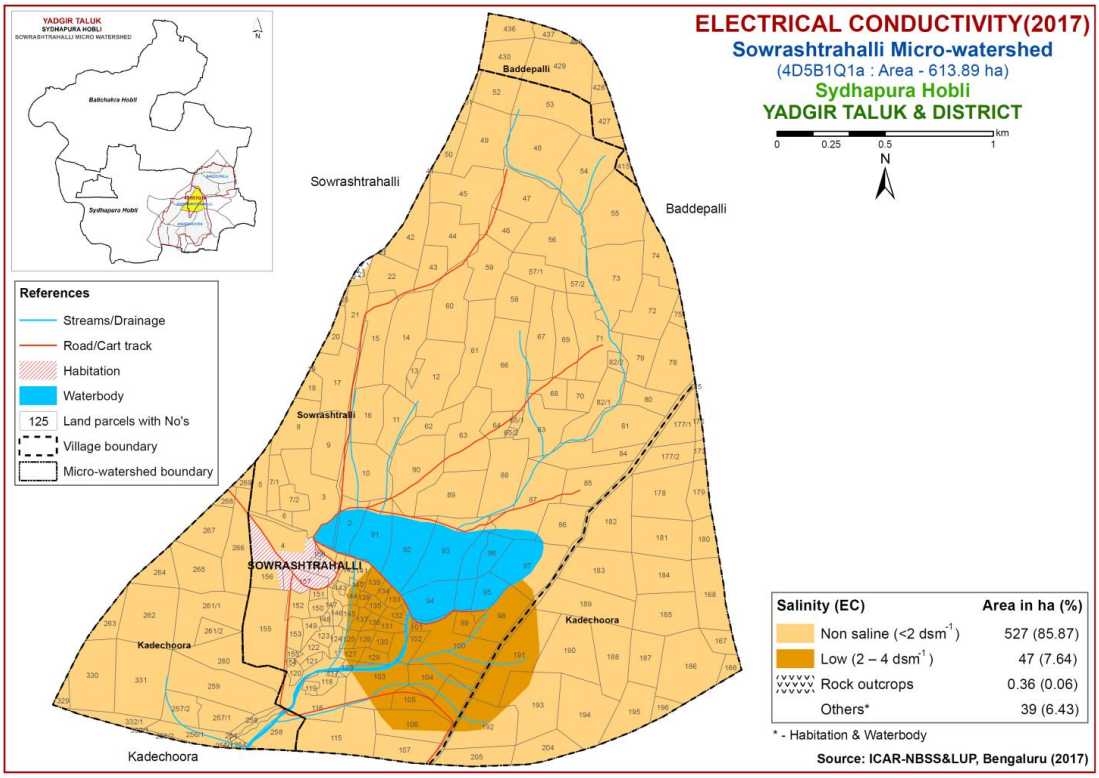



Fig.6.2 Electrical Conductivity (EC) map of Sowrashtrahalli Microwatershed

### 6.4 Available Phosphorus

The soil fertility analysis revealed that available phosphorus (Fig. 6.4) is medium (23-57 kg/ha) in an area of 374 ha (61%) and is distributed in the major part of the microwatershed. An area of about 200 ha (33%) is low (<23 kg/ha) in available phosphorus and is distributed in the northwestern, southern, western and southeastern part of the microwatershed. There is an urgent need to increase the dose of phosphorous in soils that are low and medium for all the crops by 25 per cent over the recommended dose to realize better crop performance.

### 6.5 Available Potassium

Available potassium content (Fig. 6.5) is medium (145-337 kg/ha) in area of 124 ha (20%) and are distributed in the southeastern and southwestern part of the microwatershed. An area of about 451 ha (73%) is high (>337 kg/ha) and is distributed in the major part of the microwatershed.

### 6.6 Available Sulphur

Soils that are low in available sulphur content cover an area of 156 (25%) and is distributed in the western, southwestern and southeastern part of the microwatershed. Medium (10-20 ppm) in an area of about 253 ha (41%) and is distributed in the major part of the microwatershed. Available sulphur is high (>20 ppm) in an area of 165 ha (27%) and is distributed in the northeastern and southern part of the microwatershed (Fig. 6.6). The areas that are low and medium in available sulphur need to be applied with magnesium sulphate or gypsum or factomphos (p) fertilizer (13% sulphur) for 2-3 years for the deficiency to be corrected.

### 6.7 Available Boron

Available boron content (Fig. 6.7) is low (<0.5 ppm) in an area of 134 ha (22%) and is distributed in the northwestern, southwestern and eastern part of the microwatershed. Maximum area of about 246 ha (40%) is medium (0.5-1.0 ppm) and is distributed in the major part of microwatershed. An area of about 194 ha (32%) is high (>1.0 ppm) in available boron and are distributed in the central and southern part of microwatershed.

### 6.8 Available Iron

Available iron content is sufficient (>4.5 ppm) in a maximum area of about 500 ha (82%) and is distributed in the major part of the microwatershed. It is deficient (<4.5 ppm) in an area of about 74 ha (12%) and is distributed in the southwestern and southern part of the microwatershed (Fig. 6.8).

### 6.9 Available Manganese

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

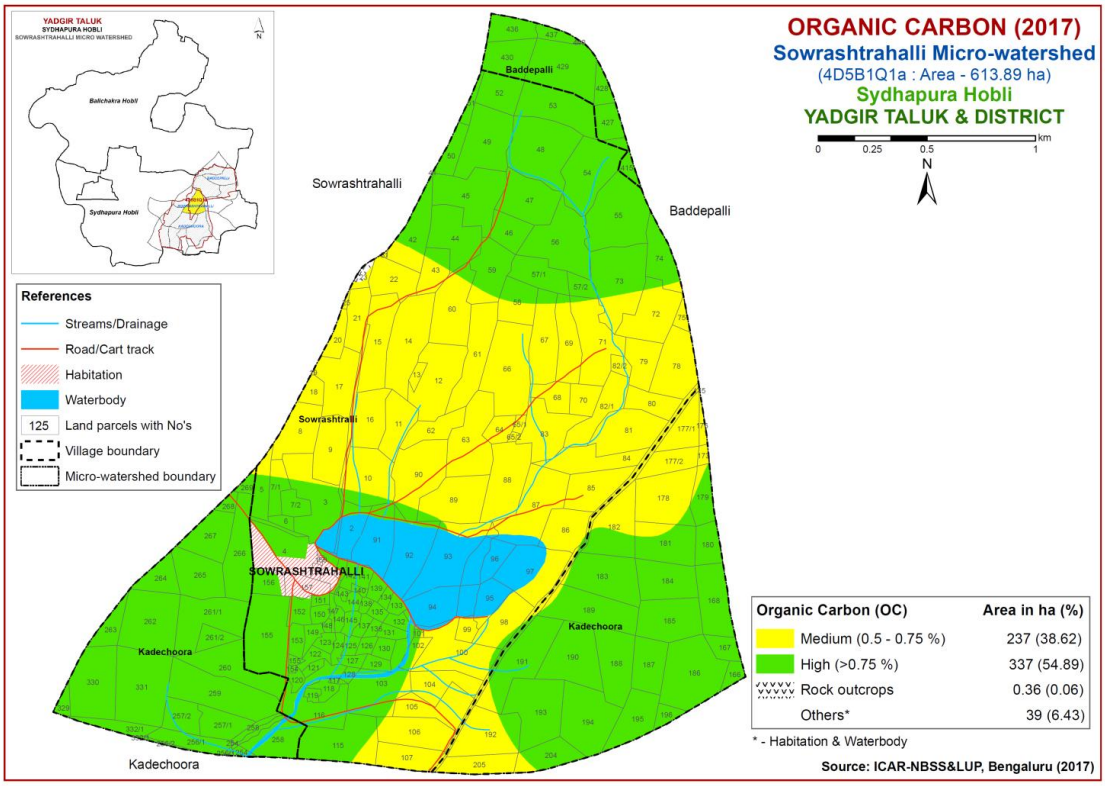



Fig.6.3 Soil Organic Carbon map of Sowrashtrahalli Microwatershed

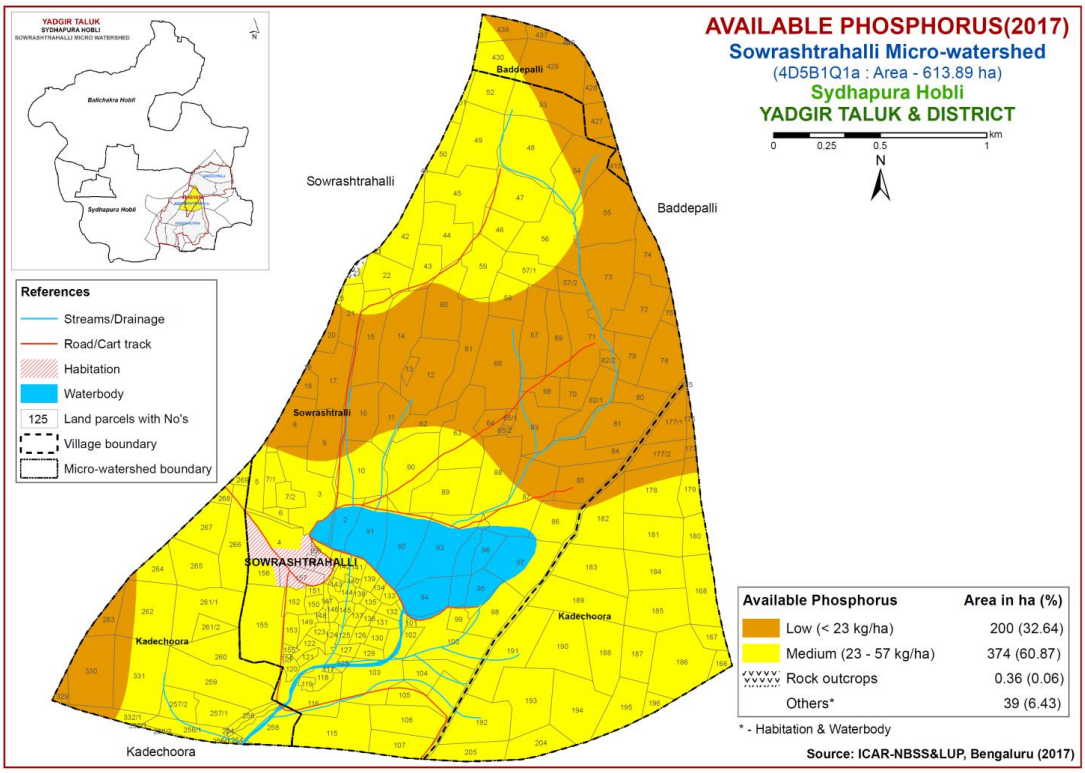



Fig.6.4 Soil available Phosphorus map of Sowrashtrahalli Microwatershed

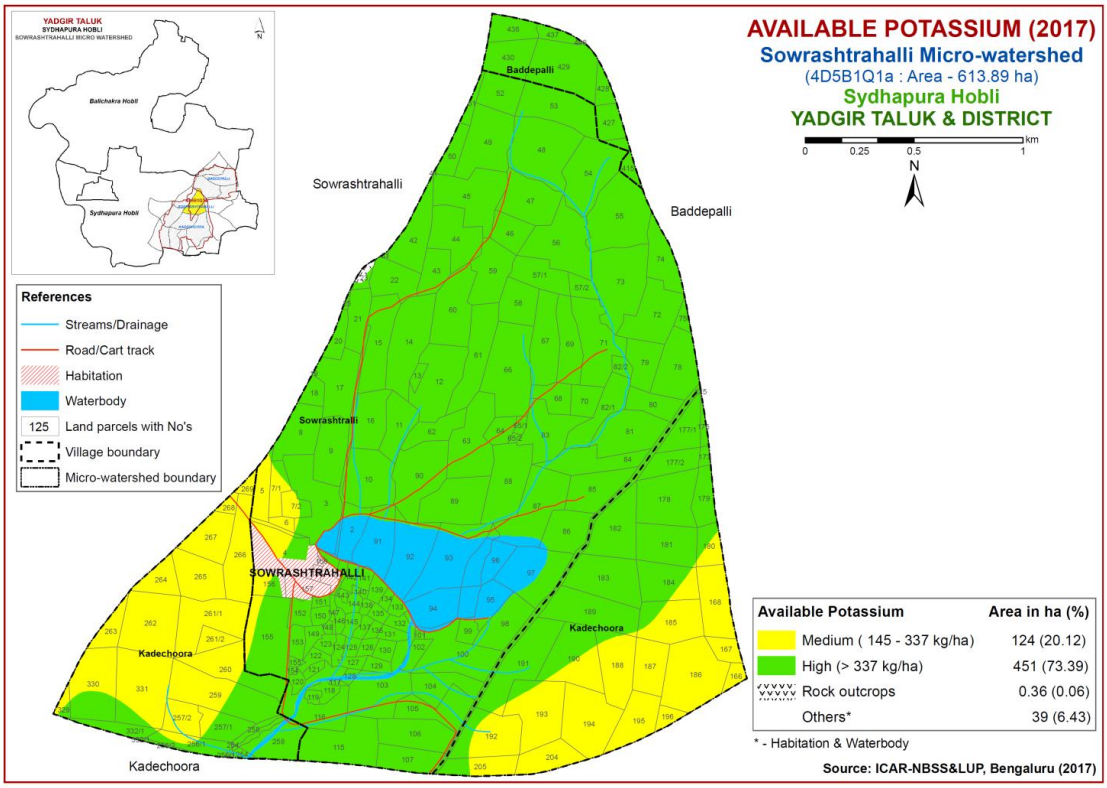



Fig. 6.5 Soil available Potassium map of Sowrashtrahalli Microwatershed

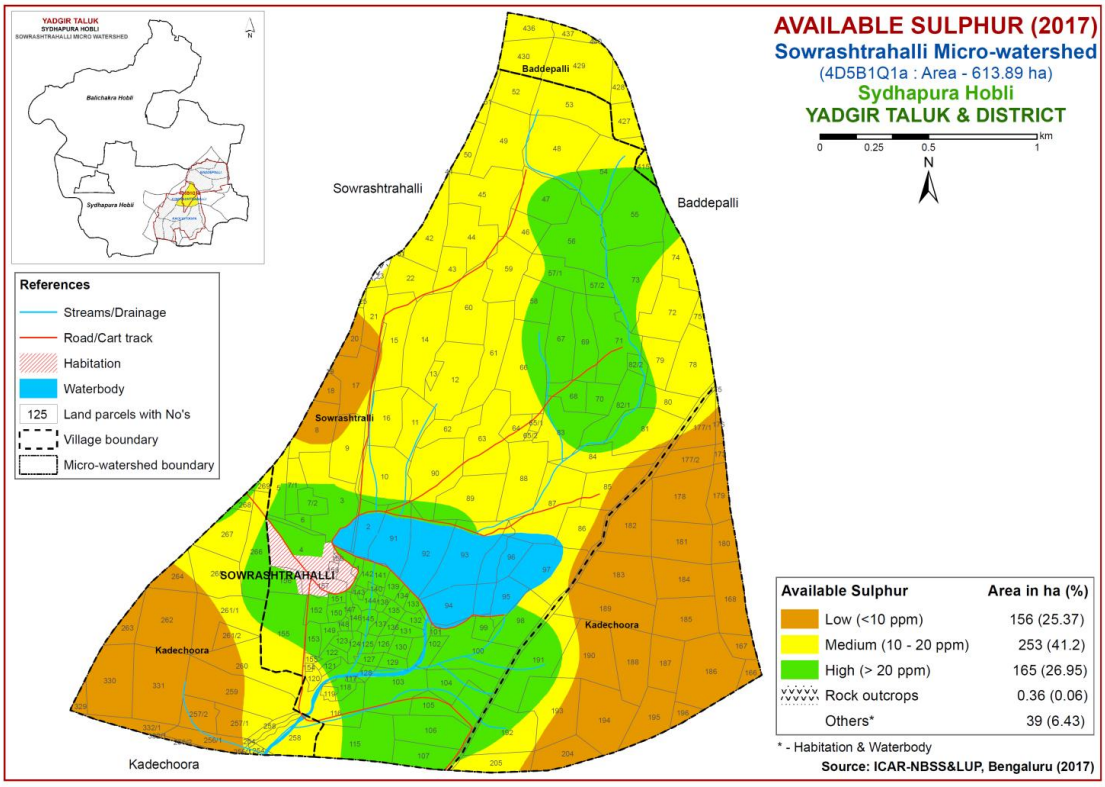



Fig. 6.6 Soil available Sulphur map of Sowrashtrahalli Microwatershed

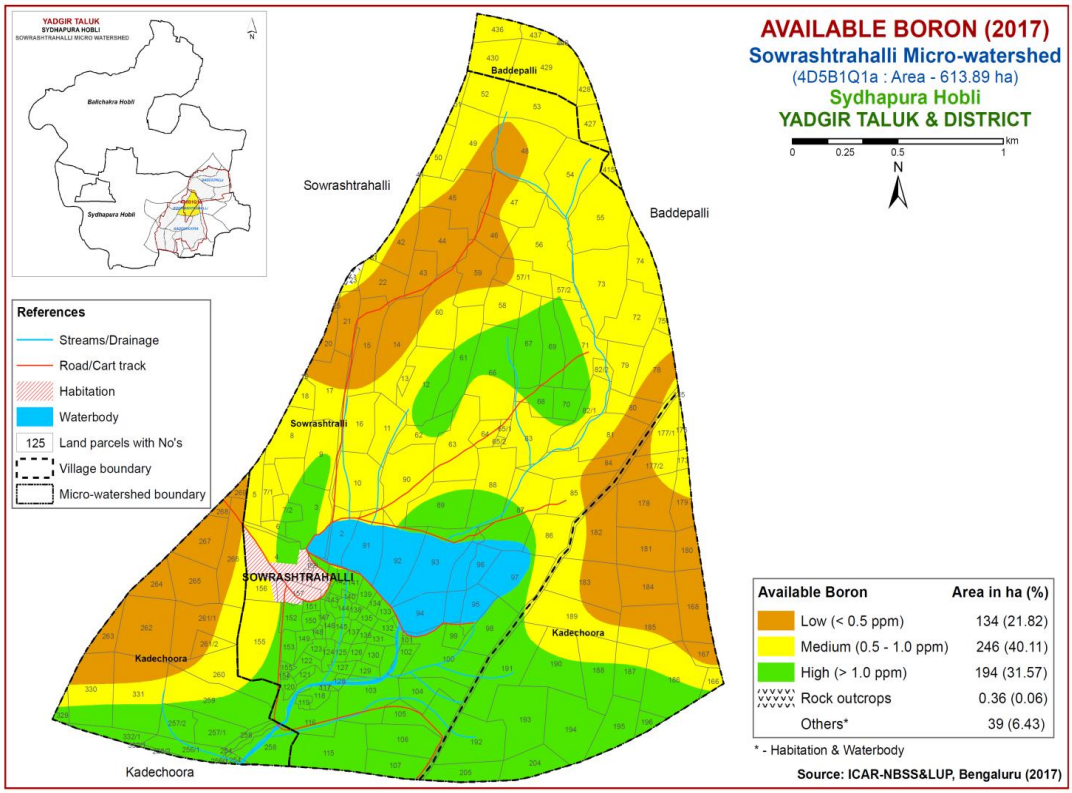



Fig. 6.7 Soil available Boron map of Sowrashtrahalli Microwatershed

## 6.10 Available Copper

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

## 6.11 Available Zinc

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

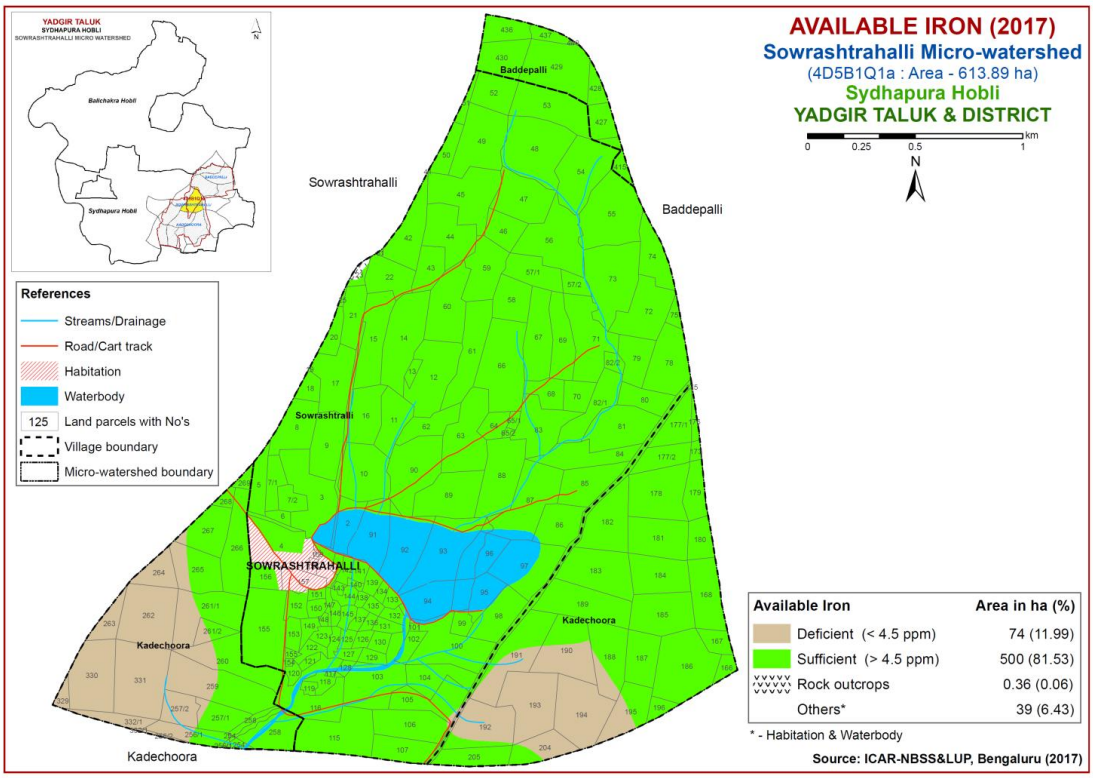



Fig. 6.8 Soil available Iron map of Sowrashtrahalli Microwatershed

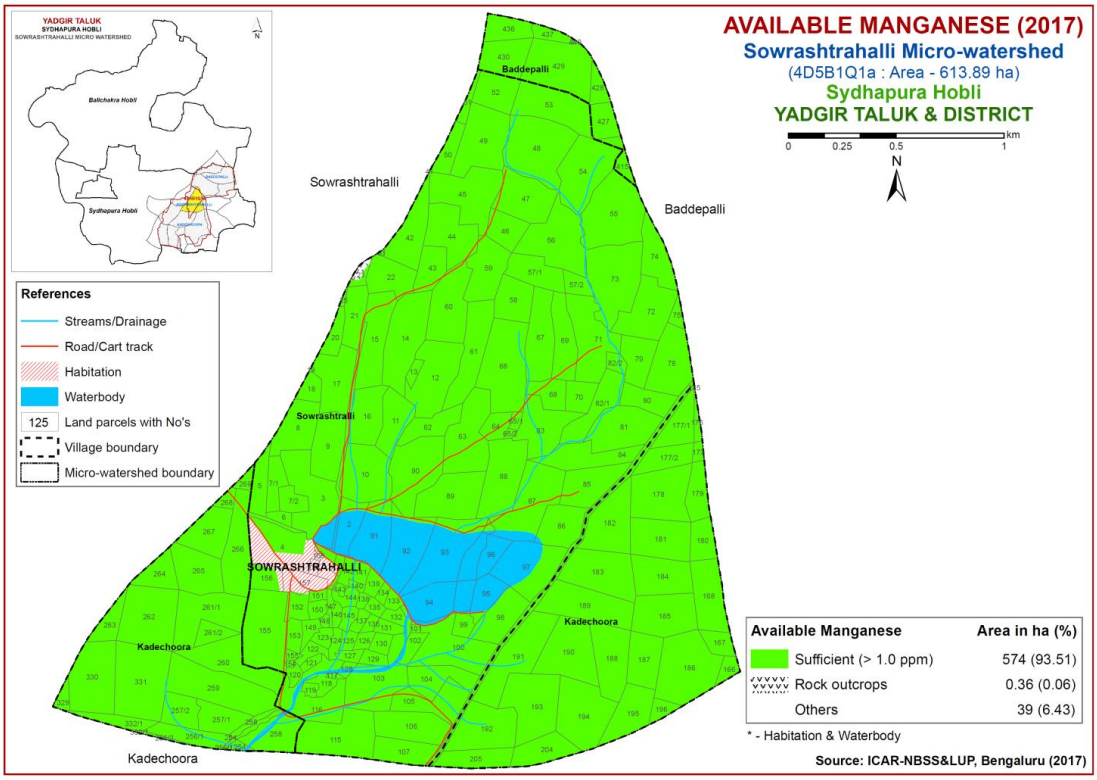



Fig. 6.9 Soil available Manganese map of Sowrashtrahalli Microwatershed

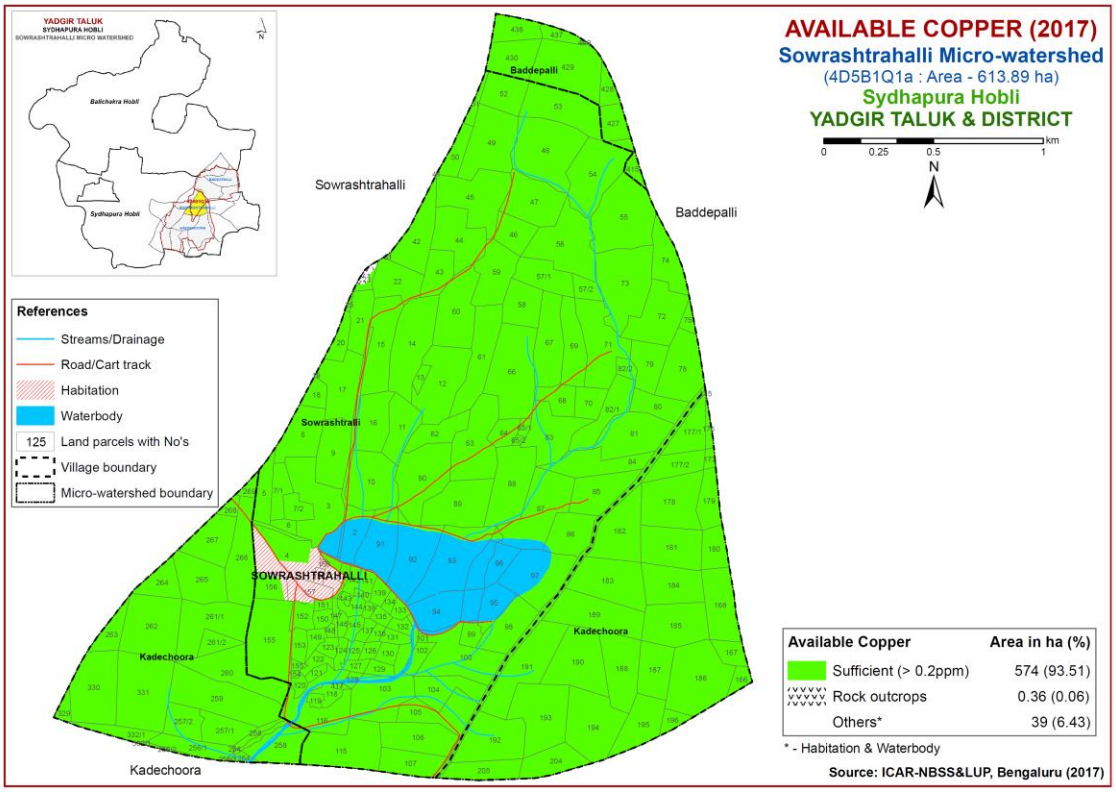



Fig. 6.10 Soil available Copper map of Sowrashtrahalli Microwatershed

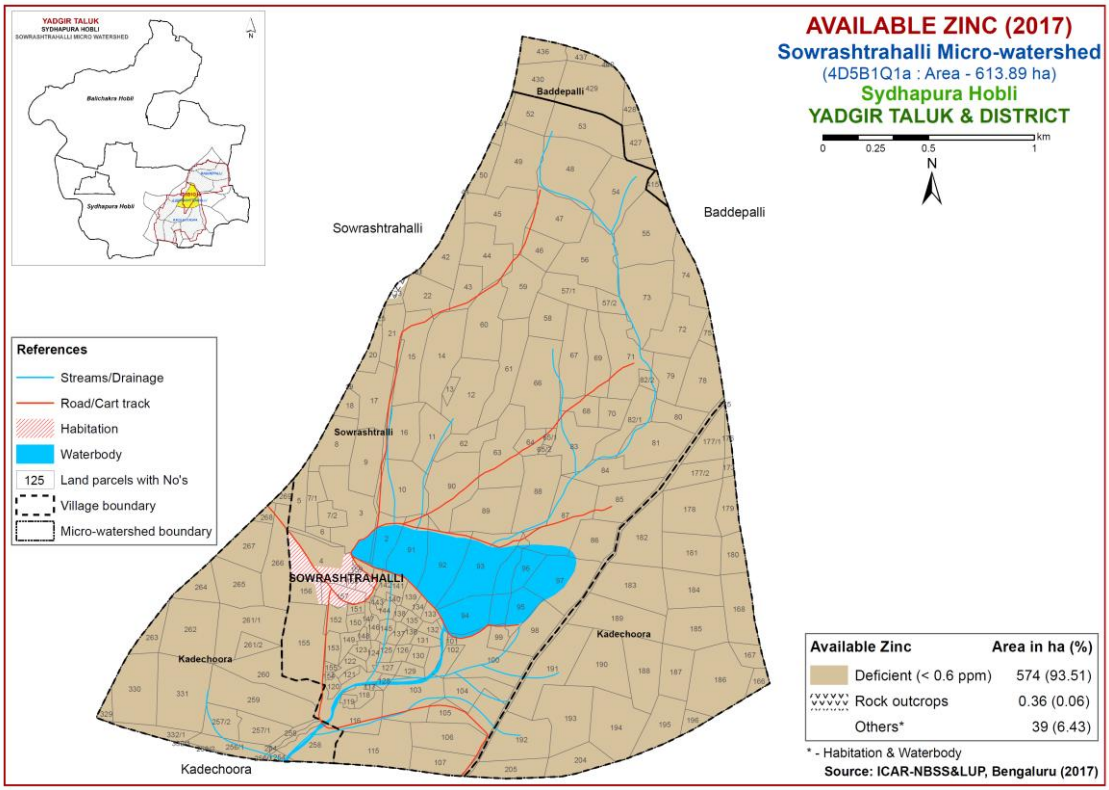



Fig. 6.11 Soil available Zinc map of Sowrashtrahalli Microwatershed

*Chapter 7*

# LAND SUITABILITY FOR MAJOR CROPS

The soil and land resource units (soil phases) of Sowrashtrahalli 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 crop requirements were matched with the soil and land characteristics (Table 7.1) to arrive at the crop suitability. 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, 'z' for calcareousness 's' for sodium and 'w' for drainage. These limitations are indicated as lower case letters to the class symbol. For example, moderately suitable land with the limitations of soil depth and erosion is 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 26 major agricultural and horticultural crops grown in the state 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 crop grown in an area of 10.47 lakh ha of northern Karnataka in Bijapur, Kalaburgi, Raichur, Bidar, Belgaum, Dharwad and Bellary 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.

**Table 7.1 Soil-Site Characteristics of Sowrashtrahalli Microwatershed**

| Soil Map Units | Climate (P) (mm) | Growing period (Days) | Drainage class | Soil depth (cm) | Soil texture | | Gravelliness | | AWC (mm/m) | Slope (%) | Erosion | pH | EC | ESP | CEC [Cmol ($p^+$) $kg^{-1}$] | BS (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Surf-ace | Sub-surface | Sur-face (%) | Sub-surface (%) | | | | | | | | |
| BDLbB2 | 866 | 120-150 | WD | 25-50 | ls | sl | - | - | <50 | 1-3 | Moderate | 6.20 | 0.07 | 0.20 | 4.20 | 93 |
| BDLiB2 | 866 | 120-150 | WD | 25-50 | sc | sl | - | - | <50 | 1-3 | Moderate | 6.20 | 0.07 | 0.20 | 4.20 | 93 |
| HLGiB2 | 866 | 120-150 | MWD | 50-75 | sc | scl | - | - | 51-100 | 1-3 | Moderate | 8.49 | 0.18 | 0.69 | 8.80 | 100 |
| JNKcB2 | 866 | 120-150 | WD | 50-75 | sl | scl | - | - | 51-100 | 1-3 | Moderate | 8.42 | 0.14 | 0.18 | 14.50 | 100 |
| BLCcB2 | 866 | 120-150 | WD | 75-100 | sl | scl | - | - | 101-150 | 1-3 | Severe | 6.75 | 1.31 | 16.80 | 16.80 | 95 |
| BLCiB2 | 866 | 120-150 | WD | 75-100 | sc | scl | - | - | 101-150 | 1-3 | Slight | 6.75 | 1.31 | 16.80 | 16.80 | 95 |
| PGPiB2 | 866 | 120-150 | WD | 75-100 | sc | sc | - | - | 101-150 | 1-3 | Moderate | 6.83 | 2.83 | 3.15 | 3.15 | 100 |
| BGDbB2 | 866 | 120-150 | WD | 100-150 | ls | c | - | - | >200 | 1-3 | Moderate | 7.85 | 0.25 | 0.26 | 65.90 | 100 |
| ANRbB3 | 866 | 120-150 | MWD | 100-150 | ls | c | - | - | >200 | 1-3 | Severe | 10.17 | 0.36 | 17.70 | 19.90 | 100 |
| ANRiB2 | 866 | 120-150 | MWD | 100-150 | sc | c | - | - | >200 | 1-3 | Moderate | 10.17 | 0.36 | 17.70 | 19.90 | 100 |
| DSBiB2 | 866 | 120-150 | WD | 25-50 | sc | g c | - | 35-60 | <50 | 1-3 | Moderate | 5.93 | 0.04 | 0.14 | 3.60 | 73 |
| HSLbB2 | 866 | 120-150 | WD | 75-100 | ls | sc | - | - | 101-150 | 1-3 | Moderate | 7.16 | 0.11 | 5.94 | 4.90 | 97 |
| RMPcB2 | 866 | 120-150 | MWD | 50-75 | sl | scl | - | - | 101-150 | 1-3 | Moderate | 5.97 | 0.04 | 0.77 | 1.70 | 56 |
| RHNmB2 | 866 | 120-150 | MWD | 75-100 | c | scl | - | - | 101-150 | 1-3 | Severe | 8.16 | 0.22 | 8.81 | 8.99 | 99 |
| KDRiB2 | 866 | 120-150 | MWD | 100-150 | sc | c | - | - | >200 | 1-3 | Moderate | 8.34 | 0.15 | 0.22 | 33.20 | 100 |
| KDRmB2 | 866 | 120-150 | MWD | 100-150 | c | c | - | - | >200 | 1-3 | Moderate | 8.34 | 0.15 | 0.22 | 33.20 | 100 |
| SWRcB2 | 866 | 120-150 | MWD | 100-150 | sl | c | - | - | >200 | 1-3 | Moderate | 8.44 | 0.18 | 0.45 | 47.70 | 100 |
| SWRmB2 | 866 | 120-150 | MWD | 100-150 | c | c | - | - | >200 | 1-3 | Moderate | 8.44 | 0.18 | 0.45 | 47.70 | 100 |
| HGNmB2 | 866 | 120-150 | MWD | >150 | c | c | - | - | >200 | 1-3 | Moderate | 8.77 | 1.33 | 14.38 | 36.23 | 100 |

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

A small area of 12 ha (2%) is highly suitable (Class S1) for growing sorghum and are distributed in the western part of the microwatershed. Maximum area of about 380 ha (62%) is moderately suitable (Class S2) and are distributed in the major part of the microwatershed. They have minor limitations of drainage, calcareousness, texture and rooting condition. Marginally suitable lands (Class S3) occupy an area of 181 ha (30%) and are distributed in the southern, central, western and southeastern part of the microwatershed. They have moderate limitations of rooting condition, texture, rooting condition and gravelliness.

**Table 7.2 Crop suitability criteria for Sorghum**

| Crop requirement | | Rating | | | |
|---|---|---|---|---|---|
| **Soil –site characteristics** | **Unit** | **Highly suitable (S1)** | **Moderately suitable (S2)** | **Marginally suitable (S3)** | **Not suitable(N)** |
| Slope | % | 2-3 | 3-8 | 8-15 | >15 |
| LGP | Days | 120-150 | 120-90 | <90 | |
| Soil drainage | class | Well to mod. drained | imperfect | Poorly/ excessively | V. poorly |
| Soil reaction | pH | 6.0-8.0 | 5.5-5.9,8.1-8.5 | <5.5,8.6-9.0 | >9.0 |
| Surface soil texture | Class | c, cl, sicl, sc | l, sil, sic | sl, ls | s,fragmental skeletal |
| Soil depth | cm | 100-75 | 50-75 | 30-50 | <30 |
| Gravel content | % vol. | 5-15 | 15-30 | 30-60 | >60 |
| Salinity (EC) | dS $m^{-1}$ | 2-4 | 4-8 | 8-10 | >10 |
| Sodicity (ESP) | % | 5-8 | 8-10 | 10-15 | >15 |

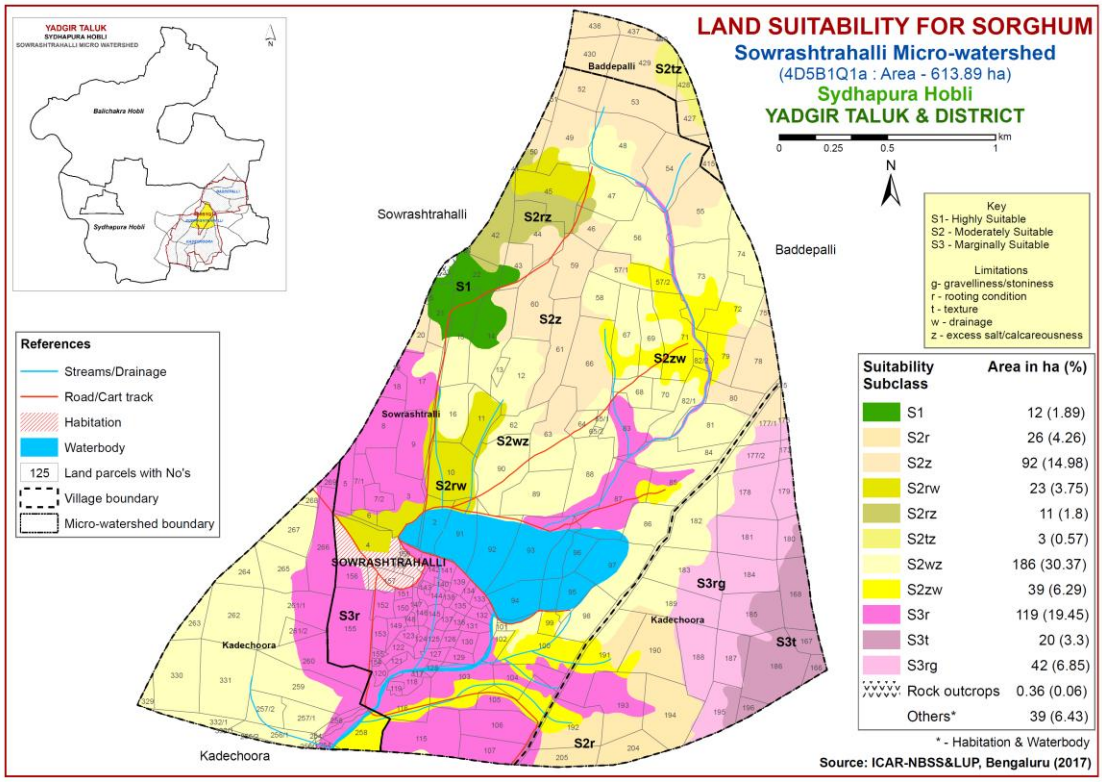



Fig. 7.1 Land Suitability map of Sorghum

### 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 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.

In Sowrashtrahalli microwatershed, an area of 12 ha (2%) is highly (Class S1) suitable for growing maize and are distributed in the western part of the microwatershed. An area of about 129 ha (21%) is moderately suitable (Class S2) and are distributed in the northern, eastern, western and southern part of the microwatershed. They have minor limitations of texture, calcareousness and rooting condition. Marginally suitable lands (Class S3) occupy maximum area of 432 ha (71%) and are distributed in all parts of the microwatershed. They have moderate limitations of texture, drainage, rooting condition, gravelliness and calcareousness.

**Table 7.3 Crop suitability criteria for Maize**

| **Crop requirement** | | **Rating** | | | |
|---|---|---|---|---|---|
| **Soil –site characteristics** | **Unit** | **Highly suitable (S1)** | **Moderately suitable(S2)** | **Marginally suitable (S3)** | **Not suitable(N)** |
| Slope | % | <3 | 3.5 | 5-8 | |
| LGP | Days | >100 | 100-80 | 60-80 | |
| Soil drainage | class | Well drained | Mod. to imperfectly | Poorly/excessively | V. poorly |
| Soil reaction | pH | 5.5-7.5 | 7.6-8.5 | 8.6-9.0 | |
| Surface soil texture | Class | l, cl, scl, sil | sl, sicl, sic | c(s-s), ls | s,fragmental |
| Soil depth | cm | >75 | 50-75 | 25-50 | <25 |
| Gravel content | %vol. | <15 | 15-35 | 35-50 | >50 |
| Salinity (EC) | $dSm^{-1}$ | <1.0 | 1.0-2.0 | 2.0-4.0 | |
| Sodicity (ESP) | % | <10 | 10-15 | >15 | |

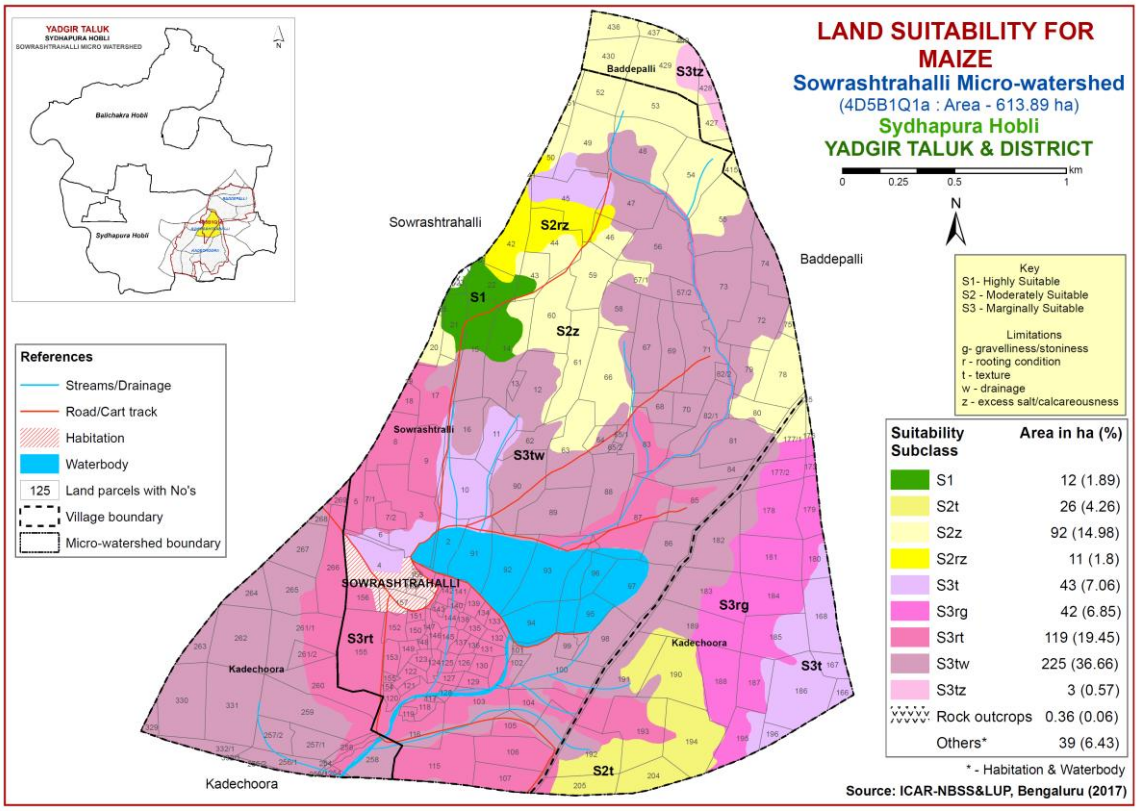



Fig. 7.2 Land Suitability map of Maize

### 7.3 Land Suitability for Red gram (*Cajanus cajan*)

Red gram is one of the major pulse crop grown in an area of 7.28 lakh ha mainly in northern Karnataka in Bijapur, Kalaburgi, Raichur, Bidar, Belgaum, Dharwad and Bellary districts. The crop requirements for growing red gram (Table 7.4) were matched with the soil-site characteristics (Table 7.1) of the soils of the microwatershed and a land suitability map for growing red gram was generated. The area extent and their geographic distribution of different suitability subclasses in the microwatershed is given in Figure 7.3.

There are no lands that are highly (Class S1) suitable for growing red gram in Sowrashtrahalli microwatershed. Maximum area of about 332 ha (54%) is moderately suitable (Class S2) and are distributed in the major part of the microwatershed. They have minor limitations of texture, rooting condition, calcareousness and drainage. An area of 241 ha (39%) is marginally suitable (Class S3) and are distributed in the western, northwestern, central, southern and southeastern part of the microwatershed. They have moderate limitations of rooting condition, gravelliness, texture, drainage and calcareousness.

**Table 7.4 Crop suitability criteria for Red gram**

| Crop requirement | | Rating | | | |
|---|---|---|---|---|---|
| **Soil–site characteristics** | **Unit** | **Highly suitable(S1)** | **Moderately suitable(S2)** | **Marginally suitable(S3)** | **Not suitable(N)** |
| Slope | % | <3 | 3-5 | 5-10 | >10 |
| LGP | Days | >210 | 180-210 | 150-180 | <150 |
| Soil drainage | class | Well drained | Mod. to well drained | Imperfectly drained | Poorly drained |
| Soil reaction | pH | 6.5-7.5 | 5.0-6.5,7.6-8.0 | 8.0-9.0 | >9.0 |
| Surface soil texture | Class | l,scl,sil,cl, sl | sicl,sic, c(m) | ls | s,fragmental |
| Soil depth | cm | >100 | 85-100 | 40-85 | <40 |
| Gravel content | % vol. | <20 | 20-35 | 35-60 | >60 |
| Salinity (EC) | $dSm^{-1}$ | <1.0 | 1.0-2.0 | >2.0 | |
| Sodicity (ESP) | % | <10 | 10-15 | >15 | |

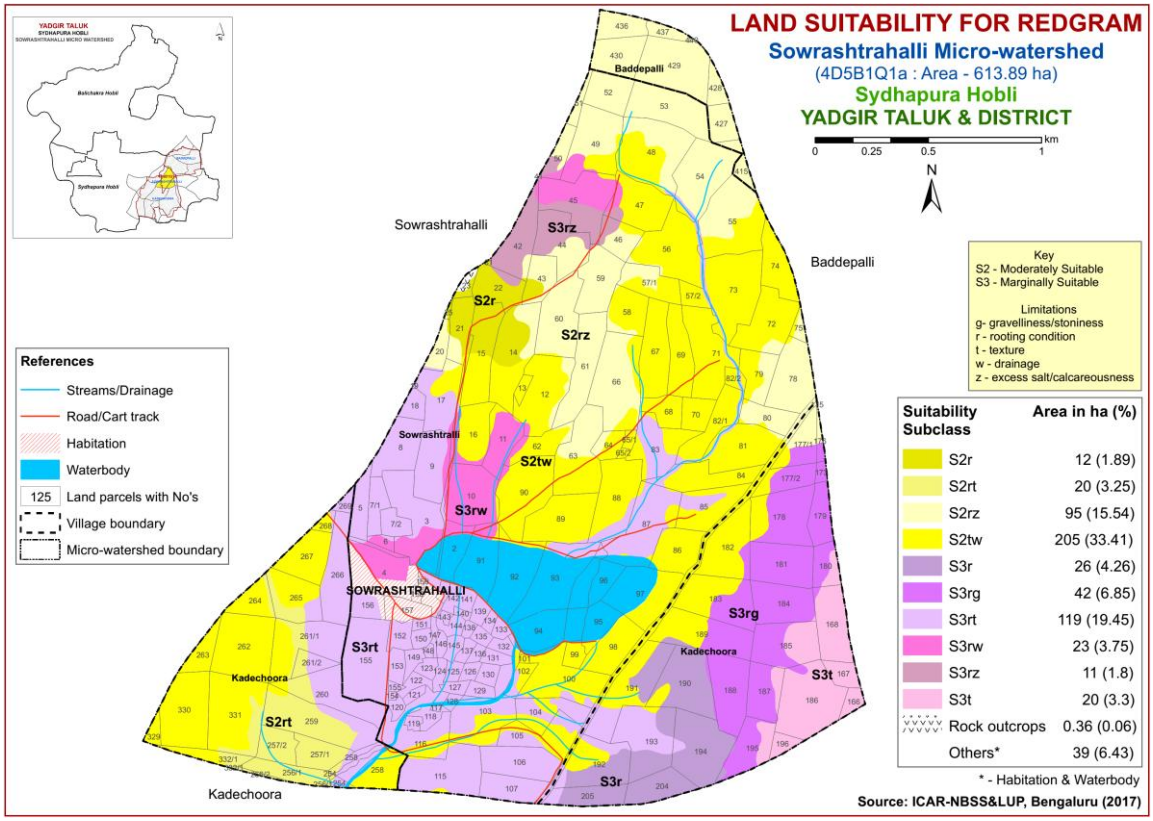



Fig. 7.3 Land Suitability map of Red gram

## 7.4 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 7.5) 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 7.4.

In Sowrashtrahalli microwatershed, a small area of about 12 ha (2%) is highly (Class S1) suitable for growing bajra and are distributed in the western part of the microwatershed. Maximum area of about 377 ha (62%) is moderately suitable (Class S2)

and are distributed in all parts of the microwatershed. They have minor limitations of drainage, texture, calcareousness and rooting condition. Marginally suitable lands (Class S3) occupy an area of 184 ha (30%) and are distributed in the western, northwestern, central, southern and southeastern part of the microwatershed. They have moderate limitations of rooting condition, gravelliness and texture.

**Table 7.5 Crop suitability criteria for Bajra**

| Crop requirement | | Rating | | | |
|---|---|---|---|---|---|
| **Soil –site characteristics** | **Unit** | **Highly suitable(S1)** | **Moderately suitable (S2)** | **Marginally suitable (S3)** | **Not suitable(N)** |
| Slope | % | 2-3 | 3-8 | 8-15 | >15 |
| LGP | Days | 120-150 | 120-90 | <90 | |
| Soil drainage | class | Well to mod. drained | imperfect | Poorly/ excessively | V. poorly |
| Soil reaction | pH | 6.0-8.0 | 5.5-5.9,8.1-8.5 | <5.5,8.6-9.0 | >9.0 |
| Surface soil texture | Class | c, cl, sicl, sc | l, sil, sic | sl, ls | s,fragmental skeletal |
| Soil depth | cm | 100-75 | 50-75 | 30-50 | <30 |
| Gravel content | % vol. | 5-15 | 15-30 | 30-60 | >60 |
| Salinity (EC) | $dSm^{-1}$ | 2-4 | 4-8 | 8-10 | >10 |
| Sodicity (ESP) | % | 5-8 | 8-10 | 10-15 | >15 |

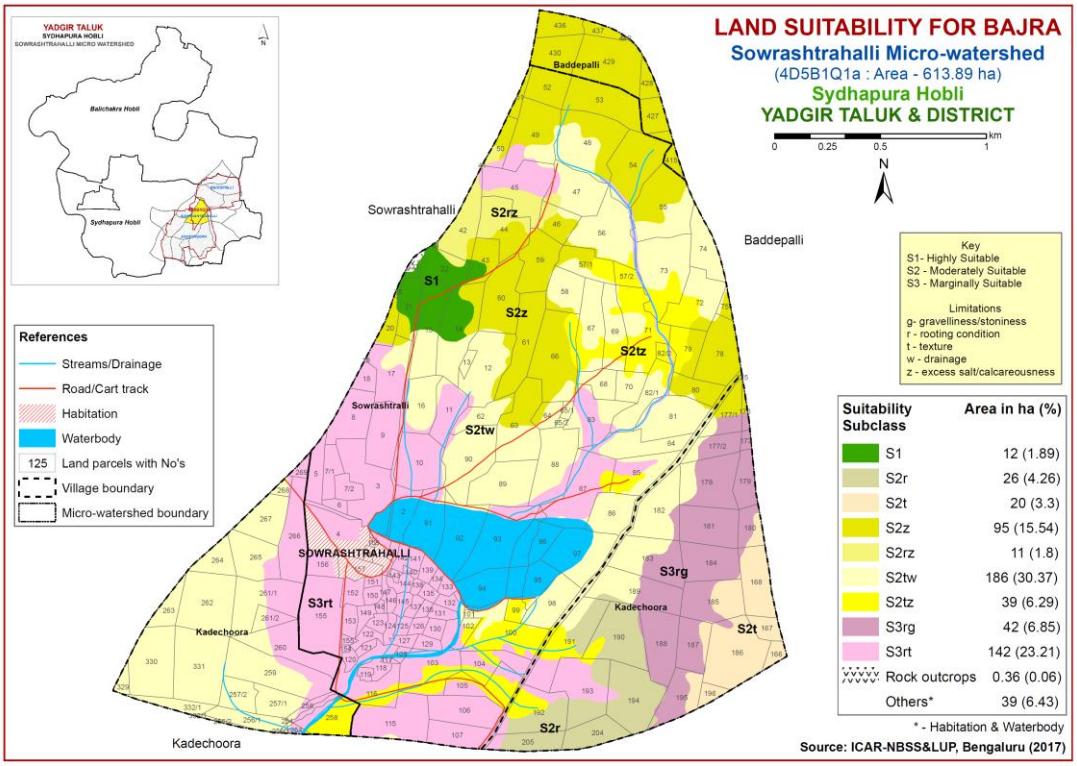



Fig. 7.4 Land Suitability map of Bajra

## 7.5 Land suitability for Groundnut (*Arachis hypogaea*)

Groundnut is one of the major oilseed crop grown in an area of 6.54 lakh ha in almost all the districts of the State. The crop requirements for growing groundnut (Table

7.6) were matched with the soil-site characteristics (Table 7.1) of soils of the microwatershed and a land suitability map for growing groundnut was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.5.

**Table 7.6 Land suitability criteria for Groundnut**

| Crop requirement | | Rating | | | |
|---|---|---|---|---|---|
| **Soil –site characteristics** | **Unit** | **Highly suitable(S1)** | **Moderately suitable(S2)** | **Marginally suitable(S3)** | **Not suitable(N)** |
| Slope | % | <3 | 3-5 | 5-10 | >10 |
| LGP | Days | 100-125 | 90-105 | 75-90 | |
| Soil drainage | class | Well drained | Mod. Well rained | imperfectly drained | Poorly drained |
| Soil reaction | pH | 6.0-8.0 | 8.1-8.5, 5.5-5.9 | >8.5, <5.5 | |
| Sub Surface soil texture | Class | l, cl, sil, scl, sicl | sc, sic, c,sl | s, ls,c (>60%) | |
| Soil depth | cm | >75 | 50-75 | 25-50 | <25 |
| Gravel content | % vol. | <35 | 35-50 | >50 | |
| $CaCO_3$ in root zone | % | low | Medium | high | |
| Salinity (EC) | $dSm^{-1}$ | <2.0 | 2.0-4.0 | 4.0-8.0 | |
| Sodicity (ESP) | % | <5 | 5-10 | >10 | |

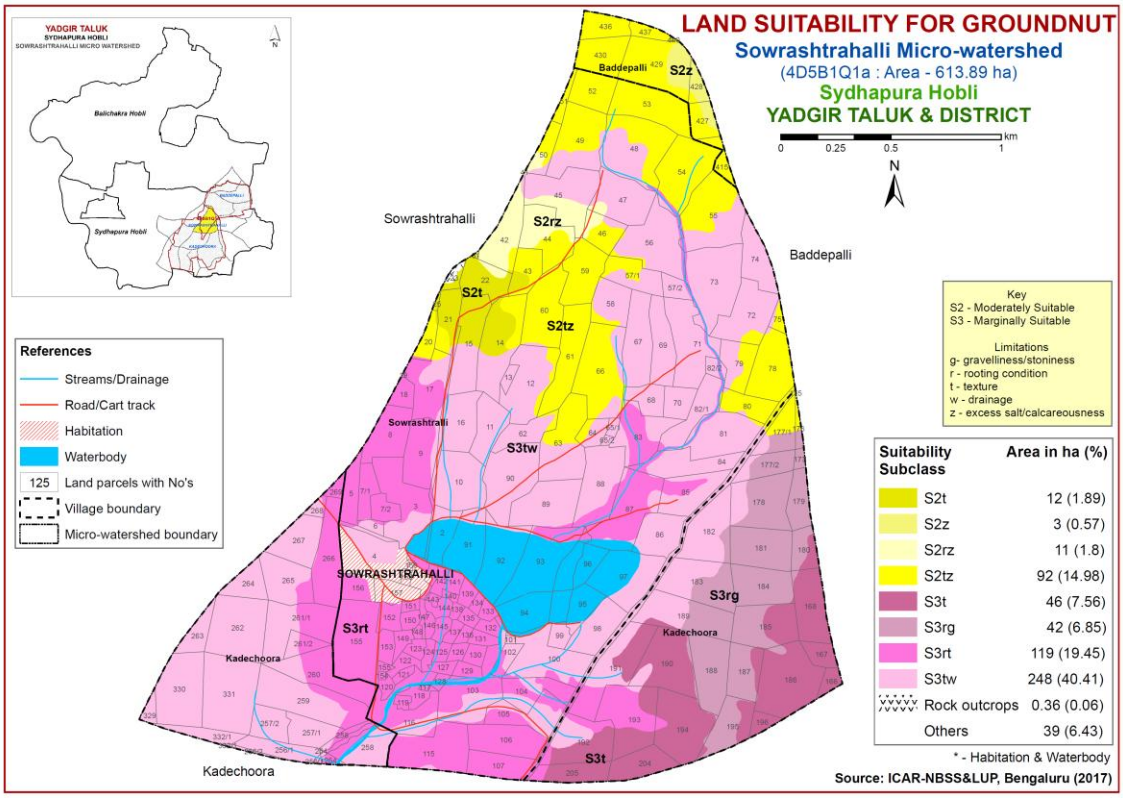



Fig. 7.5 Land Suitability map of Groundnut

## 7.6 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 7.7) 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 7.6.

**Table 7.7 Crop suitability criteria for Sunflower**

| Crop requirement | | Rating | | | |
|---|---|---|---|---|---|
| Soil –site characteristics | Unit | Highly suitable(S1) | Moderately suitable(S2) | Marginally suitable(S3) | Not suitable(N) |
| Slope | % | <3 | 3-5 | 5-10 | >10 |
| LGP | Days | >90 | 80-90 | 70-80 | <70 |
| Soil drainage | class | Well drained | mod. Well drained | imperfectly drained | Poorly drained |
| Soil reaction | pH | 6.5-8.0 | 8.1-8.5,5.5-6.4 | 8.6-9.0;4.5-5.4 | >9.0,<4.5 |
| Surface soil texture | Class | l, cl, sil, sc | scl, sic, c, | c (>60%), sl | ls, s |
| Soil depth | cm | >100 | 75-100 | 50-75 | <50 |
| Gravel content | %vol. | <15 | 15-35 | 35-60 | >60 |
| Salinity (EC) | $dSm^{-1}$ | <1.0 | 1.0-2.0 | >2.0 | |
| Sodicity (ESP) | % | <10 | 10-15 | >15 | |

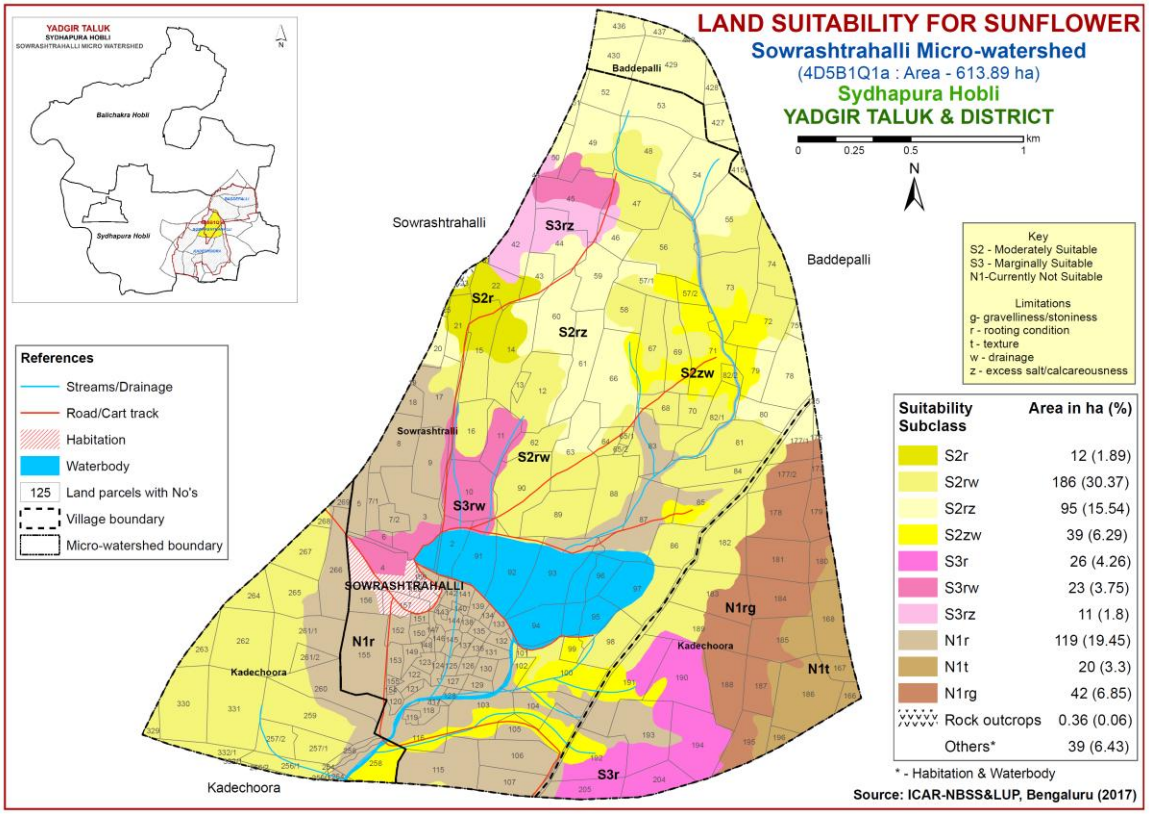



Fig. 7.6 Land Suitability map of Sunflower

There are no highly (Class S1) suitable lands for growing sunflower in the microwatershed. An area of 332 ha (54%) is moderately suitable (Class S2) and are

distributed in the major part of the microwatershed. They have minor limitations of rooting condition, calcareousness and drainage. An area of 60 ha (10%) is marginally suitable (Class S3) and are distributed in the central, northwestern and southern part of the microwatershed. They have moderate limitations of rooting condition, calcareousness and drainage. An area of 181 ha (30%) is currently not suitable (Class N1) and are distributed in the central, western, southern and southeastern part of the microwatershed with severe limitations of rooting condition, texture and gravelliness.

### 7.7 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 7.8) 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 7.7.

There are no highly (Class S1) suitable lands for growing cotton in the microwatershed. Maximum area of about 389 ha (63%) is moderately suitable (Class S2) and are distributed in the major part of the microwatershed. They have minor limitations of drainage, calcareousness and rooting condition. Marginally suitable (Class S3) lands occur in an area of 164 ha (27%) and are distributed in the western, southern, central, northeastern and southeastern part of the microwatershed with moderate limitations of rooting condition, gravelliness, texture and calcareousness. Currently not suitable (Class N1) lands cover an area of 20 ha (3%) and are distributed in the southeastern part of the microwatershed.

**Table 7.8 Crop suitability criteria for Cotton**

| Crop requirement | | Rating | | | |
|---|---|---|---|---|---|
| **Soil–site characteristics** | **Unit** | **Highly suitable(S1)** | **Moderately suitable(S2)** | **Marginally suitable(S3)** | **Not suitable(N)** |
| Slope | % | 1-2 | 2-3 | 3-5 | >5 |
| LGP | Days | 180-240 | 120-180 | <120 | |
| Soil drainage | class | Well to mod. well | imperfectly drained | Poor somewhat excessive | Stagnant/ excessive |
| Soil reaction | pH | 6.5-7.5 | 7.6-8.0 | 8.1-9.0 | >9.0 >6.5 |
| Surface soil texture | Class | sic, c | sicl, cl | si, sil, sc, scl, l | sl, s,ls |
| Soil depth | cm | 100-150 | 60-100 | 30-60 | <30 |
| Gravel content | %vol. | <5 | 5-10 | 10-15 | 15-35 |
| $CaCO_3$ in root zone | % | <3 | 3-5 | 5-10 | 10-20 |
| Salinity (EC) | $dSm^{-1}$ | 2-4 | 4.0-8.0 | 8.0-12 | >12 |
| Sodicity (ESP) | % | 5-10 | 10-20 | 20-30 | >30 |

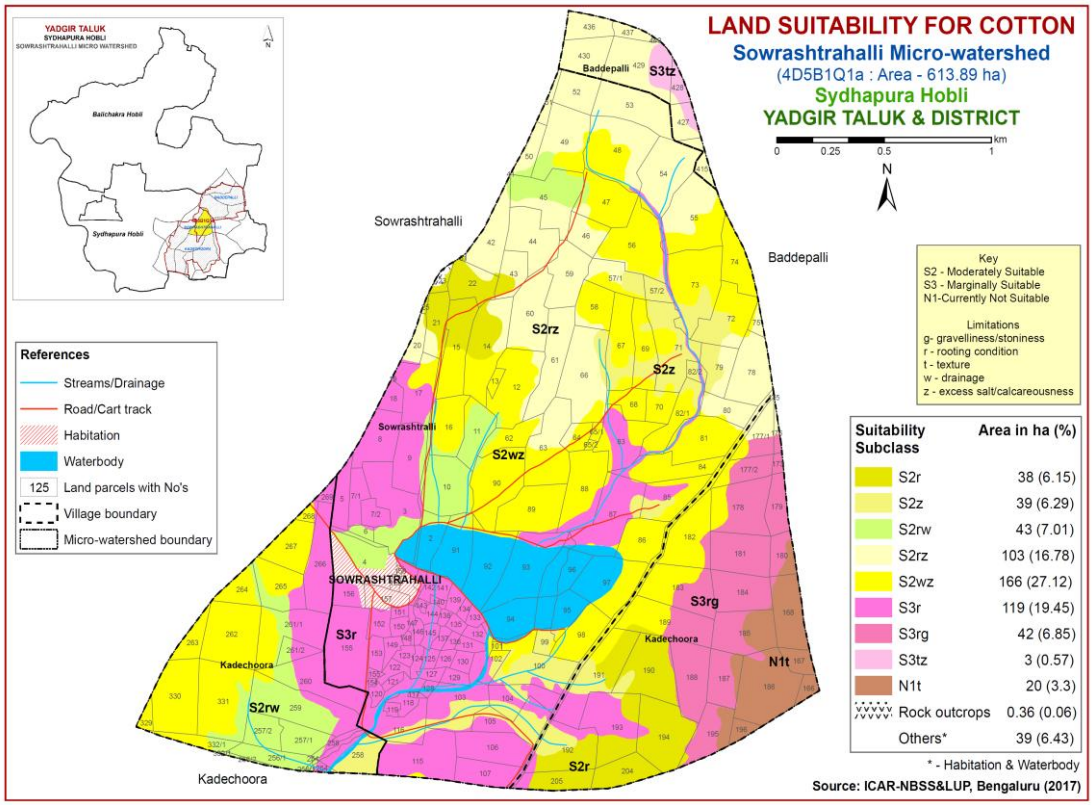



Fig. 7.7 Land Suitability map of Cotton

### 7.8 Land Suitability for Bengal gram (*Cicer aerativum*)

Bengal gram is one of the most important pulse crop grown in about 9.39 lakh ha area in Bijapur, Raichur, Kalaburgi, Dharwad, Belgaum and Bellary districts. The crop requirements for growing Bengal gram (Table 7.9) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing Bengal gram was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.8.

There are no highly (Class S1) suitable lands for growing bengal gram in the microwatershed. Maximum area of about 389 ha (63%) is moderately suitable (Class S2) and are distributed in the major part of the microwatershed. They have minor limitations of calcareousness, texture, drainage and rooting condition. Marginally suitable (Class S3) lands occur in an area of 164 ha (27%) and are distributed in the northeastern, western, central, southern and southeastern part of the microwatershed with moderate limitations of rooting condition, gravelliness, texture and calcareousness. An area of about 20 ha (3%) is currently not suitable (Class N1) for Bengal gram and are distributed in the southeastern part of the microwatershed.

**Table 7.9 Crop suitability criteria for Bengal gram**

| Crop requirement | | Rating | | | |
|---|---|---|---|---|---|
| **Soil –site characteristics** | **Unit** | **Highly suitable(S1)** | **Moderately suitable (S2)** | **Marginally suitable (S3)** | **Not suitable(N)** |
| Slope | % | <3 | 3-5 | 5-10 | >10 |
| LGP | Days | >100 | 90-100 | 70-90 | <70 |
| Soil drainage | class | Well drained | Mod. to well drained; imp. drained | Poorly drained; excessively drained | Very Poorly drained |
| Soil reaction | pH | 6.0-7.5 | 5.5-5.7, 7.6-8.0 | 8.1-9.0;4.5-5.4 | >9.0 |
| Surface soil texture | Class | l, scl, sil, cl, | sicl, sic, c | sl, c>60% | |
| Soil depth | cm | >75 | 51-75 | 25-50 | <25 |
| Gravel content | %vol. | <15 | 15-35 | >35 | |
| Salinity (ECe) | $dsm^{-1}$ | <1.0 | 1.0-2.0 | >2.0 | |
| Sodicity (ESP) | % | <10 | 10-15 | >15 | |

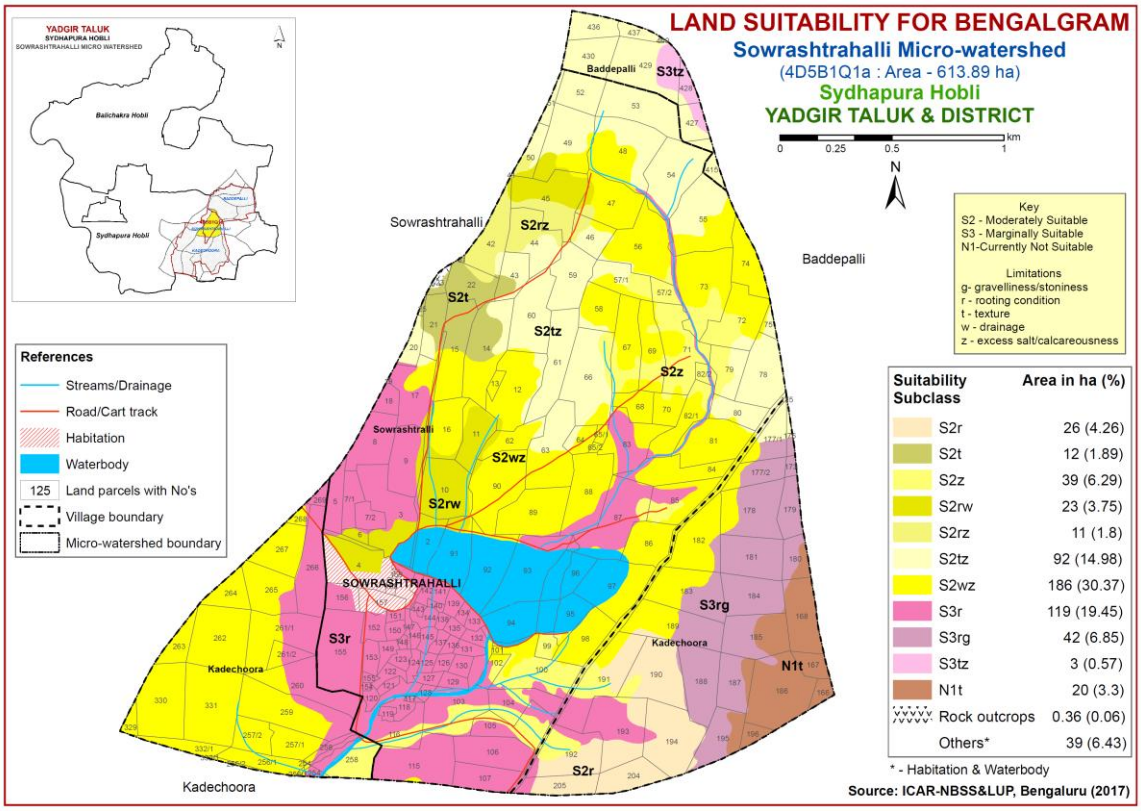



Fig. 7.8 Land Suitability map of Bengal gram

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

Chilli is one of the most important fruit and 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.

There are no highly suitable (Class S1) lands for growing chilli in the microwatershed. Maximum area of 369 ha (60%) is moderately (Class S2) suitable in the

microwatershed and are distributed in all parts of the microwatershed. They have minor limitations of drainage, calcareousness, texture and rooting condition. Marginally suitable lands (Class S3) occur in an area of 204 ha (33%) and are distributed in the central, northern, western and southwestern part of the microwatershed. They have moderate limitations of rooting condition, texture, calcareousness and gravelliness.

**Table 7.10 Crop suitability criteria for Chilli**

| **Crop requirement** | | **Rating** | | | |
|---|---|---|---|---|---|
| **Soil –site characteristics** | **Unit** | **Highly suitable(S1)** | **Moderately Suitable(S2)** | **Marginally suitable (S3)** | **Not suitable(N)** |
| Mean temperature in growing season | $^0$c | 20-30 | 30-35, 13-15 | 35-40, 10-12 | >40,<10 |
| Slope | % | <3 | 3-5 | 5-10 | >10 |
| LGP | Days | >150 | 120-150 | 90-120 | <90 |
| Soil drainage | class | Well drained | Moderately drained | Imp./ poor drained/excessively | Very poorly drained |
| Soil reaction | pH | 6.5-7.8, 6.0-7.0 | 7.8-8.4 | 8.4-9.0, 5.0-5.9 | >9.0 |
| Surface soil texture | Class | scl, cl, sil | sl, sc, sic,c(m/k) | c(ss), ls, s | |
| Soil depth | cm | >75 | 50-75 | 25-50 | <25 |
| Gravel content | %vol. | <15 | 15-35 | 35-60 | >60 |
| Salinity (ECe) | $dsm^{-1}$ | <1.0 | 1.0-2.0 | 2.0-4.0 | <4 |
| Sodicity (ESP) | % | <5 | 5-10 | 10-15 | |

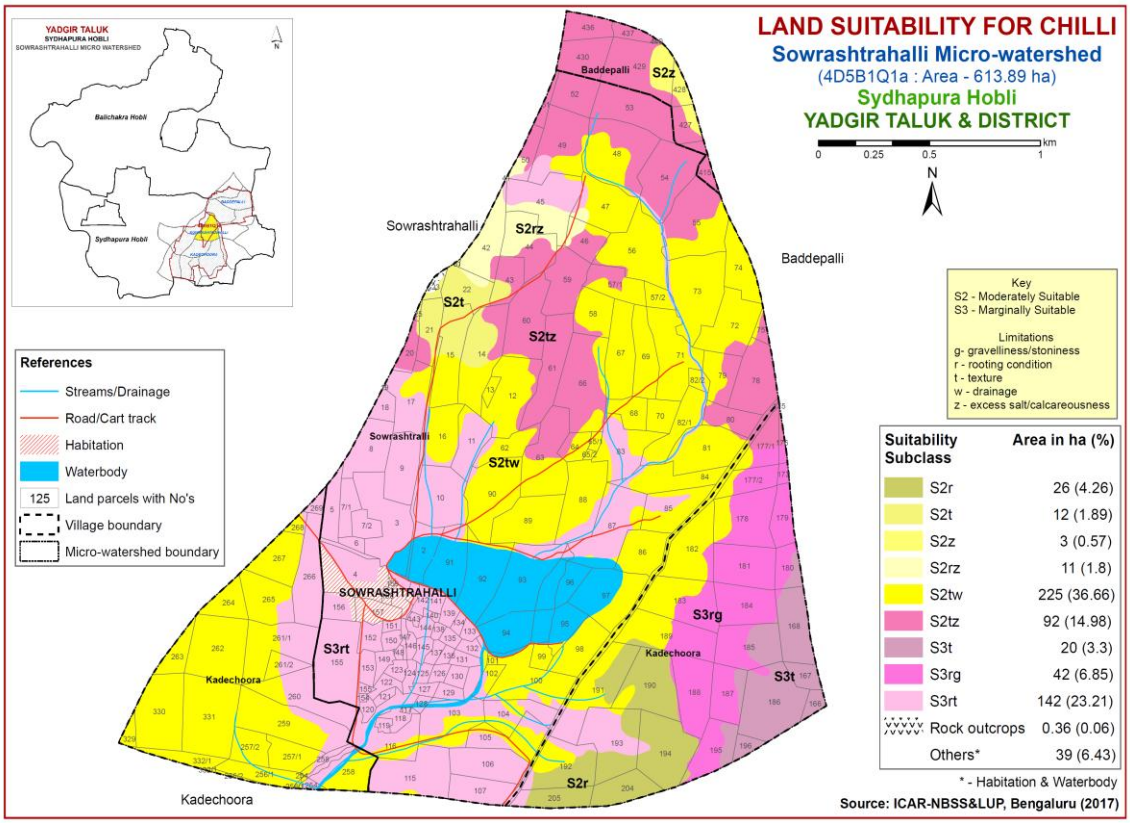



Fig 7.9 Land Suitability map of Chilli

### 7.10 Land Suitability for Tomato *(Lycopersicon esculentum)*

Tomato is one of the most important fruit 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.

A small area of 12 ha (2%) is highly (Class S1) suitable lands for growing tomato and are distributed in the western part of the microwatershed. The moderately suitable (Class S2) lands cover an area of 132 ha (22%) and occur in the northern, eastern and southern part of the microwatershed. They have minor limitations of rooting condition and calcareousness. The marginally suitable (Class S3) lands cover a maximum area of 429 ha (70%) and occur in the major part of the microwatershed. They have moderate limitations of texture, rooting condition, gravelliness and drainage.

**Table 7.11 Crop suitability criteria for Tomato**

| Crop requirement | | | Rating | | | |
|---|---|---|---|---|---|---|
| Soil –site characteristics | | Unit | Highly suitable(S1) | Moderately suitable(S2) | Marginally suitable(S3) | Not suitable(N) |
| Climate | Temperature in growing season | $^0$C | 25-28 | 29-32 , 20-24 | 15-19 33-36 | <15, >36 |
| Soil moisture | Growing period | Days | >150 | 120-150 | 90-120 | |
| Soil aeration | Soil drainage | class | Well drained | Moderately well drained | Poorly drained | V. poorly drained |
| Nutrient availability | Texture | Class | l, sl, cl, scl | sic,sicl,sc, c(m/k) | c (ss), ls | s |
| | pH | 1:2.5 | 6.0-7.3 | 5.5-6.0 7.3-8.4 | 8.4-9.0 | >9.0 |
| | $CaCO_3$ in root zone | | Non calcareous | Slightly calcareous | Strongly calcareous | |
| Roting conditions | Soil depth | cm | >75 | 50-75 | 25-50 | <25 |
| | Gravel content | %vol. | <15 | 15-35 | >35 | |
| Soil toxicity | Salinity | ds/m | Non saline | slight | strongly | |
| | Sodicity (ESP) | % | <10 | 10-15 | >15 | - |
| Erosion | Slope | % | 1-3 | 3-5 | 5-10 | >10 |

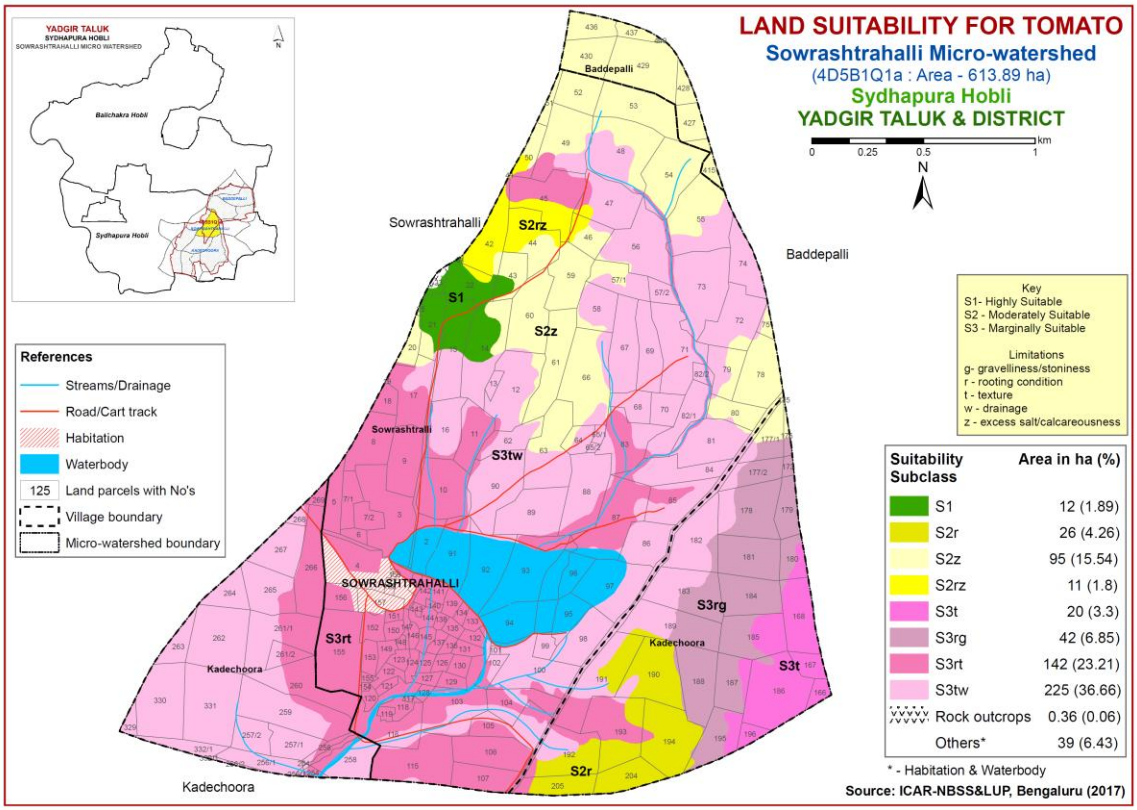



Fig 7.10 Land Suitability map of Tomato

## 7.11 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 7.12) 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 7.11.

There are no highly (Class S1) suitable lands for growing drumstick in the microwatershed. Maximum area of 332 ha (54%) is moderately suitable (Class S2) and are distributed in the major part of the microwatershed. They have minor limitations of texture, rooting condition, calcareousness and drainage. An area of about 80 ha (13%) is marginally suitable (Class S3) and are distributed in the northwestern, western, southern and southeastern part of the microwatershed. They have moderate limitations of rooting condition, texture, drainage and calcareousness. Currently not suitable (Class N1) lands occur in an area of about 161 ha (26%) and are distributed in the western, central, southern and southeastern part of the microwatershed with severe limitations of rooting condition, gravelliness and texture.

**Table 7.12 Crop suitability criteria for Drumstick**

| Crop requirement | | | Rating | | | |
|---|---|---|---|---|---|---|
| Soil –site characteristics | | Unit | Highly suitable(S1) | Moderately suitable(S2) | Marginally suitable(S3) | Not suitable(N) |
| Soil aeration | Soil drainage | Class | Well drained | Moderately well drained | Poorly drained | V. Poorly drained |
| Nutrient availability | Texture | Class | sc,scl,cl,c(red) | sl, c (black) | ls | s |
| | pH | 1:2.5 | 5.5-6.5 | 5-5.5, 6.5-7.3 | 7.8-8.4 | >8.4 |
| Rooting conditions | Soil depth | cm | >100 | 75-100 | 50-75 | <50 |
| | Gravel content | %vol. | 0-35 | 35-60 | 60-80 | >80 |
| Erosion | Slope | % | 0-3 | 3-10 | - | >10 |

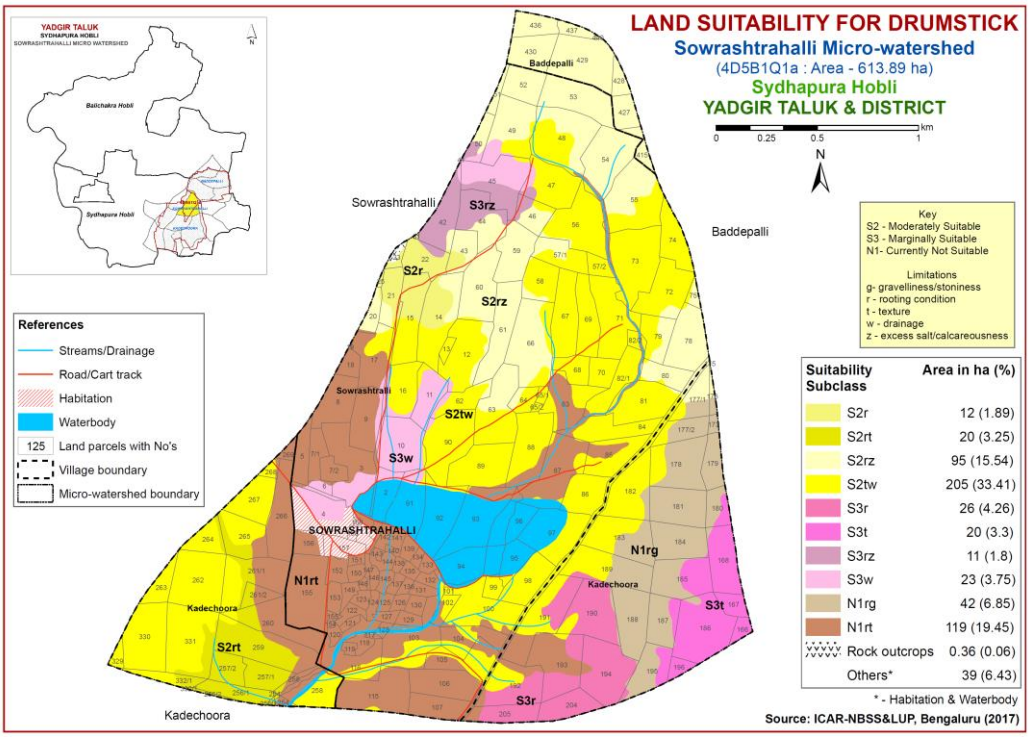



Fig 7.11 Land Suitability map of Drumstick

## 7.12 Land Suitability for Mulberry (*Morus nigra*)

Mulberry is the important leaf crop grown for rearing silk worm in about 1,66,000 ha area in all the districts of the state. The crop requirements for growing mulberry (Table 7.13) 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 7.12.

There are no highly suitable (Class S1) lands for growing mulberry in the microwatershed. Moderately suitable (Class S2) lands occur in an area of 107 ha (17%) and are distributed in the northern, northwestern, central and eastern part of the microwatershed. They have minor limitations of rooting condition and calcareousness. Marginally suitable lands (Class S3) cover a maximum area of 305 ha (50%) and are distributed in the major part of the microwatershed. They have moderate limitations of rooting condition, texture, drainage and calcareousness. Currently not suitable (Class N1) lands occur in an area of 161 ha (26%) for mulberry and are distributed in the western, central, southern and southeastern part of the microwatershed with severe limitations of rooting condition, gravelliness and texture.

**Table 7.13 Crop suitability criteria for Mulberry**

| **Crop requirement** | | | **Rating** | | | |
|---|---|---|---|---|---|---|
| **Soil –site characteristics** | | **Unit** | **Highly suitable(S1)** | **Moderately suitable(S2)** | **Marginally suitable(S3)** | **Not suitable(N)** |
| Soil aeration | Soil drainage | Class | Well drained | Moderately well drained | Poorly drained | V. Poorly drained |
| Nutrient availability | Texture | Class | sc, cl, scl | c (red) | c(black),sl, ls | - |
| | pH | 1:2.5 | | | | |
| Rooting conditions | Soil depth | cm | >100 | 75-100 | 50-75 | <50 |
| | Gravel content | % vol. | 0-35 | 35-60 | 60-80 | >80 |
| Erosion | Slope | % | 0-3 | 3-5 | 5-10 | >10 |

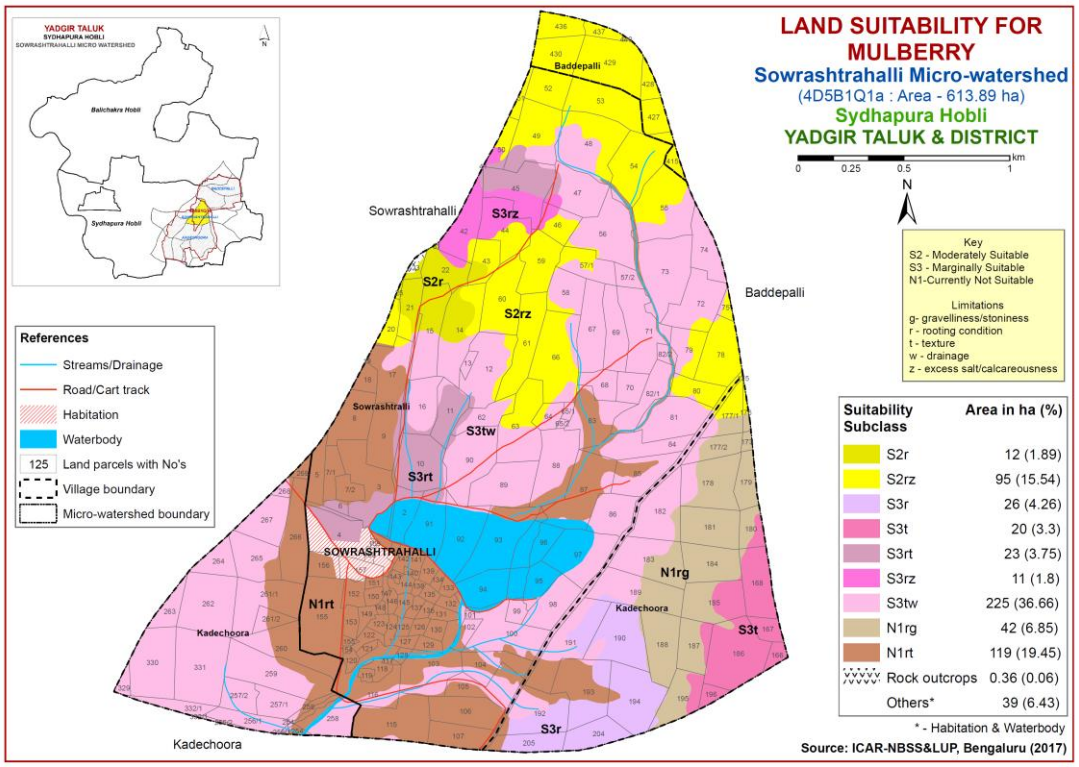



Fig 7.12 Land Suitability map of Mulberry

### 7.13 Land Suitability for Mango (*Mangifera indica*)

Mango is one of the most important fruit crop grown in about 173080 ha in all the districts of the State. The crop requirements for growing mango (Table 7.14) 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 geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.13.

There are no highly (Class S1) and moderately suitable (Class S2) lands for growing mango in the microwatershed. Maximum area of about 353 ha (57%) is marginally suitable (Class S3) and are distributed in the major part of the microwatershed. They have moderate limitations of texture, calcareousness and rooting condition. Currently not suitable lands (Class N1) occur in an area of 222 ha (36%) and are distributed in the northwestern, western, southern, central and southeastern part of the microwatershed. They have severe limitations of rooting condition, gravelliness and calcareousness.

**Table 7.14 Crop suitability criteria for Mango**

| Crop requirement | | | Rating | | | |
|---|---|---|---|---|---|---|
| **Soil-site characteristics** | | **Unit** | **Highly suitable(S1)** | **Moderately suitable (S2)** | **Marginally suitable (S3)** | **Not suitable(N)** |
| Climate | Temperature in growing season | $^0$C | 28-32 | 24-27<br>33-35 | 36-40 | 20-24 |
| | Min. temp. before flowering | $^0$C | 10-15 | 15-22 | >22 | |
| Soil moisture | Growing period | Days | >180 | 150-180 | 120-150 | <120 |
| Soil aeration | Soil drainage | class | Well drained | Mod. To imp. drained | Poor drained | V. poorly drained |
| | Water table | M | >3 | 2.50-3.0 | 2.5-1.5 | <1.5 |
| Nutrient availability | Texture | Class | sc, l, sil, cl | sl, sc, sic, l, c | c (<60%) | c (>60%), |
| | pH | 1:2.5 | 5.5-7.5 | 7.6-8.55.0-5.4 | 8.6-9.0 4.0-4.9 | >9.0 <4.0 |
| | OC | % | High | medium | low | |
| | $CaCO_3$ in root zone | % | Non calcareous | <5 | 5-10 | >10 |
| Rooting conditions | Soil depth | cm | >200 | 125-200 | 75-125 | <75 |
| | Gravel content | % vol. | Non gravelly | <15 | 15-35 | >35 |
| Soil toxicity | Salinity | dS/m | Non saline | <2.0 | 2.0-3.0 | >3.0 |
| | Sodicity | % | Non sodic | <10 | 10-15 | >15 |
| Erosion | Slope | % | <3 | 3-5 | 5-10 | |

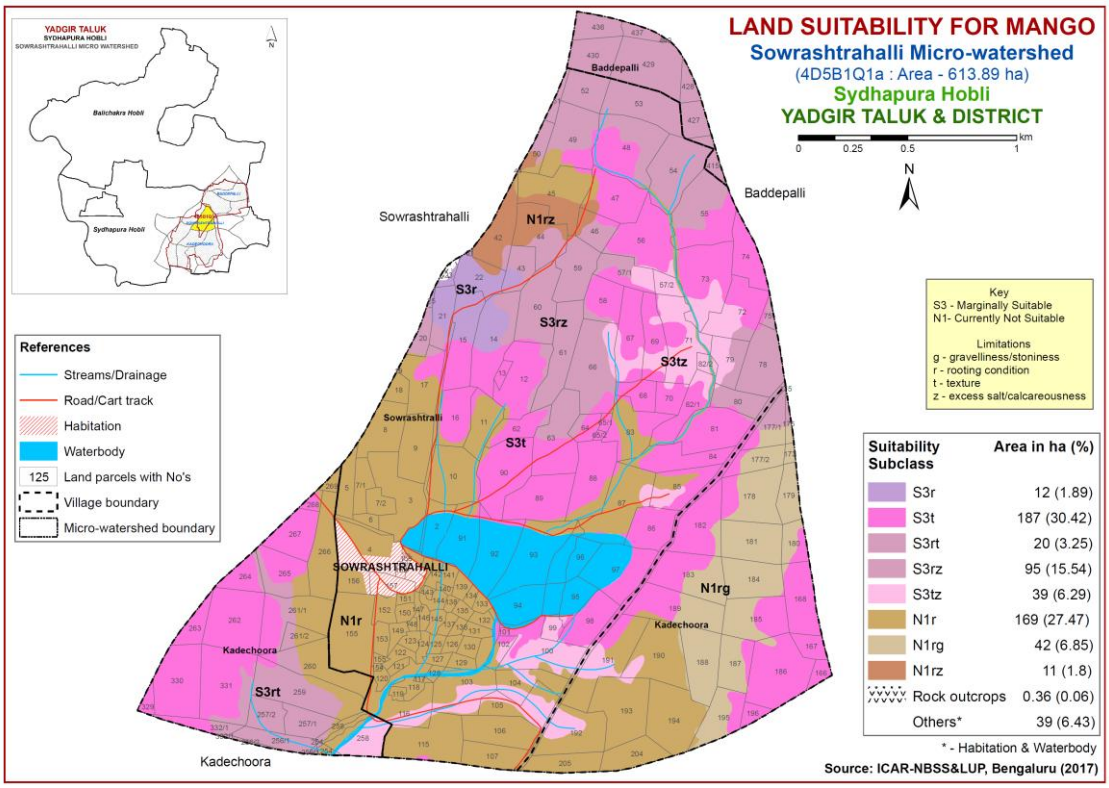



Fig. 7.13 Land Suitability map of Mango

### 7.14 Land Suitability for Sapota (*Manilkara zapota*)

Sapota is one of the most important fruit crop grown in about 29373 ha in almost all the districts of the state. The crop requirements for growing sapota (Table 7.15) 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 is given in Figure 7.14.

There are no highly (Class S1) suitable lands for growing sapota in the microwatershed. An area of 107 ha (17%) is moderately suitable (Class S2) and are distributed in the northern, northwestern and eastern part of the microwatershed. They have minor limitations of rooting condition and calcareousness. Maximum area of 305 ha (50%) is marginally suitable (Class S3) and are distributed in the major part of the microwatershed. They have moderate limitations of texture, calcareousness and rooting condition. An area of about 161 ha (26%) is currently not suitable (Class N1) and are distributed in the western, central, southern and southeastern part of the microwatershed with severe limitations of rooting condition, and gravelliness.

**Table 7.15 Crop suitability criteria for Sapota**

| **Crop requirement** | | | **Rating** | | | |
|---|---|---|---|---|---|---|
| **Soil –site characteristics** | | **Unit** | **Highly suitable (S1)** | **Moderately suitable(S2)** | **Marginally suitable (S3)** | **Not suitable(N)** |
| Climate | Temperature in growing season | $^0$ C | 28-32 | 33-36<br>24-27 | 37-42<br>20-23 | >42<br><18 |
| Soil moisture | Growing period | Days | >150 | 120-150 | 90-120 | <120 |
| Soil aeration | Soil drainage | class | Well drained | Moderately well drained | Imperfectly drained | Poorly drained |
| Nutrient availabiliy | Texture | Class | scl, l, cl, sil | sl, sicl, sc | c (<60%) | ls,s,c (>60%) |
| | pH | 1:2.5 | 6.0-7.5 | 7.6-8.0,5.0-5.9 | 8.1-9.0,4.5-4.9 | >9.0,<4.5 |
| | $CaCO_3$ in root zone | % | Non calcareous | <10 | 10-15 | >15 |
| Rooting conditions | Soil depth | cm | >150 | 75-150 | 50-75 | <50 |
| | Gravel content | % vol. | Non gravelly | <15 | 15-35 | <35 |
| Soil toxicity | Salinity | dS/m | Non saline | Up to 1.0 | 1.0-2.0 | 2.0-4.0 |
| | Sodicity | % | Non sodic | 10-15 | 15-25 | >25 |
| Erosion | Slope | % | <3 | 3-5 | 5-10 | >10 |

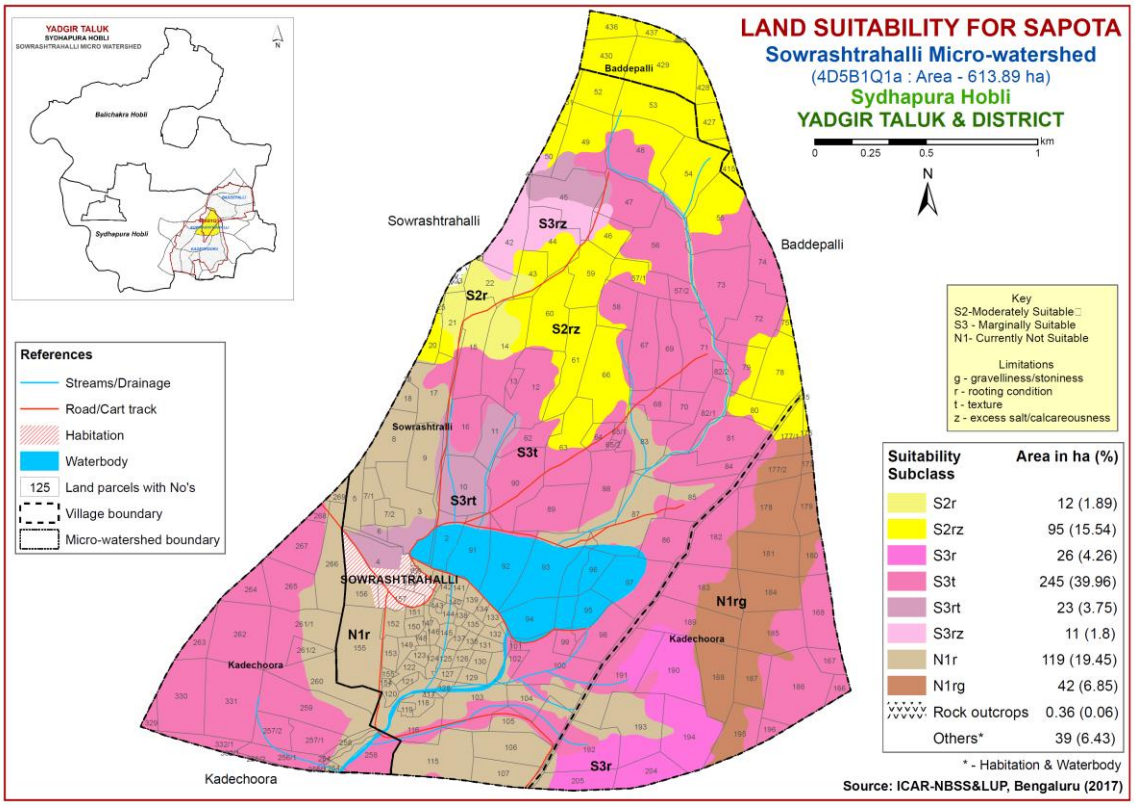



Fig. 7.14 Land Suitability map of Sapota

### 7.15 Land Suitability for Guava (*Psidium guajava*)

Guava is one of the most important fruit crop grown in about 6558 ha in the State of Raichur, Dharwad, Belgaum, Kalaburgi, Bijapur, Bidar, Bellary, Chitradurga, Bangalore, Kolar, Chikkaballapur and Chamarajnagar districts. The crop requirements for growing guava (Table 7.16) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing guava was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.15.

There are no highly (Class S1) lands for growing guava in the microwatershed. An area of 107 ha (17%) is moderately suitable (Class S2) and are distributed in the northern, northwestern and eastern part of the microwatershed. Maximum area of about 305 ha (50%) is marginally suitable (Class S3) and are distributed in all parts of the microwatershed. They have moderate limitations of texture, drainage and rooting condition. Currently not suitable (Class N1) lands occur in an area of about 161 ha (26%) and are distributed in the western, central, southern and southeastern part of the microwaterhsed. They have severe limitations of rooting condition, gravelliness and texture.

**Table 7.16 Crop suitability criteria for Guava**

| Crop requirement | | | Rating | | | |
|---|---|---|---|---|---|---|
| Soil –site characteristics | | Unit | Highly suitable (S1) | Moderately suitable (S2) | Marginally suitable(S3) | Not suitable(N |
| Climate | Temperature i growing seaso | $^0$C | 28-32 | 33-36<br>24-27 | 37-42<br>20-23 | |
| Soil moisture | Growing period | Days | >150 | 120-150 | 90-120 | <90 |
| Soil aeration | Soil drainage | class | Well drained | Mod. to imperfectly | poor | Very poor |
| Nutrient availability | Texture | Class | scl, l, cl, sil | sl,sicl,sic,sc, c | c (<60%) | c (>60%) |
| | pH | 1:2.5 | 6.0-7.5 | 7.6-8.0:5.0-5.9 | 8.1-8.5:4.5-4.9 | >8.5:<4.5 |
| | $CaCO_3$ in root zone | % | Non calcareous | <10 | 10-15 | >15 |
| Rooting conditions | Soil depth | cm | >100 | 75-100 | 50-75 | <50 |
| | Gravel content | %vol. | <15 | 15-35 | >35 | |
| Soil toxicity | Salinity | dS/m | <2.0 | 2.0-4.0 | 4.0-6.0 | |
| | Sodicity | % | Non sodic | 10-15 | 15-25 | >25 |
| Erosion | Slope | % | <3 | 3-5 | 5-10 | >10 |

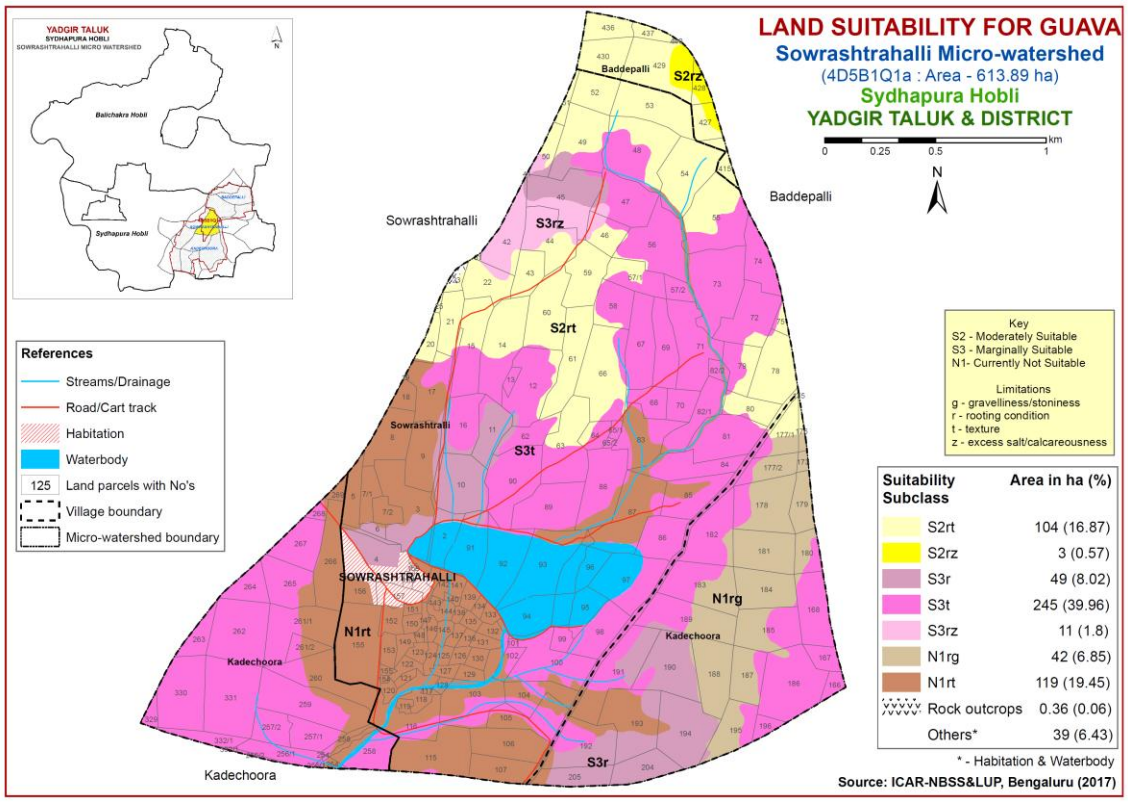



Fig 7.15 Land Suitability map of Guava

## 7.16 Land Suitability for Pomegranate (*Punica granatum*)

Pomegranate is one of the most important fruit crop commercially grown in about 18488 ha in karnataka in an area of about 0.16 lakh ha mainly in Bijapur, Bagalkot, Koppal, Gadag and Chitradurga districts. The crop requirements for growing

pomegranate (Table 7.17) 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 7.16.

There are no highly (Class S1) suitable lands for growing pomegranate in the microwatershed. An area of about 332 ha (54%) is moderately suitable (Class S2) for pomegranate and are distributed in the major part of the microwatershed. They have minor limitations of texture, rooting condition and calcareousness. An area of about 80 ha (13%) is marginally suitable (Class S3) and are distributed in the northwestern, western, southern and southeastern part of the microwatershed. They have moderate limitations of rooting condition, texture and calcareousness. Currently not suitable lands (Class N1) occur in an area of 161 ha (26%) and are distributed in the western, central, southern and southeastern part of the microwatershed. They have severe limitations of rooting condition and gravelliness.

**Table 7.17 Crop suitability criteria for Pomegranate**

| **Crop requirement** | | | **Rating** | | | |
|---|---|---|---|---|---|---|
| **Soil –site characteristics** | | **Unit** | **Highly suitable(S1)** | **Moderately suitable(S2)** | **Marginally suitable(S3)** | **Not suitable(N)** |
| Climate | Temperature in growing season | | 30-34 | 35-38,25-29 | 39-40 15-24 | |
| Soil moisture | Growing period | Days | >150 | 120-150 | 90-120 | <90 |
| Soil aeration | Soil drainage | class | Well drained | imperfectly drained | | |
| Nutrient availability | Texture | Class | sl, scl, l, cl | c, sic, sicl | cl, s, ls | |
| | pH | 1:2.5 | 5.5-7.5 | 7.6-8.5 | 8.6-9.0 | |
| Rooting conditions | Soil depth | cm | >100 | 75-100 | 50-75 | <50 |
| | Gravel content | %vol. | nil | 15-35 | >35 | |
| Soil toxicity | Salinity | ds/m | Nil | <9 | >9 | <50 |
| | Sodicity | % | nil | | | |
| Erosion | Slope | % | <3 | 3-5 | 5-10 | |

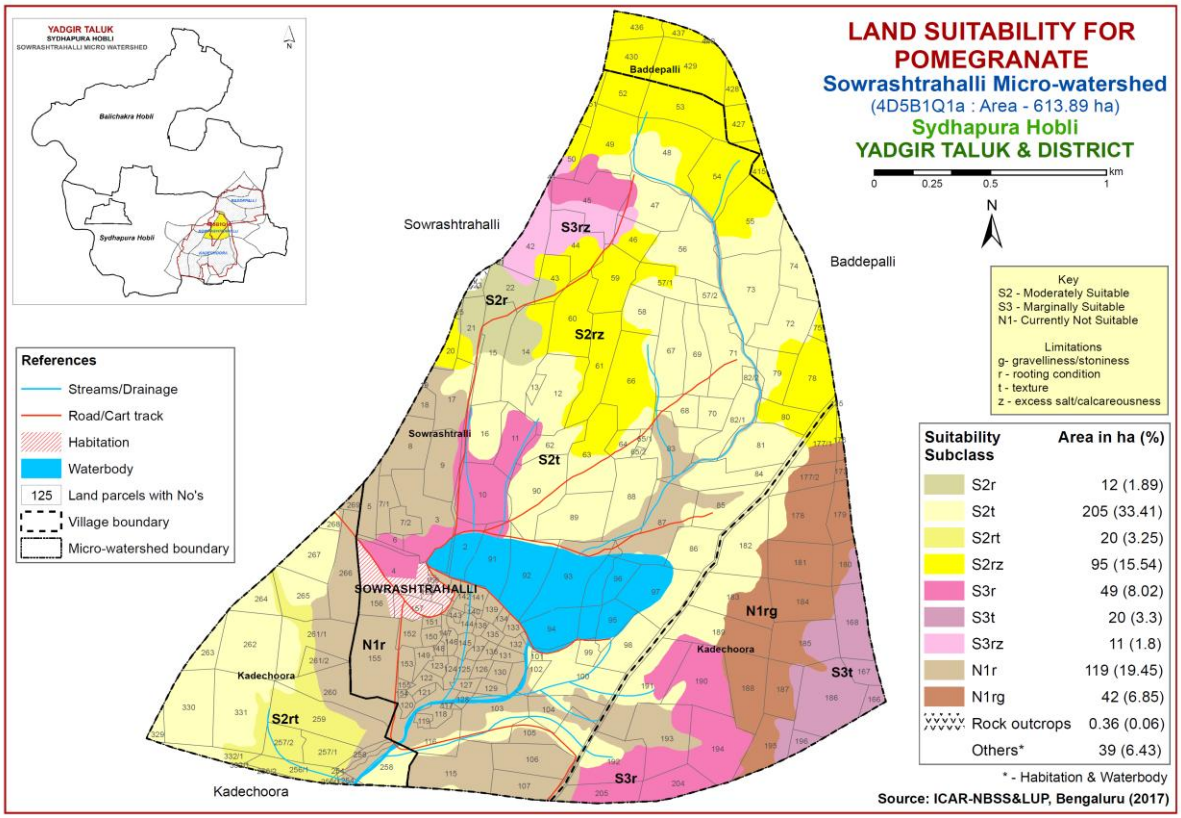



Fig 7.16 Land Suitability map of Pomegranate

### 7.17 Land Suitability for Jackfruit (*Artocarpus heterophyllus*)

Jackfruit is one of the most important fruit crop grown in 5368 ha in almost all the districts of the State. The crop requirements for growing jackfruit (Table 7.18) 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 is given in Figure 7.17.

**Table 7.18 Crop suitability criteria for Jackfruit**

| Crop requirement | | | Rating | | | |
|---|---|---|---|---|---|---|
| Soil –site characteristics | | Unit | Highly suitable(S1) | Moderately suitable(S2) | Marginally suitable(S3) | Not suitable(N) |
| Soil aeration | Soil drainage | class | well | Mod. well | Poorly | Poorly |
| 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. | 7.8-8.4 | >8.4 |
| Rooting conditions | Soil depth | cm | >100 | 75-100 | 50-75 | <50 |
| | Gravel content | % vol. | <15 | 15-35 | 35-60 | >60 |
| Erosion | Slope | % | 0-3 | 3-5 | >5 | - |

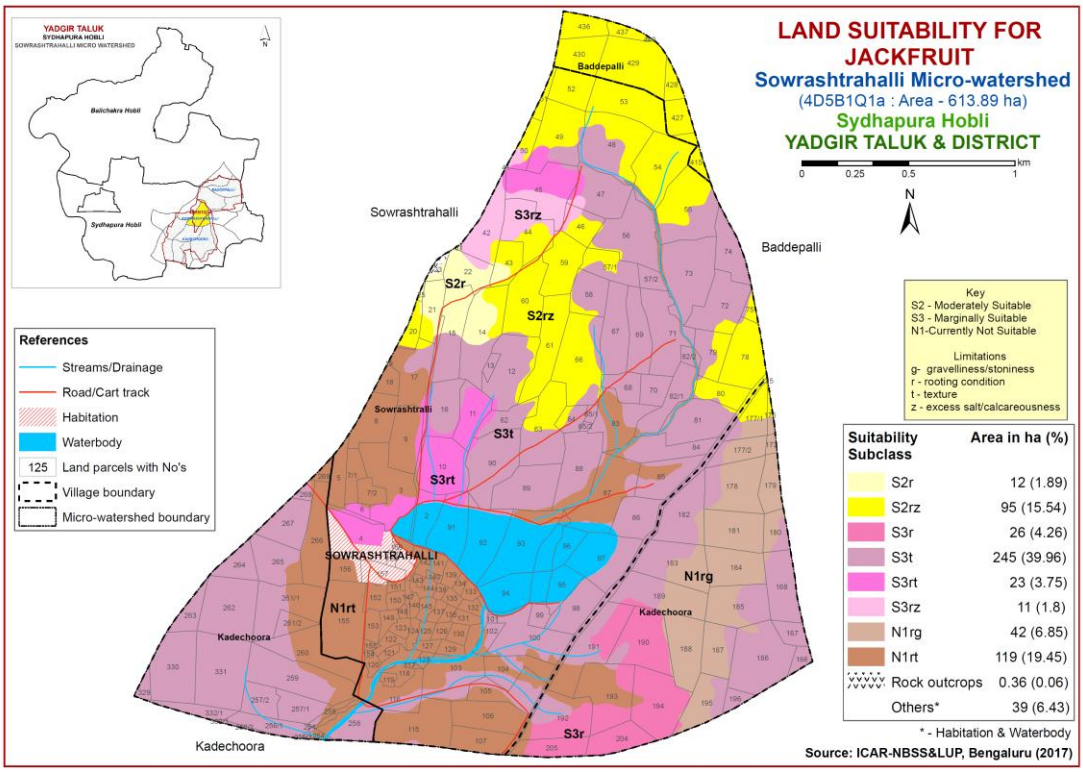



Fig 7.17 Land Suitability map of Jackfruit

There are no highly (Class S1) suitable lands for growing jackfruit in the microwatershed. An area of about 107 ha (17%) is moderately suitable (Class S2) for jackfruit and are distributed in the northern, northwestern and eastern part of the microwatershed. They have minor limitations of rooting condition and calcareousness. Maximum area of about 305 ha (50%) is marginally suitable (Class S3) and are distributed in the major part of the microwatershed. They have moderate limitations of texture, calcareousness and rooting condition. Currently not suitable lands (Class N1) occur in an area of about 161 ha (26%) and are distributed in the western, central, southern and southeastern part of the microwatershed with severe limitations of rooting condition, gravelliness and texture.

### 7.18 Land Suitability for Jamun (*Syzygium cumini*)

Jamun is one of the most important fruit crop grown in almost all the districts of the state. The crop requirements for growing jamun (Table 7.19) 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 7.18.

There are no highly suitable (Class S1) lands for growing jamun in the microwatershed. An area of about 205 ha (33%) is moderately suitable (Class S2) and are distributed in the major part of the microwatershed. They have minor limitation of texture. An area of about 207 ha (34%) is marginally suitable (Class S3) and are distributed in the northern, southern, southwestern, southeastern, eastern and western part

of the microwatershed. They have moderate limitations of rooting condition, texture, gravelliness and calcareousness. Currently not suitable lands (Class N1) occur in an area of about 161 ha (26%) and are distributed in the western, central, southern and southeastern part of the microwatershed with severe limitations of rooting condition, texture and gravelliness.

**Table 7.19 Crop suitability criteria for Jamun**

| Crop requirement | | | Rating | | | |
|---|---|---|---|---|---|---|
| Soil –site characteristics | | Unit | Highly suitable(S1) | Moderately suitable(S2) | Marginally suitable(S3) | Not suitable(N) |
| Soil aeration | Soil drainage | Class | Well | Mod. well | Poorly | V. Poorly |
| 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 |
| Rooting conditions | Soil depth | cm | >150 | 100-150 | 50-100 | <50 |
| | Gravel content | % vol. | <15 | 15-35 | 35-60 | >60 |
| Erosion | Slope | % | 0-3 | 3-5 | 5-10 | >10 |

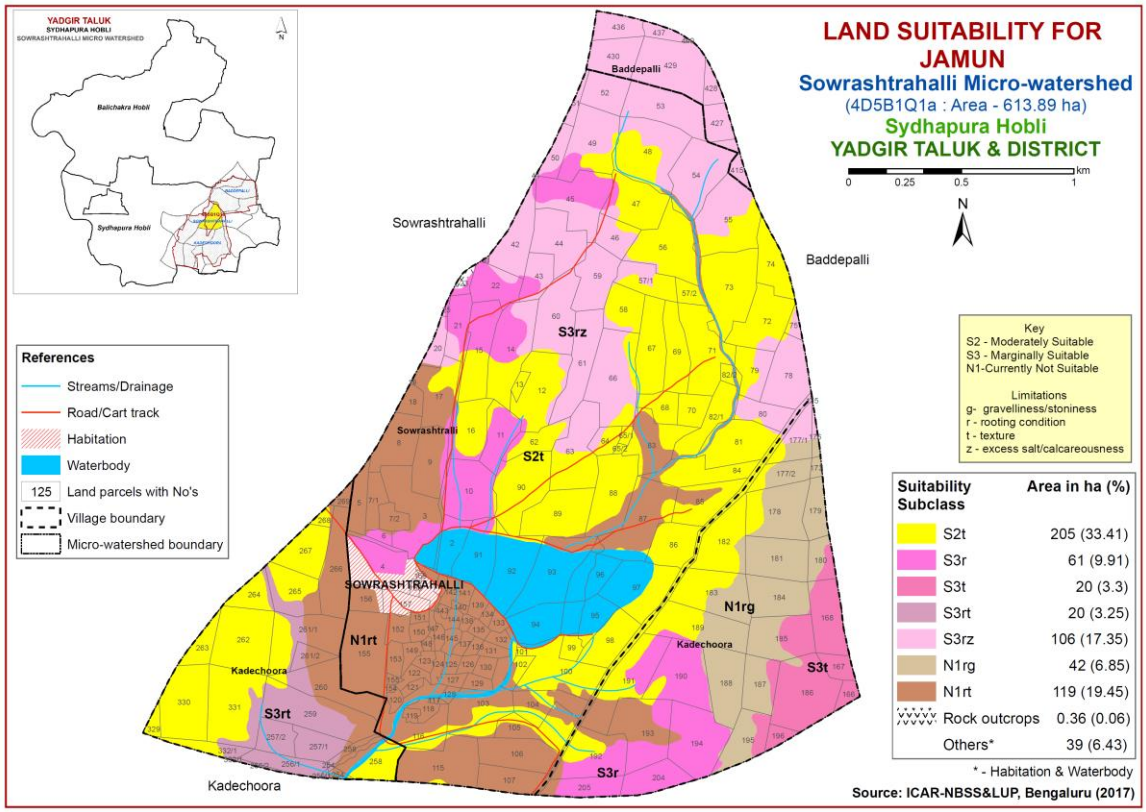



Fig 7.18 Land Suitability map of Jamun

## 7.19 Land Suitability for Musambi (*Citrus limetta*)

Musambi is one of the most important fruit crop grown in an area of 5446 ha in almost all the districts of the State. The crop requirements 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.

There are no highly (Class S1) suitable lands for growing musambi in Sowrashtrahalli microwatershed. Maximum area of about 332 ha (54%) is moderately suitable (Class S2) for musambi and are distributed in the major part of the microwatershed. They have minor limitations of calcareousness and rooting condition. An area of about 80 ha (13%) is marginally suitable (Class S3) and are distributed in the northwestern, western and southeastern part of the microwatershed. They have moderate limitations of rooting condition, texture and calcareousness. Currently not suitable (Class N1) lands occupy an area of about 161 ha (26%) and are distributed in the central, western, southern and southeastern part of the microwatershed with the severe limitations of rooting condition and gravelliness.

**Table 7.20 Crop suitability criteria for Musambi**

| **Crop requirement** | | | **Rating** | | | |
|---|---|---|---|---|---|---|
| **Soil –site characteristics** | | **Unit** | **Highly suitable(S1)** | **Moderately suitable(S2)** | **Marginally suitable(S3)** | **Not suitable(N)** |
| Climate | Temperatur in growing season | $^0$C | 28-30 | 31-35<br>24-27 | 36-40<br>20-23 | >40<br><20 |
| Soil moisture | Growing period | Days | 240-265 | 180-240 | 150-180 | <150 |
| Soil aeration | Soil drainage | class | Well drained | Mod. to imp. drained | poorly | Very poorly |
| Nutrient availability | Texture | Class | scl,l,sicl,cl,s | sc, sc, c | c (>70%) | s, ls |
| | pH | 1:2.5 | 6.0-7.5 | 5.5-6.4/ 7.6-8.0 | 4.0-5.4 8.1-8. | <4.0 >8.5 |
| | $CaCO_3$ in root zone | % | Non calcareous | Upto 5 | 5-10 | >10 |
| Rooting condition | Soil depth | cm | >150 | 100-150 | 50-100 | <50 |
| | Gravel content | % vol. | Non gravelly | 15-35 | 35-55 | >55 |
| Soil toxicity | Salinity | dS/m | Non saline | Upto 1.0 | 1.0-2.5 | >2.5 |
| | Sodicity | % | Non sodic | 5-10 | 10-15 | >15 |
| Erosion | Slope | % | <3 | 3-5 | 5-10 | |

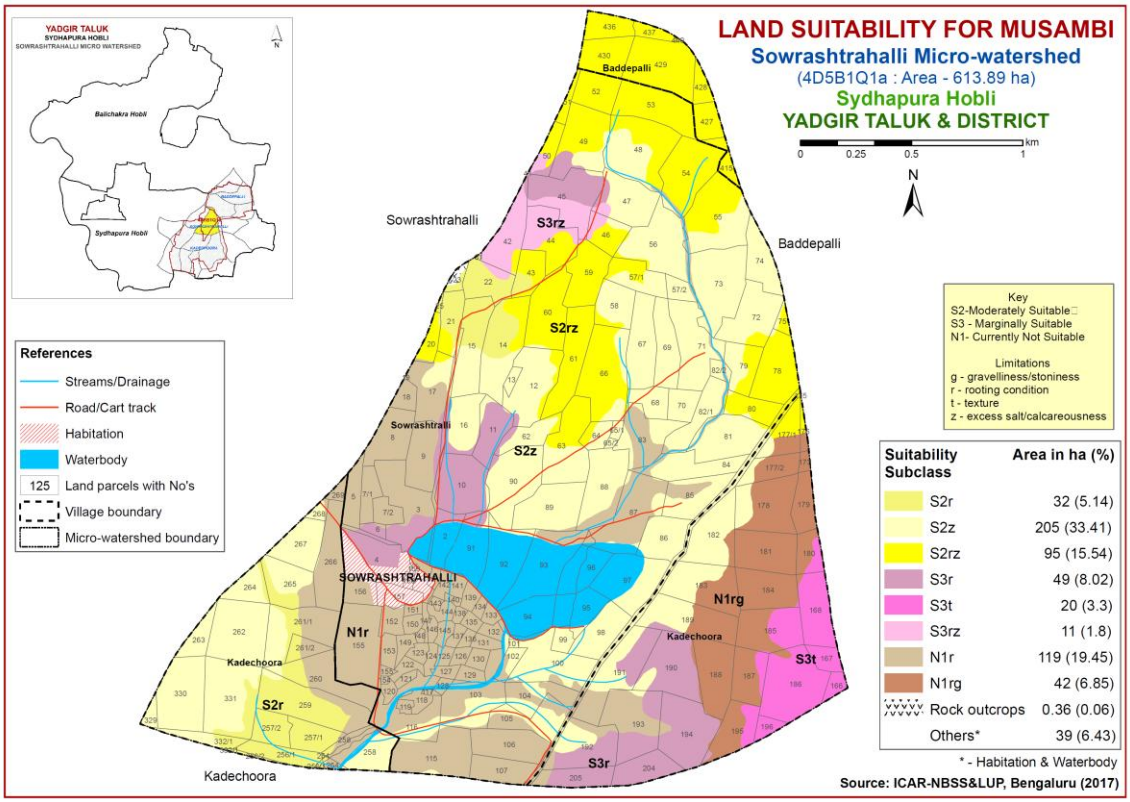



Fig 7.19 Land Suitability map of Musambi

### 7.20 Land Suitability for Lime (*Citrus sp*)

Lime is one of the most important fruit crop grown in 11752 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 geographic distribution of different suitability subclasses in the microwatershed is given in Figure 7.20.

**Table 7.21 Crop suitability criteria for Lime**

| Crop requirement | | | Rating | | | |
|---|---|---|---|---|---|---|
| Soil –site characteristics | | Unit | Highly suitable(S1) | Moderately suitable(S2) | Marginally suitable(S3) | Not suitable(N) |
| Climate | Temperature in growing season | $^0$C | 28-30 | 31-35<br>24-27 | 36-40<br>20-23 | >40<br><20 |
| Soil moisture | Growing period | Days | 240-265 | 180-240 | 150-180 | <150 |
| Soil aeration | Soil drainage | class | Well drained | Mod. to imp. drained | poorly | Very poorly |
| Nutrient availability | Texture | Class | scl, l, sicl, cl, s | sc, sc, c | c (>70%) | s, ls |
| | pH | 1:2.5 | 6.0-7.5 | 5.5-6.4/ 7.6-8.0 | 4.0-5.4 8.1-8.5 | <4.0 ,8.5 |
| | $CaCO_3$ in root zone | % | Non calcareous | Upto 5 | 5-10 | >10 |
| Rooting condition | Soil depth | cm | >150 | 100-150 | 50-100 | <50 |
| | Gravel content | % vol. | Non gravelly | 15-35 | 35-55 | >55 |
| Soil toxicity | Salinity | dS/m | Non saline | Upto 1.0 | 1.0-2.5 | >2.5 |
| | Sodicity | % | Non sodic | 5-10 | 10-15 | >15 |
| Erosion | Slope | % | <3 | 3-5 | 5-10 | |

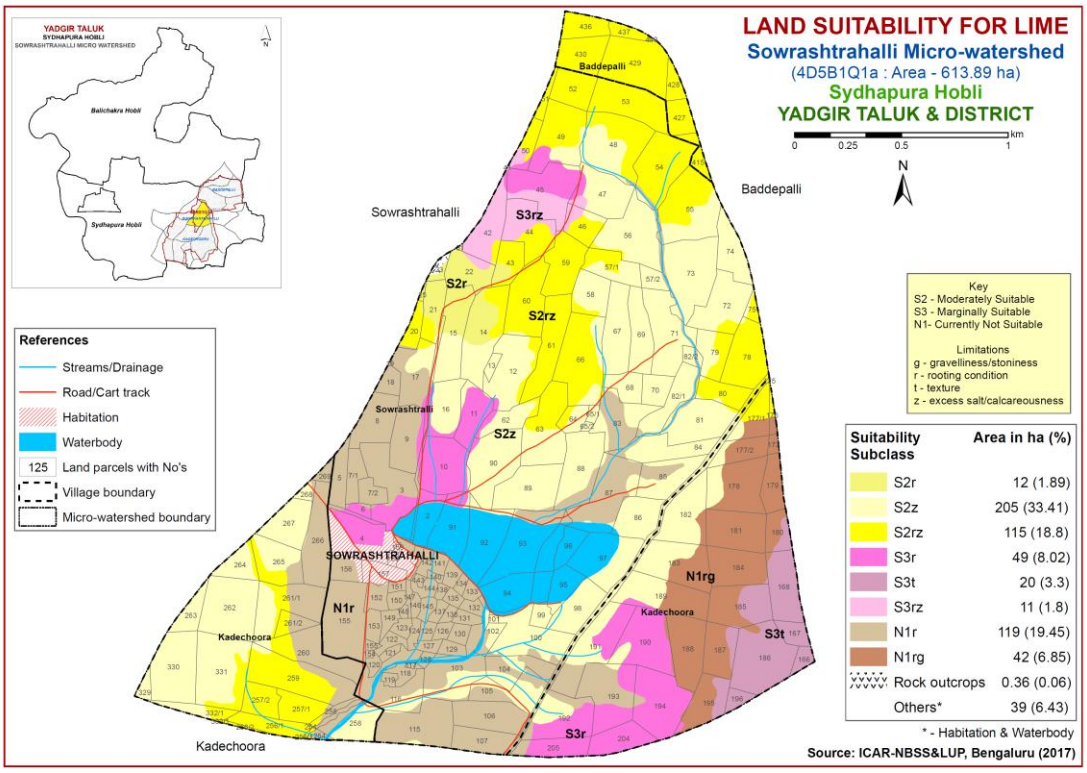



Fig 7.20 Land Suitability map of Lime

There are no highly (Class S1) suitable for growing lime in Sowrashtrahalli microwatershed. Maximum area of about 332 ha (54%) is moderately suitable (Class S2) for lime and are distributed in the major part of the microwatershed. They have minor limitations of calcareousness and rooting condition. An area of about 80 ha (13%) is marginally suitable (Class S3) and are distributed in the northwestern, western and southeastern part of the microwatershed. They have moderate limitations of rooting condition, texture and calcareousness. Currently not suitable (Class N1) lands occur in an area of about 161 ha (26%) and are distributed in the central, western, southern and southeastern part of the microwatershed with the severe limitations of rooting condition and gravelliness.

### 7.21 Land Suitability for Cashew (*Anacardium occidentale)*

Cashew is one of the most important plantation nut crop grown in an area of about 70552 ha in almost all the districts. The crop requirements for growing Cashew (Table 7.22) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing Cashew was generated. The area extent and their geographic distribution of different suitability subclasses in the microwatershed is given in Figure 7.21.

There are no highly (Class S1) suitable lands for growing cashew in the microwatershed. An area of about 104 ha (17%) is moderately suitable (Class S2) and are distributed in the northern, central, western and eastern part of the microwatershed. They have minor limitations of texture and rooting condition. Marginally suitable (Class S3) lands occur in a small area of 20 ha (3%) and are distributed in the southeastern part of

the microwatershed. They have moderate limitation of texture. Currently not suitable (Class N1) lands for growing cashew occupy a major area of 451 ha (73%) and occur in all parts of the microwatershed. They have severe limitations of rooting condition, texture and calcareousness.

**Table 7.22 Crop suitability criteria for Cashew**

| Crop requirement | | | Rating | | | |
|---|---|---|---|---|---|---|
| Soil –site characteristics | | Unit | Highly suitable(S1) | Moderately suitable(S2) | Marginally suitable(S3) | Not suitable(N) |
| Soil aeration | Soil drainage | Class | Well drained | Mod. well drained | Poorly drained | V. Poorly drainage |
| Nutrient availability | Texture | Class | | | | |
| | pH | 1:2.5 | 5.5-6.5 | 5.0-5.5 ,6.5-7.3 | 7.3-7.8 | >7.8 |
| Rooting conditions | Soil depth | cm | >100 | 75-100 | 50-75 | <50 |
| | Gravel content | % vol. | <15 | 15-35 | 35-60 | >60 |
| Erosion | Slope | % | 0-3 | 3-10 | >10 | |

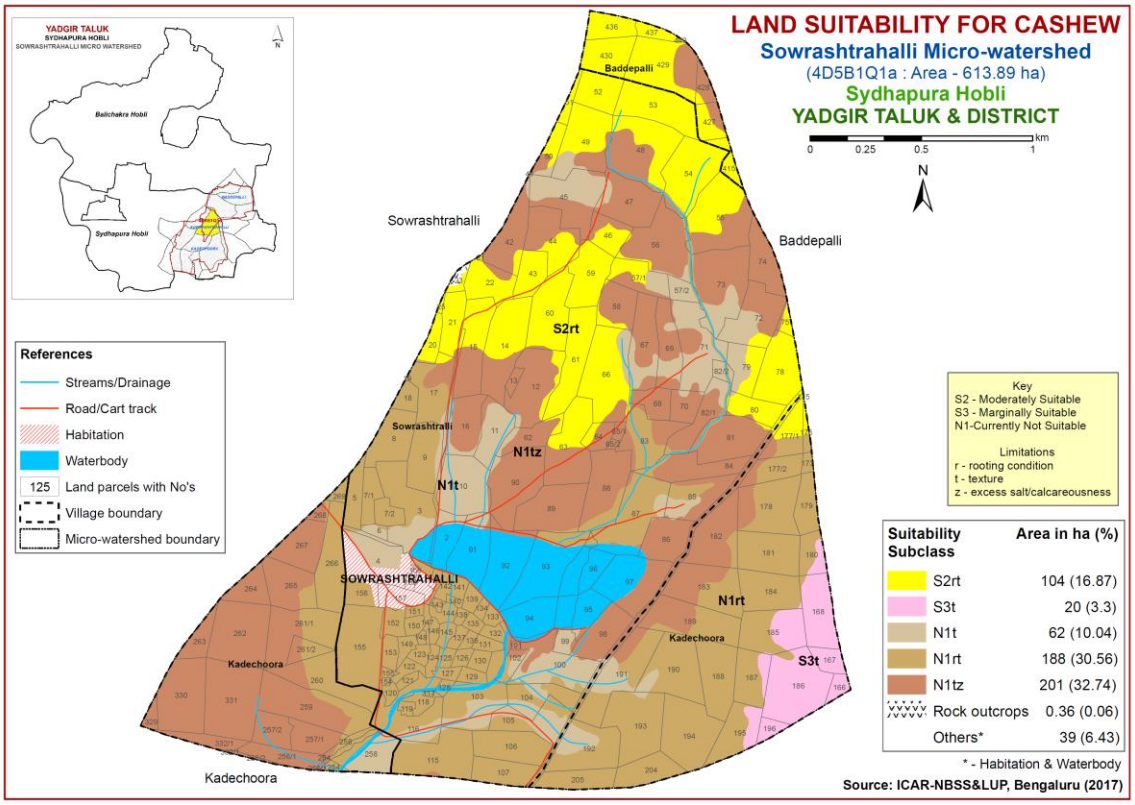



Fig 7.21 Land Suitability map of Cashew

## 7.22 Land Suitability for Custard Apple (*Annona reticulata*)

Custard apple is one of the most important fruit crop grown in 1426 ha in almost all the districts of the state. The crop requirements for growing custard apple (Table 7.23) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing custard apple was generated. The area extent and their geographic distribution of different suitability subclasses in the microwatershed is given in Figure 7.22.

**Table 7.23 Crop suitability criteria for Custard Apple**

| Crop requirement | | | Rating | | | |
|---|---|---|---|---|---|---|
| Soil –site characteristics | | Unit | Highly suitable (S1) | Moderately Suitable(S2) | Marginally suitable(S3) | Not suitable(N) |
| Soil aeration | Soil drainage | Class | Well drained | Mod. well drained | Poorly drained | V. Poorly drained |
| Nutrient availability | Texture | Class | scl, cl, sc, c (red), c (black) | - | sl, ls | - |
| | pH | 1:2.5 | 6.0-7.3 | 7.3-8.4 | 5.0-5.5,8.4-9.0 | >9.0 |
| Rooting conditions | Soil depth | cm | >75 | 50-75 | 25-50 | <25 |
| | Gravel content | % vol. | <15-35 | 35-60 | 60-80 | - |
| Erosion | Slope | % | 0-3 | 3-5 | >5 | |

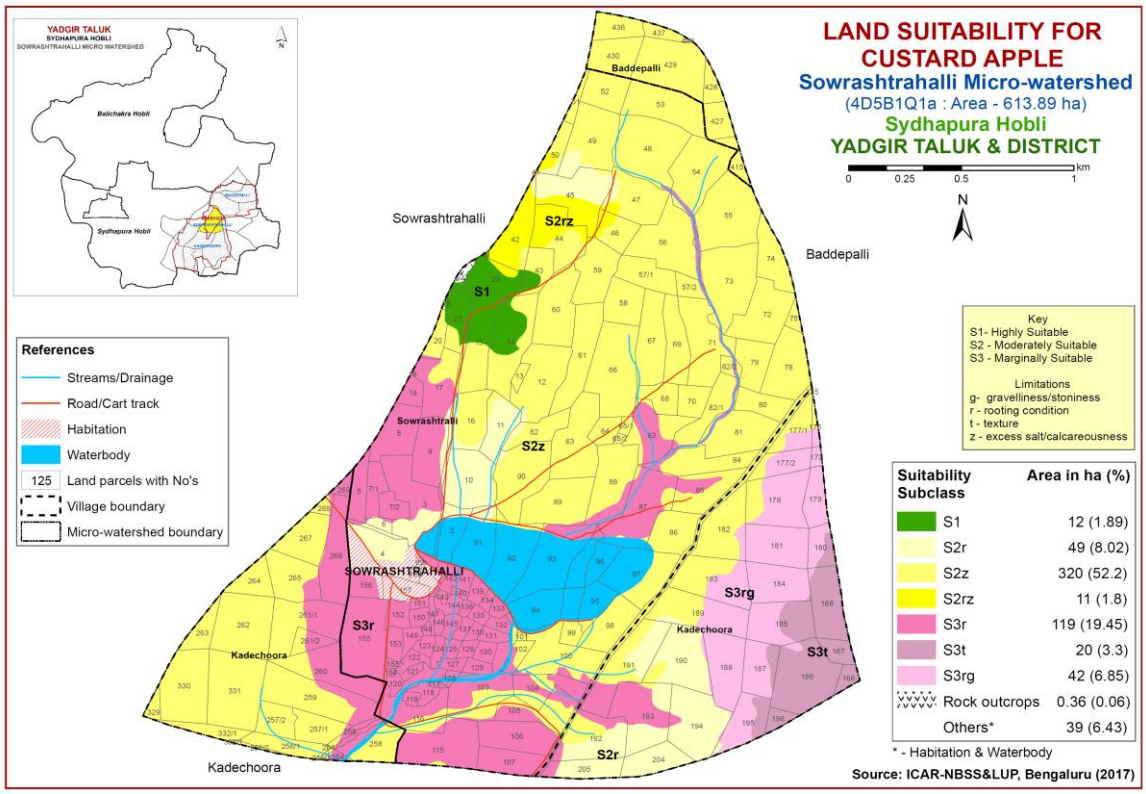



Fig 7.22 Land Suitability map of Custard Apple

There are no highly (Class S1) suitable lands for growing custard apple in the microwatershed. Maximum area of 380 ha (64%) is moderately suitable (Class S2) and are distributed in the major part of the microwatershed. They have minor limitations of calcareousness and rooting condition. Marginally suitable lands (Class S3) occur in an area of 181 ha (30%) and are distributed in the central, western, southwestern and southeastern part of the microwatershed. They have moderate limitations of rooting condition, texture and gravelliness.

### 7.23 Land Suitability for Amla (*Phyllanthus emblica*)

Amla is one of the most important medicinal and fruit plant grown in 151 ha in almost all the districts of the state. The crop requirements for growing amla (Table 7.24) 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 7.23.

In Sowrashtrahalli microwatershed, an area of 12 ha (2%) is highly (Class S1) suitable for growing amla in the microwatershed. Moderately suitable (Class S2) lands occur in a maximum area of 380 ha (62%) and are distributed in the major part of the microwatershed. They have minor limitations of texture, calcareousness and rooting condition. An area of about 181 ha (30%) is marginally suitable (Class S3) for growing amla and are distributed in the central, western, southern and southeastern part of the microwatershed. They have moderate limitations of rooting condition, gravelliness and texture.

**Table 7.24 Crop suitability criteria for Amla**

| Crop requirement | | | Rating | | | |
|---|---|---|---|---|---|---|
| Soil –site characteristics | | Unit | Highly suitable(S1) | Moderately suitable(S2) | Marginally suitable(S3) | Not suitable(N) |
| Soil aeration | Soil drainage | Class | Well drained | Mod. well drained | Poorly drained | V. Poorly drained |
| 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 | 7.8-8.4 | >8.4 |
| Rooting conditions | Soil depth | cm | >75 | 50-75 | 25-50 | <25 |
| | Gravel content | % vol. | <15-35 | 35-60 | 60-80 | - |
| Erosion | Slope | % | 0-3 | 3-5 | 5-10 | >10 |

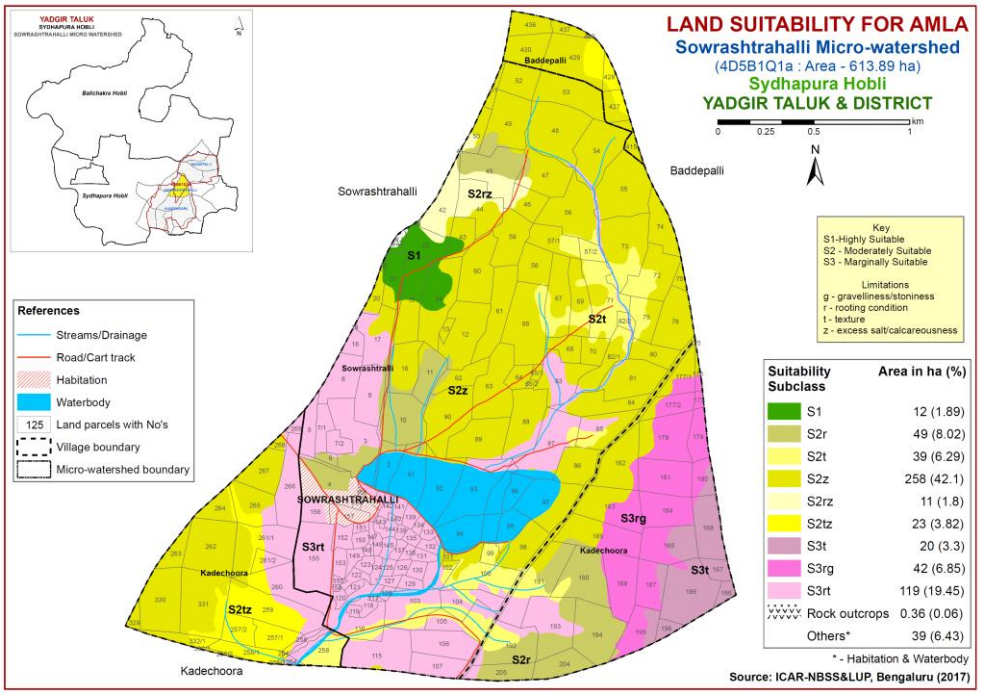



Fig 7.23 Land Suitability map of Amla

### 7.24 Land Suitability for Tamarind (*Tamarindus indica*)

Tamarind is one of the most important spice crop raised in 14897 ha in all the districts of the state. The crop requirements for growing tamarind (Table 7.25) 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 geographic distribution of different suitability subclasses in the microwatershed is given in Figure 7.24.

**Table 7.25 Crop suitability criteria for Tamarind**

| Crop requirement | | | Rating | | | |
|---|---|---|---|---|---|---|
| Soil –site characteristics | | Unit | Highly suitable(S1) | Moderately suitable(S2) | Marginally suitable(S3) | Not suitable(N) |
| Soil aeration | Soil drainage | Class | Well drained | Mod.well drained | Poorly drained | V.Poorly drained |
| 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 |
| Rooting conditions | Soil depth | cm | >150 | 100-150 | 75-100 | <50 |
| | Gravel content | % vol. | <15 | 15-35 | 35-60 | 60-80 |
| Erosion | Slope | % | 0-3 | 3-5 | 5-10 | >10 |

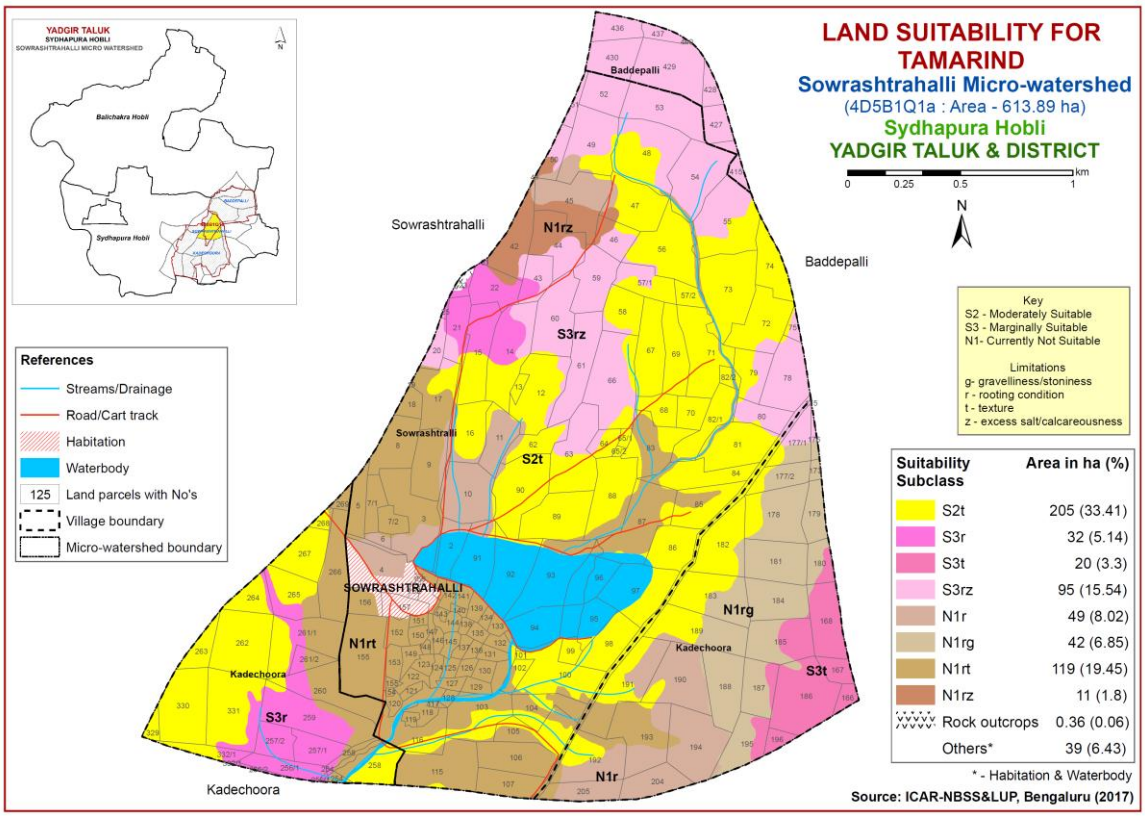



Fig 7.24 Land Suitability map of Tamarind

There are no highly suitable (Class S1) lands for growing tamarind in the microwatershed. Moderately suitable (Class S2) lands occur in an area of 205 ha (33%) and are distributed in the northern, northeastern, central, southwestern and southern part

of the microwatershed. They have minor limitation of texture. An area of 147 ha (24%) is marginally suitable (Class S3) for growing tamarind and are distributed in the northern, northwestern, eastern, southeastern and southwestern part of the microwatershed with moderate limitations of rooting condition, texture and calcareousness. Currently not suitable lands (Class N1) occupy an area of 221 ha (36%) and are distributed in the major part of the microwatershed. They have severe limitations of rooting condition, texture, gravelliness and calcareousness.

### 7.25 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 for growing marigold (Table 7.26) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing marigold was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.25.

There are no highly (Class S1) suitable lands for growing marigold in the microwatershed. Maximum area of 392 ha (64%) is moderately suitable (Class S2) and are distributed in the major part of the microwatershed. They have minor limitations of drainage, texture, calcareousness and rooting condition. Marginally suitable lands (Class S3) occupy an area of 181 ha (30%) and are distributed in the central, southeastern, southern and western part of the microwatershed. They have moderate limitations of rooting condition, texture and gravelliness.

**Table 7.26 Land suitability criteria for Marigold**

| **Crop requirement** | | | **Rating** | | | |
|---|---|---|---|---|---|---|
| **Soil –site characteristics** | | **Unit** | **Highly suitable(S1)** | **Moderately suitable(S2)** | **Marginally suitable(S3)** | **Not suitable(N)** |
| Climate | Temperature in growing season | | 18-23 | 17-15,24-35 | 35-40,10-14 | >40,<10 |
| Soil aeration | Soil drainage | class | Well drained | Moderately well drained | Imperfectly drained | Poorly drained |
| Nutrient availability | Texture | Class | l,sl,scl cl, sil | sicl, sc,sic, c | c | ls, s |
| | pH | 1:2.5 | 7.0-7.5 | 5.5-5.9,7.6-8.5 | <5, >8.5 | - |
| | $CaCO_3$ in root zone | % | Non calcareous | Slightly calcareous | Strongly calcareous | - |
| Rooting conditions | Soil depth | cm | >75 | 50-75 | 25-50 | <25 |
| | Gravel content | %vol. | <15 | 15-35 | >35 | - |
| Soil toxicity | Salinity | ds/m | Non saline | Slightly | Strongly | - |
| | Sodicity(ESP) | % | <10 | 10-15 | >15 | - |
| Erosion | Slope | % | 1-3 | 3-5 | 5-10 | - |

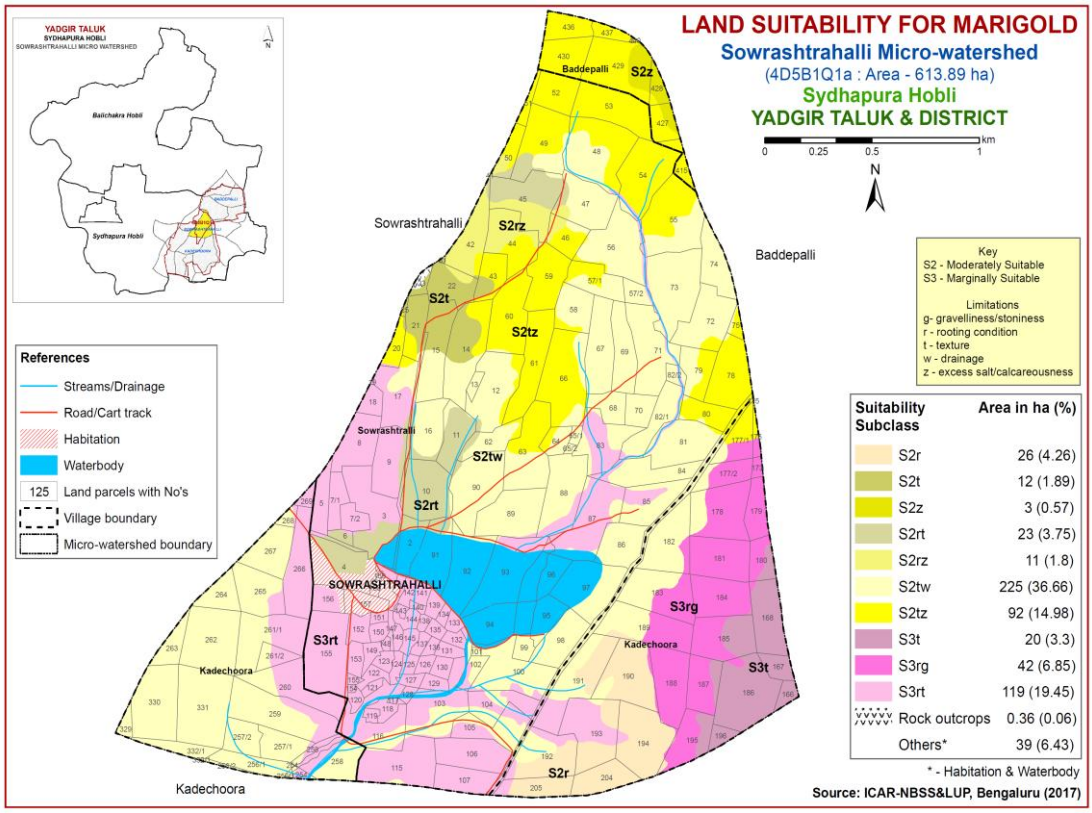



Fig. 7.25 Land Suitability map of Marigold

### 7.26 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 for growing chrysanthemum (Table 7.27) 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 is given in Figure 7.26.

There are no highly (Class S1) suitable lands for growing chrysanthemum in the microwatershed. Maximum area of about 392 ha (64%) is moderately suitable (Class S2) and are distributed in the major part of the microwatershed. They have minor limitations of drainage, texture, calcareousness and rooting condition. Marginally suitable lands (Class S3) occur in an area of 181 ha (30%) and are distributed in the central, southern, western and southeastern part of the microwatershed. They have moderate limitations of rooting condition, texture and gravelliness.

**Table 7.27 Land suitability criteria for Chrysanthemum**

| Crop requirement | | | Rating | | | |
|---|---|---|---|---|---|---|
| **Soil –site characteristics** | | **Unit** | **Highly suitable(S1)** | **Moderately suitable(S2)** | **Marginally suitable(S3)** | **Not suitable(N)** |
| Climate | Temperature in growing season | | 18-23 | 17-15, 24-35 | 35-40,10-14 | >40, <10 |
| Soil aeration | Soil drainage | class | Well drained | Moderately well drained | Imperfectly drained | Poorly drained |
| Nutrient availability | Texture | Class | l,sl,scl,cl, sil | sicl, sc, sic,c | c | ls, s |
| | pH | 1:2.5 | 7.0-7.5 | 5.5-5.9, 7.6-8.5 | <5>8.5 | |
| | $CaCO_3$ in root zone | % | Non calcareous | Slightly calcareous | Strongly calcareous | |
| Rooting conditions | Soil depth | cm | >75 | 50-75 | 25-50 | <25 |
| | Gravel content | %vol. | <15 | 15-35 | >35 | |
| Soil toxicity | Salinity | ds/m | Non saline | slightly | strongly | |
| | Sodicity(ESP) | % | <10 | 10-15 | >15 | - |
| Erosion | Slope | % | 1-3 | 3-5 | 5-10 | |

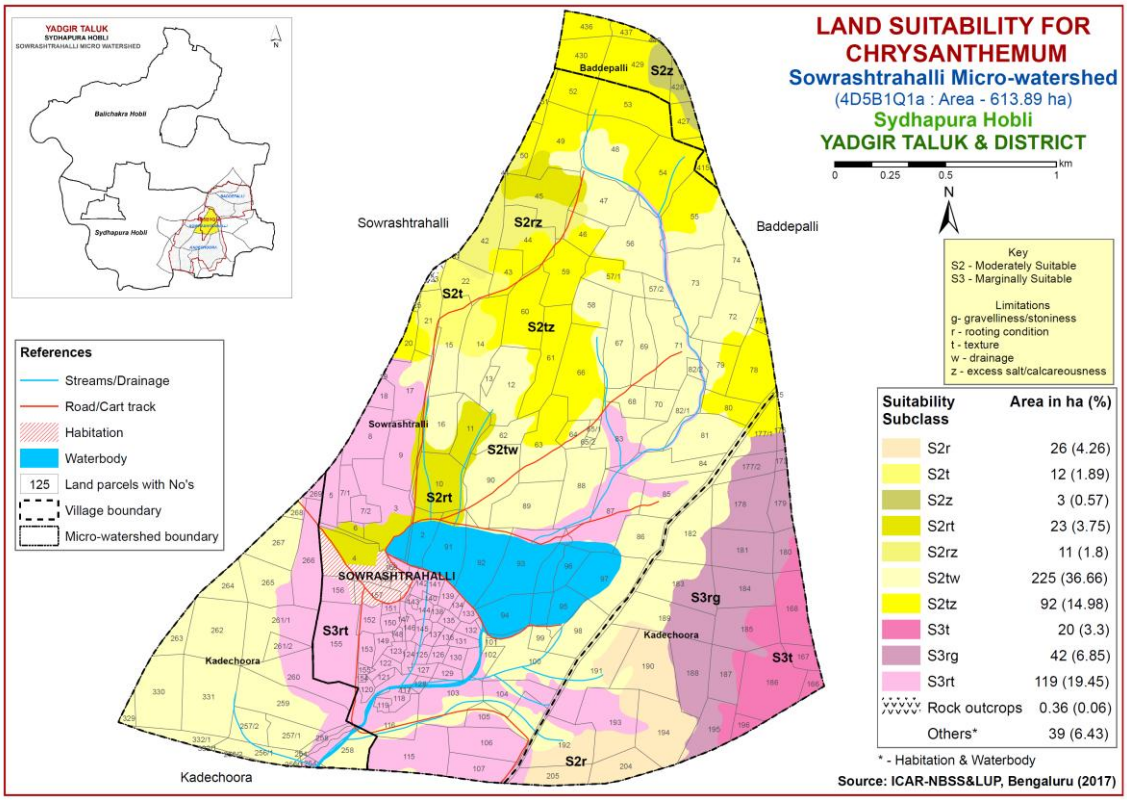



Fig. 7.26 Land Suitability map of Chrysanthemum

## 7.27 Land Management Units (LMUs)

The 19 soil map units identified in Sowrashtrahalli microwatershed have been grouped into five Land Management Units (LMU's) for the purpose of preparing a Proposed Crop Plan. Land Management Units are grouped based on the similarities in respect of the type of soil, the depth of the soil, the surface soil texture, gravel content, AWC, slope, erosion etc. and a Land Management Units map (Fig. 7.27) has been

generated. These Land Management Units are expected to behave similarly for a given level of management.

The 19 soil map units that have been grouped into five Land Management Units along with brief description of soil and site characteristics are given below.

| LMU NO. | Soil Map Unit number | Soil Map Units | Soil and site characteristics |
|---|---|---|---|
| 1 | 111, 50, 52, 55, 79, 87, 89, 90, 91, 95 | HSLbB2, BGDbB2, ANRbB3, ANRiB2, RHNmB2, KDRiB2, KDRmB2, SWRcB2, SWRmB2, HGNmB2 | Moderately deep to very deep, black sandy loam to clay soils |
| 2 | 37, 38, 41 | BLCcB2, BLCiB2, PGPiB2 | Moderately deep, red clay soils |
| 3 | 17, 20,70 | HLGiB2, JNKcB2, RMPcB2 | Moderately shallow, black sandy clay to sandy clay loam soils |
| 4 | 2, 5 | BDLbB2, BDLiB2 | Shallow, black clay soils |
| 5 | 108 | DSBiB2 | Shallow, gravelly black clay soils |

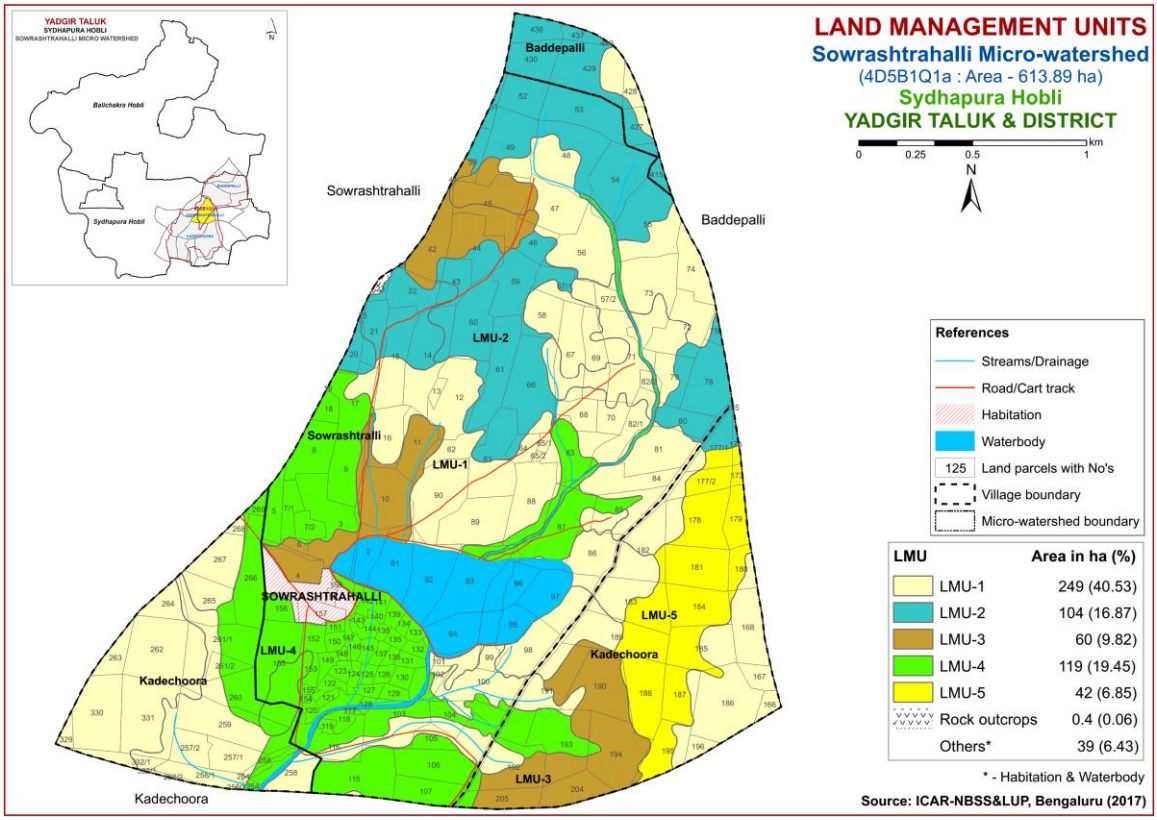



Fig. 7.27 Land Management Units (LMU's) map of Sowrashtrahalli microwatershed

## 7.28 Proposed Crop Plan for Sowrashtrahalli Microwatershed

After assessing the land suitability for the 26 crops, a 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 26 crops. The resultant proposed crop plan is presented in Table 7.28.

**Table 7.28 Proposed Crop Plan for Sowrashtrahalli Micro watershed**

| Proposed LMU | Soil Map Units | Survey Number | Soil characters | Field Crops | Horticulture Crops | Suitable Interventions |
|---|---|---|---|---|---|---|
| LUC 1<br>249 ha<br>(41%) | 111.HSLbB2<br>50.BGDbB2<br>52.ANRbB3<br>55.ANRiB2<br>79.RHNmB2<br>87.KDRiB2<br>89.KDRmB2<br>90.SWRcB2<br>91.SWRmB2<br>95.HGNmB2 | **Baddepalli:** 428<br>**Kadechoora:** 166,167,168,182,186,196,256/1,256/2,257/1,257/2,258, 259,262,263,264,265,267, 268,329,330,331,332/1<br>**Sowrashtralli:** 12,13,16,47,56,57/2,58,62,63,64,65/1,65/2,67,68,69,70,71,72,73,74,79,81,82/1,82/2,84,85,86,88,89,90,98,99, 100,101,102,105 | Moderately deep to very deep, black sandy loam to clay soils | Sunflower, Sorghum, Cotton, Bengal gram, Safflower, Linseed, Bajra | **Fruit crops:** Pomegranate, Lime, Musambi, Amla, Custard apple, Tamarind, Jamun,<br>**Vegetables:** Drumstick, Chilli, Coriander<br>**Flowers:** Marigold, Chrysanthemum | Application of FYM, Biofertilizers and micronutrients, drip irrigation, Mulching, suitable soil and water conservation practices |
| LUC 2<br>104 ha<br>(17%) | 37.BLCcB2<br>38.BLCiB2<br>41.PGPiB2 | **Baddepalli:** 415,427,429, 430,436,437,440<br>**Kadechoora:** 175,177/1<br>**Sowrashtralli:** 14,15,20,21,22,23,25,31,43,46,48,49,50,51,52,53,54,55,57/1,59,60,61,66,75,78,80 | Moderately deep, red clay soils | Maize, Sorghum, Groundnut, Redgram, Bajra | **Fruit crops:** Sapota, Guava, Jackfruit, Musambi, Pomegranate, Lime, Amla, Custard apple<br>**Vegetables:** Tomato, Drumstick, Chilli,<br>**Flowers:** Marigold, Chrysanthemum | Drip irrigation, mulching, suitable conservation practices (Crescent Bunding with Catch Pit etc) |
| LUC 3<br>60 ha<br>(10%) | 17.HLGiB2<br>20.JNKcB2<br>70.RMPcB2 | **Kadechoora:** 190,191,192,194,204, 205<br>**Sowrashtralli:** 6,10,11,41,42,44, 45 | Moderately shallow, black sandy clay to sandy clay loam soils | Maize, Sorghum, Groundnut, Bengal gram, Bajra | **Fruit crops:**, Amla, Custard apple,<br>**Vegetables:** Tomato, Chilli, Coriander<br>**Flowers:** Marigold, Chrysanthemum | Application of FYM, Biofertilizers and micronutrients, drip irrigation, Mulching, suitable soil and water conservation practices |

| | | | | | | |
|---|---|---|---|---|---|---|
| LUC 4<br>119 ha<br>(19%) | 2.BDLbB2<br>5.BDLiB2 | Kadechoora:<br>193,254,260,261/1,261/2,266, 269<br>Sowrashtralli:<br>1,3,5,7/1,7/2,8,9,17,18,19,83,87,103,104,106,107,115,116,117,118,119,120,121,122,123,124,125,126,127,128,129,130,131,132,133,134,135,136,137,138,139,140,141,142,143,144,145,146,147,148,149,150,151,152,153, 154,155,156 | Shallow, black clay soils | Bengal gram, Horse gram, Linseed, Safflower, Coriander | **Agri-Silvi-Pasture:** Hybrid Napier, *Styloxanthes hamata*, Glyricidia, *Styloxanthes scabra* | Use of short duration varieties, sowing across the slope, drip irrigation and mulching is recommended. |
| LUC 5<br>42 ha<br>(7%) | 108.DSBiB2 | Kadechoora:<br>173,176,177/2,178,179,180,181,183,184,185,187,188,189,195 | Shallow, gravelly black clay soils | - | **Agri-Silvi-Pasture:** Hybrid Napier, *Styloxanthes hamata*, Glyricidia, *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 unfavourable conditions occur

**Characteristics of Sowrashtrahalli Microwatershed**

- The soil phases with sizeable area identified in the microwatershed belonged to the soil series of Badiyala (BDL) 120 ha (19%), Sowrashtrahalli (SWR) 77 ha (12%), Kudlura (KDR) 55 ha (9%), Dastharabad (DSB) 42 ha (7%), Anur (ANR) 38 ha (6%), Hegganakera (HGN) 35 ha (6%), Jinkera (JNK) 26 ha (4%), Rampur (RMP) 23 ha (4%), Belagundi (BGD) 20 ha (3%), Poglapur (PGP) 12 ha (2%), Halagera (HLG) 11 ha (2%) and Hosalli (HSL) 3 ha (<1%) area in the microwatershed.

- As per land capability classification, entire area comes under arable land category (Class II, III and IV). The major limitations identified in the arable lands were soil and erosion.

- On the basis of soil reaction, about 0.48 ha (<1%) is slightly acid (pH 6.0-6.5), 61 ha (10%) is neutral (pH 6.5-7.3), 80 ha (13%) is slightly alkaline (pH 7.3-7.8). An area of about 246 ha (40%) is moderately alkaline (pH 7.8-8.4) in reaction. An area of about 160 ha (26%) is strongly alkaline (pH 8.4-9.0) in reaction and a small area of 26 ha (4%) is very strongly alkaline (pH >9.0 in the microwatershed. Major area in the microwatershed is alkaline in reaction.

**Soil Health Management**

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

**Acid soils**

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

Liming materials:

1. $CaCO_3$ (Calcium Carbonate). More than 90% use in India.
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 to moderately alkaline 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, 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**

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

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

**Soil Degradation**

Soil erosion is one of the major factor affecting the soil health in the microwatershed. Out of total 614 ha area in the microwatershed, an area of about 553 ha (90%) is suffering from moderate and 21 ha (3%) is suffering from severe erosion. The areas with severe and moderate erosion need immediate soil and water conservation and, other land development and land husbandry practices for restoring soil health.

**Dissemination of Information and Communication of Benefits**

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

**Inputs for Net Planning (Saturation Plan) and Interventions needed**

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

1. Soil and Water Conservation Treatment 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 may be adopted.

- **Gravelliness:** More gravel content is favourable 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 Sowrashtrahalli microwatershed.
- **Organic Carbon:** The OC content (an index of available Nitrogen) is medium (0.5-0.75%) in an area of 237 ha (39%) and about 337 ha (55%) area high (>0.75%). In the areas of low and medium OC, it needs to be further improved by applying farmyard manure and rotating crops with cereals and legumes or mixed cropping.
- **Promoting green manuring:** Growing of green manuring crops cost Rs. 1250/ha (green manuring seeds) and about Rs. 2000/ha towards cultivation that totals to Rs. 3250/- per ha. On the other hand, application of organic manure @ 10 tons/ha costs Rs. 5000/ha. The practice needs to be continued for 2-3 years or more. Nitrogen fertilizer needs to be supplemented by 25% in addition to the recommended level in 237 ha area where OC is less than 0.5-0.75%. For example, for rainfed maize, recommended level is 50 kg N per ha and an additional 12 kg /ha needs to be applied for all the crops grown in these plots.
- **Available Phosphorus**: In 200 ha (33%) area, the available phosphorus is low and about 374 ha (61%) is medium. Hence for all the crops, 25% additional P-needs to be applied, where it is low or medium in available phosphorus.
- **Available Potassium:** Available potassium is medium in 124 ha (20%) and high in 451 ha (73%) area of the microwatershed. In the medium plots, for all crops, additional 25 % potassium may be applied.
- **Available Sulphur:** Available sulphur is a very critical nutrient for oilseed crops. It is low in 156 ha (25%) area of the microwatershed and medium in 253 ha (41%). These 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 sulphur is high in 165 ha (27%) area in the microwatershed**.**
- **Available Boron:** It is low in 134 ha (22%) area of the microwatershed and medium in 246 ha (40%). The areas that are low and medium need to be applied with sodium borate @ 10 kg/ha as soil application or 0.2% borax as foliar spray to correct the deficiency. High in area of about 194 ha (32%) in the microwatershed.
- **Available Iron:** It is sufficient in 500 ha (82%) area and it is defficient in 74 ha (12%) area in the microwatershed. To manage iron deficiency, iron sulphate @ 25 ka/ha needs to be applied for 2-3 years.

- **Available Zinc:** Entire area is deficient in available zinc. Application of zinc sulphate @25kg/ha is to be followed.

**Soil acidity:** The microwatershed has 0.48 ha (<1%) area with soils that are slightly acid. These areas need application of lime (Clalcium Carbonate)

**Soil Alkalinity:** The microwatershed has 512 ha (84%) soils that are slightly to very strongly alkaline in reaction. These areas need application of gypsum and wherever calcium is in excess, iron pyrites and element sulphur can be recommended. Management practices like treating repeatedly with good quality water to drain out the excess salts and, provision of subsurface drainage and growing of salt tolerant crops like Casuarina, Acasia, Neem, Ber etc., are recommended.

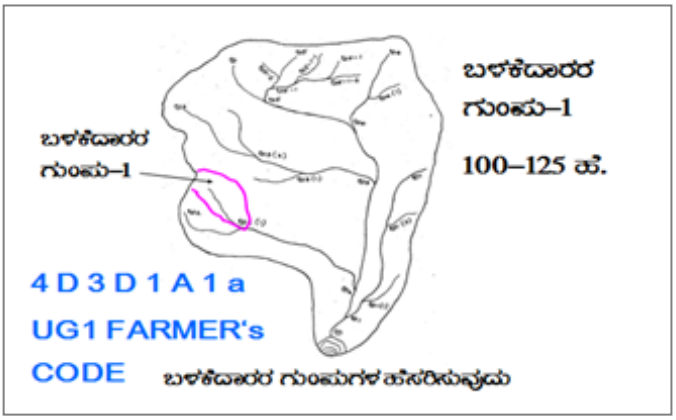
**Land Suitability for various crops:** Areas that are highly, moderately, marginally suitable and not suitable for growing various crops are indicated. Along with the suitability, various constraints that are limiting the productivity are also indicated. For example, in case of cotton, gravel content, rooting depth and salinity/alkalinity are the major constraints in various plots. With suitable management interventions, the productivity can be enhanced. In order to increase water holding capacity of light textured soils, growing of green manure crops and application of organic manure is recommended.

*Chapter 9*

## SOIL AND WATER CONSERVATION TREATMENT PLAN

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

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




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

### Steps for Survey and Preparation of Treatment Plan

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

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

### 9.1 Treatment Plan

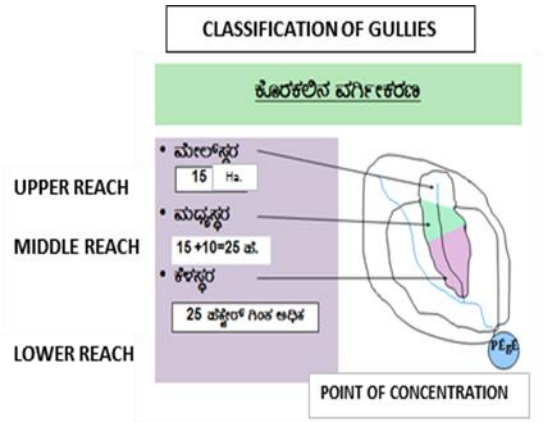
The treatment plan recommended for arable lands is briefly described below

### 9.1.1 Arable Land Treatment

### A. BUNDING

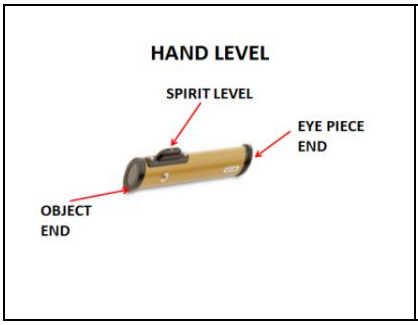
| Steps for Survey and Preparation of Treatment Plan | |
|---|---|
| • Cadastral map (1:7920 scale) is enlarged to a scale of 1:2500 scale<br>• Existing network of waterways, pothissa boundaries, grass belts, natural drainage lines/ watercourse, cut ups/ terraces are marked on the cadastral map to the scale<br>• 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) |

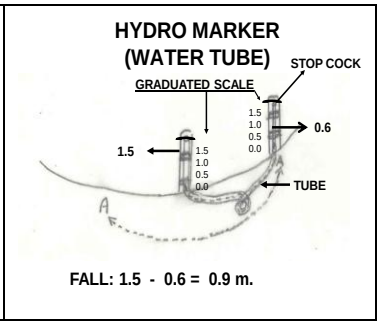
**USER GROUP-1**




**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.

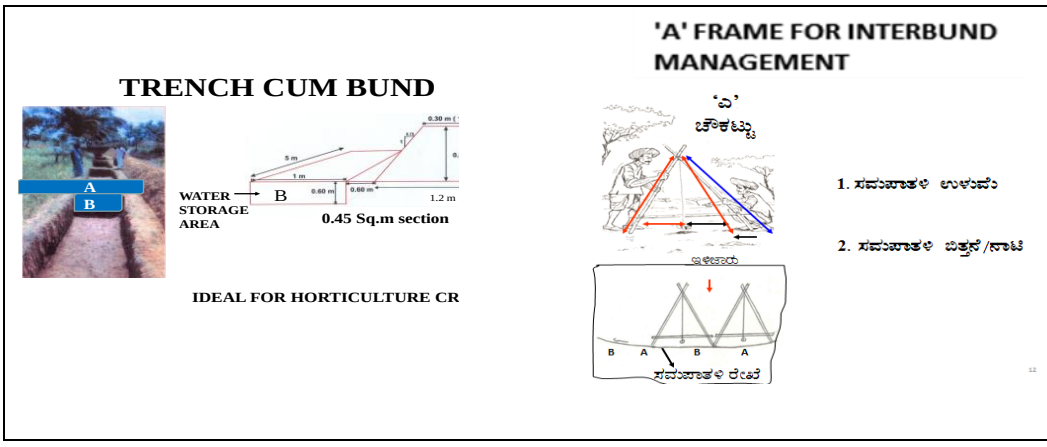
**Recommended Bund Section**

| 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 soil | |
| 0.3 | 1.2 | 0.6 | 0.75:1 | 0.45 | | |
| 0.3 | 1.5 | 0.6 | 01:01 | 0.54 | Red sandy loam | |
| 0.3 | 2.1 | 0.6 | 1.5:1 | 0.72 | Very shallow black clayey soils | |
| 0.45 | 2 | 0.75 | 01:01 | 0.92 | | |
| 0.45 | 2.4 | 0.75 | 1.3:1 | 1.07 | Shallow black clayey soils | |
| 0.6 | 3.1 | 0.7 | 1.78:1 | 1.29 | Medium black clayey soils | |
| 0.5 | 3 | 0.85 | 1.47:1 | 1.49 | | |

**Formation of Trench cum Bund**

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

Details of Borrow Pit dimensions are given below:



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

| Bund section | Bund length | Earth quantity | Pit | | | | Berm (pit to pit) | Soil depth class |
|---|---|---|---|---|---|---|---|---|
| $m^2$ | m | $m^3$ | L(m) | W(m) | D(m) | Qantity ($m^3$) | 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**

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

**C. Farm Ponds**

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

**D. Diversion Channel**

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

**9.1.2 Non-Arable Land Treatment**

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

**9.1.3 Treatment of Natural Water Course/ Drainage Lines**

a) The cadastral map has to be updated as regards the network of drainage lines (gullies/ *nalas/ hallas*) and existing structures are marked to the scale and storage capacity of the existing water bodies are documented.
b) The drainage line will be demarcated into Upper Reach, Middle Reach and Lower Reach.

c) Considering the Catchment, *Nala* bed and bank conditions, suitable structures are decided.
d) Number of storage structures (Check dam/ *Nala* bund/ Percolation tank) will be decided considering the commitments and available runoff in water budgeting and quality of water in the wells and site suitability.
e) Detailed Levelling Survey using Dumpy Level / Total Station has to be carried out to arrive at the site-specific designs as shown in the Manual.
f) The location of ground water recharge structures are decided by examining the lineaments and fracture zones from geological maps.
g) Rainfall intensity data of the nearest Rain Gauge Station is considered for Hydrologic Designs.
h) Silt load to the Storage/Recharge Structures is reduced by providing vegetative, boulder and earthen checks in the natural water course. Location and design details are given in the Manual.

**9.2 Recommended Soil and Water Conservation Measures**

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

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

A map (Fig. 9.1) showing soil and water conservation plan with the kind of conservation structures recommended has been prepared, which shows the spatial distribution and extent of area. Major area of about 146 ha (24%) requires Trench cum Bunding and 428 ha (70%) requires Graded Bunding. The conservation plan prepared may be presented to all the stakeholders including farmers and after including their suggestions, the conservation plan for the microwatershed may be finalised in a participatory approach.

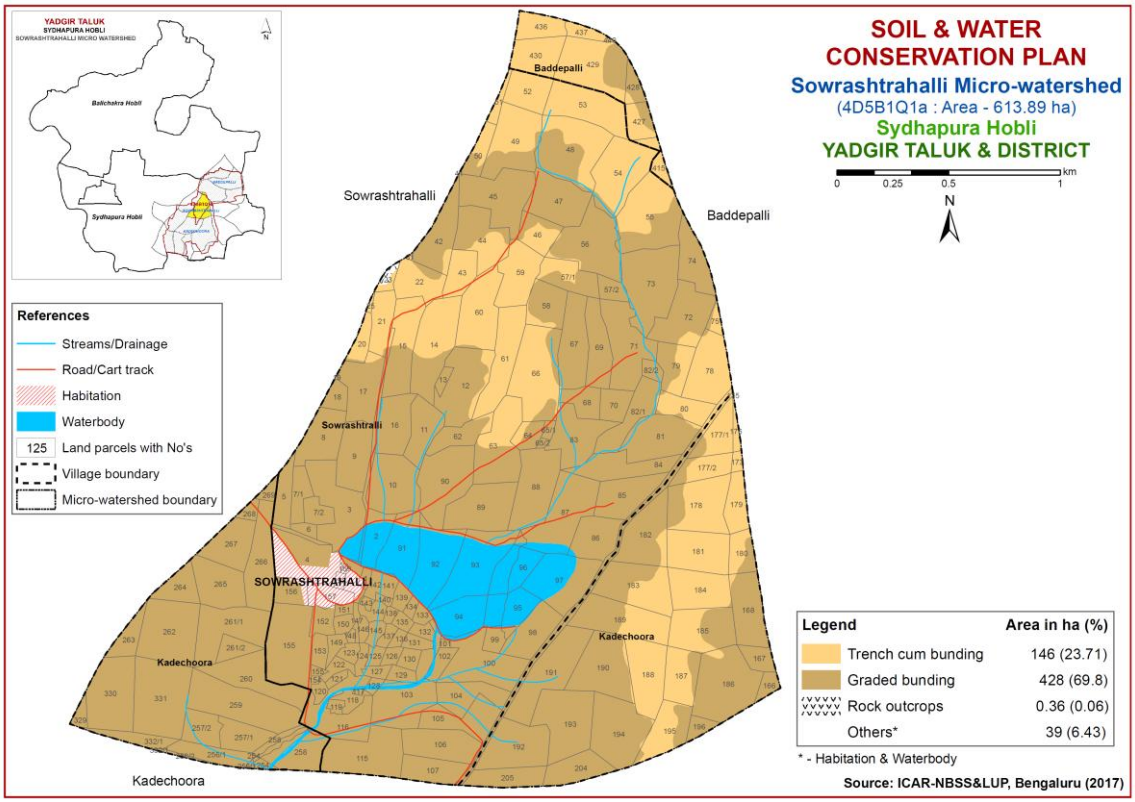



Fig. 9.1 Soil and Water Conservation Plan map of Sowrashtrahalli Microwatershed

### 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 1$^{st}$ 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 2$^{nd}$ or 3$^{rd}$ week of April depending on the rainfall.

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

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

## References


1. FAO (1976) Framework for Land Evaluation, Food and Agriculture Organization, Rome.72 pp.
2. FAO (1983) Guidelines for Land Evaluation for Rainfed Agriculture, FAO, Rome, 237 pp.
3. IARI (1971) Soil Survey Manual, All India Soil and Land Use Survey Organization, IARI, New Delhi, 121 pp.
4. Katyal, J.C. and Rattan, R.K. (2003) Secondary and Micronutrients; Research Gap and Future Needs. Fert. News 48 (4); 9-20.
5. Naidu, L.G.K., Ramamurthy, V., Challa, O., Hegde, R. and Krishnan, P. (2006) Manual Soil Site Suitability Criteria for Major Crops, NBSS Publ. No. 129, NBSS & LUP, Nagpur, 118 pp.
6. Natarajan, A. and Dipak Sarkar (2010) Field Guide for Soil Survey, National Bureau of Soil Survey and Land Use Planning (ICAR), Nagpur, India.
7. Natarajan, A., Rajendra Hegde, Raj, J.N. and Shivananda Murthy, H.G. (2015) Implementation Manual for Sujala-III Project, Watershed Development Department, Bengaluru, Karnataka.
8. Sarma, V.A.K., Krishnan, P. and Budihal, S.L. (1987) Laboratory Manual, Tech. Bull. 23, NBSS &LUP, Nagpur.
9. Sehgal, J.L. (1990) Soil Resource Mapping of Different States of India; Why and How?, National Bureau of Soil Survey and Land Use Planning, Nagpur, 49 pp.
10. Shivaprasad, C.R., R.S. Reddy, J. Sehgal and M. Velayuthum (1998) Soils of Karntaka for Optimising Land Use, NBSS Publ. No. 47b, NBSS & LUP, Nagpur, India.
11. Soil Survey Staff (2006) Keys to Soil Taxonomy, Tenth edition, U.S. Department of Agriculture/ NRCS, Washington DC, U.S.A.
12. Soil Survey Staff (2012) Soil Survey Manual, Handbook No. 18, USDA, Washington DC, USA.

# Appendix I

## Sowrashtrahalli 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Baddepalli | 415 | 1.15 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | TCB |
| Baddepalli | 427 | 1.9 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | TCB |
| Baddepalli | 428 | 1.15 | HSLbB2 | LMU-1 | Moderately deep (75-100 cm) | Loamy sand | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | Graded bunding |
| Baddepalli | 429 | 6.73 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | TCB |
| Baddepalli | 430 | 3.48 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | TCB |
| Baddepalli | 436 | 2.25 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | TCB |
| Baddepalli | 437 | 0.98 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | TCB |
| Baddepalli | 440 | 0.04 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | TCB |
| Kadechoora | 166 | 0.88 | BGDbB2 | LMU-1 | Deep (100-150 cm) | Loamy sand | Non gravelly (<15%) | Medium (101-150 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Kadechoora | 167 | 1.41 | BGDbB2 | LMU-1 | Deep (100-150 cm) | Loamy sand | Non gravelly (<15%) | Medium (101-150 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IIes | Graded bunding |
| Kadechoora | 168 | 4.53 | BGDbB2 | LMU-1 | Deep (100-150 cm) | Loamy sand | Non gravelly (<15%) | Medium (101-150 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy+Redgram (Pd+Rg) | Not Available | IIes | Graded bunding |
| Kadechoora | 173 | 0.43 | DSBiB2 | LMU-5 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IVes | TCB |
| Kadechoora | 175 | 0 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Redgram (Jw+Rg) | Not Available | IIes | TCB |
| Kadechoora | 176 | 0.54 | DSBiB2 | LMU-5 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IVes | TCB |
| Kadechoora | 177/1 | 2.77 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | TCB |
| Kadechoora | 177/2 | 2.52 | DSBiB2 | LMU-5 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IVes | TCB |
| Kadechoora | 178 | 6.14 | DSBiB2 | LMU-5 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton+Redgram (Jw+Ct+Rg) | Not Available | IVes | TCB |
| Kadechoora | 179 | 2.34 | DSBiB2 | LMU-5 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IVes | TCB |
| Kadechoora | 180 | 2.09 | DSBiB2 | LMU-5 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IVes | TCB |
| Kadechoora | 181 | 4.97 | DSBiB2 | LMU-5 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton (Jw+Ct) | Not Available | IVes | TCB |
| Kadechoora | 182 | 5.37 | SWRmB2 | LMU-1 | 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 |
| Kadechoora | 183 | 6.09 | DSBiB2 | LMU-5 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton (Jw+Ct) | Not Available | IVes | TCB |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kadechoora | 184 | 4.5 | DSBiB2 | LMU-5 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IVes | TCB |
| Kadechoora | 185 | 5.33 | DSBiB2 | LMU-5 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IVes | TCB |
| Kadechoora | 186 | 7.75 | BGDbB2 | LMU-1 | Deep (100-150 cm) | Loamy sand | Non gravelly (<15%) | Medium (101-150 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton (Jw+Ct) | Not Available | IIes | Graded bunding |
| Kadechoora | 187 | 3.55 | DSBiB2 | LMU-5 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IVes | TCB |
| Kadechoora | 188 | 5.1 | DSBiB2 | LMU-5 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IVes | TCB |
| Kadechoora | 189 | 6.03 | DSBiB2 | LMU-5 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IVes | TCB |
| Kadechoora | 190 | 6.38 | JNKcB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IIes | Graded bunding |
| Kadechoora | 191 | 6.77 | JNKcB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Fallow land+Jowar (Ct+Fl+Jw) | Not Available | IIes | Graded bunding |
| Kadechoora | 192 | 5.61 | JNKcB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Kadechoora | 193 | 6.72 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IIIes | Graded bunding |
| Kadechoora | 194 | 6.67 | JNKcB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IIes | Graded bunding |
| Kadechoora | 195 | 3.96 | DSBiB2 | LMU-5 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IVes | TCB |
| Kadechoora | 196 | 0.94 | BGDbB2 | LMU-1 | Deep (100-150 cm) | Loamy sand | Non gravelly (<15%) | Medium (101-150 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Kadechoora | 204 | 3.17 | JNKcB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IIes | Graded bunding |
| Kadechoora | 205 | 2.89 | JNKcB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | Graded bunding |
| Kadechoora | 254 | 0.36 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Banana (Ba) | Not Available | IIIes | Graded bunding |
| Kadechoora | 256/1 | 2.47 | RHNmB2 | LMU-1 | Moderately deep (75-100 cm) | Clay | Non gravelly (<15%) | Medium (101-150 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | Graded bunding |
| Kadechoora | 256/2 | 0.24 | RHNmB2 | LMU-1 | Moderately deep (75-100 cm) | Clay | Non gravelly (<15%) | Medium (101-150 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Kadechoora | 257/1 | 2.65 | RHNmB2 | LMU-1 | Moderately deep (75-100 cm) | Clay | Non gravelly (<15%) | Medium (101-150 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar (Jw) | Not Available | IIes | Graded bunding |
| Kadechoora | 257/2 | 2.42 | RHNmB2 | LMU-1 | Moderately deep (75-100 cm) | Clay | Non gravelly (<15%) | Medium (101-150 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar (Jw) | Not Available | IIes | Graded bunding |
| Kadechoora | 258 | 4.18 | ANRbB3 | LMU-1 | Deep (100-150 cm) | Loamy sand | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Severe | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Kadechoora | 259 | 7.62 | RHNmB2 | LMU-1 | Moderately deep (75-100 cm) | Clay | Non gravelly (<15%) | Medium (101-150 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Kadechoora | 260 | 5.11 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIIes | Graded bunding |
| Kadechoora | 261/1 | 5.87 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kadechoora | 261/2 | 1.39 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Kadechoora | 262 | 6.91 | HGNmB2 | LMU-1 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Kadechoora | 263 | 1.86 | HGNmB2 | LMU-1 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Redgram (Jw+Rg) | Not Available | IIes | Graded bunding |
| Kadechoora | 264 | 2.31 | HGNmB2 | LMU-1 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar (Jw) | Not Available | IIes | Graded bunding |
| Kadechoora | 265 | 4.31 | HGNmB2 | LMU-1 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IIes | Graded bunding |
| Kadechoora | 266 | 5.1 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton (Jw+Ct) | Not Available | IIIes | Graded bunding |
| Kadechoora | 267 | 3.78 | HGNmB2 | LMU-1 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Kadechoora | 268 | 0.61 | HGNmB2 | LMU-1 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar (Jw) | Not Available | IIes | Graded bunding |
| Kadechoora | 269 | 0.59 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIIes | Graded bunding |
| Kadechoora | 329 | 0.68 | HGNmB2 | LMU-1 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar (Jw) | Not Available | IIes | Graded bunding |
| Kadechoora | 330 | 6.49 | HGNmB2 | LMU-1 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IIes | Graded bunding |
| Kadechoora | 331 | 8.04 | HGNmB2 | LMU-1 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Kadechoora | 332/1 | 1.73 | HGNmB2 | LMU-1 | 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 |
| Sowrashtralli | 1 | 0.42 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Habitation | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 2 | 2.46 | Waterbody | Others | Others | Others | Others | Others | Others | Others | Redgram (Rg) | Not Available | Others | Others |
| Sowrashtralli | 3 | 6.9 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 4 | 5.58 | Habitation | Others | Others | Others | Others | Others | Others | Others | Redgram (Rg) | 1 Bore Well | Others | Others |
| Sowrashtralli | 5 | 2.07 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 6 | 0.58 | RMPcB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy loam | Non gravelly (<15%) | Medium (101-150 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 7/1 | 1.76 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 7/2 | 1.37 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 8 | 3.95 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 9 | 4.2 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | 1 Check Dam | IIIes | Graded bunding |
| Sowrashtralli | 10 | 5.53 | RMPcB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy loam | Non gravelly (<15%) | Medium (101-150 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton (Jw+Ct) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sowrashtralli | 11 | 3.32 | RMPcB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy loam | Non gravelly (<15%) | Medium (101-150 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 12 | 6.18 | KDRiB2 | LMU-1 | Deep (100-150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | 4 Bore Well | IIes | Graded bunding |
| Sowrashtralli | 13 | 0.53 | KDRiB2 | LMU-1 | Deep (100-150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar (Jw) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 14 | 6.79 | PGPiB2 | LMU-2 | 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 | TCB |
| Sowrashtralli | 15 | 5.13 | PGPiB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | 1 Check Dam | IIes | TCB |
| Sowrashtralli | 16 | 3.81 | KDRiB2 | LMU-1 | Deep (100-150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton (Jw+Ct) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 17 | 4.52 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 18 | 1.18 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 19 | 0.03 | BDLiB2 | LMU-4 | 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 |
| Sowrashtralli | 20 | 1.38 | BLCiB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton+Redgram (Jw+Ct+Rg) | Not Available | IIes | TCB |
| Sowrashtralli | 21 | 2.63 | PGPiB2 | LMU-2 | 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 | TCB |
| Sowrashtralli | 22 | 3.31 | PGPiB2 | LMU-2 | 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 | TCB |
| Sowrashtralli | 23 | 0.74 | PGPiB2 | LMU-2 | 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 | TCB |
| Sowrashtralli | 25 | 0.15 | PGPiB2 | LMU-2 | 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 | TCB |
| Sowrashtralli | 31 | 0.06 | PGPiB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Redgram (Jw+Rg) | Not Available | IIes | TCB |
| Sowrashtralli | 41 | 0 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 42 | 4.3 | HLGiB2 | LMU-3 | 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 |
| Sowrashtralli | 43 | 2.46 | BLCiB2 | LMU-2 | 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 | TCB |
| Sowrashtralli | 44 | 4.86 | HLGiB2 | LMU-3 | 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 |
| Sowrashtralli | 45 | 6.44 | RMPcB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy loam | Non gravelly (<15%) | Medium (101-150 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton+Redgram (Jw+Ct+Rg) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 46 | 2.46 | BLCiB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | TCB |
| Sowrashtralli | 47 | 4.95 | SWRmB2 | LMU-1 | Deep (100-150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 48 | 7.95 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IIes | TCB |
| Sowrashtralli | 49 | 6.17 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IIes | TCB |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sowrashtralli | 50 | 1.75 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | TCB |
| Sowrashtralli | 51 | 0.74 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Redgram (Jw+Rg) | Not Available | IIes | TCB |
| Sowrashtralli | 52 | 3.07 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar (Jw) | Not Available | IIes | TCB |
| Sowrashtralli | 53 | 5.52 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton (Jw+Ct) | Not Available | IIes | TCB |
| Sowrashtralli | 54 | 6.39 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton (Jw+Ct) | Not Available | IIes | TCB |
| Sowrashtralli | 55 | 7.86 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton+Redgram (Jw+Ct+Rg) | Not Available | IIes | TCB |
| Sowrashtralli | 56 | 6.81 | SWRmB2 | LMU-1 | Deep (100-150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 57/1 | 3.18 | BLCiB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | TCB |
| Sowrashtralli | 57/2 | 1.18 | ANRiB2 | LMU-1 | Deep (100-150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 58 | 3.2 | SWRcB2 | LMU-1 | Deep (100-150 cm) | Sandy loam | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton (Jw+Ct) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 59 | 4.35 | BLCiB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Redgram (Jw+Rg) | Not Available | IIes | TCB |
| Sowrashtralli | 60 | 5.62 | BLCiB2 | LMU-2 | 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 | TCB |
| Sowrashtralli | 61 | 5.32 | BLCiB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton (Jw+Ct) | 1 Bore Well | IIes | TCB |
| Sowrashtralli | 62 | 2.58 | KDRiB2 | LMU-1 | Deep (100-150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 63 | 6.26 | KDRiB2 | LMU-1 | Deep (100-150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 64 | 1.43 | KDRiB2 | LMU-1 | Deep (100-150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 65/1 | 0.39 | KDRiB2 | LMU-1 | Deep (100-150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 65/2 | 0.19 | KDRiB2 | LMU-1 | Deep (100-150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 66 | 7.95 | BLCiB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IIes | TCB |
| Sowrashtralli | 67 | 4.88 | SWRcB2 | LMU-1 | Deep (100-150 cm) | Sandy loam | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 68 | 2.03 | SWRmB2 | LMU-1 | 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 |
| Sowrashtralli | 69 | 3.77 | SWRcB2 | LMU-1 | Deep (100-150 cm) | Sandy loam | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 70 | 1.84 | SWRmB2 | LMU-1 | 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 |
| Sowrashtralli | 71 | 6.14 | ANRiB2 | LMU-1 | Deep (100-150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sowrashtralli | 72 | 5.3 | SWRmB2 | LMU-1 | Deep (100-150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 73 | 7.63 | SWRmB2 | LMU-1 | Deep (100-150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Current fallow (Ct+Cf) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 74 | 3.34 | SWRmB2 | LMU-1 | Deep (100-150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 75 | 0.64 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | TCB |
| Sowrashtralli | 78 | 5.09 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | TCB |
| Sowrashtralli | 79 | 2.97 | ANRiB2 | LMU-1 | Deep (100-150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 80 | 2.4 | BLCcB2 | LMU-2 | Moderately deep (75-100 cm) | Sandy loam | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IIes | TCB |
| Sowrashtralli | 81 | 5.37 | SWRmB2 | LMU-1 | Deep (100-150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton (Jw+Ct) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 82/1 | 3.64 | SWRmB2 | LMU-1 | 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 |
| Sowrashtralli | 82/2 | 0.72 | ANRiB2 | LMU-1 | Deep (100-150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 83 | 4.81 | BDLbB2 | LMU-4 | Shallow (25-50 cm) | Loamy sand | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 84 | 4.01 | SWRmB2 | LMU-1 | Deep (100-150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton (Jw+Ct) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 85 | 4.16 | SWRmB2 | LMU-1 | Deep (100-150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Current fallow (Cf) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 86 | 3.58 | SWRcB2 | LMU-1 | Deep (100-150 cm) | Sandy loam | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton (Jw+Ct) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 87 | 6.97 | BDLbB2 | LMU-4 | Shallow (25-50 cm) | Loamy sand | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Current fallow (Ct+Cf) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 88 | 5.98 | KDRiB2 | LMU-1 | Deep (100-150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 89 | 5.66 | KDRiB2 | LMU-1 | Deep (100-150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 90 | 6.54 | KDRiB2 | LMU-1 | Deep (100-150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Cotton (Rg+Ct) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 91 | 4.5 | Waterbody | Others | Others | Others | Others | Others | Others | Others | Redgram (Rg) | Not Available | Others | Others |
| Sowrashtralli | 92 | 5.69 | Waterbody | Others | Others | Others | Others | Others | Others | Others | Jowar (Jw) | Not Available | Others | Others |
| Sowrashtralli | 93 | 6.67 | Waterbody | Others | Others | Others | Others | Others | Others | Others | Jowar+Cotton (Jw+Ct) | Not Available | Others | Others |
| Sowrashtralli | 94 | 3.47 | Waterbody | Others | Others | Others | Others | Others | Others | Others | Bengalgram (Bg) | Not Available | Others | Others |
| Sowrashtralli | 95 | 2.18 | Waterbody | Others | Others | Others | Others | Others | Others | Others | Not Available (NA) | Not Available | Others | Others |
| Sowrashtralli | 96 | 1.67 | Waterbody | Others | Others | Others | Others | Others | Others | Others | Jowar (Jw) | Not Available | Others | Others |
| Sowrashtralli | 97 | 6.07 | Waterbod | Others | Others | Others | Others | Others | Others | Others | Redgram+Cotton | Not | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | y | | | | | | | | (Rg+Ct) | Available | | |
| Sowrashtralli | 98 | 3.72 | KDRiB2 | LMU-1 | Deep (100-150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 99 | 0.97 | ANRbB3 | LMU-1 | Deep (100-150 cm) | Loamy sand | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Severe | Redgram (Rg) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 100 | 6.17 | ANRbB3 | LMU-1 | Deep (100-150 cm) | Loamy sand | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Severe | Scrub land (Sl) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 101 | 0.17 | KDRmB2 | LMU-1 | Deep (100-150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | Graded bunding |
| Sowrashtralli | 102 | 1.1 | ANRbB3 | LMU-1 | Deep (100-150 cm) | Loamy sand | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Severe | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 103 | 6.36 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 104 | 3.29 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Scrub land (Sl) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 105 | 3.98 | ANRbB3 | LMU-1 | Deep (100-150 cm) | Loamy sand | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Severe | Cotton+Scrub land (Ct+Sl) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 106 | 4.43 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Cotton (Jw+Ct) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 107 | 3.04 | BDLiB2 | LMU-4 | 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 |
| Sowrashtralli | 115 | 6.39 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram+Paddy+Jowar (Rg+Pd+Jw) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 116 | 5.42 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy+Cotton (Pd+Ct) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 117 | 0.11 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 118 | 0.88 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 119 | 0.42 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 120 | 0.55 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 121 | 0.43 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 122 | 0.8 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 123 | 0.68 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 124 | 0.63 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 125 | 0.6 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 126 | 0.6 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 127 | 0.62 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 128 | 0.4 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sowrashtralli | 129 | 0.77 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Groundnut (Gn) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 130 | 0.81 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 131 | 0.75 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 132 | 0.66 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 133 | 0.57 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 134 | 0.41 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 135 | 0.56 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 136 | 0.43 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 137 | 0.56 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 138 | 0.34 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 139 | 0.77 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 140 | 0.26 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 141 | 0.69 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 142 | 0.71 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 143 | 0.24 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 144 | 0.8 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 145 | 0.71 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 146 | 0.48 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 147 | 0.37 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 148 | 0.21 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 149 | 0.8 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | 1 Bore Well | IIIes | Graded bunding |
| Sowrashtralli | 150 | 0.7 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 151 | 0.39 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 152 | 1.3 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | 1 Bore Well | IIIes | Graded bunding |
| Sowrashtralli | 153 | 1.02 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly | Very low (<50 | Very gently | Moderate | Not Available (NA) | 1 Bore | IIIes | Graded |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | (<15%) | mm/m) | sloping (1-3%) | | | Well | | bunding |
| Sowrashtralli | 154 | 0.12 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 155 | 7.38 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy+Cotton (Pd+Ct) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 156 | 1.71 | BDLiB2 | LMU-4 | Shallow (25-50 cm) | Sandy clay | Non gravelly (<15%) | Very low (<50 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIIes | Graded bunding |
| Sowrashtralli | 157 | 1.78 | Habitation | Others | Others | Others | Others | Others | Others | Others | Habitation | Not Available | Others | Others |
| Sowrashtralli | 158 | 0.31 | Habitation | Others | Others | Others | Others | Others | Others | Others | Habitation | Not Available | Others | Others |
| Sowrashtralli | 159 | 0.1 | Habitation | Others | Others | Others | Others | Others | Others | Others | Habitation | Not Available | Others | Others |

# Appendix I

## Sowrashtrahalli Microwatershed

## Soil Fertility Information

| Village | Survey NO | Soil Reaction | Salinity (EC) | Organic Carbon | Available Phosphorus | Available Potassium | Available Sulphur | Available Boron | Available Iron | Available Manganese | Available Copper | Available Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Baddepalli | 415 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Baddepalli | 427 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Baddepalli | 428 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Baddepalli | 429 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (>0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Baddepalli | 430 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Baddepalli | 436 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (>0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Baddepalli | 437 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (>0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Baddepalli | 440 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (>0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 166 | 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 167 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 168 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 173 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 175 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 176 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 177/1 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 177/2 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | Medium (0.5 - 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 178 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 179 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 180 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 181 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 182 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 183 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |

| Village | Survey NO | Soil Reaction | Salinity (EC) | Organic Carbon | Available Phosphorus | Available Potassium | Available Sulphur | Available Boron | Available Iron | Available Manganese | Available Copper | Available Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kadechoora | 184 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 185 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 186 | 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) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 187 | 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) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 188 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 189 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 190 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | High (> 1.0 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 191 | Moderately alkaline (pH 7.8 – 8.4) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 192 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 193 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | High (> 1.0 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 194 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | High (> 1.0 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 195 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 196 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 204 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | High (> 1.0 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 205 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Medium (10 - 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 254 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 256/1 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | High (> 1.0 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 256/2 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | High (> 1.0 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 257/1 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 257/2 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | High (> 1.0 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 258 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 259 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 260 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Medium (10 - 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 261/1 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |

| Village | Survey NO | Soil Reaction | Salinity (EC) | Organic Carbon | Available Phosphorus | Available Potassium | Available Sulphur | Available Boron | Available Iron | Available Manganese | Available Copper | Available Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kadechoora | 261/2 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 262 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 263 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Low (< 23 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 264 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 265 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Medium (10 - 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 266 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | High (> 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 267 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Medium (10 - 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 268 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | High (> 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 269 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Medium (10 - 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 329 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Low (< 23 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | High (> 1.0 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 330 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Low (< 23 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 331 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Kadechoora | 332/1 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | High (> 1.0 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 1 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 2 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowrashtralli | 3 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 4 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowrashtralli | 5 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | Medium (10 - 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 6 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | High (> 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 7/1 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | High (> 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 7/2 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 8 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 9 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 10 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 11 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |

| Village | Survey NO | Soil Reaction | Salinity (EC) | Organic Carbon | Available Phosphorus | Available Potassium | Available Sulphur | Available Boron | Available Iron | Available Manganese | Available Copper | Available Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sowrashtralli | 12 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 13 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 14 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 15 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 16 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 17 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 18 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 19 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 20 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | Medium (0.5 - 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 21 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | Medium (0.5 - 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 22 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | Medium (0.5 - 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 23 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Rock outcrops | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 25 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 31 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 41 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 42 | 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 43 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | Medium (0.5 - 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 44 | 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 45 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 46 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 47 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 48 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 49 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 50 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |

| Village | Survey NO | Soil Reaction | Salinity (EC) | Organic Carbon | Available Phosphorus | Available Potassium | Available Sulphur | Available Boron | Available Iron | Available Manganese | Available Copper | Available Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sowrashtralli | 51 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 52 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 53 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 54 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 55 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 56 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 57/1 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 57/2 | Very strongly alkaline (pH > 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 58 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 59 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 60 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 61 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 62 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 63 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 64 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 65/1 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 65/2 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 66 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 67 | Very strongly alkaline (pH > 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 68 | Very strongly alkaline (pH > 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 69 | Very strongly alkaline (pH > 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 70 | Very strongly alkaline (pH > 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 71 | Very strongly alkaline (pH > 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 72 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |

| Village | Survey NO | Soil Reaction | Salinity (EC) | Organic Carbon | Available Phosphorus | Available Potassium | Available Sulphur | Available Boron | Available Iron | Available Manganese | Available Copper | Available Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sowrashtralli | 73 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 74 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 75 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 78 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 79 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 80 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 81 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 82/1 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 82/2 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 83 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 84 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 85 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 86 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 87 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Low (< 23 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 (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 88 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 89 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 90 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 91 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowrashtralli | 92 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowrashtralli | 93 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowrashtralli | 94 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowrashtralli | 95 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowrashtralli | 96 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowrashtralli | 97 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowrashtralli | 98 | Strongly alkaline (pH 8.4 – 9.0) | Low (2 – 4 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 99 | Very strongly alkaline (pH > 9.0) | Low (2 – 4 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 100 | Strongly alkaline (pH 8.4 – 9.0) | Low (2 – 4 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 101 | Strongly alkaline (pH 8.4 – 9.0) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |

| Village | Survey NO | Soil Reaction | Salinity (EC) | Organic Carbon | Available Phosphorus | Available Potassium | Available Sulphur | Available Boron | Available Iron | Available Manganese | Available Copper | Available Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sowrashtralli | 102 | Strongly alkaline (pH 8.4 – 9.0) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 103 | Strongly alkaline (pH 8.4 – 9.0) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 104 | Strongly alkaline (pH 8.4 – 9.0) | Low (2 – 4 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 105 | Strongly alkaline (pH 8.4 – 9.0) | Low (2 – 4 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 106 | Moderately alkaline (pH 7.8 – 8.4) | Low (2 – 4 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 107 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 - 0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 115 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 116 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 117 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 118 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 119 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 120 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 121 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 122 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 123 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 124 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 125 | Strongly alkaline (pH 8.4 – 9.0) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 126 | Strongly alkaline (pH 8.4 – 9.0) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 127 | Strongly alkaline (pH 8.4 – 9.0) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 128 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 129 | Strongly alkaline (pH 8.4 – 9.0) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 130 | Strongly alkaline (pH 8.4 – 9.0) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 131 | Strongly alkaline (pH 8.4 – 9.0) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 132 | Strongly alkaline (pH 8.4 – 9.0) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |

| Village | Survey NO | Soil Reaction | Salinity (EC) | Organic Carbon | Available Phosphorus | Available Potassium | Available Sulphur | Available Boron | Available Iron | Available Manganese | Available Copper | Available Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sowrashtralli | 133 | Moderately alkaline (pH 7.8 – 8.4) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 134 | Moderately alkaline (pH 7.8 – 8.4) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 135 | Moderately alkaline (pH 7.8 – 8.4) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 136 | Strongly alkaline (pH 8.4 – 9.0) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 137 | Moderately alkaline (pH 7.8 – 8.4) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 138 | Moderately alkaline (pH 7.8 – 8.4) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 139 | Moderately alkaline (pH 7.8 – 8.4) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 140 | Moderately alkaline (pH 7.8 – 8.4) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 141 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 142 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 143 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 144 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 145 | Moderately alkaline (pH 7.8 – 8.4) | Low (2 – 4 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 146 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 147 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 148 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 149 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 150 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 151 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 152 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 153 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 154 | Strongly alkaline (pH 8.4 – 9.0) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | Medium (10 - 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 155 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 156 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (>0.75 %) | Medium (23 - 57 kg/ha) | Medium ( 145 - 337 kg/ha) | High (> 20 ppm) | Medium (0.5 - 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2ppm) | Deficient (< 0.6 ppm) |
| Sowrashtralli | 157 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |

| Village | Survey NO | Soil Reaction | Salinity (EC) | Organic Carbon | Available Phosphorus | Available Potassium | Available Sulphur | Available Boron | Available Iron | Available Manganese | Available Copper | Available Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sowrashtralli | 158 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowrashtralli | 159 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |

# Appendix I

## Sowrashtrahalli Microwatershed

## Soil Suitability Information

| Village | Survey No | Mango | Maize | Sapota | Sorghum | Guava | Cotton | Tamarind | Lime | Bengalgram | Sunflower | Red gram | Amla | Jackfruit | Custard-apple | Cashew | Jamun | Musambi | Groundnut | Chilly | Tomato | Marigold | Chrysanthemum | Pomegranate | Bajra | Drumstick | Mulberry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Baddepalli | 415 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Baddepalli | 427 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Baddepalli | 428 | S3rz | S3tz | S2rz | S2tz | S2rz | S3tz | S3rz | S2rz | S3tz | S2rz | S2rz | S2tz | S2rz | S2z | N1tz | S3rz | S2rz | S2z | S2z | S2z | S2z | S2z | S2rz | S2z | S2rz | S2rz |
| Baddepalli | 429 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Baddepalli | 430 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Baddepalli | 436 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Baddepalli | 437 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Baddepalli | 440 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Kadechoora | 166 | S3t | S3t | S3t | S3t | S3t | N1t | S3t | S3t | N1t | N1t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S2t | S3t | S3t |
| Kadechoora | 167 | S3t | S3t | S3t | S3t | S3t | N1t | S3t | S3t | N1t | N1t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S2t | S3t | S3t |
| Kadechoora | 168 | S3t | S3t | S3t | S3t | S3t | N1t | S3t | S3t | N1t | N1t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S2t | S3t | S3t |
| Kadechoora | 173 | N1rg | S3rg | N1rg | S3rg | N1rg | S3rg | N1rg | N1rg | S3rg | N1rg | S3rg | S3rg | N1rg | S3rg | N1rt | N1rg | N1rg | S3rg | S3rg | S3rg | S3rg | S3rg | N1rg | S3rg | N1rg | N1rg |
| Kadechoora | 175 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Kadechoora | 176 | N1rg | S3rg | N1rg | S3rg | N1rg | S3rg | N1rg | N1rg | S3rg | N1rg | S3rg | S3rg | N1rg | S3rg | N1rt | N1rg | N1rg | S3rg | S3rg | S3rg | S3rg | S3rg | N1rg | S3rg | N1rg | N1rg |
| Kadechoora | 177/1 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Kadechoora | 177/2 | N1rg | S3rg | N1rg | S3rg | N1rg | S3rg | N1rg | N1rg | S3rg | N1rg | S3rg | S3rg | N1rg | S3rg | N1rt | N1rg | N1rg | S3rg | S3rg | S3rg | S3rg | S3rg | N1rg | S3rg | N1rg | N1rg |
| Kadechoora | 178 | N1rg | S3rg | N1rg | S3rg | N1rg | S3rg | N1rg | N1rg | S3rg | N1rg | S3rg | S3rg | N1rg | S3rg | N1rt | N1rg | N1rg | S3rg | S3rg | S3rg | S3rg | S3rg | N1rg | S3rg | N1rg | N1rg |
| Kadechoora | 179 | N1rg | S3rg | N1rg | S3rg | N1rg | S3rg | N1rg | N1rg | S3rg | N1rg | S3rg | S3rg | N1rg | S3rg | N1rt | N1rg | N1rg | S3rg | S3rg | S3rg | S3rg | S3rg | N1rg | S3rg | N1rg | N1rg |
| Kadechoora | 180 | N1rg | S3rg | N1rg | S3rg | N1rg | S3rg | N1rg | N1rg | S3rg | N1rg | S3rg | S3rg | N1rg | S3rg | N1rt | N1rg | N1rg | S3rg | S3rg | S3rg | S3rg | S3rg | N1rg | S3rg | N1rg | N1rg |
| Kadechoora | 181 | N1rg | S3rg | N1rg | S3rg | N1rg | S3rg | N1rg | N1rg | S3rg | N1rg | S3rg | S3rg | N1rg | S3rg | N1rt | N1rg | N1rg | S3rg | S3rg | S3rg | S3rg | S3rg | N1rg | S3rg | N1rg | N1rg |
| Kadechoora | 182 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |

| Village | Survey No | Mango | Maize | Sapota | Sorghum | Guava | Cotton | Tamarind | Lime | Bengalgram | Sunflower | Red gram | Amla | Jackfruit | Custard-apple | Cashew | Jamun | Musambi | Groundnut | Chilly | Tomato | Marigold | Chrysanthemum | Pomegranate | Bajra | Drumstick | Mulberry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kadechoora | 183 | N1rg | S3rg | N1rg | S3rg | N1rg | S3rg | N1rg | N1rg | S3rg | N1rg | S3rg | S3rg | N1rg | S3rg | N1rt | N1rg | N1rg | S3rg | S3rg | S3rg | S3rg | S3rg | N1rg | S3rg | N1rg | N1rg |
| Kadechoora | 184 | N1rg | S3rg | N1rg | S3rg | N1rg | S3rg | N1rg | N1rg | S3rg | N1rg | S3rg | S3rg | N1rg | S3rg | N1rt | N1rg | N1rg | S3rg | S3rg | S3rg | S3rg | S3rg | N1rg | S3rg | N1rg | N1rg |
| Kadechoora | 185 | N1rg | S3rg | N1rg | S3rg | N1rg | S3rg | N1rg | N1rg | S3rg | N1rg | S3rg | S3rg | N1rg | S3rg | N1rt | N1rg | N1rg | S3rg | S3rg | S3rg | S3rg | S3rg | N1rg | S3rg | N1rg | N1rg |
| Kadechoora | 186 | S3t | S3t | S3t | S3t | S3t | N1t | S3t | S3t | N1t | N1t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S2t | S3t | S3t |
| Kadechoora | 187 | N1rg | S3rg | N1rg | S3rg | N1rg | S3rg | N1rg | N1rg | S3rg | N1rg | S3rg | S3rg | N1rg | S3rg | N1rt | N1rg | N1rg | S3rg | S3rg | S3rg | S3rg | S3rg | N1rg | S3rg | N1rg | N1rg |
| Kadechoora | 188 | N1rg | S3rg | N1rg | S3rg | N1rg | S3rg | N1rg | N1rg | S3rg | N1rg | S3rg | S3rg | N1rg | S3rg | N1rt | N1rg | N1rg | S3rg | S3rg | S3rg | S3rg | S3rg | N1rg | S3rg | N1rg | N1rg |
| Kadechoora | 189 | N1rg | S3rg | N1rg | S3rg | N1rg | S3rg | N1rg | N1rg | S3rg | N1rg | S3rg | S3rg | N1rg | S3rg | N1rt | N1rg | N1rg | S3rg | S3rg | S3rg | S3rg | S3rg | N1rg | S3rg | N1rg | N1rg |
| Kadechoora | 190 | N1r | S2t | S3r | S2r | S3r | S2r | N1r | S3r | S2r | S3r | S3r | S2r | S3r | S2r | N1rt | S3r | S3r | S3t | S2r | S2r | S2r | S2r | S3r | S2r | S3r | S3r |
| Kadechoora | 191 | N1r | S2t | S3r | S2r | S3r | S2r | N1r | S3r | S2r | S3r | S3r | S2r | S3r | S2r | N1rt | S3r | S3r | S3t | S2r | S2r | S2r | S2r | S3r | S2r | S3r | S3r |
| Kadechoora | 192 | N1r | S2t | S3r | S2r | S3r | S2r | N1r | S3r | S2r | S3r | S3r | S2r | S3r | S2r | N1rt | S3r | S3r | S3t | S2r | S2r | S2r | S2r | S3r | S2r | S3r | S3r |
| Kadechoora | 193 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Kadechoora | 194 | N1r | S2t | S3r | S2r | S3r | S2r | N1r | S3r | S2r | S3r | S3r | S2r | S3r | S2r | N1rt | S3r | S3r | S3t | S2r | S2r | S2r | S2r | S3r | S2r | S3r | S3r |
| Kadechoora | 195 | N1rg | S3rg | N1rg | S3rg | N1rg | S3rg | N1rg | N1rg | S3rg | N1rg | S3rg | S3rg | N1rg | S3rg | N1rt | N1rg | N1rg | S3rg | S3rg | S3rg | S3rg | S3rg | N1rg | S3rg | N1rg | N1rg |
| Kadechoora | 196 | S3t | S3t | S3t | S3t | S3t | N1t | S3t | S3t | N1t | N1t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S3t | S2t | S3t | S3t |
| Kadechoora | 204 | N1r | S2t | S3r | S2r | S3r | S2r | N1r | S3r | S2r | S3r | S3r | S2r | S3r | S2r | N1rt | S3r | S3r | S3t | S2r | S2r | S2r | S2r | S3r | S2r | S3r | S3r |
| Kadechoora | 205 | N1r | S2t | S3r | S2r | S3r | S2r | N1r | S3r | S2r | S3r | S3r | S2r | S3r | S2r | N1rt | S3r | S3r | S3t | S2r | S2r | S2r | S2r | S3r | S2r | S3r | S3r |
| Kadechoora | 254 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Kadechoora | 256/1 | S3rt | S3tw | S3t | S2wz | S3t | S2rw | S3r | S2rz | S2wz | S2rw | S2rt | S2tz | S3t | S2z | N1tz | S3rt | S2r | S3tw | S2tw | S3tw | S2tw | S2tw | S2rt | S2tw | S2rt | S3tw |
| Kadechoora | 256/2 | S3rt | S3tw | S3t | S2wz | S3t | S2rw | S3r | S2rz | S2wz | S2rw | S2rt | S2tz | S3t | S2z | N1tz | S3rt | S2r | S3tw | S2tw | S3tw | S2tw | S2tw | S2rt | S2tw | S2rt | S3tw |
| Kadechoora | 257/1 | S3rt | S3tw | S3t | S2wz | S3t | S2rw | S3r | S2rz | S2wz | S2rw | S2rt | S2tz | S3t | S2z | N1tz | S3rt | S2r | S3tw | S2tw | S3tw | S2tw | S2tw | S2rt | S2tw | S2rt | S3tw |
| Kadechoora | 257/2 | S3rt | S3tw | S3t | S2wz | S3t | S2rw | S3r | S2rz | S2wz | S2rw | S2rt | S2tz | S3t | S2z | N1tz | S3rt | S2r | S3tw | S2tw | S3tw | S2tw | S2tw | S2rt | S2tw | S2rt | S3tw |
| Kadechoora | 258 | S3tz | S3tw | S3t | S2zw | S3t | S2z | S2t | S2z | S2z | S2zw | S2tw | S2t | S3t | S2z | N1t | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tz | S2tw | S3tw |
| Kadechoora | 259 | S3rt | S3tw | S3t | S2wz | S3t | S2rw | S3r | S2rz | S2wz | S2rw | S2rt | S2tz | S3t | S2z | N1tz | S3rt | S2r | S3tw | S2tw | S3tw | S2tw | S2tw | S2rt | S2tw | S2rt | S3tw |

| Village | Survey No | Mango | Maize | Sapota | Sorghum | Guava | Cotton | Tamarind | Lime | Bengalgram | Sunflower | Red gram | Amla | Jackfruit | Custard-apple | Cashew | Jamun | Musambi | Groundnut | Chilly | Tomato | Marigold | Chrysanthemum | Pomegranate | Bajra | Drumstick | Mulberry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kadechoora | 260 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Kadechoora | 261/1 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Kadechoora | 261/2 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Kadechoora | 262 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Kadechoora | 263 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Kadechoora | 264 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Kadechoora | 265 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Kadechoora | 266 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Kadechoora | 267 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Kadechoora | 268 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Kadechoora | 269 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Kadechoora | 329 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Kadechoora | 330 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Kadechoora | 331 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Kadechoora | 332/1 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowrashtralli | 1 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrashtralli | 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 |
| Sowrashtralli | 3 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrashtralli | 4 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowrashtralli | 5 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrashtralli | 6 | N1r | S3t | S3rt | S2rw | S3r | S2rw | N1r | S3r | S2rw | S3rw | S3rw | S2r | S3rt | S2r | N1t | S3r | S3r | S3tw | S3rt | S3rt | S2rt | S2rt | S3r | S3rt | S3w | S3rt |
| Sowrashtralli | 7/1 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrashtralli | 7/2 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |

| Village | Survey No | Mango | Maize | Sapota | Sorghum | Guava | Cotton | Tamarind | Lime | Bengalgram | Sunflower | Red gram | Amla | Jackfruit | Custard-apple | Cashew | Jamun | Musambi | Groundnut | Chilly | Tomato | Marigold | Chrysanthemum | Pomegranate | Bajra | Drumstick | Mulberry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sowras htralli | 8 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 9 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 10 | N1r | S3t | S3rt | S2rw | S3r | S2rw | N1r | S3r | S2rw | S3rw | S3rw | S2r | S3rt | S2r | N1t | S3r | S3r | S3tw | S3rt | S3rt | S2rt | S2rt | S3r | S3rt | S3w | S3rt |
| Sowras htralli | 11 | N1r | S3t | S3rt | S2rw | S3r | S2rw | N1r | S3r | S2rw | S3rw | S3rw | S2r | S3rt | S2r | N1t | S3r | S3r | S3tw | S3rt | S3rt | S2rt | S2rt | S3r | S3rt | S3w | S3rt |
| Sowras htralli | 12 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 13 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 14 | S3r | S1 | S2r | S1 | S2rt | S2r | S3r | S2r | S2t | S2r | S2r | S1 | S2r | S1 | S2rt | S3r | S2r | S2t | S2t | S1 | S2t | S2t | S2r | S1 | S2r | S2r |
| Sowras htralli | 15 | S3r | S1 | S2r | S1 | S2rt | S2r | S3r | S2r | S2t | S2r | S2r | S1 | S2r | S1 | S2rt | S3r | S2r | S2t | S2t | S1 | S2t | S2t | S2r | S1 | S2r | S2r |
| Sowras htralli | 16 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 17 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 18 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 19 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 20 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowras htralli | 21 | S3r | S1 | S2r | S1 | S2rt | S2r | S3r | S2r | S2t | S2r | S2r | S1 | S2r | S1 | S2rt | S3r | S2r | S2t | S2t | S1 | S2t | S2t | S2r | S1 | S2r | S2r |
| Sowras htralli | 22 | S3r | S1 | S2r | S1 | S2rt | S2r | S3r | S2r | S2t | S2r | S2r | S1 | S2r | S1 | S2rt | S3r | S2r | S2t | S2t | S1 | S2t | S2t | S2r | S1 | S2r | S2r |
| Sowras htralli | 23 | S3r | S1 | S2r | S1 | S2rt | S2r | S3r | S2r | S2t | S2r | S2r | S1 | S2r | S1 | S2rt | S3r | S2r | S2t | S2t | S1 | S2t | S2t | S2r | S1 | S2r | S2r |
| Sowras htralli | 25 | S3r | S1 | S2r | S1 | S2rt | S2r | S3r | S2r | S2t | S2r | S2r | S1 | S2r | S1 | S2rt | S3r | S2r | S2t | S2t | S1 | S2t | S2t | S2r | S1 | S2r | S2r |
| Sowras htralli | 31 | S3r | S1 | S2r | S1 | S2rt | S2r | S3r | S2r | S2t | S2r | S2r | S1 | S2r | S1 | S2rt | S3r | S2r | S2t | S2t | S1 | S2t | S2t | S2r | S1 | S2r | S2r |
| Sowras htralli | 41 | N1rz | S2rz | S3rz | S2rz | S3rz | S2rz | N1rz | S3rz | S2rz | S3rz | S3rz | S2rz | S3rz | S2rz | N1tz | S3rz | S3rz | S2rz | S2rz | S2rz | S2rz | S2rz | S3rz | S2rz | S3rz | S3rz |
| Sowras htralli | 42 | N1rz | S2rz | S3rz | S2rz | S3rz | S2rz | N1rz | S3rz | S2rz | S3rz | S3rz | S2rz | S3rz | S2rz | N1tz | S3rz | S3rz | S2rz | S2rz | S2rz | S2rz | S2rz | S3rz | S2rz | S3rz | S3rz |
| Sowras htralli | 43 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowrash tralli | 44 | N1rz | S2rz | S3rz | S2rz | S3rz | S2rz | N1rz | S3rz | S2rz | S3rz | S3rz | S2rz | S3rz | S2rz | N1tz | S3rz | S3rz | S2rz | S2rz | S2rz | S2rz | S2rz | S3rz | S2rz | S3rz | S3rz |
| Sowrash tralli | 45 | N1r | S3t | S3rt | S2rw | S3r | S2rw | N1r | S3r | S2rw | S3rw | S3rw | S2r | S3rt | S2r | N1t | S3r | S3r | S3tw | S3rt | S3rt | S2rt | S2rt | S3r | S3rt | S3w | S3rt |

| Village | Survey No | Mango | Maize | Sapota | Sorghum | Guava | Cotton | Tamarind | Lime | Bengalgram | Sunflower | Red gram | Amla | Jackfruit | Custard-apple | Cashew | Jamun | Musambi | Groundnut | Chilly | Tomato | Marigold | Chrysanthemum | Pomegranate | Bajra | Drumstick | Mulberry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sowras htralli | 46 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowras htralli | 47 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 48 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowras htralli | 49 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowras htralli | 50 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowras htralli | 51 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowras htralli | 52 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowras htralli | 53 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowras htralli | 54 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowras htralli | 55 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowras htralli | 56 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 57/1 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowras htralli | 57/2 | S3tz | S3tw | S3t | S2zw | S3t | S2z | S2t | S2z | S2z | S2zw | S2tw | S2t | S3t | S2z | N1t | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tz | S2tw | S3tw |
| Sowras htralli | 58 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 59 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowras htralli | 60 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowras htralli | 61 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowras htralli | 62 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 63 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 64 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 65/1 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowrash tralli | 65/2 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowrash tralli | 66 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |

| Village | Survey No | Mango | Maize | Sapota | Sorghum | Guava | Cotton | Tamarind | Lime | Bengalgram | Sunflower | Red gram | Amla | Jackfruit | Custard-apple | Cashew | Jamun | Musambi | Groundnut | Chilly | Tomato | Marigold | Chrysanthemum | Pomegranate | Bajra | Drumstick | Mulberry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sowras htralli | 67 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 68 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 69 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 70 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 71 | S3tz | S3tw | S3t | S2zw | S3t | S2z | S2t | S2z | S2z | S2zw | S2tw | S2t | S3t | S2z | N1t | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tz | S2tw | S3tw |
| Sowras htralli | 72 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 73 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 74 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 75 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowras htralli | 78 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowras htralli | 79 | S3tz | S3tw | S3t | S2zw | S3t | S2z | S2t | S2z | S2z | S2zw | S2tw | S2t | S3t | S2z | N1t | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tz | S2tw | S3tw |
| Sowras htralli | 80 | S3rz | S2z | S2rz | S2z | S2rt | S2rz | S3rz | S2rz | S2tz | S2rz | S2rz | S2z | S2rz | S2z | S2rt | S3rz | S2rz | S2tz | S2tz | S2z | S2tz | S2tz | S2rz | S2z | S2rz | S2rz |
| Sowras htralli | 81 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 82/1 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 82/2 | S3tz | S3tw | S3t | S2zw | S3t | S2z | S2t | S2z | S2z | S2zw | S2tw | S2t | S3t | S2z | N1t | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tz | S2tw | S3tw |
| Sowras htralli | 83 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 84 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 85 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 86 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 87 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 88 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowrash tralli | 89 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowrash tralli | 90 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |

| Village | Survey No | Mango | Maize | Sapota | Sorghum | Guava | Cotton | Tamarind | Lime | Bengalgram | Sunflower | Red gram | Amla | Jackfruit | Custard-apple | Cashew | Jamun | Musambi | Groundnut | Chilly | Tomato | Marigold | Chrysanthemum | Pomegranate | Bajra | Drumstick | Mulberry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sowras htralli | 91 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowras htralli | 92 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowras htralli | 93 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowras htralli | 94 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowras htralli | 95 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowras htralli | 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 |
| Sowras htralli | 97 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowras htralli | 98 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 99 | S3tz | S3tw | S3t | S2zw | S3t | S2z | S2t | S2z | S2z | S2zw | S2tw | S2t | S3t | S2z | N1t | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tz | S2tw | S3tw |
| Sowras htralli | 100 | S3tz | S3tw | S3t | S2zw | S3t | S2z | S2t | S2z | S2z | S2zw | S2tw | S2t | S3t | S2z | N1t | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tz | S2tw | S3tw |
| Sowras htralli | 101 | S3t | S3tw | S3t | S2wz | S3t | S2wz | S2t | S2z | S2wz | S2rw | S2tw | S2z | S3t | S2z | N1tz | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Sowras htralli | 102 | S3tz | S3tw | S3t | S2zw | S3t | S2z | S2t | S2z | S2z | S2zw | S2tw | S2t | S3t | S2z | N1t | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tz | S2tw | S3tw |
| Sowras htralli | 103 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 104 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 105 | S3tz | S3tw | S3t | S2zw | S3t | S2z | S2t | S2z | S2z | S2zw | S2tw | S2t | S3t | S2z | N1t | S2t | S2z | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tz | S2tw | S3tw |
| Sowras htralli | 106 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 107 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 115 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 116 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 117 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 118 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrash tralli | 119 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrash tralli | 120 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |

| Village | Survey No | Mango | Maize | Sapota | Sorghum | Guava | Cotton | Tamarind | Lime | Bengalgram | Sunflower | Red gram | Amla | Jackfruit | Custard-apple | Cashew | Jamun | Musambi | Groundnut | Chilly | Tomato | Marigold | Chrysanthemum | Pomegranate | Bajra | Drumstick | Mulberry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sowras htralli | 121 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 122 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 123 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 124 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 125 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 126 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 127 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 128 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 129 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 130 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 131 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 132 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 133 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 134 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 135 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 136 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 137 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 138 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 139 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 140 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowras htralli | 141 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrash tralli | 142 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrash tralli | 143 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |

| Village | Survey No | Mango | Maize | Sapota | Sorghum | Guava | Cotton | Tamarind | Lime | Bengalgram | Sunflower | Red gram | Amla | Jackfruit | Custard-apple | Cashew | Jamun | Musambi | Groundnut | Chilly | Tomato | Marigold | Chrysanthemum | Pomegranate | Bajra | Drumstick | Mulberry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sowrashtralli | 144 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrashtralli | 145 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrashtralli | 146 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrashtralli | 147 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrashtralli | 148 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrashtralli | 149 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrashtralli | 150 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrashtralli | 151 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrashtralli | 152 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrashtralli | 153 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrashtralli | 154 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrashtralli | 155 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrashtralli | 156 | N1r | S3rt | N1r | S3r | N1rt | S3r | N1rt | N1r | S3r | N1r | S3rt | S3rt | N1rt | S3r | N1rt | N1rt | N1r | S3rt | S3rt | S3rt | S3rt | S3rt | N1r | S3rt | N1rt | N1rt |
| Sowrashtralli | 157 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowrashtralli | 158 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Sowrashtralli | 159 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |

# PART-B

## SOCIO-ECONOMIC STATUS OF FARM HOUSEHOLDS

**CONTENTS**

## LIST OF TABLES

***Chapter 1***

## *SALIENT FINDINGS OF THE SURVEY*

- *The data on households sampled for socio economic survey indicated that 35 farmers were sampled in Sowrashtrahalli micro-watershed among them 5 (14.29 %) were landless, 9 (25.71 %) were marginal farmers, 10 (28.57 %) were small farmers, 9 (25.71 %) were semi medium farmers and 2 (5.71 %) were semi medium farmers.*
- *The data indicated that there were 90 (58.82 %) men and 63 (41.18 %) women among the sampled households. The average family size of landless farmers' was 4.2, marginal farmers' was 3.55, small farmers' was 4.9, semi medium farmers' was 4.44 and medium farmers' was 5.5.*
- *The data indicated that, 23 (15.03 %) people were in 0-15 years of age, 78 (50.98 %) were in 16-35 years of age, 43 (28.10 %) were in 36-60 years of age and 9 (5.88 %) were above 61 years of age.*
- *The results indicated that Sowrashtrahalli had 32.03 per cent illiterates, 3.27 per cent of them had functional literate, 12.42 per cent of them had primary school, 8.50 per cent of them had middle school, 17.65 per cent of them had High School, 12.42 per cent of them had PUC, 1.96 per cent of them had Diploma, 3.27 per cent of them had ITI, 5.88 per cent of them had Degree education and 1.31 per cent of them had Masters education.*
- *The results indicate that, 85.71 per cent of household heads were practicing agriculture, 8.57 per cent of the household heads were General labourers, 2.86 cent of the household heads were in private service and 2.86 per cent of them were trade and business.*
- *The results indicate that agriculture was the major occupation for 38.56 per cent of the household members, 16.34 per cent were agricultural labourers, 2.61 per cent were in general labour, 3.27 per cent were private service, 24.18 per cent were Student, 12.42 per cent were housewives and 1.96 per cent were children.*
- *The results show that, 1.31 per cent of the population in the micro watershed has participated in Self Help Group.*
- *The results indicate that 54.29 per cent of the households possess katcha house and 48.57 per cent of them possess pucca/RCC house.*
- *The results show that 100 per cent of the households possess TV, 37.14 per cent of the households possess mixer/grinder, 28.57 per cent of the households possess Motor Cycle, 2.86 per cent of the households possess Auto, LPG Stove and Car/Four Wheeler and 85.71 per cent of the households possess mobile phones.*
- *The results show that the average value of television was Rs. 9,142, mixer/grinder was Rs. 2,007, Motor Cycle was Rs. 103,800, Auto was Rs. 120,000, Car/Four Wheeler was Rs. 800,000, LPG Stove was Rs. 2,000, and mobile phone was Rs. 3,141.*

- *About 31.43 per cent of the households possess bullock cart, 34.29 per cent of them possess plough, 2.86 per cent of them possess seed/fertilizer drill, 5.71 per cent of them possess Power Tiller, 8.57 per cent of them possess Tractor, 17.14 per cent of them possess Sprayer and 2.86 per cent of them possess Weeder.*
- *The results show that the average value of bullock cart was Rs. 19,181, plough was Rs. 2,483, seed/fertilizer drill was Rs. 4,000, Power Tiller was Rs.150,000, Tractor was Rs. 800,000, Sprayer was Rs. 4,633 and the average value of weeder was Rs. 2,000.*
- *The results indicate that, 34.29 per cent of the households possess bullocks, 8.57 per cent of the households possess local cow, 2.86 per cent of the households possess buffalo and Sheep and 5.71 per cent of the households possess goat and poultry birds.*
- *The results indicate that, average own labour men available in the micro watershed was 1.58, average own labour (women) available was 1.32, average hired labour (men) available was 9.19 and average hired labour (women) available was 15.84.*
- *The results indicate that, 37.14 per cent of the households opined that the hired labour was adequate and 45.71 per cent of the households opined that the hired labour was inadequate.*
- *The results indicate that, 2 (1.31 %) of the households migrated.*
- *The results indicate that, the average distance was 600 (kms) and average duration was around 12 months.*
- *The results indicate that, job/wage/work was the main reason for the migration of the households.*
- *The results indicate that, there were no such positive consequences for the migration of the households.*
- *The results indicate that, there were no such negative consequences for the migration of the households.*
- *The results indicate that, households of the Sowrashtrahalli micro-watershed possess 51.15 ha (96.75 %) of dry land, 1.72 ha (3.25 %) of irrigated land. Marginal farmers possess 5.53 ha (100 %) of dry land. Small farmers possess 11.72 ha (87.20 %) of dry land and 1.72 ha (12.80 %) of irrigated land. Semi medium farmers possess 23.31 ha (100%) of dry land. Medium farmers possess 10.59 ha (100%) of dry land.*
- *The results indicate that, the average value of dry land was Rs. 305,061.32 and the average value of irrigated land was Rs. 1,310,612.24. In case of marginal famers, the average land value was Rs. 715,523.05 for dry land. In case of small famers, the average land value was Rs. 290,086.36 for dry land and Rs. 639,294.12 for irrigated land. In case of semi medium famers, the average land value was Rs. 302,265.23 for dry land. In case of medium famers, the average land value was Rs. 113,302.75 for dry land.*

- *The results indicate that, there were 1 functioning open wells in the micro watershed.*
- *The results indicate that, bore well was the major irrigation source in the micro water shed for 2.86 per cent of the farmers.*
- *The results indicate that, small farmers had an irrigated area of 3.64 ha.*
- *The results indicate that, farmers have grown red gram (29.25 ha), Cotton (11.51 ha), Paddy (0.81 ha), Jowar (3.79 ha) and Sorghum (1.78 ha). Marginal farmers have grown red gram, Sorghum and cotton. Small farmers have grown red gram, cotton, Jowar, Sorghum and paddy. Semi medium farmers have grown red gram, Cotton and Jowar. Medium farmers have grown red gram and Cotton.*
- *The results indicate that, the cropping intensity in Sowrashtrahalli micro-watershed was found to be 87.69 per cent.*
- *The results indicate that, 91.43 per cent of the households have bank account and 71.43 per cent of the households have savings.*
- *The results indicate that, 60 per cent of the households have availed credit from different sources.*
- *The results indicate that, 28.57 per cent of the households have borrowed from Commercial Bank, 33.33 per cent from Friends/Relatives, 9.52 per cent from Grameena Bank and 9.52 per cent from Traders.*
- *The results indicate that, the average credit amount borrowed by households in micro-watershed was Rs. 7,714.29.*
- *The results indicate that, 37.50 per cent of the households borrowed from institutional sources for the purpose of agricultural production.*
- *The results indicate that, 28.57 per cent of the households borrowed from private credit for the purpose of agricultural production and Education purpose.*
- *The results indicated that 12.50 per cent of the households did not repay their loan borrowed from institutional sources.*
- *The results indicated that 22.22 per cent of the households did not repay their loan borrowed from Private source.*
- *The results indicate that, around 25 per cent opined that the loan amount borrowed from institutional sources helped to perform timely agricultural operations.*
- *The results indicate that, the total cost of cultivation for red gram was Rs. 31742.73. The gross income realized by the farmers was Rs. 48886.66. The net income from red gram cultivation was Rs.17143.93. Thus the benefit cost ratio was found to be 1: 1.54.*
- *The results indicate that, the total cost of cultivation for Sorghum was Rs. 34622.79. The gross income realized by the farmers was Rs. 49202.42. The net income from Sorghum cultivation was Rs. 14579.63. Thus the benefit cost ratio was found to be 1: 1.42.*

- *The results indicate that, the total cost of cultivation for paddy was Rs. 85452.63. The gross income realized by the farmers was Rs. 72247.50. The net income from paddy cultivation was Rs. -13205.13. Thus the benefit cost ratio was found to be 1: 0.85.*
- *The results indicate that, the total cost of cultivation for Cotton was Rs. 34976.52. The gross income realized by the farmers was Rs. 56970.03. The net income from Cotton cultivation was Rs. 21993.51. Thus the benefit cost ratio was found to be 1: 1.63.*
- *The results indicate that, 45.71 per cent of the households opined that dry fodder was adequate and 48.57 per cent of the households opined that green fodder was adequate.*
- *The results indicate that the annual gross income was Rs. 108,333.33 for landless farmers, for marginal farmers it was Rs. 105,785, for small farmers it was Rs. 179,718.18 and for semi medium farmers it was Rs. 191,928.*
- *The results indicate that the average annual expenditure is Rs. 13,063.15. For landless households it was Rs. 4,000, for marginal farmers it was Rs. 2,746.91, for small farmers it was Rs. 6,200, for semi medium farmers it was Rs. 5,609.79 and medium farmers it was Rs. 150,000.*
- *The results indicate that, sampled households have grown 1 Lemon, 16 lime and 3 mango tree in their field.*
- *The results indicated that, 2.86 per cent have shown interest in soil test.*
- *The results indicate that, households have planted 104 neem and 12 tamarind trees in their field and also 12 neem trees in their backyard.*
- *The results indicated that, households have an average investment capacity of Rs. 6,514.34 for land development, Rs. 2,085.71 for irrigation facility and Rs. 428.57 for improved crop production.*
- *The results indicated that Government subsidy was the source of additional investment for 17.14 per cent for land development. Loan from bank was the source of additional investment for 22.86 per cent for land development, 5.71 for irrigation facility and for 5.71 per cent of irrigation facility. Own funds was the source of additional investment for 42.86 per cent for land development and 2.86 for irrigation facility.*
- *The results indicated that, Cotton was sold to the extent of 93.67 per cent, Red gram was sold to the extent of 91.22 per cent and Sorghum was sold to the extent of 97.92 per cent.*
- *The results indicated that, about 57.14 per cent of the farmers sold their produce to local/village merchants and 34.29 per cent of the farmers sold their produce to regulated markets.*

- *The results indicated that, 88.57 per cent of the households have used tractor as a mode of transportation and 2.86 per cent of the households have used Cart as a mode of transportation.*
- *The results indicated that, 28.57 per cent of the households have experienced soil and water erosion problems in the farm.*
- *The results indicated that, 85.71 per cent have shown interest in soil test.*
- *The results indicated that, 28.57 per cent of the households practicing field bunding and 2.86 per cent of the households practicing Farm Pond.*
- *The results indicated that, 100 per cent of the household's farm pond conservation structures were good and 80 per cent of the households field bunding conservation structure were good and 20 per cent of the conservation structures were slightly damaged.*
- *The results indicated that, 28.57 per cent of the households depend on own funds and 2.86 per cent of the households were depend on Farmer organization*
- *The results indicated that, 80 per cent of the households used firewood and 17.14 per cent of them used LPG as a source of fuel.*
- *The results indicated that, piped supply was the major source of drinking water for 65.71 per cent of the households in the micro watershed and Bore Well was the major source of drinking water for 28.57 per cent of the households.*
- *The results indicated that, Electricity was the major source of light for 100 per cent of the households in micro watershed.*
- *The results indicated that, 48.57 per cent of the households possess sanitary toilet facility.*
- *The results indicated that, 97.14 per cent of the sampled households possessed BPL cards and 2.86 per cent of the sampled households possessed APL cards.*
- *The results indicated that, 71.43 per cent of the households participated in NREGA programme.*
- *The results indicated that, cereals were adequate for 57.14 per cent, Pulses were adequate for 54.29 per cent, Oilseed were adequate for 40 per cent, vegetables were adequate for 42.86 per cent, fruits were adequate for 14.29 per cent, Milk were adequate for 40 per cent, Egg were adequate for 37.14 per cent and Meat were adequate for 25.71 per cent.*
- *The results indicated that, Cereals were inadequate for 34.29 per cent of the households, pulses were inadequate for 34.29 per cent of the households, oilseeds were inadequate for 45.71 per cent, vegetables were inadequate for 51.43 per cent and fruits were inadequate for 77.14 per cent of the households, Milk were inadequate for 45.71 per cent of the households, Egg were inadequate for 54.29 per cent of the households and Meat were inadequate for 37.14 per cent of the households,.*

- *The results indicated that, lower fertility status of the soil (77.14% ), Wild animal menace on farm field (77.14% ), frequent incidence of pest and diseases (22.86 % ), inadequacy of irrigation water (34.29 % ), high cost of fertilizers and plant protection chemicals was the constraint experienced by 71.43 per cent of the households, high rate of interest on credit (31.43 %), low price for the agricultural commodities (62.86 %), lack of marketing facilities in the area (48.57 %), inadequate extension services (25.71 %), Lack of transport for safe transport of the Agril produce to the market (68.57 %), Less rainfall (62.86 %) and Source of Agri-technology information (Newspaper/TV/Mobile) (17.14 %).*

*Chapter 2*

# INTRODUCTION

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

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

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

**Scope and importance of survey**

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

*Chapter 3*

# METHODOLOGY

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

**Description of the study area**

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

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

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

**Description of the micro watershed**

Sowrashtrahalli micro-watershed in Kadechur sub-watershed (Yadgiri taluk and district) is located in between $16^0$34’2.534’’ to $16^0$32’12.987’’ North latitudes and $77^0$21’13.766’’ to $77^0$19’30.58’’ East longitudes, covering an area of about 613.57 ha, bounded by Baddepalli and Kadechora villages.

**Methodology followed in assessing socio-economic status of households**

In order to assess the socio-economic condition of the farmers in the watershed a comprehensive questionnaire was prepared. Major components such as demographic conditions, migration details, food consumption and family expenditure pattern, material possession, land holding, land use management, cropping pattern, cost of cultivation of crops, livestock management. The statistical components such as frequency and percentage were used to analyze the data. About 35 households located in the micro-watershed were interviewed for the survey.

*Chapter 4*

## SALIENT FEATURES OF THE SURVEY

**Households sampled for socio-economic survey:** The data on households sampled for socio economic survey in Sowrashtrahalli micro-watershed is presented in Table 1 and it indicated that 35 farmers were sampled in Sowrashtrahalli micro-watershed among them 5 (14.29 %) were landless, 9 (25.71 %) were marginal farmers, 10 (28.57 %) were small farmers, 9 (25.71 %) were semi medium farmers and 2 (5.71 %) were semi medium farmers.

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

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Farmers | 5 | 14.29 | 9 | 25.71 | 10 | 28.57 | 9 | 25.71 | 2 | 5.71 | 35 | 100 |

**Population characteristics:** The population characteristics of households sampled for socio-economic survey in Sowrashtrahalli micro-watershed is presented in Table 2. The data indicated that there were 90 (58.82 %) men and 63 (41.18 %) women among the sampled households. The average family size of landless farmers' was 4.2, marginal farmers' was 3.55, small farmers' was 4.9, semi medium farmers' was 4.44 and medium farmers' was 5.5.

**Table 2: Population characteristics of Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (21) | | MF (32) | | SF (49) | | SMF (40) | | MDF (11) | | All (153) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Men | 11 | 52.38 | 19 | 59.38 | 28 | 57.14 | 25 | 62.50 | 7 | 63.64 | 90 | 58.82 |
| 2 | Women | 10 | 47.62 | 13 | 40.63 | 21 | 42.86 | 15 | 37.50 | 4 | 36.36 | 63 | 41.18 |
| Total | | 21 | 100 | 32 | 100 | 49 | 100 | 40 | 100 | 11 | 100 | 153 | 100 |
| Average | | 4.2 | | 3.55 | | 4.9 | | 4.44 | | 5.5 | | 4.37 | |

**Age wise classification of population:** The age wise classification of household members in Sowrashtrahalli micro-watershed is presented in Table 3. The data indicated that, 23 (15.03 %) people were in 0-15 years of age, 78 (50.98 %) were in 16-35 years of age, 43 (28.10 %) were in 36-60 years of age and 9 (5.88 %) were above 61 years of age.

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

| Sl. No. | Particulars | LL (21) | | MF (32) | | SF (49) | | SMF (40) | | MDF (11) | | All (153) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | 0-15 years of age | 6 | 28.57 | 1 | 3.13 | 8 | 16.33 | 6 | 15 | 2 | 18.18 | 23 | 15.03 |
| 2 | 16-35 years of age | 8 | 38.10 | 18 | 56.25 | 29 | 59.18 | 18 | 45 | 5 | 45.45 | 78 | 50.98 |
| 3 | 36-60 years of age | 7 | 33.33 | 13 | 40.63 | 8 | 16.33 | 12 | 30 | 3 | 27.27 | 43 | 28.10 |
| 4 | > 61 years | 0 | 0 | 0 | 0 | 4 | 8.16 | 4 | 10 | 1 | 9.09 | 9 | 5.88 |
| Total | | 21 | 100 | 32 | 100 | 49 | 100 | 40 | 100 | 11 | 100 | 153 | 100 |

**Education level of household members:** Education level of household members in Sowrashtrahalli micro-watershed is presented in Table 4. The results indicated that Sowrashtrahalli had 32.03 per cent illiterates, 3.27 per cent of them had functional literate, 12.42 per cent of them had primary school, 8.50 per cent of them had middle school, 17.65 per cent of them had High School, 12.42 per cent of them had PUC, 1.96 per cent of them had Diploma, 3.27 per cent of them had ITI, 5.88 per cent of them had Degree education and 1.31 per cent of them had Masters education.

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

| Sl. No. | Particulars | LL (21) | | MF (32) | | SF (49) | | SMF (40) | | MDF (11) | | All (153) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Illiterate | 4 | 19.05 | 16 | 50 | 17 | 34.69 | 10 | 25 | 2 | 18.18 | 49 | 32.03 |
| 2 | Functional Literate | 2 | 9.52 | 0 | 0 | 1 | 2.04 | 1 | 2.50 | 1 | 9.09 | 5 | 3.27 |
| 3 | Primary School | 4 | 19.05 | 2 | 6.25 | 6 | 12.24 | 5 | 12.50 | 2 | 18.18 | 19 | 12.42 |
| 4 | Middle School | 2 | 9.52 | 3 | 9.38 | 2 | 4.08 | 5 | 12.50 | 1 | 9.09 | 13 | 8.50 |
| 5 | High School | 2 | 9.52 | 4 | 12.50 | 9 | 18.37 | 10 | 25 | 2 | 18.18 | 27 | 17.65 |
| 6 | PUC | 3 | 14.29 | 3 | 9.38 | 7 | 14.29 | 5 | 12.50 | 1 | 9.09 | 19 | 12.42 |
| 7 | Diploma | 2 | 9.52 | 1 | 3.13 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1.96 |
| 8 | ITI | 0 | 0 | 1 | 3.13 | 2 | 4.08 | 2 | 5 | 0 | 0 | 5 | 3.27 |
| 9 | Degree | 2 | 9.52 | 2 | 6.25 | 3 | 6.12 | 1 | 2.50 | 1 | 9.09 | 9 | 5.88 |
| 10 | Masters | 0 | 0 | 0 | 0 | 1 | 2.04 | 0 | 0 | 1 | 9.09 | 2 | 1.31 |
| 11 | Others | 0 | 0 | 0 | 0 | 1 | 2.04 | 1 | 2.50 | 0 | 0 | 2 | 1.31 |
| Total | | 21 | 100 | 32 | 100 | 49 | 100 | 40 | 100 | 11 | 100 | 153 | 100 |

**Occupation of household heads:** The data regarding the occupation of the household heads in Sowrashtrahalli micro-watershed is presented in Table 5. The results indicate that, 85.71 per cent of household heads were practicing agriculture, 8.57 per cent of the household heads were General labourers, 2.86 cent of the household heads were in private service and 2.86 per cent of them were trade and business.

**Table 5: Occupation of household heads in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Agriculture | 0 | 0 | 9 | 100 | 10 | 100 | 9 | 100 | 2 | 100 | 30 | 85.71 |
| 2 | General Labour | 3 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 8.57 |
| 3 | Private Service | 1 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2.86 |
| 4 | Housewife | 1 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2.86 |
| Total | | 5 | 100 | 9 | 100 | 10 | 100 | 9 | 100 | 2 | 100 | 35 | 100 |

**Occupation of the household members:** The data regarding the occupation of the household members in Sowrashtrahalli micro-watershed is presented in Table 6. The results indicate that agriculture was the major occupation for 38.56 per cent of the household members, 16.34 per cent were agricultural labourers, 2.61 per cent were in general labour, 3.27 per cent were private service, 24.18 per cent were Student, 12.42 per cent were housewives and 1.96 per cent were children.

**Table 6: Occupation of family members in Sowrashtrahalli micro-watershed**

| Sl. No. | Particulars | LL (21) | | MF (32) | | SF (49) | | SMF (40) | | MDF (11) | | All (153) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Agriculture | 0 | 0 | 16 | 50 | 19 | 38.78 | 21 | 52.50 | 3 | 27.27 | 59 | 38.56 |
| 2 | Agricultural Labour | 0 | 0 | 1 | 3.13 | 13 | 26.53 | 8 | 20 | 3 | 27.27 | 25 | 16.34 |
| 3 | General Labour | 3 | 14.29 | 0 | 0 | 0 | 0 | 1 | 2.50 | 0 | 0 | 4 | 2.61 |
| 4 | Private Service | 2 | 9.52 | 0 | 0 | 1 | 2.04 | 0 | 0 | 2 | 18.18 | 5 | 3.27 |
| 5 | Student | 10 | 47.62 | 10 | 31.25 | 7 | 14.29 | 8 | 20 | 2 | 18.18 | 37 | 24.18 |
| 6 | Others | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2.50 | 0 | 0 | 1 | 0.65 |
| 7 | Housewife | 5 | 23.81 | 5 | 15.63 | 7 | 14.29 | 1 | 2.50 | 1 | 9.09 | 19 | 12.42 |
| 8 | Children | 1 | 4.76 | 0 | 0 | 2 | 4.08 | 0 | 0 | 0 | 0 | 3 | 1.96 |
| Total | | 21 | 100 | 32 | 100 | 49 | 100 | 40 | 100 | 11 | 100 | 153 | 100 |

**Institutional participation of the household members:** The data regarding the institutional participation of the household members in Sowrashtrahalli micro-watershed is presented in Table 7. The results show that, 1.31 per cent of the population in the micro watershed has participated in Self Help Group.

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

| Sl.No. | Particulars | LL (21) | | MF (32) | | SF (49) | | SMF (40) | | MDF (11) | | All (153) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Self Help Group | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 5 | 0 | 0 | 2 | 1.31 |
| 2 | No Participation | 21 | 100 | 32 | 100 | 49 | 100 | 38 | 95 | 11 | 100 | 151 | 98.69 |
| Total | | 21 | 100 | 32 | 100 | 49 | 100 | 40 | 100 | 11 | 100 | 153 | 100 |

**Type of house owned:** The data regarding the type of house owned by the households in Sowrashtrahalli micro-watershed is presented in Table 8. The results indicate that 54.29 per cent of the households possess katcha house and 48.57 per cent of them possess pucca/RCC house.

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

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Katcha | 3 | 60 | 3 | 33.33 | 8 | 80 | 4 | 44.44 | 1 | 50 | 19 | 54.29 |
| 2 | Pucca/RCC | 2 | 40 | 6 | 66.67 | 2 | 20 | 6 | 66.67 | 1 | 50 | 17 | 48.57 |
| Total | | 5 | 100 | 9 | 100 | 10 | 100 | 10 | 100 | 2 | 100 | 36 | 100 |

**Durable Assets owned by the households:** The data regarding the Durable Assets owned by the households in Sowrashtrahalli micro-watershed is presented in Table 9. The results show that 100 per cent of the households possess TV, 37.14 per cent of the households possess mixer/grinder, 28.57 per cent of the households possess Motor Cycle, 2.86 per cent of the households possess Auto, LPG Stove and Car/Four Wheeler and 85.71 per cent of the households possess mobile phones.

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

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Television | 5 | 100 | 9 | 100 | 10 | 100 | 9 | 100 | 2 | 100 | 35 | 100 |
| 2 | Mixer/Grinder | 0 | 0 | 2 | 22.22 | 5 | 50 | 4 | 44.44 | 2 | 100 | 13 | 37.14 |
| 3 | Motor Cycle | 1 | 20 | 3 | 33.33 | 4 | 40 | 1 | 11.11 | 1 | 50 | 10 | 28.57 |
| 4 | Auto | 0 | 0 | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 1 | 2.86 |
| 5 | Car/Four Wheeler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 50 | 1 | 2.86 |
| 6 | Mobile Phone | 5 | 100 | 9 | 100 | 6 | 60 | 8 | 88.89 | 2 | 100 | 30 | 85.71 |
| 7 | LPG Stove | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 11.11 | 0 | 0 | 1 | 2.86 |

**Average value of durable assets:** The data regarding the average value of durable assets owned by the households in Sowrashtrahalli micro-watershed is presented in Table 10. The results show that the average value of television was Rs. 9,142, mixer/grinder was Rs. 2,007, Motor Cycle was Rs. 103,800, Auto was Rs. 120,000, Car/Four Wheeler was Rs. 800,000, LPG Stove was Rs. 2,000, and mobile phone was Rs. 3,141.

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

Average value (Rs.)

| Sl.No. | Particulars | LL (5) | MF (9) | SF (10) | SMF (9) | MDF (2) | All (35) |
|---|---|---|---|---|---|---|---|
| 1 | Television | 9,400 | 9,444 | 8,400 | 9,666 | 8,500 | 9,142 |
| 2 | Mixer/Grinder | 0 | 2,000 | 1,800 | 2,075 | 2,400 | 2,007 |
| 3 | Motor Cycle | 65,000 | 218,333 | 52,000 | 60,000 | 50,000 | 103,800 |
| 4 | Auto | 0 | 0 | 120,000 | 0 | 0 | 120,000 |
| 5 | Car/Four Wheeler | 0 | 0 | 0 | 0 | 800,000 | 800,000 |
| 6 | Mobile Phone | 4,150 | 2,947 | 3,090 | 2,809 | 3,333 | 3,141 |
| 7 | LPG Stove | 0 | 0 | 0 | 2,000 | 0 | 2,000 |

**Farm Implements owned:** The data regarding the farm implements owned by the households in Sowrashtrahalli micro-watershed is presented in Table 11. About 31.43 per cent of the households possess bullock cart, 34.29 per cent of them possess plough, 2.86 per cent of them possess seed/fertilizer drill, 5.71 per cent of them possess Power Tiller, 8.57 per cent of them possess Tractor, 17.14 per cent of them possess Sprayer and 2.86 per cent of them possess Weeder.

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

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Bullock Cart | 0 | 0 | 3 | 33.33 | 4 | 40 | 4 | 44.44 | 0 | 0 | 11 | 31.43 |
| 2 | Plough | 0 | 0 | 3 | 33.33 | 5 | 50 | 4 | 44.44 | 0 | 0 | 12 | 34.29 |
| 3 | Seed/Fertilizer Drill | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 11.11 | 0 | 0 | 1 | 2.86 |
| 4 | Power Tiller | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 22.22 | 0 | 0 | 2 | 5.71 |
| 5 | Tractor | 0 | 0 | 0 | 0 | 2 | 20 | 1 | 11.11 | 0 | 0 | 3 | 8.57 |
| 6 | Sprayer | 0 | 0 | 3 | 33.33 | 2 | 20 | 1 | 11.11 | 0 | 0 | 6 | 17.14 |
| 7 | Weeder | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 11.11 | 0 | 0 | 1 | 2.86 |
| 8 | Blank | 0 | 0 | 5 | 55.56 | 4 | 40 | 4 | 44.44 | 2 | 100 | 15 | 42.86 |

**Average value of farm implements:** The data regarding the average value of farm Implements owned by the households in Sowrashtrahalli micro-watershed is presented in Table 12. The results show that the average value of bullock cart was Rs. 19,181, plough was Rs. 2,483, seed/fertilizer drill was Rs. 4,000, Power Tiller was Rs.150,000, Tractor was Rs. 800,000, Sprayer was Rs. 4,633 and the average value of weeder was Rs. 2,000.

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

| Sl.No. | Particulars | LL (5) | MF (9) | SF (10) | SMF (9) | MDF (2) | All (35) |
|---|---|---|---|---|---|---|---|
| 1 | Bullock Cart | 0 | 19,666 | 16,250 | 21,750 | 0 | 19,181 |
| 2 | Plough | 0 | 4,000 | 1,800 | 2,200 | 0 | 2,483 |
| 3 | Seed/Fertilizer Drill | 0 | 0 | 0 | 4,000 | 0 | 4,000 |
| 4 | Power Tiller | 0 | 0 | 0 | 150,000 | 0 | 150,000 |
| 5 | Tractor | 0 | 0 | 800,000 | 800,000 | 0 | 800,000 |
| 6 | Sprayer | 0 | 4,600 | 6,000 | 2,000 | 0 | 4,633 |
| 7 | Weeder | 0 | 0 | 0 | 2,000 | 0 | 2,000 |

**Livestock possession by the households:** The data regarding the Livestock possession by the households in Sowrashtrahalli micro-watershed is presented in Table 13. The results indicate that, 34.29 per cent of the households possess bullocks, 8.57 per cent of the households possess local cow, 2.86 per cent of the households possess buffalo and Sheep and 5.71 per cent of the households possess goat and poultry birds.

**Table 13. Livestock possession by households in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Bullock | 0 | 0 | 6 | 66.67 | 4 | 40 | 2 | 22.22 | 0 | 0 | 12 | 34.29 |
| 2 | Local cow | 0 | 0 | 1 | 11.11 | 1 | 10 | 1 | 11.11 | 0 | 0 | 3 | 8.57 |
| 3 | Buffalo | 0 | 0 | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 1 | 2.86 |
| 4 | Sheep | 0 | 0 | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 1 | 2.86 |
| 5 | Poultry birds | 0 | 0 | 1 | 11.11 | 0 | 0 | 1 | 11.11 | 0 | 0 | 2 | 5.71 |
| 6 | blank | 0 | 0 | 3 | 33.33 | 5 | 50 | 6 | 66.67 | 2 | 100 | 16 | 45.71 |

**Average Labour availability:** The data regarding the average labour availability in Sowrashtrahalli micro-watershed is presented in Table 14. The results indicate that, average own labour men available in the micro watershed was 1.58, average own labour (women) available was 1.32, average hired labour (men) available was 9.19 and average hired labour (women) available was 15.84.

In case of marginal farmers, average own labour men available was 1.22, average own labour (women) was 1.22, average hired labour (men) was 3.78 and average hired labour (women) available was 9.56. In case of small farmers, average own labour men available was 1.80, average own labour (women) was 1.60, average hired labour (men) was 9.10 and average hired labour (women) available was 15.50. In case of semi medium farmers, average own labour men available was 1.78, average own labour (women) was 1.11,

average hired labour (men) was 12.89 and average hired labour (women) available was 21.11. In case of medium farmers, average own labour men available was 1.50, average own labour (women) was 1.50, average hired labour (men) was 20 and average hired labour (women) available was 20.

**Table 14. Average Labour availability in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | MF (9) | SF (10) | SMF (9) | MDF (2) | All (35) |
|---|---|---|---|---|---|---|---|
| | | N | N | N | N | N | N |
| 1 | Hired labour Female | 20 | 9.56 | 15.50 | 21.11 | 20 | 15.84 |
| 2 | Own Labour Female | 1 | 1.22 | 1.60 | 1.11 | 1.50 | 1.32 |
| 3 | Own labour Male | 1 | 1.22 | 1.80 | 1.78 | 1.50 | 1.58 |
| 4 | Hired labour Male | 4 | 3.78 | 9.10 | 12.89 | 20 | 9.19 |

**Adequacy of Hired Labour:** The data regarding the adequacy of hired labour in Sowrashtrahalli micro-watershed is presented in Table 15. The results indicate that, 37.14 per cent of the households opined that the hired labour was adequate and 45.71 per cent of the households opined that the hired labour was inadequate.

**Table 15. Adequacy of Hired Labour in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Adequate | 0 | 0 | 3 | 33.33 | 3 | 30 | 6 | 66.67 | 1 | 50 | 13 | 37.14 |
| 2 | Inadequate | 0 | 0 | 5 | 55.56 | 7 | 70 | 3 | 33.33 | 1 | 50 | 16 | 45.71 |

**Migration among the households:** The data regarding the migration among the households in Sowrashtrahalli micro-watershed is presented in Table 16. The results indicate that, 2 (1.31 %) of the households migrated.

**Table 16. Migration among the households in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (21) | | MF (32) | | SF (49) | | SMF (40) | | MDF (11) | | All (153) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Migration | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 18.18 | 2 | 1.31 |

**Average distance and duration of migration:** The data regarding the average distance and duration of migration among the households in Sowrashtrahalli micro-watershed is presented in Table 17. The results indicate that, the average distance was 600 (kms) and average duration was around 12 months.

**Table 17. Average distance and duration of migration among the households in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | MDF (2) | All (2) |
|---|---|---|---|
| | | N | N |
| 1 | Avg. Distance (kms) | 600 | 600 |
| 2 | Avg. Duration (months) | 12 | 12 |

**Purpose of migration by household members:** The data regarding the purpose of migration by household members among the households in Sowrashtrahalli micro-

watershed is presented in Table 18. The results indicate that, job/wage/work was the main reason for the migration of the households.

**Table 18. Purpose of migration by household members among the households in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | MDF (2) | | All (2) | |
|---|---|---|---|---|---|
| | | N | % | N | % |
| 1 | Job/wage/work | 2 | 100 | 2 | 100 |

**Positive consequences of migration:** The data regarding the positive consequences of migration among the households in Sowrashtrahalli micro-watershed is presented in Table 19. The results indicate that, there were no such positive consequences for the migration of the households.

**Table 19. Positive consequences of migration among the households in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | MDF (2) | | All (2) | |
|---|---|---|---|---|---|
| | | N | % | N | % |
| 1 | None | 1 | 50 | 1 | 50 |

**Negative consequences of migration:** The data regarding the Negative consequences of migration among the households in Sowrashtrahalli micro-watershed is presented in Table 20. The results indicate that, there were no such negative consequences for the migration of the households.

**Table 20. Negative consequences of migration among the households in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | MDF (2) | | All (2) | |
|---|---|---|---|---|---|
| | | N | % | N | % |
| 1 | None | 1 | 50 | 1 | 50 |

**Distribution of land (ha):** The data regarding the distribution of land (ha) in Sowrashtrahalli micro-watershed is presented in Table 21. The results indicate that, households of the Sowrashtrahalli micro-watershed possess 51.15 ha (96.75 %) of dry land, 1.72 ha (3.25 %) of irrigated land. Marginal farmers possess 5.53 ha (100 %) of dry land. Small farmers possess 11.72 ha (87.20 %) of dry land and 1.72 ha (12.80 %) of irrigated land. Semi medium farmers possess 23.31 ha (100%) of dry land. Medium farmers possess 10.59 ha (100%) of dry land.

**Table 21. Distribution of land (Ha) in Sowrashtrahalli micro-watershed**

| Sl. No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ha | % | ha | % | ha | % | ha | % | ha | % | ha | % |
| 1 | Dry | 0 | 0 | 5.53 | 100 | 11.72 | 87.20 | 23.31 | 100 | 10.59 | 100 | 51.15 | 96.75 |
| 2 | Irrigated | 0 | 0 | 0 | 0 | 1.72 | 12.80 | 0 | 0 | 0 | 0 | 1.72 | 3.25 |
| Total | | 0 | 100 | 5.53 | 100 | 13.44 | 100 | 23.31 | 100 | 10.59 | 100 | 52.87 | 100 |

**Average land value (Rs./ha):** The data regarding the average land value (Rs./ha) in Sowrashtrahalli micro-watershed is presented in Table 22. The results indicate that, the average value of dry land was Rs. 305,061.32 and the average value of irrigated land was Rs. 1,310,612.24. In case of marginal famers, the average land value was Rs. 715,523.05 for dry land. In case of small famers, the average land value was Rs. 290,086.36 for dry land and Rs. 639,294.12 for irrigated land. In case of semi medium famers, the average land value was Rs. 302,265.23 for dry land. In case of medium famers, the average land value was Rs. 113,302.75 for dry land.

**Table 22. Average land value (Rs./ha) in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | MF (9) | SF (10) | SMF (9) | MDF (2) | All (35) |
|---|---|---|---|---|---|---|---|
| | | N | N | N | N | N | N |
| 1 | Dry | 0 | 715,523.05 | 290,086.36 | 302,265.23 | 113,302.75 | 305,061.32 |
| 2 | Irrigated | 0 | 0 | 639,294.12 | 0 | 0 | 639,294.12 |

**Status of open wells:** The data regarding the status of bore wells in Sowrashtrahalli micro-watershed is presented in Table 23. The results indicate that, there were 1 functioning open wells in the micro watershed.

**Table 23. Status of open wells in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | MF (9) | SF (10) | SMF (9) | MDF (2) | All (35) |
|---|---|---|---|---|---|---|---|
| | | N | N | N | N | N | N |
| 1 | De-functioning | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | Functioning | 0 | 0 | 0 | 1 | 0 | 1 |

**Source of irrigation**: The data regarding the source of irrigation in Sowrashtrahalli micro-watershed is presented in Table 24. The results indicate that, bore well was the major irrigation source in the micro water shed for 2.86 per cent of the farmers.

**Table 24. Source of irrigation in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Open Well | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 11.11 | 0 | 0 | 1 | 2.86 |

**Irrigated Area (ha):** The data regarding the irrigated area (ha) in Sowrashtrahalli micro-watershed is presented in Table 25. The results indicate that, small farmers had an irrigated area of 3.64 ha.

**Table 25. Irrigated Area (ha) in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | MF (9) | SF (10) | SMF (9) | MDF (2) | All (35) |
|---|---|---|---|---|---|---|---|
| 1 | Kharif | 0 | 0 | 0.40 | 0 | 0 | 0.40 |
| 2 | Summer | 0 | 0 | 3.24 | 0 | 0 | 3.24 |
| Total | | 0 | 0 | 3.64 | 0 | 0 | 3.64 |

**Cropping pattern:** The data regarding the cropping pattern in Sowrashtrahalli micro-watershed is presented in Table 26. The results indicate that, farmers have grown red

gram (29.25 ha), Cotton (11.51 ha), Paddy (0.81 ha), Jowar (3.79 ha) and Sorghum (1.78 ha). Marginal farmers have grown red gram, Sorghum and cotton. Small farmers have grown red gram, cotton, Jowar, Sorghum and paddy. Semi medium farmers have grown red gram, Cotton and Jowar. Medium farmers have grown red gram and Cotton.

**Table 26. Cropping pattern in Sowrashtrahalli micro-watershed (Area in ha)**

| Sl.No. | Particulars | LL (5) | MF (9) | SF (10) | SMF (9) | MDF (2) | All (35) |
|---|---|---|---|---|---|---|---|
| 1 | Kharif - Red gram | 0 | 3.38 | 8.71 | 8.58 | 8.57 | 29.25 |
| 2 | Kharif - Cotton | 0 | 0 | 0.4 | 8.27 | 2.02 | 10.7 |
| 3 | Kharif - Jowar | 0 | 0 | 1.62 | 2.17 | 0 | 3.79 |
| 4 | Kharif - Sorghum | 0 | 0.53 | 1.26 | 0 | 0 | 1.78 |
| 5 | Kharif - Paddy | 0 | 0 | 0.81 | 0 | 0 | 0.81 |
| 6 | Rabi - Cotton | 0 | 0.81 | 0 | 0 | 0 | 0.81 |
| Total | | 0 | 4.72 | 12.8 | 19.02 | 10.59 | 47.14 |

**Cropping intensity:** The data regarding the cropping intensity in Sowrashtrahalli micro-watershed is presented in Table 27. The results indicate that, the cropping intensity in Sowrashtrahalli micro-watershed was found to be 87.69 per cent.

**Table 27. Cropping intensity (%) in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | MF (9) | SF (10) | SMF (9) | MDF (2) | All (35) |
|---|---|---|---|---|---|---|---|
| 1 | Cropping Intensity | 0 | 85.30 | 95.24 | 79.24 | 98.35 | 87.69 |

**Possession of Bank account and savings:** The data regarding the possession of bank account and saving in Sowrashtrahalli micro-watershed is presented in Table 28. The results indicate that, 91.43 per cent of the households have bank account and 71.43 per cent of the households have savings.

**Table 28. Possession of Bank account and savings in Sowrashtrahallimicro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Account | 5 | 100 | 7 | 77.78 | 10 | 100 | 8 | 88.89 | 2 | 100 | 32 | 91.43 |
| 2 | Savings | 5 | 100 | 6 | 66.67 | 8 | 80 | 4 | 44.44 | 2 | 100 | 25 | 71.43 |

**Borrowing status:** The data regarding the borrowing status in Sowrashtrahalli micro-watershed is presented in Table 29. The results indicate that, 60 per cent of the households have availed credit from different sources.

**Table 29. Borrowing status in Sowrashtrahallimicro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Credit Availed | 5 | 100 | 5 | 55.56 | 7 | 70 | 3 | 33.33 | 1 | 50 | 21 | 60 |

**Source of credit availed by households:** The data regarding the borrowing status in Sowrashtrahalli micro-watershed is presented in Table 30. The results indicate that, 28.57

per cent of the households have borrowed from Commercial Bank, 33.33 per cent from Friends/Relatives, 9.52 per cent from Grameena Bank and 9.52 per cent from Traders.

**Table 30. Source of credit availed by households in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (5) | | SF (7) | | SMF (3) | | MDF (1) | | All (21) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Commercial Bank | 0 | 0 | 5 | 100 | 0 | 0 | 1 | 33.33 | 0 | 0 | 6 | 28.57 |
| 2 | Friends/Relatives | 1 | 20 | 4 | 80 | 1 | 14.29 | 1 | 33.33 | 0 | 0 | 7 | 33.33 |
| 3 | Grameena Bank | 0 | 0 | 0 | 0 | 2 | 28.57 | 0 | 0 | 0 | 0 | 2 | 9.52 |
| 4 | Traders | 0 | 0 | 1 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4.76 |

**Avg. Credit amount:** The data regarding the avg. Credit amount in Sowrashtrahalli micro-watershed is presented in Table 31. The results indicate that, the average credit amount borrowed by households in micro-watershed was Rs. 7,714.29.

**Table 31. Avg. credit amount by household in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | MF (5) | SF (7) | SMF (3) | MDF (1) | All (21) |
|---|---|---|---|---|---|---|---|
| | | N | N | N | N | N | N |
| 1 | Average Credit | 5,000 | 17,400 | 7,142.87 | 0 | 0 | 7,714.29 |

**Purpose of credit borrowed - Institutional Credit:** The data regarding the purpose of credit borrowed - Institutional Credit in Sowrashtrahalli micro-watershed is presented in Table 32. The results indicate that, 37.50 per cent of the households borrowed from institutional sources for the purpose of agricultural production.

**Table 32. Purpose of credit borrowed - Institutional Credit by household in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | MF (5) | | SF (2) | | SMF (1) | | All (8) | |
|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % |
| 1 | Agriculture production | 1 | 20 | 2 | 100 | 0 | 0 | 3 | 37.50 |
| 2 | Other | 4 | 80 | 0 | 0 | 1 | 100 | 5 | 62.50 |

**Purpose of credit borrowed - Private Credit:** The data regarding the purpose of credit borrowed - private credit in Sowrashtrahalli micro-watershed is presented in Table 33. The results indicate that, 28.57 per cent of the households borrowed from private credit for the purpose of agricultural production and Education purpose.

**Table 33. Purpose of credit borrowed - Private Credit by household in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (1) | | MF (4) | | SF (1) | | SMF (1) | | All (7) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % |
| 1 | Agriculture production | 0 | 0 | 1 | 25 | 1 | 100 | 0 | 0 | 2 | 28.57 |
| 2 | Education | 1 | 100 | 1 | 25 | 0 | 0 | 0 | 0 | 2 | 28.57 |
| 3 | Other | 0 | 0 | 2 | 50 | 0 | 0 | 1 | 100 | 3 | 42.86 |

**Repayment status of households – Institutional:** The data regarding the repayment status of credit borrowed from institutional sources by households in Sowrashtrahalli micro watershed is presented in Table 34. The results indicated that 12.50 per cent of the households did not repay their loan borrowed from institutional sources.

**Table 34. Repayment status of households – Institutional Credit in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | MF (5) | | SF (2) | | SMF (1) | | All (8) | |
|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % |
| 1 | Un paid | 0 | 0 | 1 | 50 | 0 | 0 | 1 | 12.50 |
| 2 | Fully paid | 5 | 100 | 1 | 50 | 1 | 100 | 7 | 87.50 |

**Repayment status of households – Private:** The data regarding the repayment status of credit borrowed from Private source by households in Sowrashtrahalli micro watershed is presented in Table 35. The results indicated that 22.22 per cent of the households did not repay their loan borrowed from Private source.

**Table 35. Repayment status of households – Private source in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (1) | | MF (5) | | SF (2) | | SMF (1) | | All (9) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % |
| 1 | Fully paid | 0 | 0 | 3 | 60 | 0 | 0 | 1 | 100 | 4 | 44.44 |
| 2 | Un paid | 1 | 100 | 1 | 20 | 0 | 0 | 0 | 0 | 2 | 22.22 |

**Opinion on institutional sources of credit:** The data regarding the opinion on institutional sources of credit in Sowrashtrahalli micro watershed is presented in Table 36. The results indicate that, around 25 per cent opined that the loan amount borrowed from institutional sources helped to perform timely agricultural operations.

**Table 36. Opinion on institutional sources of credit in Sowrashtrahalli micro watershed**

| Sl.No. | Particulars | MF (5) | | SF (2) | | SMF (1) | | All (8) | |
|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % |
| 1 | Helped to perform timely agricultural operations | 0 | 0 | 2 | 100 | 0 | 0 | 2 | 25 |
| 2 | None | 5 | 100 | 0 | 0 | 1 | 100 | 6 | 75 |

**Cost of cultivation of Red gram:** The data regarding the cost of cultivation of red gram in Sowrashtrahalli micro-watershed is presented in Table 37. The results indicate that, the total cost of cultivation for red gram was Rs. 31742.73. The gross income realized by the farmers was Rs. 48886.66. The net income from red gram cultivation was Rs.17143.93. Thus the benefit cost ratio was found to be 1: 1.54.

**Table 37. Cost of Cultivation of red gram in Sowrashtrahalli micro-watershed**

| Sl.No | Particulars | | Units | Phy Units | Value(Rs.) | % to C3 |
|---|---|---|---|---|---|---|
| **I** | **Cost A1** | | | | | |
| 1 | Hired Human Labour | | Man days | 45.55 | 9001.93 | 28.36 |
| 2 | Bullock | | Pairs/day | 1.82 | 1199.26 | 3.78 |
| 3 | Tractor | | Hours | 3.40 | 2238.45 | 7.05 |
| 4 | Machinery | | Hours | 1.65 | 702.52 | 2.21 |
| 5 | Seed Main Crop (Establishment and Maintenance) | | Kgs (Rs.) | 11.09 | 1020.28 | 3.21 |
| 6 | Seed Inter Crop | | Kgs. | 0 | 0 | 0 |
| 7 | FYM | | Quintal | 10.20 | 2214.92 | 6.98 |
| 8 | Fertilizer + micronutrients | | Quintal | 2.64 | 3194.66 | 10.06 |
| 9 | Pesticides (PPC) | | Kgs/liters | 1.37 | 2208.63 | 6.96 |
| 10 | Irrigation | | Number | 0 | 0 | 0 |
| 11 | Repairs | | | 0 | 107.14 | 0.34 |
| 12 | Msc. Charges (Marketing costs etc) | | | 0 | 0 | 0 |
| 13 | Depreciation charges | | | 0 | 164.64 | 0.52 |
| 14 | Land revenue and Taxes | | | 0 | 0 | 0 |
| **II** | **Cost B1** | | | | | |
| 16 | Interest on working capital | | | | 1087.96 | 3.43 |
| 17 | **Cost B1 = (Cost A1 + sum of 15 and 16)** | | | | 23140.41 | 72.90 |
| **III** | **Cost B2** | | | | | |
| 18 | Rental Value of Land | | | | 130.95 | 0.41 |
| 19 | **Cost B2 = (Cost B1 + Rental value)** | | | | 23271.36 | 73.31 |
| **IV** | **Cost C1** | | | | | |
| 20 | Family Human Labour | | | 22.26 | 5157.81 | 16.25 |
| 21 | **Cost C1 = (Cost B2 + Family Labour)** | | | | 28429.17 | 89.56 |
| **V** | **Cost C2** | | | | | |
| 22 | Risk Premium | | | | 427.86 | 1.35 |
| 23 | **Cost C2 = (Cost C1 + Risk Premium)** | | | | 28857.03 | 90.91 |
| **VI** | **Cost C3** | | | | | |
| 24 | Managerial Cost | | | | 2885.70 | 9.09 |
| 25 | **Cost C3 = (Cost C2 + Managerial Cost)** | | | | 31742.73 | 100 |
| **VII** | **Economics of the Crop** | | | | | |
| a. | Main Product | a) Main Product (q) | | 10.34 | 48800.98 | |
| | | b) Main Crop Sales Price (Rs.) | | | 4721.43 | |
| | By Product | e) Main Product (q) | | 0.80 | 85.68 | |
| | | f) Main Crop Sales Price (Rs.) | | | 107.14 | |
| b. | Gross Income (Rs.) | | | | 48886.66 | |
| c. | Net Income (Rs.) | | | | 17143.93 | |
| d. | Cost per Quintal (Rs./q.) | | | | 3071.07 | |
| e. | Benefit Cost Ratio (BC Ratio) | | | | 1:1.54 | |

**Cost of Cultivation of Sorghum:** The data regarding the cost of cultivation of Sorghum in Sowrashtrahalli micro-watershed is presented in Table 38. The results indicate that, the total cost of cultivation for Sorghum was Rs. 34622.79. The gross income realized by the farmers was Rs. 49202.42. The net income from Sorghum cultivation was Rs. 14579.63. Thus the benefit cost ratio was found to be 1: 1.42.

**Table 38. Cost of Cultivation of Sorghum in Sowrashtrahalli micro-watershed**

| Sl.No | Particulars | | Units | Phy Units | Value(Rs.) | % to C3 |
|---|---|---|---|---|---|---|
| **I** | **Cost A1** | | | | | |
| 1 | Hired Human Labour | | Man days | 49.79 | 10407.76 | 30.06 |
| 2 | Bullock | | Pairs/day | 0.57 | 574.95 | 1.66 |
| 3 | Tractor | | Hours | 4.59 | 2844.25 | 8.21 |
| 4 | Machinery | | Hours | 5.15 | 1029.96 | 2.97 |
| 5 | Seed Main Crop (Establishment and Maintenance) | | Kgs (Rs.) | 52.82 | 3299.08 | 9.53 |
| 6 | Seed Inter Crop | | Kgs. | 0 | 0 | 0 |
| 7 | FYM | | Quintal | 1.74 | 1736.75 | 5.02 |
| 8 | Fertilizer + micronutrients | | Quintal | 1.84 | 2396.45 | 6.92 |
| 9 | Pesticides (PPC) | | Kgs / liters | 0.15 | 154.38 | 0.45 |
| 10 | Irrigation | | Number | 0 | 0 | 0 |
| 11 | Repairs | | | 0 | 0 | 0 |
| 12 | Msc. Charges (Marketing costs etc) | | | 0 | 0 | 0 |
| 13 | Depreciation charges | | | 0 | 120.79 | 0.35 |
| 14 | Land revenue and Taxes | | | 0 | 0 | 0 |
| **II** | **Cost B1** | | | | | |
| 16 | Interest on working capital | | | | 1450.70 | 4.19 |
| 17 | **Cost B1 = (Cost A1 + sum of 15 and 16)** | | | | 24015.08 | 69.36 |
| **III** | **Cost B2** | | | | | |
| 18 | Rental Value of Land | | | | 42.33 | 0.12 |
| 19 | **Cost B2 = (Cost B1 + Rental value)** | | | | 24057.41 | 69.48 |
| **IV** | **Cost C1** | | | | | |
| 20 | Family Human Labour | | | 12.29 | 2915.35 | 8.42 |
| 21 | **Cost C1 = (Cost B2 + Family Labour)** | | | | 26972.76 | 77.90 |
| **V** | **Cost C2** | | | | | |
| 22 | Risk Premium | | | | 4502.50 | 13 |
| 23 | **Cost C2 = (Cost C1 + Risk Premium)** | | | | 31475.26 | 90.91 |
| **VI** | **Cost C3** | | | | | |
| 24 | Managerial Cost | | | | 3147.53 | 9.09 |
| 25 | **Cost C3 = (Cost C2 + Managerial Cost)** | | | | 34622.79 | 100 |
| **VII** | **Economics of the Crop** | | | | | |
| a. | Main Product | a) Main Product (q) | | 17.55 | 48257.08 | |
| | | b) Main Crop Sales Price (Rs.) | | | 2750 | |
| | By Product | e) Main Product (q) | | 5.04 | 945.35 | |
| | | f) Main Crop Sales Price (Rs.) | | | 187.50 | |
| b. | Gross Income (Rs.) | | | | 49202.42 | |
| c. | Net Income (Rs.) | | | | 14579.63 | |
| d. | Cost per Quintal (Rs./q.) | | | | 1973.03 | |
| e. | Benefit Cost Ratio (BC Ratio) | | | | 1:1.42 | |

**Cost of Cultivation of paddy:** The data regarding the cost of cultivation of paddy in Sowrashtrahalli micro-watershed is presented in Table 39. The results indicate that, the total cost of cultivation for paddy was Rs. 85452.63. The gross income realized by the farmers was Rs. 72247.50. The net income from paddy cultivation was Rs. -13205.13. Thus the benefit cost ratio was found to be 1: 0.85.

**Table 39. Cost of Cultivation of paddy in Sowrashtrahalli micro-watershed**

| Sl.No | Particulars | | Units | Phy Units | Value(Rs.) | % to C3 |
|---|---|---|---|---|---|---|
| **I** | **Cost A1** | | | | | |
| 1 | Hired Human Labour | | Man days | 58.05 | 11856 | 13.87 |
| 2 | Bullock | | Pairs/day | 9.88 | 7904 | 9.25 |
| 3 | Tractor | | Hours | 7.41 | 4446 | 5.20 |
| 4 | Machinery | | Hours | 19.76 | 13832 | 16.19 |
| 5 | Seed Main Crop (Establishment and Maintenance) | | Kgs (Rs.) | 61.75 | 8645 | 10.12 |
| 6 | Seed Inter Crop | | Kgs. | 0 | 0 | 0 |
| 7 | FYM | | Quintal | 0 | 0 | 0 |
| 8 | Fertilizer + micronutrients | | Quintal | 4.94 | 3952 | 4.62 |
| 9 | Pesticides (PPC) | | Kgs / liters | 1.24 | 741 | 0.87 |
| 10 | Irrigation | | Number | 0 | 0 | 0 |
| 11 | Repairs | | | 0 | 20 | 0.02 |
| 12 | Msc. Charges (Marketing costs etc) | | | 0 | 0 | 0 |
| 13 | Depreciation charges | | | 0 | 20056.40 | 23.47 |
| 14 | Land revenue and Taxes | | | 0 | 0 | 0 |
| **II** | **Cost B1** | | | | | |
| 16 | Interest on working capital | | | | 1600.56 | 1.87 |
| 17 | **Cost B1 = (Cost A1 + sum of 15 and 16)** | | | | 73052.96 | 85.49 |
| **III** | **Cost B2** | | | | | |
| 18 | Rental Value of Land | | | | 0 | 0 |
| 19 | **Cost B2 = (Cost B1 + Rental value)** | | | | 73052.96 | 85.49 |
| **IV** | **Cost C1** | | | | | |
| 20 | Family Human Labour | | | 19.76 | 4631.25 | 5.42 |
| 21 | **Cost C1 = (Cost B2 + Family Labour)** | | | | 77684.21 | 90.91 |
| **V** | **Cost C2** | | | | | |
| 22 | Risk Premium | | | | 0 | 0 |
| 23 | **Cost C2 = (Cost C1 + Risk Premium)** | | | | 77684.21 | 90.91 |
| **VI** | **Cost C3** | | | | | |
| 24 | Managerial Cost | | | | 7768.42 | 9.09 |
| 25 | **Cost C3 = (Cost C2 + Managerial Cost)** | | | | 85452.63 | 100 |
| **VII** | **Economics of the Crop** | | | | | |
| a. | Main Product | a) Main Product (q) | | 49.40 | 69160 | |
| | | b) Main Crop Sales Price (Rs.) | | | 1400 | |
| | By Product | e) Main Product (q) | | 6.18 | 3087.50 | |
| | | f) Main Crop Sales Price (Rs.) | | | 500 | |
| b. | Gross Income (Rs.) | | | | 72247.50 | |
| c. | Net Income (Rs.) | | | | -13205.13 | |
| d. | Cost per Quintal (Rs./q.) | | | | 1729.81 | |
| e. | Benefit Cost Ratio (BC Ratio) | | | | 1:0.85 | |

**Cost of cultivation of Cotton:** The data regarding the cost of cultivation of Cotton in Sowrashtrahalli micro-watershed is presented in Table 40. The results indicate that, the total cost of cultivation for Cotton was Rs. 34976.52. The gross income realized by the farmers was Rs. 56970.03. The net income from Cotton cultivation was Rs. 21993.51. Thus the benefit cost ratio was found to be 1: 1.63.

**Table 40. Cost of Cultivation of Cotton in Sowrashtrahalli micro-watershed**

| Sl.No | Particulars | | Units | Phy Units | Value(Rs.) | % to C3 |
|---|---|---|---|---|---|---|
| **I** | **Cost A1** | | | | | |
| 1 | Hired Human Labour | | Man days | 43.19 | 8169.98 | 23.36 |
| 2 | Bullock | | Pairs/day | 2.06 | 1408.60 | 4.03 |
| 3 | Tractor | | Hours | 4.47 | 2788.01 | 7.97 |
| 4 | Machinery | | Hours | 2.22 | 349.71 | 1 |
| 5 | Seed Main Crop (Establishment and Maintenance) | | Kgs (Rs.) | 7.87 | 1811.93 | 5.18 |
| 6 | Seed Inter Crop | | Kgs. | 0 | 0 | 0 |
| 7 | FYM | | Quintal | 5.04 | 1583.27 | 4.53 |
| 8 | Fertilizer + micronutrients | | Quintal | 2.15 | 2109.11 | 6.03 |
| 9 | Pesticides (PPC) | | Kgs / liters | 1.81 | 5378.45 | 15.38 |
| 10 | Irrigation | | Number | 0 | 0 | 0 |
| 11 | Repairs | | | 0 | 285.71 | 0.82 |
| 12 | Msc. Charges (Marketing costs etc) | | | 0 | 0 | 0 |
| 13 | Depreciation charges | | | 0 | 2511.92 | 7.18 |
| 14 | Land revenue and Taxes | | | 0 | 0 | 0 |
| **II** | **Cost B1** | | | | | |
| 16 | Interest on working capital | | | | 1433.65 | 4.10 |
| 17 | **Cost B1 = (Cost A1 + sum of 15 and 16)** | | | | 27830.35 | 79.57 |
| **III** | **Cost B2** | | | | | |
| 18 | Rental Value of Land | | | | 104.76 | 0.30 |
| 19 | **Cost B2 = (Cost B1 + Rental value)** | | | | 27935.11 | 79.87 |
| **IV** | **Cost C1** | | | | | |
| 20 | Family Human Labour | | | 12.88 | 2797.44 | 8 |
| 21 | **Cost C1 = (Cost B2 + Family Labour)** | | | | 30732.55 | 87.87 |
| **V** | **Cost C2** | | | | | |
| 22 | Risk Premium | | | | 1064.29 | 3.04 |
| 23 | **Cost C2 = (Cost C1 + Risk Premium)** | | | | 31796.84 | 90.91 |
| **VI** | **Cost C3** | | | | | |
| 24 | Managerial Cost | | | | 3179.68 | 9.09 |
| 25 | **Cost C3 = (Cost C2 + Managerial Cost)** | | | | 34976.52 | 100 |
| **VII** | **Economics of the Crop** | | | | | |
| a. | Main Product | a) Main Product (q) | | 12.08 | 56970.03 | |
| | | b) Main Crop Sales Price (Rs.) | | | 4714.29 | |
| b. | Gross Income (Rs.) | | | | 56970.03 | |
| c. | Net Income (Rs.) | | | | 21993.51 | |
| d. | Cost per Quintal (Rs./q.) | | | | 2894.32 | |
| e. | Benefit Cost Ratio (BC Ratio) | | | | 1:1.63 | |

**Adequacy of fodder:** The data regarding the adequacy of fodder in Sowrashtrahalli micro-watershed is presented in Table 41. The results indicate that, 45.71 per cent of the households opined that dry fodder was adequate and 48.57 per cent of the households opined that green fodder was adequate.

**Table 41. Adequacy of fodder in Sowrashtrahalli micro-watershed**

| Sl. No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Adequate-Dry Fodder | 0 | 0.00 | 5 | 55.56 | 2 | 20.00 | 2 | 22.22 | 0 | 0.00 | 9 | 25.71 |
| 2 | Inadequate-Dry Fodder | 0 | 0.00 | 2 | 22.22 | 2 | 20.00 | 0 | 0.00 | 0 | 0.00 | 4 | 11.43 |
| 3 | Adequate-Green Fodder | 0 | 0.00 | 2 | 22.22 | 1 | 10.00 | 1 | 11.11 | 0 | 0.00 | 4 | 11.43 |
| 4 | Inadequate-Green Fodder | 0 | 0.00 | 1 | 11.11 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 1 | 2.86 |

**Annual gross income:** The data regarding the annual gross income in Sowrashtrahalli micro-watershed is presented in Table 42. The results indicate that the annual gross income was Rs. 108,333.33 for landless farmers, for marginal farmers it was Rs. 105,785, for small farmers it was Rs. 179,718.18 and for semi medium farmers it was Rs. 191,928.

**Table 42. Annual gross income in Sowrashtrahalli micro-watershed**

**(**Avg value in Rs.)

| Sl.No. | Particulars | LL (5) | MF (9) | SF (10) | SMF (9) | MDF (2) | All (35) |
|---|---|---|---|---|---|---|---|
| 1 | Service/salary | 0 | 0 | 18,000 | 0 | 250,000 | 19,428.57 |
| 2 | Business | 0 | 0 | 10,000 | 5,555.56 | 0 | 4,285.71 |
| 3 | Wage | 10,000 | 40,555.56 | 31,500 | 37,777.78 | 0 | 30,571.43 |
| 4 | Agriculture | 0 | 41,333.33 | 60,400 | 137,055.56 | 256,750 | 77,800 |
| Income(Rs.) | | 10,000 | 81,888.89 | 119,900 | 180,388.89 | 506,750 | 132,085.71 |

**Average annual expenditure:** The data regarding the average annual expenditure in Sowrashtrahalli micro-watershed is presented in Table 43. The results indicate that the average annual expenditure is Rs. 13,063.15. For landless households it was Rs. 4,000, for marginal farmers it was Rs. 2,746.91, for small farmers it was Rs. 6,200, for semi medium farmers it was Rs. 5,609.79 and medium farmers it was Rs. 150,000.

**Table 43. Average annual expenditure in Sowrashtrahalli micro-watershed**

**(**Avg value in Rs.)

| Sl.No. | Particulars | LL (5) | MF (9) | SF (10) | SMF (9) | MDF (2) | All (35) |
|---|---|---|---|---|---|---|---|
| 1 | Service/salary | 0 | 0 | 25,000 | 0 | 200,000 | 6,428.57 |
| 2 | Business | 0 | 0 | 2,000 | 2,000 | 0 | 114.29 |
| 3 | Wage | 20,000 | 9,111.11 | 10,000 | 5,571.43 | 0 | 5,742.86 |
| 4 | Agriculture | 0 | 15,611.11 | 25,000 | 42,916.67 | 100,000 | 30,871.43 |
| Total | | 20,000 | 24,722.22 | 62,000 | 50,488.10 | 300,000 | 457,210.32 |
| Average | | 4,000 | 2,746.91 | 6,200 | 5,609.79 | 150,000 | 13,063.15 |

**Horticulture species grown:** The data regarding horticulture species grown in Sowrashtrahalli micro-watershed is presented in Table 44. The results indicate that, sampled households have grown 1 Lemon, 16 lime and 3 mango tree in their field.

**Table 44. Horticulture species grown in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | F | B | F | B | F | B | F | B | F | B | F | B |
| 1 | Lemon | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2 | Mango | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| 3 | lime | 0 | 0 | 1 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 16 | 0 |

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

**Interest towards cultivation of horticulture crops:** The data regarding interest towards cultivation of horticulture crops in Sowrashtrahalli micro-watershed is presented in Table 45. The results indicated that, 2.86 per cent have shown interest in soil test.

**Table 45. Interest shown towards soil testing in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Interested towards cultivation of horticulture crops | 0 | 0 | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 1 | 2.86 |

**Forest species grown:** The data regarding forest species grown in Sowrashtrahalli micro-watershed is presented in Table 46. The results indicate that, households have planted 104 neem and 12 tamarind trees in their field and also 12 neem trees in their backyard.

**Table 46: Forest species grown in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | F | B | F | B | F | B | F | B | F | B | F | B |
| 1 | Neem | 0 | 0 | 20 | 11 | 41 | 0 | 25 | 1 | 18 | 0 | 104 | 12 |
| 2 | Tamarind | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 4 | 0 |

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

**Average Additional investment capacity:** The data regarding average additional investment capacity in Sowrashtrahalli micro-watershed is presented in Table 47. The results indicated that, households have an average investment capacity of Rs. 6,514.34 for land development, Rs. 2,085.71 for irrigation facility and Rs. 428.57 for improved crop production.

**Table 47: Average Additional investment capacity in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | MF (9) | SF (10) | SMF (9) | MDF (2) | All (35) |
|---|---|---|---|---|---|---|---|
| | | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. |
| 1 | Land development | 0 | 4,222.22 | 4,500.20 | 14,444.44 | 7,500 | 6,514.34 |
| 2 | Irrigation facility | 0 | 0 | 5,300 | 2,222.22 | 0 | 2,085.71 |
| 3 | Improved crop production | 0 | 1,111.11 | 500 | 0 | 0 | 428.57 |

**Source of additional investment:** The data regarding source of funds for additional investment in Sowrashtrahalli micro-watershed is presented in Table 48. The results indicated that Government subsidy was the source of additional investment for 17.14 per cent for land development. Loan from bank was the source of additional investment for

22.86 per cent for land development, 5.71 for irrigation facility and for 5.71 per cent of irrigation facility. Own funds was the source of additional investment for 42.86 per cent for land development and 2.86 for irrigation facility.

**Table 48: Source of funds for additional investment capacity in Sowrashtrahalli micro-watershed**

| Sl.No | Item | Land development | | Irrigation facility | | Improved crop production | |
|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % |
| 1 | Government subsidy | 6 | 17.14 | 0 | 0.0 | 0 | 0.0 |
| 2 | Loan from bank | 8 | 22.86 | 2 | 5.71 | 2 | 5.71 |
| 3 | Own funds | 15 | 42.86 | 1 | 2.86 | 0 | 0.0 |

**Marketing of the agricultural produce:** The data regarding marketing of the agricultural produce in Sowrashtrahalli micro-watershed is presented in Table 49. The results indicated that, Cotton was sold to the extent of 93.67 per cent, Red gram was sold to the extent of 91.22 per cent and Sorghum was sold to the extent of 97.92 per cent.

**Table 49. Marketing of the agricultural produce in Sowrashtrahalli micro-watershed**

| Sl.No | Crops | Output obtained (q) | Output retained (q) | Output sold (q) | Output sold (%) | Avg. Price obtained (Rs/q) |
|---|---|---|---|---|---|---|
| 1 | Cotton | 158.0 | 10.0 | 148.0 | 93.67 | 4625.0 |
| 2 | Paddy | 40.0 | 40.0 | 0.0 | 0.0 | 1400.0 |
| 3 | Redgram | 353.0 | 31.0 | 322.0 | 91.22 | 4542.11 |
| 4 | Sorghum | 96.0 | 2.0 | 94.0 | 97.92 | 2750.0 |

**Marketing Channels used for sale of agricultural produce:** The data regarding marketing channels used for sale of agricultural produce in Sowrashtrahalli micro-watershed is presented in Table 50. The results indicated that, about 57.14 per cent of the farmers sold their produce to local/village merchants and 34.29 per cent of the farmers sold their produce to regulated markets.

**Table 50. Marketing Channels used for sale of agricultural produce in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Local/village Merchant | 0 | 0 | 8 | 88.89 | 4 | 40 | 7 | 77.78 | 1 | 50 | 20 | 57.14 |
| 2 | Regulated Market | 0 | 0 | 1 | 11.11 | 6 | 60 | 3 | 33.33 | 2 | 100 | 12 | 34.29 |

**Mode of transport of agricultural produce:** The data regarding mode of transport of agricultural produce in Sowrashtrahalli micro-watershed is presented in Table 51. The results indicated that, 88.57 per cent of the households have used tractor as a mode of transportation and 2.86 per cent of the households have used Cart as a mode of transportation.

**Table 51. Mode of transport of agricultural produce in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Cart | 0 | 0 | 1 | 11.11 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2.86 |
| 2 | Tractor | 0 | 0 | 8 | 88.89 | 10 | 100 | 10 | 111.11 | 3 | 150 | 31 | 88.57 |

**Incidence of soil and water erosion problems:** The data regarding incidence of soil and water erosion problems in Sowrashtrahalli micro-watershed is presented in Table 52. The results indicated that, 28.57 per cent of the households have experienced soil and water erosion problems in the farm.

**Table 52. Incidence of soil and water erosion problems in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Soil and water erosion problems in the farm | 0 | 0 | 0 | 0 | 7 | 70 | 3 | 33.33 | 0 | 0 | 10 | 28.57 |

**Interest shown towards soil testing:** The data regarding interest shown towards soil testing in Sowrashtrahalli micro-watershed is presented in Table 53. The results indicated that, 85.71 per cent have shown interest in soil test.

**Table 53. Interest shown towards soil testing in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Interest in soil test | 0 | 0 | 9 | 100 | 10 | 100 | 9 | 100 | 2 | 100 | 30 | 85.71 |

**Soil and water conservation practices and structures adopted:** The data regarding of soil and water conservation practices and structures adopted in Sowrashtrahalli micro-watershed is presented in Table 54. The results indicated that, 28.57 per cent of the households practicing field bunding and 2.86 per cent of the households practicing Farm Pond.

**Table 54. Soil and water conservation practices and structures adopted in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Field Bunding | 3 | 60 | 5 | 55.56 | 1 | 10 | 1 | 11.11 | 0 | 0 | 10 | 28.57 |
| 2 | Farm Pond | 0 | 0 | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 1 | 2.86 |

**Table 55. Status of soil and water conservation structures in Sowrashtrahalli micro-watershed**

| Sl.No | Item | Good | | Slightly Damaged | |
|---|---|---|---|---|---|
| | | N | % | N | % |
| 1 | Farm Pond | 1 | 100.0 | 0 | 0.0 |
| 2 | Field Bunding | 8 | 80.0 | 2 | 20.0 |

**Status of soil and water conservation structures:** The data regarding status of soil and water conservation structures in Sowrashtrahalli micro-watershed is presented in Table 55. The results indicated that, 100 per cent of the household's farm pond conservation

structures were good and 80 per cent of the households field bunding conservation structure were good and 20 per cent of the conservation structures were slightly damaged

**Agencies involved in soil conservation structures:** The data regarding agencies involved in soil conservation structures in Sowrashtrahalli micro-watershed is presented in Table 56. The results indicated that, 28.57 per cent of the households depend on own funds and 2.86 per cent of the households were depend on Farmer organization

**Table 56. Agencies involved in soil conservation structures in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Own | 3 | 60 | 5 | 55.56 | 1 | 10 | 1 | 11.11 | 0 | 0 | 10 | 28.57 |
| 2 | Farmer organization | 0 | 0 | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 1 | 2.86 |

**Usage pattern of fuel for domestic use:** The data regarding usage pattern of fuel for domestic use in Sowrashtrahalli micro-watershed is presented in Table 57. The results indicated that, 80 per cent of the households used firewood and 17.14 per cent of them used LPG as a source of fuel.

**Table 57. Usage pattern of fuel for domestic use in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Fire Wood | 2 | 40 | 9 | 100 | 9 | 90 | 7 | 77.78 | 1 | 50 | 28 | 80 |
| 2 | LPG | 3 | 60 | 0 | 0 | 0 | 0 | 2 | 22.22 | 1 | 50 | 6 | 17.14 |

**Source of drinking water:** The data regarding source of drinking water in Sowrashtrahalli micro-watershed is presented in Table 58. The results indicated that, piped supply was the major source of drinking water for 65.71 per cent of the households in the micro watershed and Bore Well was the major source of drinking water for 28.57 per cent of the households.

**Table 58. Source of drinking water in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Piped supply | 5 | 100 | 7 | 77.78 | 3 | 30 | 7 | 77.78 | 1 | 50 | 23 | 65.71 |
| 2 | Bore Well | 0 | 0 | 1 | 11.11 | 6 | 60 | 2 | 22.22 | 1 | 50 | 10 | 28.57 |

**Table 59. Source of light in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Electricity | 5 | 100 | 9 | 100 | 10 | 100 | 9 | 100 | 2 | 100 | 35 | 100 |

**Source of light:** The data regarding source of light in Sowrashtrahalli micro-watershed is presented in Table 59. 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 facilit**y** in Sowrashtrahalli micro-watershed is presented in Table 60. The results indicated that, 48.57 per cent of the households possess sanitary toilet facility.

**Table 60. Existence of Sanitary toilet facility in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Sanitary toilet facility | 5 | 100 | 2 | 22.22 | 1 | 10 | 7 | 77.78 | 2 | 100 | 17 | 48.57 |

**Possession of PDS card:** The data regarding possession of PDS card in Sowrashtrahalli micro-watershed is presented in Table 61. The results indicated that, 97.14 per cent of the sampled households possessed BPL cards and 2.86 per cent of the sampled households possessed APL cards.

**Table 61. Possession of PDS card in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | APL | 1 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2.86 |
| 2 | BPL | 4 | 80 | 9 | 100 | 10 | 100 | 9 | 100.0 | 2 | 100 | 34 | 97.14 |

**Participation in NREGA program:** The data regarding participation in NREGA programme in Sowrashtrahalli micro-watershed is presented in Table 62. The results indicated that, 71.43 per cent of the households participated in NREGA programme.

**Table 62. Participation in NREGA programme in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Participation in NREGA programme | 3 | 60 | 7 | 77.78 | 5 | 50 | 8 | 88.89 | 2 | 100 | 25 | 71.43 |

**Table 63. Adequacy of food items in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Cereals | 0 | 0 | 4 | 44.44 | 7 | 70 | 7 | 77.78 | 2 | 100 | 20 | 57.14 |
| 2 | Pulses | 0 | 0 | 7 | 77.78 | 3 | 30 | 7 | 77.78 | 2 | 100 | 19 | 54.29 |
| 3 | Oilseed | 0 | 0 | 4 | 44.44 | 3 | 30 | 6 | 66.67 | 1 | 50 | 14 | 40 |
| 4 | Vegetables | 0 | 0 | 3 | 33.33 | 5 | 50 | 6 | 66.67 | 1 | 50 | 15 | 42.86 |
| 5 | Fruits | 0 | 0 | 0 | 0 | 5 | 50 | 0 | 0 | 0 | 0 | 5 | 14.29 |
| 6 | Milk | 0 | 0 | 3 | 33.33 | 3 | 30 | 7 | 77.78 | 1 | 50 | 14 | 40 |
| 7 | Egg | 0 | 0 | 3 | 33.33 | 4 | 40 | 5 | 55.56 | 1 | 50 | 13 | 37.14 |
| 8 | Meat | 0 | 0 | 3 | 33.33 | 1 | 10 | 4 | 44.44 | 1 | 50 | 9 | 25.71 |

**Adequacy of food items:** The data regarding adequacy of food items in Sowrashtrahalli micro-watershed is presented in Table 63. The results indicated that, cereals were adequate for 57.14 per cent, Pulses were adequate for 54.29 per cent, Oilseed were adequate for 40 per cent, vegetables were adequate for 42.86 per cent, fruits were adequate for 14.29 per cent, Milk were adequate for 40 per cent, Egg were adequate for 37.14 per cent and Meat were adequate for 25.71 per cent.

**Response on Inadequacy of food items:** The data regarding inadequacy of food items in Sowrashtrahalli micro-watershed is presented in Table 64. The results indicated that, Cereals were inadequate for 34.29 per cent of the households, pulses were inadequate for 34.29 per cent of the households, oilseeds were inadequate for 45.71 per cent, vegetables were inadequate for 51.43 per cent and fruits were inadequate for 77.14 per cent of the

households, Milk were inadequate for 45.71 per cent of the households, Egg were inadequate for 54.29 per cent of the households and Meat were inadequate for 37.14 per cent of the households,.

**Table 64. Response on Inadequacy of food items in Sowrashtrahalli micro-watershed**

| Sl.No. | Particulars | LL (5) | | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Cereals | 5 | 100 | 5 | 55.56 | 1 | 10 | 1 | 11.11 | 0 | 0 | 12 | 34.29 |
| 2 | Pulses | 5 | 100 | 2 | 22.22 | 4 | 40 | 1 | 11.11 | 0 | 0 | 12 | 34.29 |
| 3 | Oilseed | 5 | 100 | 5 | 55.56 | 3 | 30 | 2 | 22.22 | 1 | 50 | 16 | 45.71 |
| 4 | Vegetables | 5 | 100 | 6 | 66.67 | 4 | 40 | 2 | 22.22 | 1 | 50 | 18 | 51.43 |
| 5 | Fruits | 5 | 100 | 9 | 100 | 3 | 30 | 9 | 100 | 1 | 50 | 27 | 77.14 |
| 6 | Milk | 5 | 100 | 5 | 55.56 | 3 | 30 | 2 | 22.22 | 1 | 50 | 16 | 45.71 |
| 7 | Egg | 5 | 100 | 6 | 66.67 | 4 | 40 | 3 | 33.33 | 1 | 50 | 19 | 54.29 |
| 8 | Meat | 5 | 100 | 5 | 55.56 | 1 | 10 | 2 | 22.22 | 0 | 0 | 13 | 37.14 |

**Farming constraints:** The data regarding farming constraints experienced by households in Sowrashtrahalli micro-watershed is presented in Table 65. The results indicated that, lower fertility status of the soil (77.14% ), Wild animal menace on farm field (77.14% ), frequent incidence of pest and diseases (22.86 % ), inadequacy of irrigation water (34.29 % ), high cost of fertilizers and plant protection chemicals was the constraint experienced by 71.43 per cent of the households, high rate of interest on credit (31.43 %), low price for the agricultural commodities (62.86 %), lack of marketing facilities in the area (48.57 %), inadequate extension services (25.71 %), Lack of transport for safe transport of the Agril produce to the market (68.57 %), Less rainfall (62.86 %) and Source of Agri-technology information (Newspaper/TV/Mobile) (17.14 %).

**Table 65. Farming constraints Experienced in Sowrashtrahalli micro-watershed**

| Sl. No. | Particulars | MF (9) | | SF (10) | | SMF (9) | | MDF (2) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % |
| 1 | Lower fertility status of the soil | 8 | 88.89 | 8 | 80 | 9 | 100 | 2 | 100 | 27 | 77.14 |
| 2 | Wild animal menace on farm field | 9 | 100 | 10 | 100 | 6 | 66.67 | 2 | 100 | 27 | 77.14 |
| 3 | Frequent incidence of pest and diseases | 3 | 33.33 | 2 | 20 | 3 | 33.33 | 0 | 0 | 8 | 22.86 |
| 4 | Inadequacy of irrigation water | 2 | 22.22 | 2 | 20 | 7 | 77.78 | 1 | 50 | 12 | 34.29 |
| 5 | High cost of Fertilizers and plant protection chemicals | 8 | 88.89 | 8 | 80 | 7 | 77.78 | 2 | 100 | 25 | 71.43 |
| 6 | High rate of interest on credit | 6 | 66.67 | 2 | 20 | 3 | 33.33 | 0 | 0 | 11 | 31.43 |
| 7 | Low price for the agricultural commodities | 8 | 88.89 | 5 | 50 | 8 | 88.89 | 1 | 50 | 22 | 62.86 |
| 8 | Lack of marketing facilities in the area | 6 | 66.67 | 5 | 50 | 5 | 55.56 | 1 | 50 | 17 | 48.57 |
| 9 | Inadequate extension services | 3 | 33.33 | 2 | 20 | 4 | 44.44 | 0 | 0 | 9 | 25.71 |
| 10 | Lack of transport for safe transport of the Agril produce to the market. | 9 | 100 | 7 | 70 | 6 | 66.67 | 2 | 100 | 24 | 68.57 |
| 11 | Less rainfall | 9 | 100 | 4 | 40 | 8 | 88.89 | 1 | 50 | 22 | 62.86 |
| 12 | Source of Agri-technology information (Newspaper/TV/Mobile) | 1 | 11.11 | 3 | 30 | 1 | 11.11 | 1 | 50 | 6 | 17.14 |

*Chapter 5*

## SUMMARY

In order to assess the socio-economic condition of the farmers in the watershed a comprehensive questionnaire was prepared. Major components such as demographic conditions, migration details, food consumption and family expenditure pattern, material possession, land holding, land use management, cropping pattern, cost of cultivation of crops, livestock management. The statistical components such as frequency and percentage were used to analyze the data. About 35 households located in the micro watershed were interviewed for the survey.

The data on households sampled for socio economic survey indicated that 35 farmers were sampled in Sowrashtrahalli micro-watershed among them 5 (14.29 %) were landless, 9 (25.71 %) were marginal farmers, 10 (28.57 %) were small farmers, 9 (25.71 %) were semi medium farmers and 2 (5.71 %) were semi medium farmers.

The data indicated that there were 90 (58.82 %) men and 63 (41.18 %) women among the sampled households. The average family size of landless farmers' was 4.2, marginal farmers' was 3.55, small farmers' was 4.9, semi medium farmers' was 4.44 and medium farmers' was 5.5.

The data indicated that, 23 (15.03 %) people were in 0-15 years of age, 78 (50.98 %) were in 16-35 years of age, 43 (28.10 %) were in 36-60 years of age and 9 (5.88 %) were above 61 years of age.

The results indicated that Sowrashtrahalli had 32.03 per cent illiterates, 3.27 per cent of them had functional literate, 12.42 per cent of them had primary school, 8.50 per cent of them had middle school, 17.65 per cent of them had High School, 12.42 per cent of them had PUC, 1.96 per cent of them had Diploma, 3.27 per cent of them had ITI, 5.88 per cent of them had Degree education and 1.31 per cent of them had Masters education.

The results indicate that, 85.71 per cent of household heads were practicing agriculture, 8.57 per cent of the household heads were General labourers, 2.86 cent of the household heads were in private service and 2.86 per cent of them were trade and business.

The results indicate that agriculture was the major occupation for 38.56 per cent of the household members, 16.34 per cent were agricultural labourers, 2.61 per cent were in general labour, 3.27 per cent were private service, 24.18 per cent were Student, 12.42 per cent were housewives and 1.96 per cent were children.

The results show that, 1.31 per cent of the population in the micro watershed has participated in Self Help Group. The results indicate that 54.29 per cent of the households possess katcha house and 48.57 per cent of them possess pucca/RCC house.

The results show that 100 per cent of the households possess TV, 37.14 per cent of the households possess mixer/grinder, 28.57 per cent of the households possess Motor Cycle, 2.86 per cent of the households possess Auto, LPG Stove and Car/Four Wheeler and 85.71 per cent of the households possess mobile phones.

The results show that the average value of television was Rs. 9,142, mixer/grinder was Rs. 2,007, Motor Cycle was Rs. 103,800, Auto was Rs. 120,000, Car/Four Wheeler was Rs. 800,000, LPG Stove was Rs. 2,000, and mobile phone was Rs. 3,141.

About 31.43 per cent of the households possess bullock cart, 34.29 per cent of them possess plough, 2.86 per cent of them possess seed/fertilizer drill, 5.71 per cent of them possess Power Tiller, 8.57 per cent of them possess Tractor, 17.14 per cent of them possess Sprayer and 2.86 per cent of them possess Weeder.

The results show that the average value of bullock cart was Rs. 19,181, plough was Rs. 2,483, seed/fertilizer drill was Rs. 4,000, Power Tiller was Rs.150,000, Tractor was Rs. 800,000, Sprayer was Rs. 4,633 and the average value of weeder was Rs. 2,000.

The results indicate that, 34.29 per cent of the households possess bullocks, 8.57 per cent of the households possess local cow, 2.86 per cent of the households possess buffalo and Sheep and 5.71 per cent of the households possess goat and poultry birds.

The results indicate that, average own labour men available in the micro watershed was 1.58, average own labour (women) available was 1.32, average hired labour (men) available was 9.19 and average hired labour (women) available was 15.84.

The results indicate that, 37.14 per cent of the households opined that the hired labour was adequate and 45.71 per cent of the households opined that the hired labour was inadequate.

The results indicate that, 2 (1.31 %) of the households migrated. The results indicate that, the average distance was 600 (kms) and average duration was around 12 months. The results indicate that, job/wage/work was the main reason for the migration of the households. The results indicate that, there were no such positive consequences for the migration of the households.

The results indicate that, there were no such negative consequences for the migration of the households. The results indicate that, households of the Sowrashtrahalli micro-watershed possess 51.15 ha (96.75 %) of dry land, 1.72 ha (3.25 %) of irrigated land. Marginal farmers possess 5.53 ha (100 %) of dry land. Small farmers possess 11.72 ha (87.20 %) of dry land and 1.72 ha (12.80 %) of irrigated land. Semi medium farmers possess 23.31 ha (100%) of dry land. Medium farmers possess 10.59 ha (100%) of dry land.

The results indicate that, the average value of dry land was Rs. 305,061.32 and the average value of irrigated land was Rs. 1,310,612.24. In case of marginal famers, the average land value was Rs. 715,523.05 for dry land. In case of small famers, the average land value was Rs. 290,086.36 for dry land and Rs. 639,294.12 for irrigated land. In case of semi medium famers, the average land value was Rs. 302,265.23 for dry land. In case of medium famers, the average land value was Rs. 113,302.75 for dry land.

The results indicate that, there were 1 functioning open wells in the micro watershed. The results indicate that, bore well was the major irrigation source in the micro water shed for 2.86 per cent of the farmers. The results indicate that, small farmers had an irrigated area of 3.64 ha.

The results indicate that, farmers have grown red gram (29.25 ha), Cotton (11.51 ha), Paddy (0.81 ha), Jowar (3.79 ha) and Sorghum (1.78 ha). Marginal farmers have grown red gram, Sorghum and cotton. Small farmers have grown red gram, cotton, Jowar, Sorghum and paddy. Semi medium farmers have grown red gram, Cotton and Jowar. Medium farmers have grown red gram and Cotton.

The results indicate that, the cropping intensity in Sowrashtrahalli micro-watershed was found to be 87.69 per cent. The results indicate that, 91.43 per cent of the households have bank account and 71.43 per cent of the households have savings.

The results indicate that, 60 per cent of the households have availed credit from different sources. The results indicate that, 28.57 per cent of the households have borrowed from Commercial Bank, 33.33 per cent from Friends/Relatives, 9.52 per cent from Grameena Bank and 9.52 per cent from Traders.

The results indicate that, the average credit amount borrowed by households in micro-watershed was Rs. 7,714.29. The results indicate that, 37.50 per cent of the households borrowed from institutional sources for the purpose of agricultural production.

The results indicate that, 28.57 per cent of the households borrowed from private credit for the purpose of agricultural production and Education purpose. The results indicated that 12.50 per cent of the households did not repay their loan borrowed from institutional sources.

The results indicated that 22.22 per cent of the households did not repay their loan borrowed from Private source. The results indicate that, around 25 per cent opined that the loan amount borrowed from institutional sources helped to perform timely agricultural operations.

The results indicate that, the total cost of cultivation for red gram was Rs. 31742.73. The gross income realized by the farmers was Rs. 48886.66. The net income

from red gram cultivation was Rs.17143.93. Thus the benefit cost ratio was found to be 1: 1.54.

The results indicate that, the total cost of cultivation for Sorghum was Rs. 34622.79. The gross income realized by the farmers was Rs. 49202.42. The net income from Sorghum cultivation was Rs. 14579.63. Thus the benefit cost ratio was found to be 1: 1.42. The results indicate that, the total cost of cultivation for paddy was Rs. 85452.63. The gross income realized by the farmers was Rs. 72247.50. The net income from paddy cultivation was Rs. -13205.13. Thus the benefit cost ratio was found to be 1: 0.85.

The results indicate that, the total cost of cultivation for Cotton was Rs. 34976.52. The gross income realized by the farmers was Rs. 56970.03. The net income from Cotton cultivation was Rs. 21993.51. Thus the benefit cost ratio was found to be 1: 1.63. The results indicate that, 45.71 per cent of the households opined that dry fodder was adequate and 48.57 per cent of the households opined that green fodder was adequate.

The results indicate that the annual gross income was Rs. 108,333.33 for landless farmers, for marginal farmers it was Rs. 105,785, for small farmers it was Rs. 179,718.18 and for semi medium farmers it was Rs. 191,928.

The results indicate that the average annual expenditure is Rs. 13,063.15. For landless households it was Rs. 4,000, for marginal farmers it was Rs. 2,746.91, for small farmers it was Rs. 6,200, for semi medium farmers it was Rs. 5,609.79 and medium farmers it was Rs. 150,000.

The results indicate that, sampled households have grown 1 Lemon, 16 lime and 3 mango tree in their field. The results indicated that, 2.86 per cent have shown interest in soil test. The results indicate that, households have planted 104 neem and 12 tamarind trees in their field and also 12 neem trees in their backyard. The results indicated that, households have an average investment capacity of Rs. 6,514.34 for land development, Rs. 2,085.71 for irrigation facility and Rs. 428.57 for improved crop production.

The results indicated that Government subsidy was the source of additional investment for 17.14 per cent for land development. Loan from bank was the source of additional investment for 22.86 per cent for land development, 5.71 for irrigation facility and for 5.71 per cent of irrigation facility. Own funds was the source of additional investment for 42.86 per cent for land development and 2.86 for irrigation facility.

The results indicated that, Cotton was sold to the extent of 93.67 per cent, Red gram was sold to the extent of 91.22 per cent and Sorghum was sold to the extent of 97.92 per cent. The results indicated that, about 57.14 per cent of the farmers sold their produce to local/village merchants and 34.29 per cent of the farmers sold their produce to regulated markets.

The results indicated that, 88.57 per cent of the households have used tractor as a mode of transportation and 2.86 per cent of the households have used Cart as a mode of transportation. The results indicated that, 28.57 per cent of the households have experienced soil and water erosion problems in the farm. The results indicated that, 85.71 per cent have shown interest in soil test.

The results indicated that, 28.57 per cent of the households practicing field bunding and 2.86 per cent of the households practicing Farm Pond.

The results indicated that, 100 per cent of the household's farm pond conservation structures were good and 80 per cent of the household's field bunding conservation structure were good and 20 per cent of the conservation structures were slightly damaged. The results indicated that, 28.57 per cent of the households depend on own funds and 2.86 per cent of the households were depend on Farmer organization

The results indicated that, 80 per cent of the households used firewood and 17.14 per cent of them used LPG as a source of fuel. The results indicated that, piped supply was the major source of drinking water for 65.71 per cent of the households in the micro watershed and Bore Well was the major source of drinking water for 28.57 per cent of the households.

The results indicated that, Electricity was the major source of light for 100 per cent of the households in micro watershed. The results indicated that, 48.57 per cent of the households possess sanitary toilet facility. The results indicated that, 97.14 per cent of the sampled households possessed BPL cards and 2.86 per cent of the sampled households possessed APL cards.

The results indicated that, 71.43 per cent of the households participated in NREGA programme.The results indicated that, cereals were adequate for 57.14 per cent, Pulses were adequate for 54.29 per cent, Oilseed were adequate for 40 per cent, vegetables were adequate for 42.86 per cent, fruits were adequate for 14.29 per cent, Milk were adequate for 40 per cent, Egg were adequate for 37.14 per cent and Meat were adequate for 25.71 per cent.

The results indicated that, Cereals were inadequate for 34.29 per cent of the households, pulses were inadequate for 34.29 per cent of the households, oilseeds were inadequate for 45.71 per cent, vegetables were inadequate for 51.43 per cent and fruits were inadequate for 77.14 per cent of the households, Milk were inadequate for 45.71 per cent of the households, Egg were inadequate for 54.29 per cent of the households and Meat were inadequate for 37.14 per cent of the households,.

The results indicated that, lower fertility status of the soil (77.14% ), Wild animal menace on farm field (77.14% ), frequent incidence of pest and diseases (22.86 % ), inadequacy of irrigation water (34.29 % ), high cost of fertilizers and plant protection

chemicals was the constraint experienced by 71.43 per cent of the households, high rate of interest on credit (31.43 %), low price for the agricultural commodities (62.86 %), lack of marketing facilities in the area (48.57 %), inadequate extension services (25.71 %), Lack of transport for safe transport of the Agril produce to the market (68.57 %), Less rainfall (62.86 %) and Source of Agri-technology information (Newspaper/TV/Mobile) (17.14 %).