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

## BHIMANAHALLI-2 (4D5B1N2b) MICROWATERSHED

**Sydhapura Hobli , Yadgir Taluk and District, Karnataka**

Karnataka Watershed Development Project – II

**SUJALA – III**

**World Bank funded Project**

The World Bank

ICAR – NATIONAL BUREAU OF SOIL SURVEY AND LAND USE PLANNING

ICAR - NBSS & LUP

WATERSHED DEVELOPMENT DEPARTMENT
GOVT. OF KARNATAKA, BANGALORE

## About ICAR - NBSS&LUP

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

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

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## PREFACE

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

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

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

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

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

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

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

Nagpur
Date: 28.02.2019

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# PART-A

## LAND RESOURCE INVENTORY

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## *EXECUTIVE SUMMARY*

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

*The present study covers an area of 642 ha in Yadgir taluk & district, Karnataka. The climate is semiarid and categorized as drought-prone with an average annual rainfall of 866 mm, of which about 652 mm is received during south-west monsoon, 138 mm during north-east and the remaining 76 mm during the rest of the year. An area of 592 ha in the microwatershed is covered by soils, 50 ha by others (habitation and water body). The salient findings from the land resource inventory are summarized briefly below.*

- *The soils belong to 3 soil series and 4 soil phases (management units) and 3 land management units.*
- *The length of crop growing period is about 120-150 days starting from 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 was assessed and maps showing the degree of suitability along with constraints were generated.*
- *Entire area in the microwatershed is suitable for agriculture.*
- *About 87 per cent soils in the microwatershed are very deep (>150 cm) and 5 per cent soils are moderately shallow (50-75 cm).*
- *Entire area in the microwatershed has clayey soils at the surface.*
- *About 86 per cent area in the microwatershed is non gravelly (<15%) and 6 per cent is gravelly (15-35%).*
- *About 87 per cent area of the microwatershed is very high (>200 mm/m) in available water capacity and 5 per cent is low (51-100 mm/m).*
- *Entire area in the microwatershed has very gently sloping (1-3% slope) lands.*
- *Entire area in the microwatershed is moderately (e2) eroded.*

- *An area of about 5 per cent is neutral (pH 6.5-7.3) in soil reaction, 84 per cent soils is slightly to moderately alkaline (pH 7.3-8.4) and about 4 per cent soils are strongly alkaline (pH 8.4 - 9.0).*
- *The Electrical Conductivity (EC) of the entire soils in the microwatershed are non saline (<2 $dSm^{-1}$).*
- *About 18 per cent of the soils are low (<0.5%) in organic carbon, 32 per cent is medium (0.5-0.75%) and 42 per cent is high (>0.75).*
- *About 32 per cent area is low in available phosphorus, 39 per area is medium (23-57 kg/ha) and 21 per cent is high (>57 kg/ha).*
- *Less than 1 per cent area is medium (145-337 kg/ha) in available potassium and 92 per cent is high (>337 kg/ha).*
- *Available sulphur is low (<10 ppm) in 18 per cent area, medium (10 -20 ppm) in an area of about 24 per cent and high (>20 ppm) in 50 per cent area of the microwatershed.*
- *Available boron is low (<0.5 ppm) in an area of about 51 per cent, medium (0.5-1.0 ppm) in an area of 34 per cent and high (>1.0 ppm) in 7 per cent area.*
- *Available iron is sufficient (>4.5 ppm) in 71 per cent area and deficient in 21 per cent area of the microwatershed.*
- *Available manganese and copper are sufficient in all the soils of the microwatershed.*
- *Available zinc is deficient (<0.6 ppm) in an area of 61 per cent and sufficient (>0.6 ppm) in 31 per cent area of the microwatershed.*
- *The land suitability for 26 major crops grown in the microwatershed were assessed and the areas that are highly suitable (S1) and moderately suitable (S2) are given below. It is however to be noted that a given soil may be suitable for various crops but what specific crop to be grown may be decided by the farmer looking to his capacity to invest on various inputs, marketing infrastructure, market price and finally the demand and supply position.*

***Land suitability for various crops in the Microwatershed***

| Crop | Suitability Area in ha (%) | | | Crop | Suitability Area in ha (%) | |
|---|---|---|---|---|---|---|
| | Highly suitable (S1) | Moderately suitable (S2) | | | Highly suitable (S1) | Moderately suitable (S2) |
| *Sorghum* | *561(87)* | *31(5)* | | *Sapota* | - | - |
| *Maize* | - | *592(92)* | | *Pomegranate* | - | *561(87)* |
| *Bajra* | - | *592(92)* | | *Musambi* | *451(70)* | *110(17)* |
| *Groundnut* | - | *31(5)* | | *Lime* | *451(70)* | *110(17)* |
| *Sunflower* | *451(70)* | *110(17)* | | *Amla* | *110(17)* | *482(75)* |
| *Redgram* | - | *561(87)* | | *Cashew* | - | - |
| *Bengal gram* | *561(87)* | *31(5)* | | *Jackfruit* | - | - |
| *Cotton* | *561(87)* | *31(5)* | | *Jamun* | - | *561(87)* |
| *Chilli* | - | *592 (92)* | | *Custard apple* | *561(87)* | *31(5)* |
| *Tomato* | - | *482(75)* | | *Tamarind* | - | *561(87)* |
| *Drumstick* | - | *561(87)* | | *Mulberry* | - | - |
| *Mango* | - | - | | *Marigold* | - | *592(92)* |
| *Guava* | - | - | | *Chrysanthemum* | - | *592(92)* |

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

*Chapter 1*

# INTRODUCTION

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

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

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

Therefore, the land resource inventory required for farm level planning is the one which investigates not only the surface but also consider the other parameters which are critical for productivity *viz.*, soils, climate, water, minerals and rocks, topography, geology, hydrology, vegetation, crops, land use pattern, animal population, socio-economic conditions, infrastructure, marketing facilities and various schemes and developmental works of the government etc. From the data collected at farm level, the specific problems and potentials of the area can be identified and highlighted,

conservation measures required for the area can be planned on a scientific footing, suitability of the area for various uses can be worked out and finally viable and sustainable land use options suitable for each and every land holding can be prescribed.

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

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

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

*Chapter 2*

# GEOGRAPHICAL SETTING

## 2.1 Location and Extent

The Bhimanahalli-2 microwatershed is located in the northern part of Karnataka in Yadgir Taluk & District, Karnataka State (Fig.2.1). It comprises parts of Belagundi, Gondedagi and Bheemanalli villages. It lies between $16^0$ 29' and $16^0$ 32' North latitudes and $77^0$ 11' and $77^0$ 14' East longitudes covering an area of about 642 ha. It is about 41 km south of Yadgir town and is surrounded by Bheemanalli on the west and northwest, Belagundi on the north and Gondedagi village on the south, east and northeastern side.

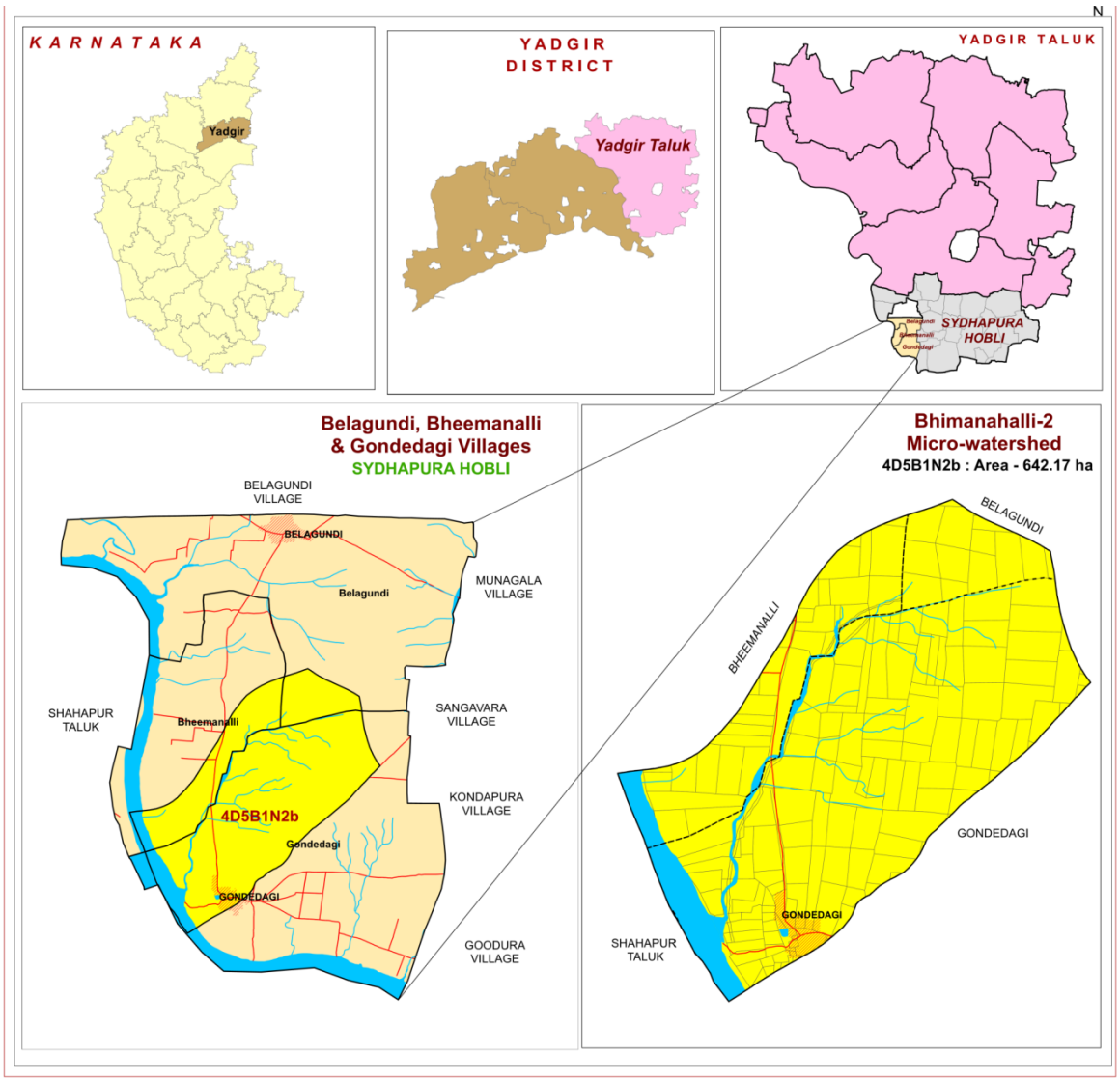



Fig.2.1 Location map of Bhimanahalli-2 Microwatershed

## 2.2 Geology

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

highly weathered, fractured and fissured upto a depth of about 10 m. Dolerite dykes and quartz veins are common with variable width and found to occur in Bhimanahalli-2 microwatershed.

Fig.2.2 Granite and granite gneiss rocks

**2.3 Physiography**

Physiographically, the area has been identified as granite gneiss landscape based on geology. The area has been further subdivided into five landforms, *viz;* mounds/ridges, summits, side slopes and very gently sloping uplands, plains and valleys based on slope and its relief features. The elevation ranges from 367-379 m above MSL. The mounds and ridges are mostly covered by rock outcrops.

**2.4 Drainage**

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

**2.5 Climate**

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

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

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

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

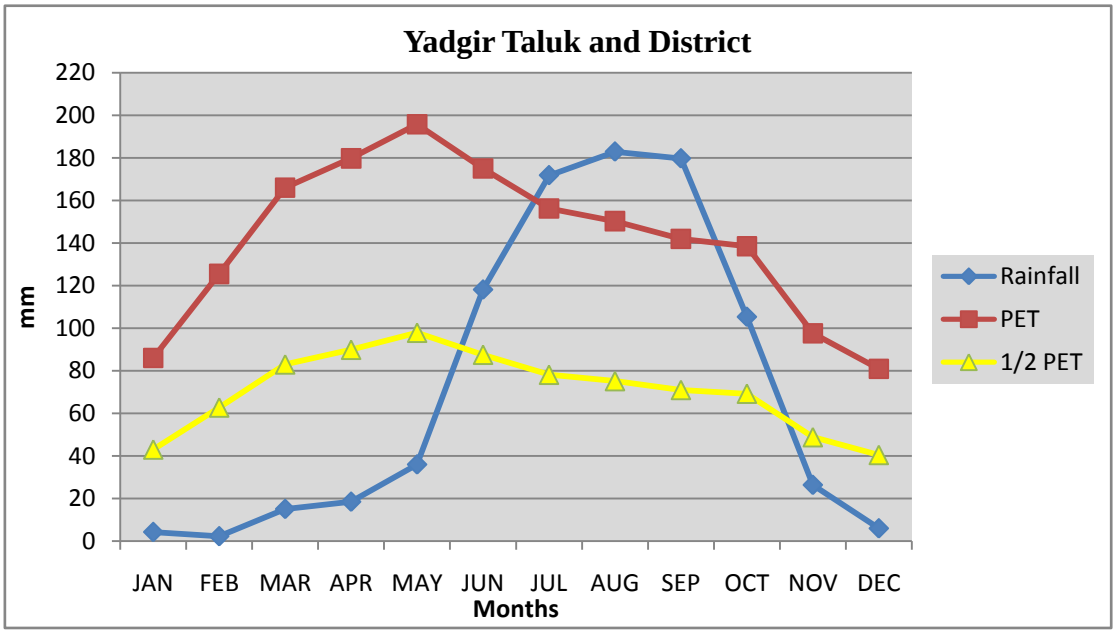



Fig 2.3 Rainfall distribution in Yadgir Taluk, Yadgir District

## 2.6 Natural Vegetation

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

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 district is cultivated at present. An area of about 2 per cent is permanently under pasture, 20 per cent under current fallows and 6 per cent under non-agricultural land, and 5 per cent under currently barren. Forests occupy an area of about 7 per cent and the tree cover is in a very poor state. Most of the mounds, ridges and bouldery areas have very poor vegetative cover. Major crops grown in the area are sorghum, maize, cotton, sunflower, groundnut, red gram, mango, pomegranate, marigold and sapota. The cropping intensity is 120 per cent in the taluk. While carrying out land resource inventory, the land use/land cover particulars are collected from all the survey numbers and a current land use map of the microwatershed is prepared. The current land use map prepared shows the arable and non-arable lands, other land uses and different types of crops grown in the area. The current land use map of Bhimanahalli-2 microwatershed is presented in Fig.2.4. The different crops and cropping systems adopted in the microwatershed is presented in the Figures 2.5 a & b.

**Table 2.2 Land Utilization in Yadgir District**

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

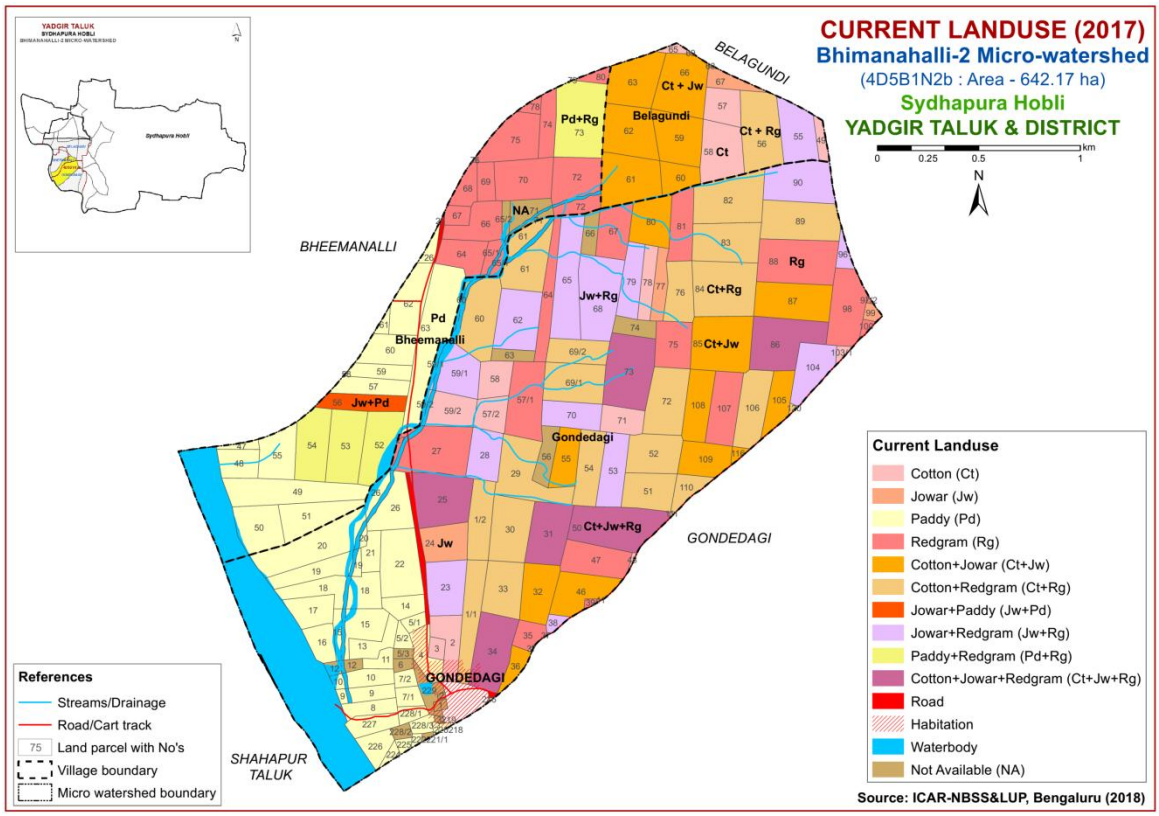



Fig.2.4 Current Land Use map of Bhimanahalli-2 Microwatershed


Fig 2.5 a. Different Crops and Cropping Systems in Bhimanahalli-2 Microwatershed

Fig 2.5 b. Different Crops and Cropping Systems in Bhimanahalli-2 Microwatershed

*Chapter 3*

# SURVEY METHODOLOGY

The purpose of land resource inventory is to delineate similar areas (soil series and phases), which respond or expected to respond similarly for a given level of management. This was achieved in Bhimanahalli-2 microwatershed by the detailed study of all the soil characteristics (depth, texture, colour, structure, consistence, coarse fragments, porosity, soil reaction, soil horizons etc.) and site characteristics (slope of the land, erosion, drainage, occurrence of rock fragments etc.) followed by grouping of similar areas based on soil-site characteristics into homogeneous (management units) units, and showing the area extent and their geographic distribution on the microwatershed cadastral map. The detailed survey at 1:7920 scale was carried out in an area of 369 ha. The methodology followed for carrying out land resource inventory was as per the guidelines given in Soil Survey Manual (IARI, 1971; Soil Survey Staff, 2006; Natarajan *et al.,* 2015) which is briefly described below.

## 3.1 Base Maps

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

## 3.2 Image Interpretation for Physiography

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

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

## Image Interpretation Legend for Physiography

### G- Granite Gneiss Landscape

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

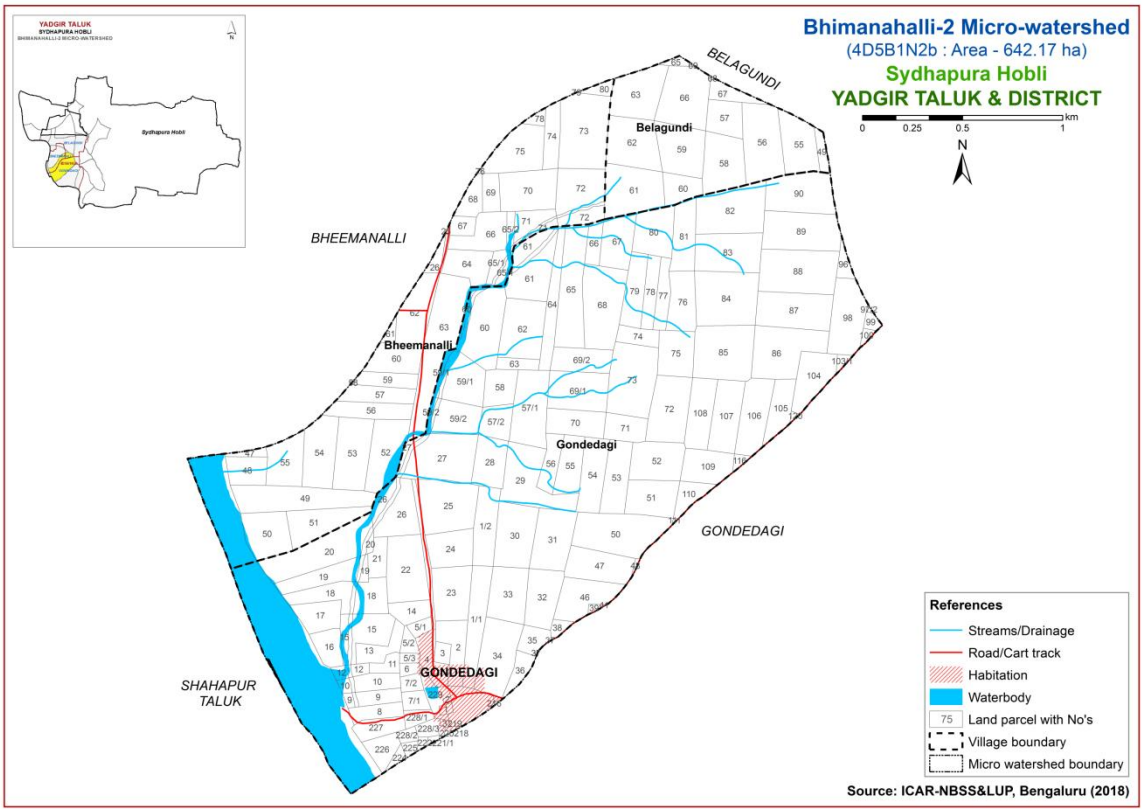



Fig 3.1 Scanned and Digitized Cadastral map of Bhimanahalli-2 Microwatershed

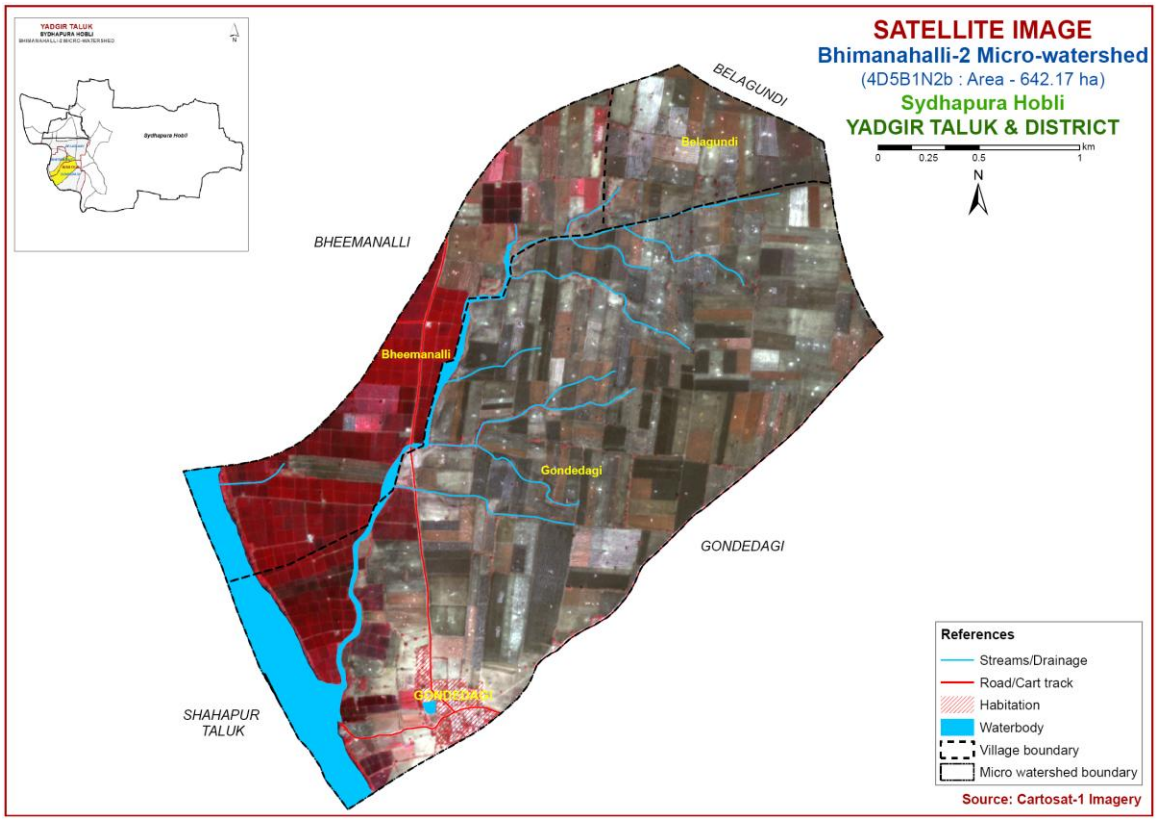



Fig.3.2 Satellite Image of Bhimanahalli-2 Microwatershed

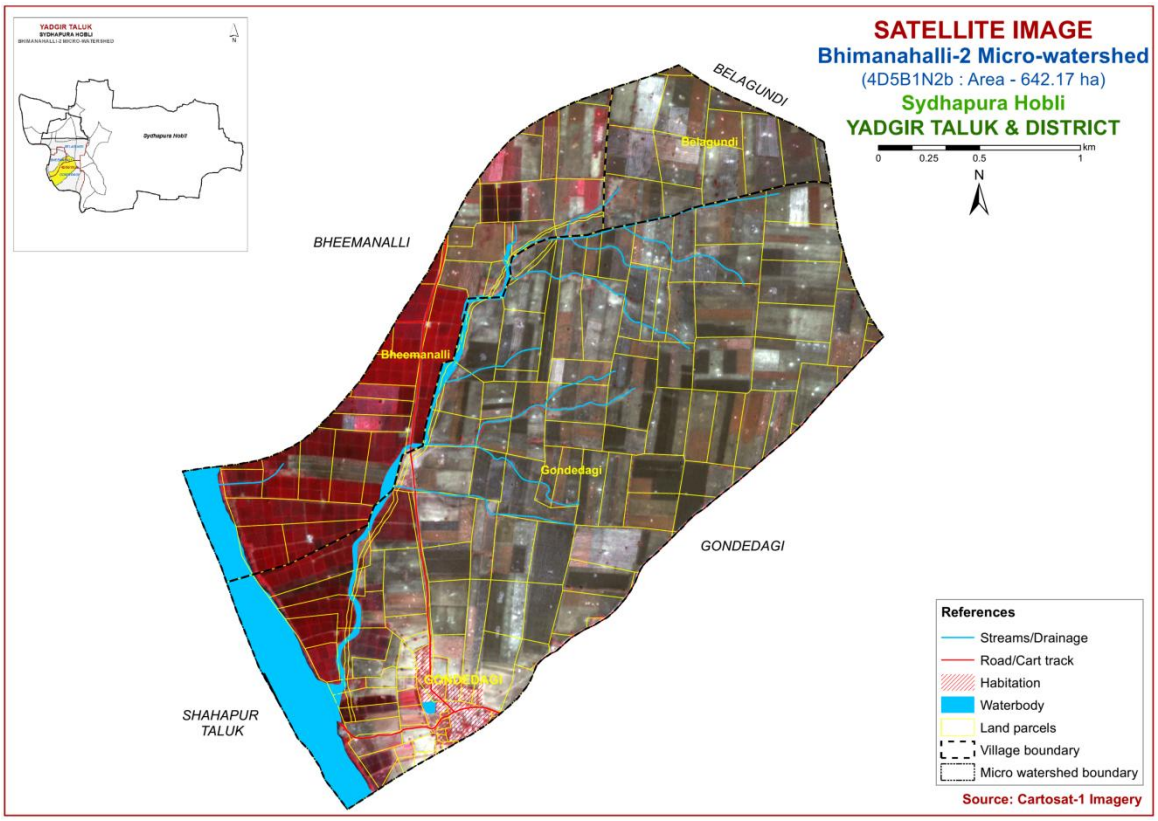



Fig.3.3 Cadastral map overlaid on IRS PAN+LISS IV merged imagery of Bhimanahalli-2 Microwatershed

### 3.3 Field Investigation

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

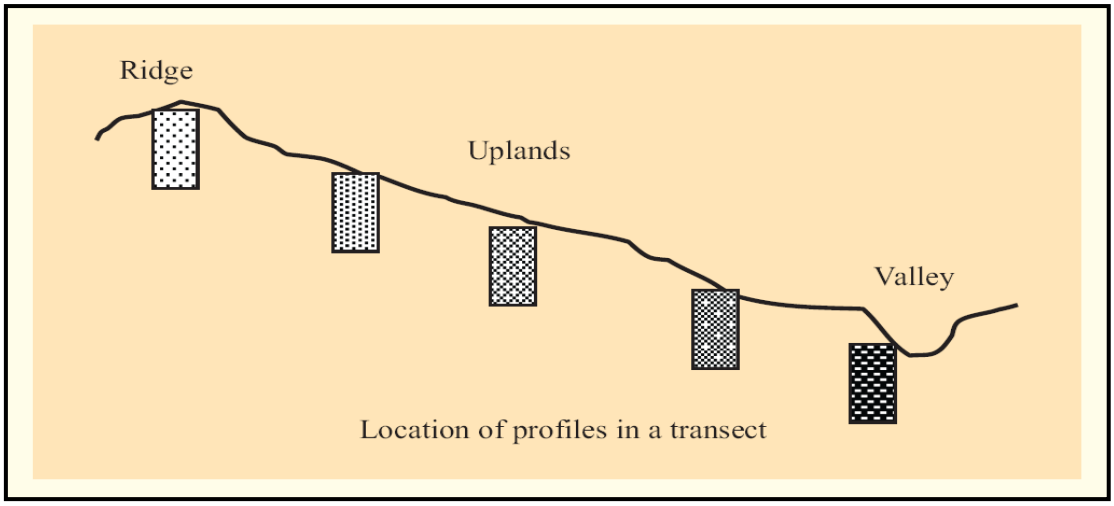



Fig: 3.4. Location of profiles in a transect

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

Based on the soil characteristics, the soils were grouped into different soil series. Soil series is the most homogeneous unit having similar horizons and properties and behaves similarly for a given level of management. Soil depth, texture, colour, kind of horizon and horizon sequence, calcareousness, amount and nature of gravel present, nature of substratum etc, were used as the major differentiating characteristics for identifying soil series occurring in the area. The differentiating characteristics used for identifying the soil series are given in Table 3.1. Based on the above characteristics, 3 soil series were identified in the Bhimanahalli-2 microwatershed.

**Table 3.1 Differentiating Characteristics used for identifying Soil Series**

(Characteristics are of Series Control Section)

| **Soils of Granite gneiss Landscape** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Sl. no** | **Soil Series** | **Depth (cm)** | **Colour (moist)** | **Texture** | **Gravel (%)** | **Horizon sequence** | **Calcareous-ness** |
| **Soil of Granite Gneiss Landscape** | | | | | | | |
| 1 | HLG (Halagera) | 50-75 | 10YR 3/2,4/4 7.5YR 4/3,4/2 | scl | | Ap-Bw | es |
| 2 | BMN (Bhimanahalli) | >150 | 10YR 3/1 | c | - | Ap-Bss | es |
| 3 | TMK (Thumakur) | >150 | 10YR 3/1,3/2,3/3,4/3 | c | - | Ap-Bw | e |

### 3.4 Soil Mapping

The area under each soil series was further separated into soil phases and their boundaries delineated on the cadastral map based on the variations observed in the texture of the surface soil, slope, erosion, presence of gravel, stoniness etc. A soil phase is a subdivision of soil series based mostly on surface features that affect its use and management. The soil mapping units are shown on the map (Fig.3.5) in the form of symbols. During the survey many soil profile pits, few minipits and a few auger bores representing different landforms occurring in the microwatershed were studied. In addition to the profile study, spot observations in the form of minipits, road cuts, terrace cuts etc., were studied to validate the soil boundaries on the soil map. The soil map shows the geographic distribution of 4 mapping units representing 3 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 4 soil phases mapped in the microwatershed. Each mapping unit (soil phase) delineated on the map has similar soil and site characteristics. In other words, all the farms or survey numbers included in one soil phase will have similar management needs and have to be treated accordingly.

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

The 4 soil phases identified and mapped in the microwatershed were grouped into 3 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 Bhimanahalli-2 microwatershed, five soil and site characteristics, namely soil depth, soil texture, slope, erosion and gravel content have been considered for defining LMUs. The Land Management Units are expected to behave similarly for a given level of management.

### 3.6 Laboratory Characterization

Soil samples for each soil series were collected from representative master profiles for laboratory characterization by following the methods outlined in the Laboratory Manual (Sarma *et al*, 1987). Surface soil samples collected from farmer's fields (62 samples) for fertility status (major and micronutrients) at 320 m grid interval in the year 2017 were analyzed in the laboratory (Katyal and Rattan, 2003). By linking the soil fertility data to the survey numbers through GIS, soil fertility maps were generated by using Kriging method for the microwatershed.

**Table 3.2 Soil map unit description of Bhimanahalli-2 Microwatershed**

| Soil Map unit No. | Soil Series | Soil Phase | Mapping Unit Description | Area in ha (%) |
|---|---|---|---|---|
| **Soils of Granite Gneiss Landscape** | | | | |
| | HLG | Halagera soils are moderately shallow (50-75 cm), 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 | | **31 (4.78)** |
| 17 | | HLGiB2 | Sandy clay surface, slope 1-3%, moderate erosion | 31 (4.78) |
| | BMN | Bhimanahalli soils are very deep (>150 cm), moderately well drained, have very dark gray, calcareous cracking clay black soils occurring on very gently sloping uplands under cultivation | | **451 (70.21)** |
| 62 | | BMNmB2 | Clay surface, slope 1-3%, moderate erosion | 414 (64.39) |
| 63 | | BMNmB2g1 | Clay surface, slope 1-3%, moderate erosion, gravelly (15-35%) | 37 (5.82) |
| | TMK | Thumakur soils are very deep (>150 cm), moderately well drained, have brown to very dark grayish brown, sodic, slightly calcareous clay black soils occurring on nearly level to very gently sloping lowlands under cultivation | | **110 (17.17)** |
| 104 | | TMKiB2 | Sandy clay surface, slope 1-3%, moderate erosion | 110 (17.17) |
| 1000 | | Others | Habitation and water body | 50 (7.84) |

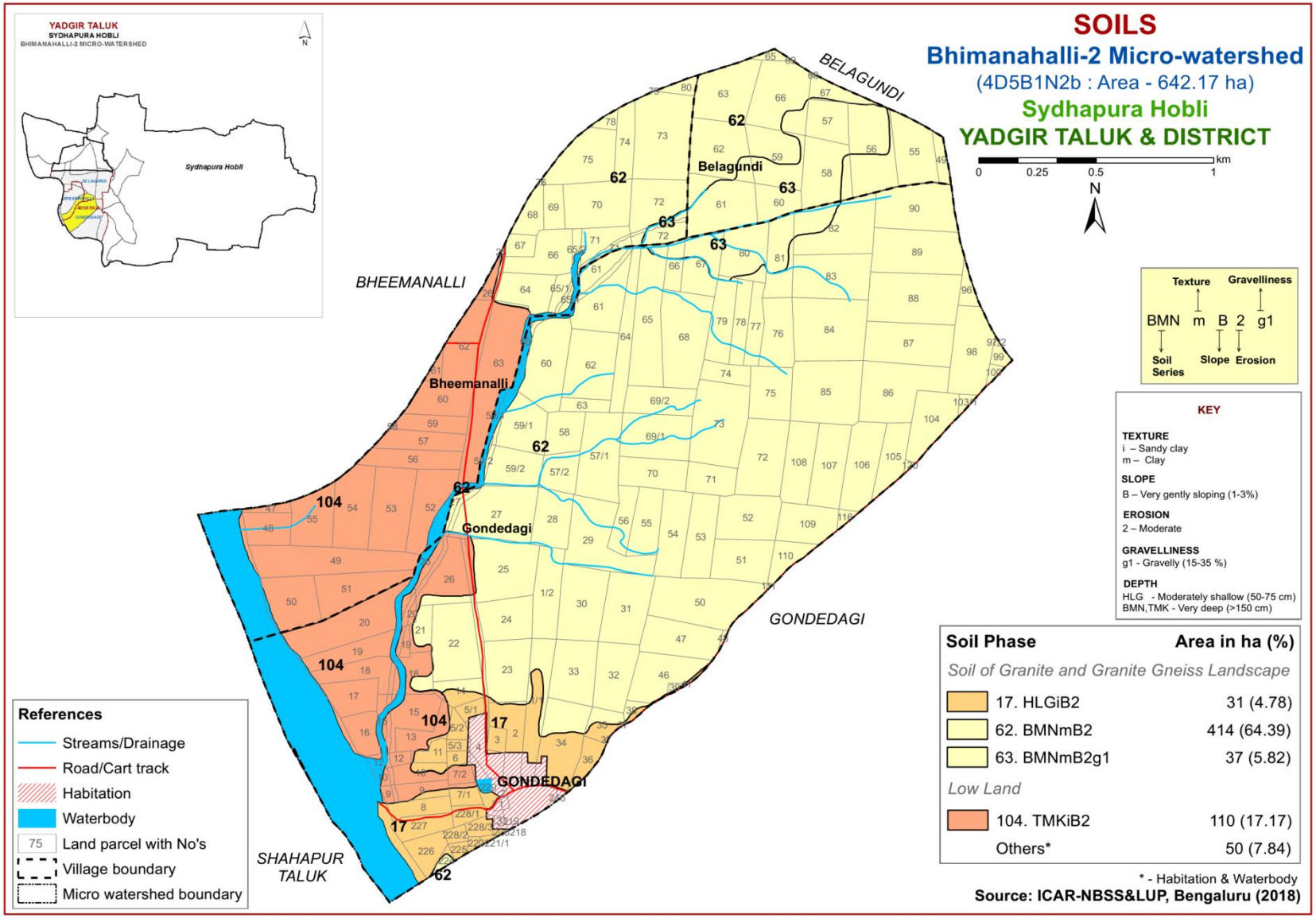



Fig 3.5 Soil Phase or Management Units - Bhimanahalli-2 Microwatershed

*Chapter 4*

# THE SOILS

Detailed information pertaining to the nature, extent and their distribution of different kinds of soils occurring in Bhimanahalli-2 microwatershed is provided in this chapter. The microwatershed area has been identified as granite gneiss landscape based on geology. In all, 3 soil series are identified. Soil formation is the result of the combined effect of environmental and terrain factors that are reflected in soil morphology. In the granite gneiss landscape, it is by parent material, relief and climate.

A brief description of each of the 3 soil series identified followed by 4 soil phases (management units) mapped are furnished below. The physical and chemical characteristics of soil series identified in Bhimanahalli-2 microwatershed are given in Table 4.1 along with soil classification. The soils in any one map unit differ from place to place in their depth, texture, slope, gravelliness, erosion or any other site characteristic that affect management. The soil phase map can be used for identifying the suitability of areas for growing specific crops or for other alternative uses and also for deciding the type of conservation structures needed. The detailed information on soil and site-characteristics like soil depth, surface soil texture, slope, erosion, gravelliness, AWC, LCC etc, with respect to each of the soil phase identified is given village/survey number wise for the microwatershed in Appendix-I.

## 4.1 Soils of granite gneiss landscape

In this landscape, 3 soil series are identified and mapped. Of these, BMN series occupies a maximum area of 451 ha (70%) followed by TMK 110 ha (17) and HLG 31 ha (5%). Brief description of each series identified and number of soil phases mapped is given below.

**4.1.1 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 4 and 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 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

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

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


Landscape and Soil Profile characteristics of Bhimanahalli (BMN) Series

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

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

Landscape and Soil Profile characteristics of Thumakur (TMK) Series

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

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

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

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

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

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

*Contd...*

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

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

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

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

| Depth (cm) | pH (1:2.5) | | | E.C. (1:2.5) | O.C. | $CaCO_3$ | Exchangeable bases | | | | | CEC | CEC/ Clay | Base saturation | ESP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Ca | Mg | K | Na | Total | | | | |
| | Water | $CaCl_2$ | M KCl | dS $m^{-1}$ | % | % | cmol $kg^{-1}$ | | | | | | | % | % |
| 0-12 | 9.60 | - | - | 0.35 | 0.48 | 1.44 | - | - | 0.23 | 3.62 | - | 21.83 | 1.02 | 100 | 16.57 |
| 12-29 | 9.72 | - | - | 1.27 | 0.50 | 1.44 | - | - | 0.59 | 20.88 | - | 30.50 | 0.86 | 100 | 68.48 |
| 29-74 | 9.16 | - | - | 3.44 | 0.31 | 3.72 | - | - | 0.38 | 25.84 | - | 28.68 | 0.81 | 100 | 90.10 |
| 74-132 | 9.33 | - | - | 2.52 | 0.23 | 4.92 | - | - | 0.82 | 20.25 | - | 34.99 | 0.85 | 100 | 57.87 |
| 132-158 | 9.23 | - | - | 2.07 | 0.31 | 3.48 | - | - | 0.70 | 21.03 | - | 34.24 | 0.79 | 100 | 61.41 |

*Chapter 5*

# INTERPRETATION FOR LAND RESOURCE MANAGEMENT

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

## 5.1 Land Capability Classification

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

*Soil Characteristics*: Depth, texture, gravelliness, calcareousness.

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

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

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

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

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

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

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

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

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

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

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

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

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

The 4 soil map units identified in Bhimanahalli-2 microwatershed are grouped under one land capability class and 2 land capability subclasses. An area of 592 ha (92%) in the microwatershed is suitable for agriculture and about 50 ha (8%) is covered by others (habitation and water body) (Fig. 5.1).

Good cultivable lands (Class II) cover entire area of the microwatershed with minor problems of soil, drainage/wetness and erosion.

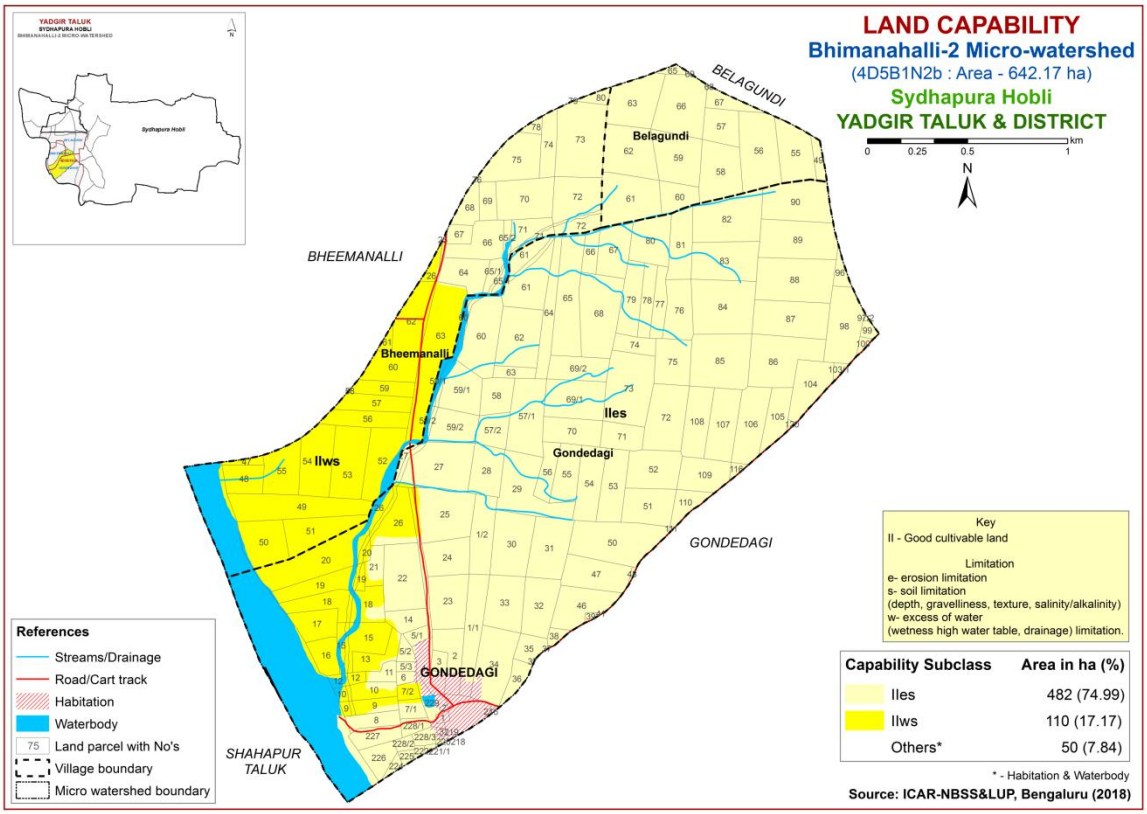



Fig. 5.1 Land Capability map of Bhimanahalli-2 Microwatershed

## 5.2 Soil Depth

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

Moderately shallow (50-75 cm) soils occupy an area of 31 ha (5%) and is distributed in the southern part of the microwatershed in these areas only shallow rooted and short duration crops can be grown. Very deep (>150 cm) soils cover a maximum area of 561 ha (87%) and are distributed in the major part of the microwatershed. These are the most productive lands with respect to soil rooting depth where all climatically adapted annual and perennial crops can be grown.

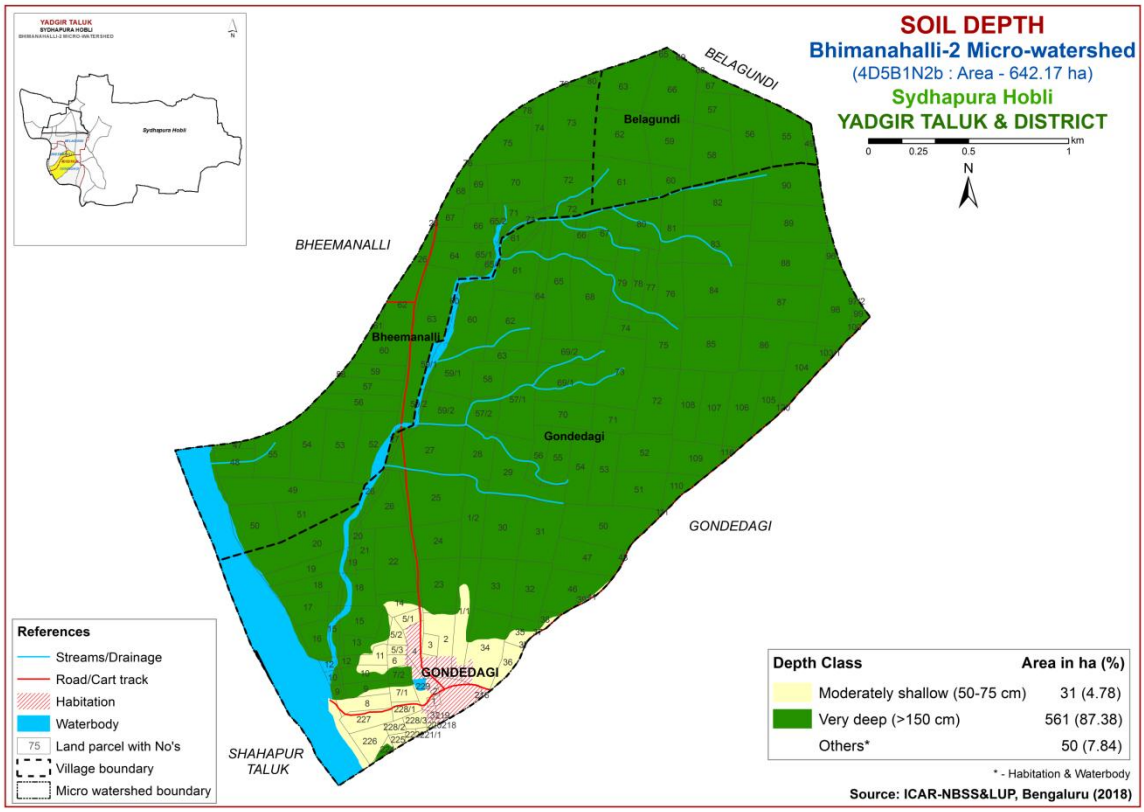



Fig. 5.2 Soil Depth map of Bhimanahalli-2 Microwatershed

### 5.3 Surface Soil Texture

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

Entire area of 592 ha (92%) of the microwatershed has soils that are clayey at the surface. These soils have high potential for soil-water retention and availability, and nutrient retention and availability, but have more problems of drainage, infiltration, workability and other physical problems.

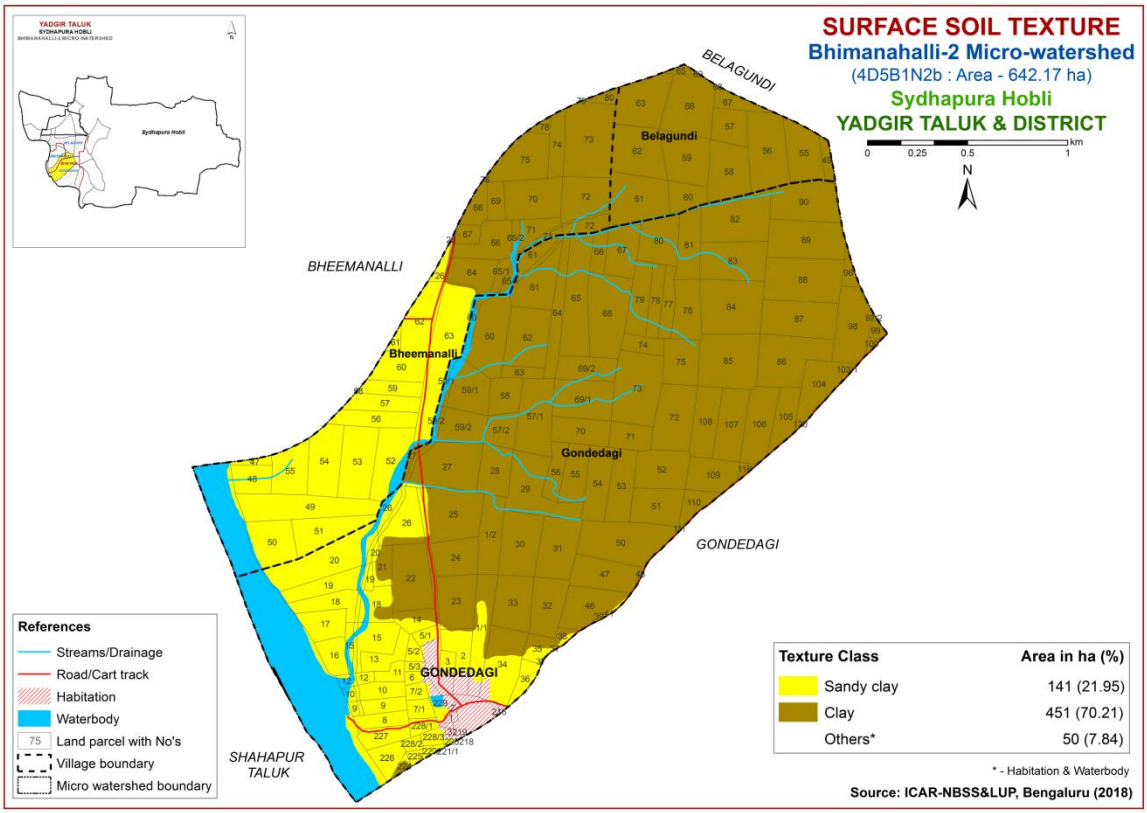



Fig. 5.3 Surface Soil Texture map of Bhimanahalli-2 Microwatershed

## 5.4 Soil Gravelliness

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

Non gravelly (<15%) soils cover maximum area of 554 ha (86%) of the microwatershed and is distributed in the major part of the microwatershed. These are the most productive soils, where all climatically adapted short and long duration crops can be grown. Gravelly (15-35%) soils cover an area of 37 ha (6%) and are distributed in the central and northern part of the microwatershed.

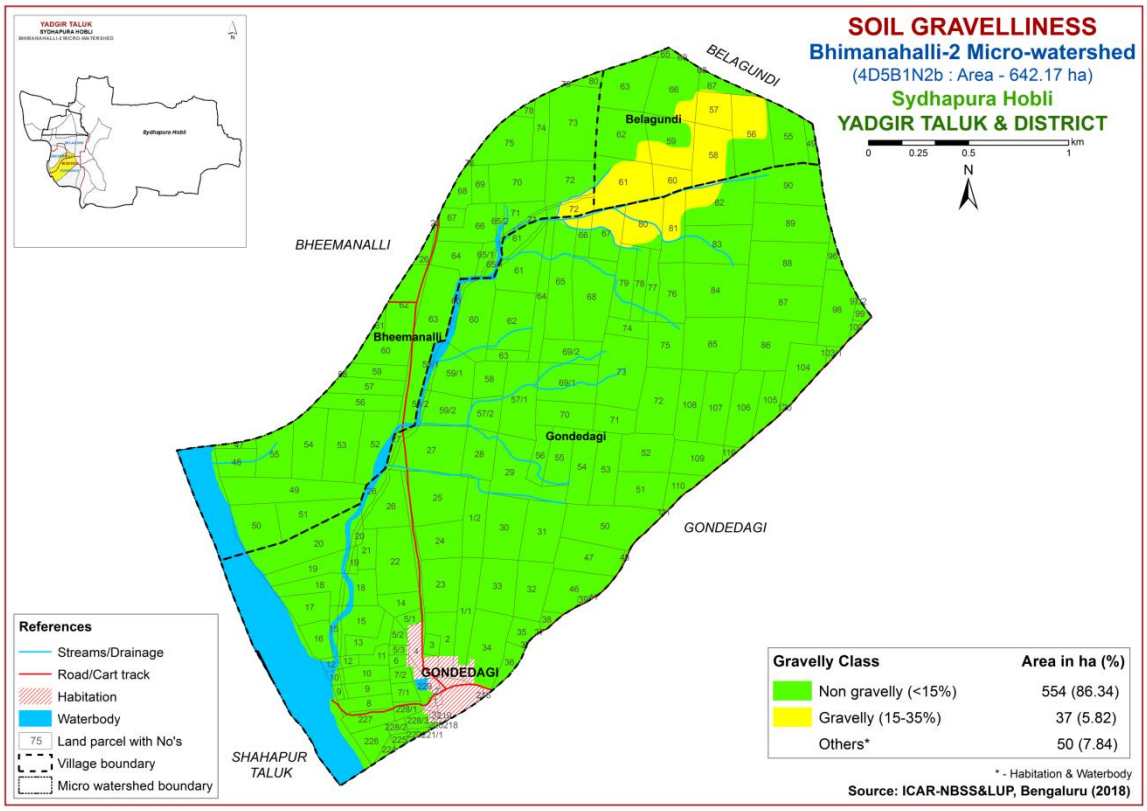



Fig. 5.4 Soil Gravelliness map of Bhimanahalli-2 Microwatershed

## 5.5 Available Water Capacity

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

An area of 31 ha (5%) in the microwatershed is low (51-100 mm/m) in available water capacity; in these areas only short duration crops can be grown. About 561 ha (87%) is very high (>200 mm/m). These areas are highly potential with regard to AWC where all climatically adapted annual and perennial crops can be grown.

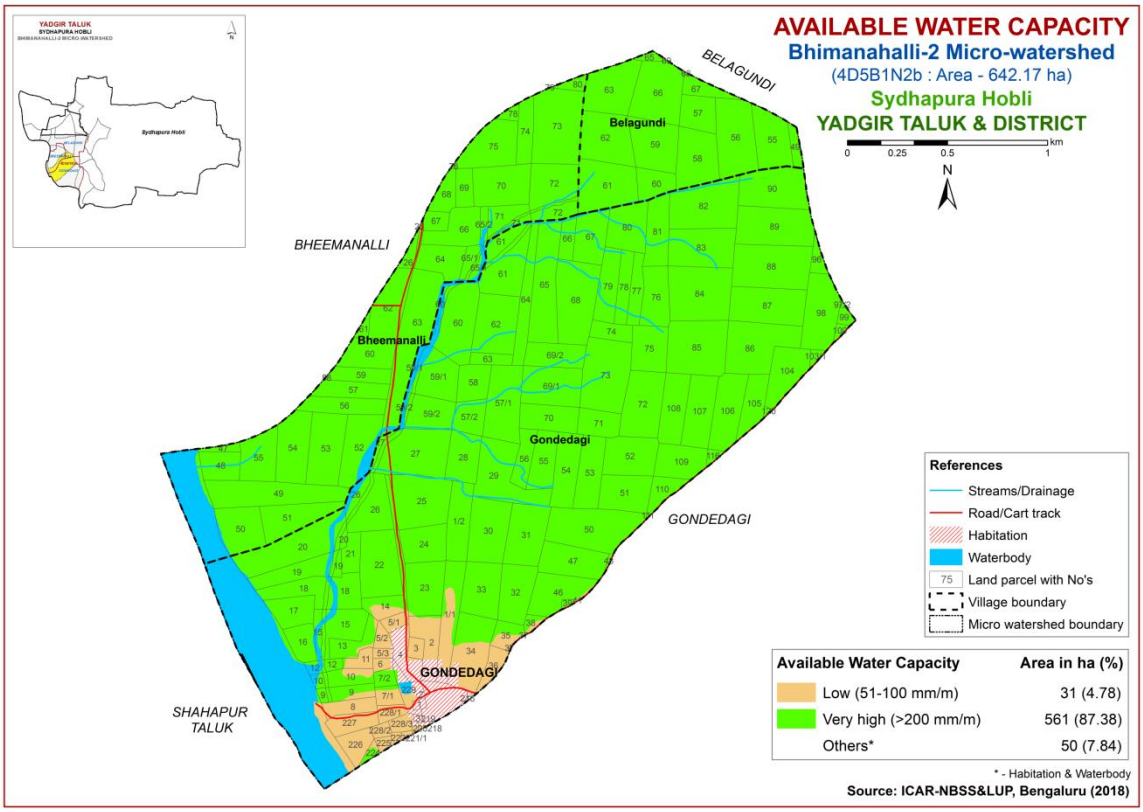



Fig. 5.5 Soil Available Water Capacity map of Bhimanahalli-2 Microwatershed

## 5.6 Soil Slope

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

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

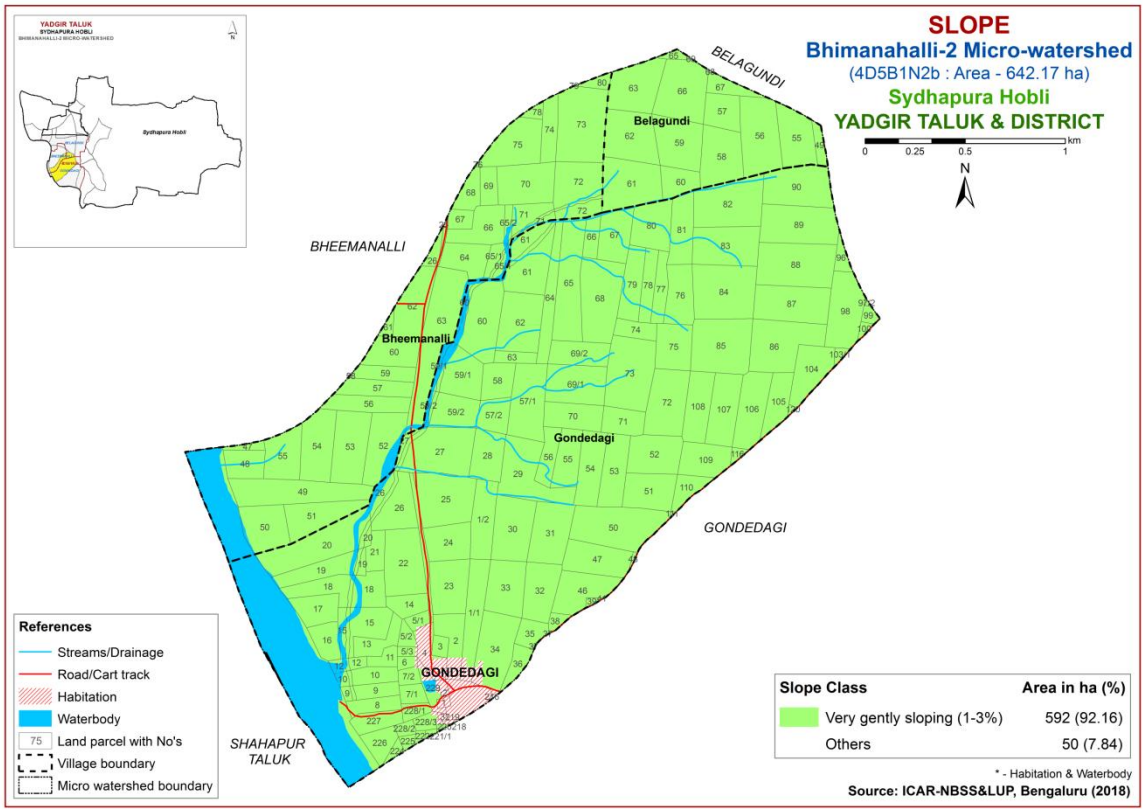



Fig. 5.6 Soil Slope map of Bhimanahalli-2 Microwatershed

## 5.7 Soil Erosion

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

Soils that are moderately eroded (e2 class) cover an entire area of 592 ha (92%). Thus, the entire area in the microwatershed is problematic because of moderate erosion. For these areas, taking up of soil and water conservation and other land development measures is necessary for crop production.

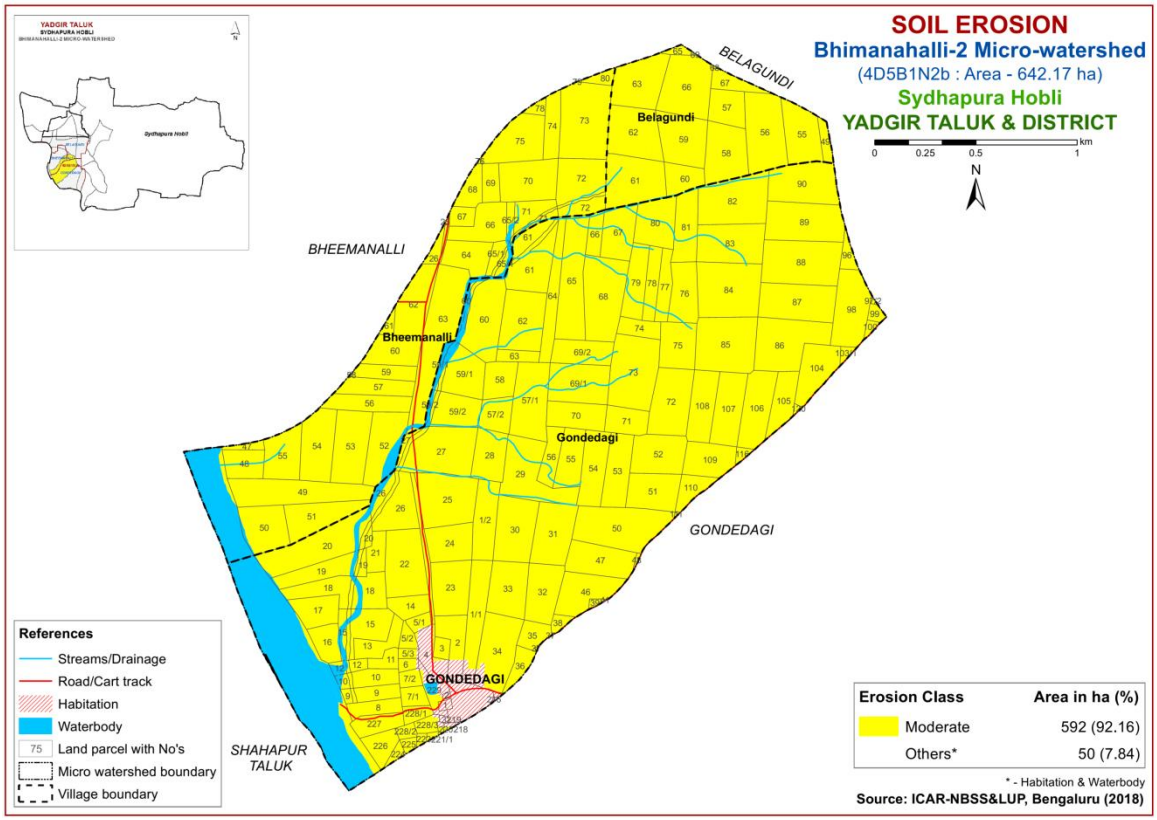



Fig. 5.7 Soil Erosion map of Bhimanahalli-2 Microwatershed

*Chapter 6*

# FERTILITY STATUS

Soil fertility plays an important role in increasing crop yield. The adoption of high yielding varieties that require high amounts of nutrients has resulted in deficiency symptoms in crops and plants due to imbalanced fertilization and poor inherent fertility status as these areas are characterised by low rainfall and high temperatures. Hence, it is necessary to know the fertility (macro and micro nutrients) status of the soils of the watersheds for assessing the kind and amount of fertilizers required for each of the crop intended to be grown. For this purpose, the surface soil samples collected from the grid points (one soil sample at every 320 m interval) all over the microwatershed through land resource inventory in the year 2017 were analysed for pH, EC, organic carbon, available phosphorus and potassium, and for micronutrients like zinc, boron, copper, iron and manganese, and secondary nutrient sulphur.

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

## 6.1 Soil Reaction (pH)

The soil analysis of the Bhimanahalli-2 microwatershed for soil reaction (pH) showed that an area of 32 ha (5%) is neutral (pH 6.5-7.3) and is distributed in the southern part of the microwatershed. An area of 44 ha (7%) is slightly alkaline (pH 7.3-7.8) and are distributed in the central and southern part of the microwatershed. Maximum area of about 492 ha (77%) is moderately alkaline (pH 7.8-8.4) and are distributed in the major part of the microwatershed. An area of 24 ha (4%) is strongly alkaline (pH 8.4-9.0) and are distributed in the northwestern and eastern part of the microwatershed (Fig. 6.1). Thus, major area of the soils in the microwatershed are alkaline in soil reaction.

## 6.2 Electrical Conductivity (EC)

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

## 6.3 Organic Carbon

The soil organic carbon content (an index of available Nitrogen) in the soils of the microwatershed is high (>0.75) in an area of about 271 ha (42%) and are distributed in the major part of the microwatershed, medium (0.5-0.75%) in an area of about 206 ha (32%) and are distributed in all parts of the microwatershed and low in an area 115 ha (18%) and is distributed in the northeastern, central and eastern part of the microwatershed (Fig. 6.3).

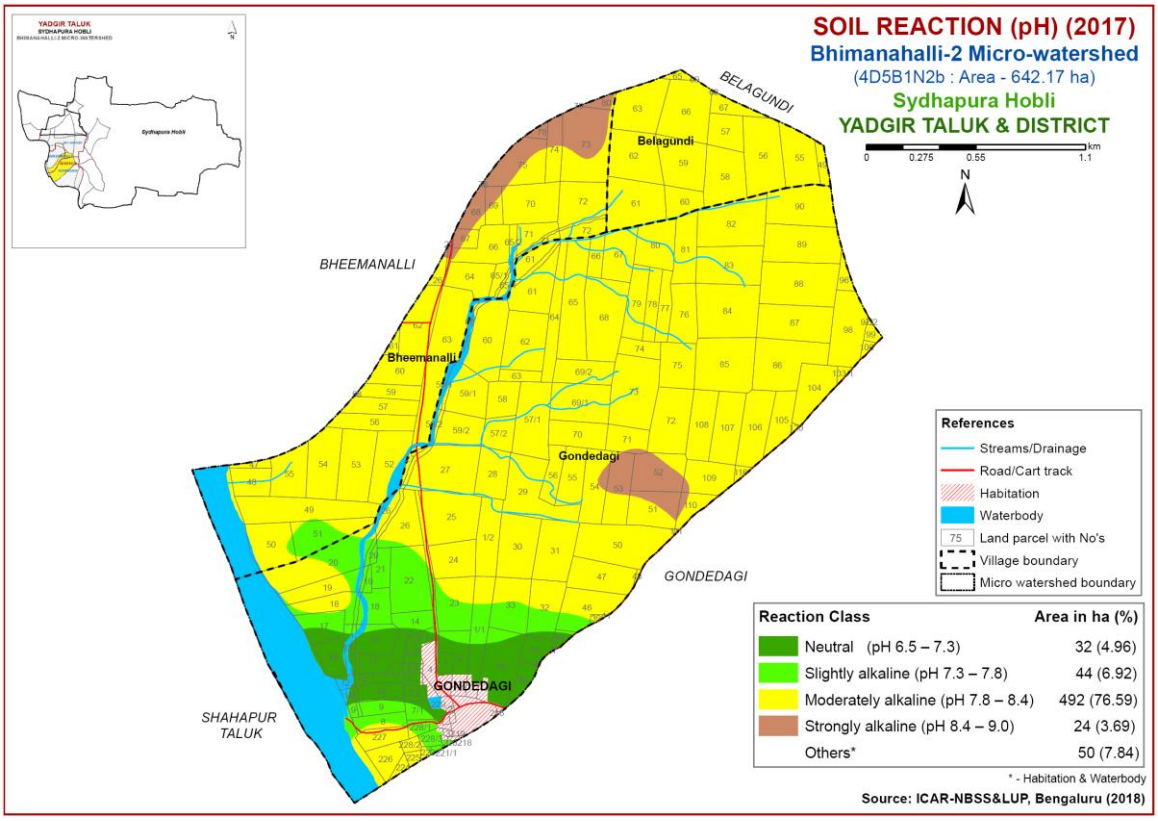



Fig.6.1 Soil Reaction (pH) map of Bhimanahalli-2 Microwatershed

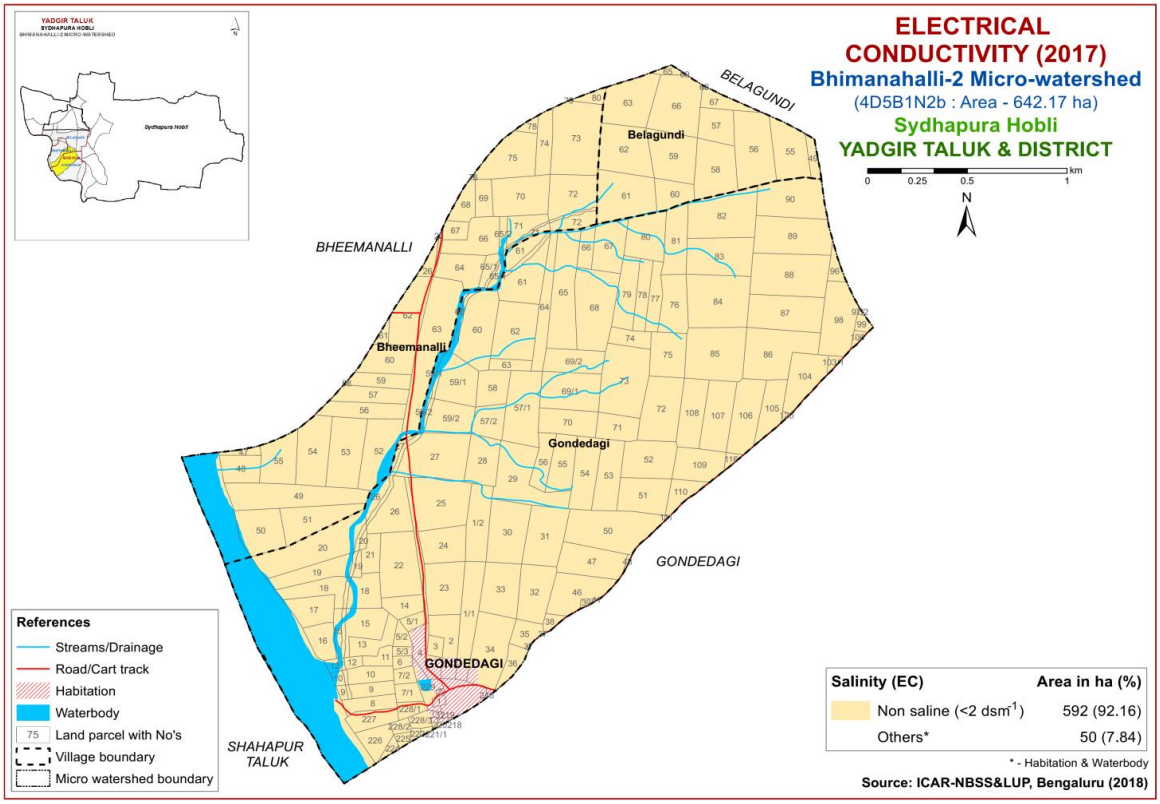



Fig.6.2 Electrical Conductivity (EC) map of Bhimanahalli-2 Microwatershed

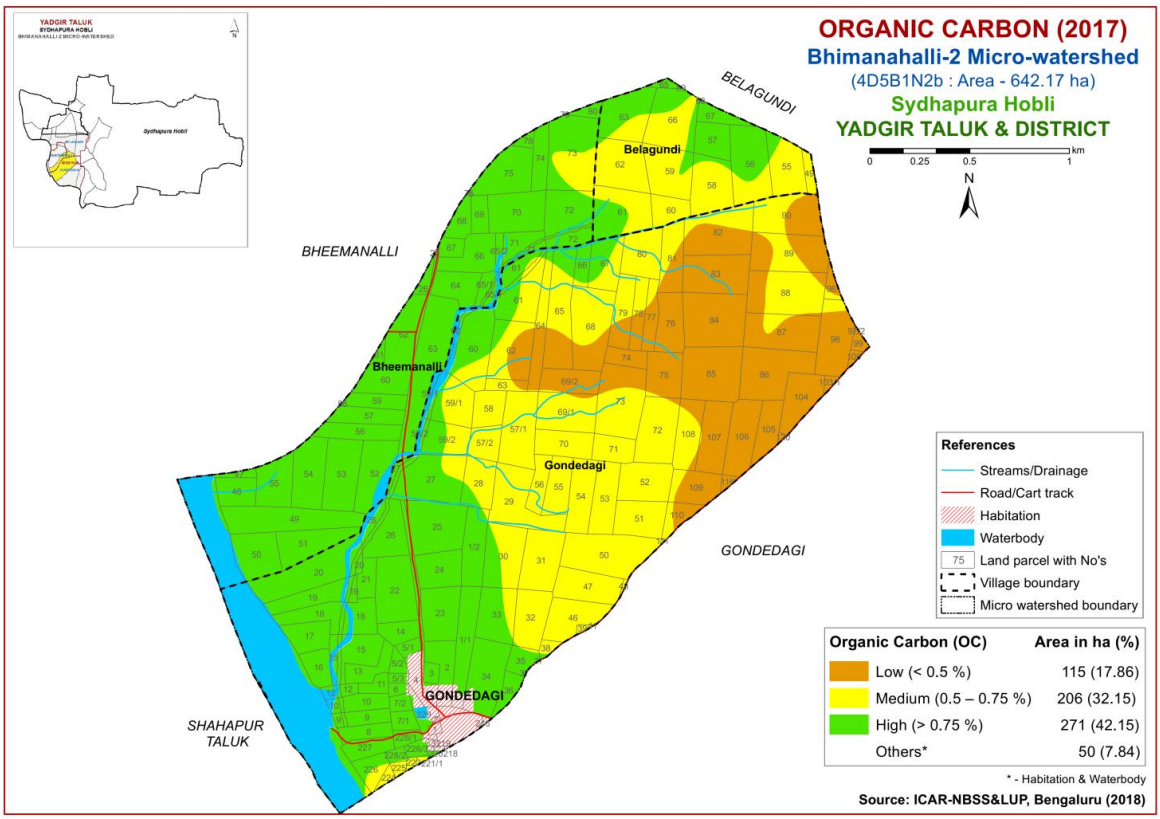



Fig.6.3 Soil Organic Carbon map of Bhimanahalli-2 Microwatershed

### 6.4 Available Phosphorus

Available phosphorus content is low (<23 kg/ha) in an area of 205 ha (32%) and are distributed in the northeastern, eastern, and central part of the microwatershed. Medium (23-57 kg/ha) in a maximum area of about 252 ha (39%) and occur in the major part of the microwatershed and high (>57 kg/ha) in an area of about 134 ha (21%) and are distributed in the southern, southwestern and central part of the microwatershed (Fig. 6.4).

### 6.5 Available Potassium

Available potassium content is medium (145-337 kg/ha) in very small area of about 1 ha (<1%) and are distributed in the southeastern part of the microwatershed (Fig. 6.5). High (>337 kg/ha) in a maximum area of 591 ha (92%) and is distributed in the major part of the microwatershed.

### 6.6 Available Sulphur

An area of 115 ha (18%) is low (<10 ppm) in available sulphur and is distributed in the northeastern, eastern and southeastern part of the microwatershed. An area of about 156 ha (24%) is medium (10-20 ppm) in available sulphur (Fig. 6.6) and is distributed in the northern, central and southeastern part of the microwatershed. High (>20 ppm) in a maximum area of 321 ha (50%) and is distributed in the major part of the microwatershed.

### 6.7 Available Boron

Available boron content is medium (0.5-1.0 ppm) in an area of 221 ha (34%) and are distributed in all parts of the microwatershed. Maximum area of about 325 ha (51%) is low (<0.5 ppm) in available boron and is distributed in the major part of the microwatershed. High in (>10 ppm) 46 ha (7%) and is distributed in the northwestern and western part of the microwatershed (Fig. 6.7).

### 6.8 Available Iron

Available iron content is sufficient (>4.5 ppm) in a maximum area of 455 ha (71%) and are distributed in the major part of the microwatershed and deficient in an area of 137 ha (21%) and is distributed in the northeastern, northwestern, central 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).

### 6.10 Available Copper

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

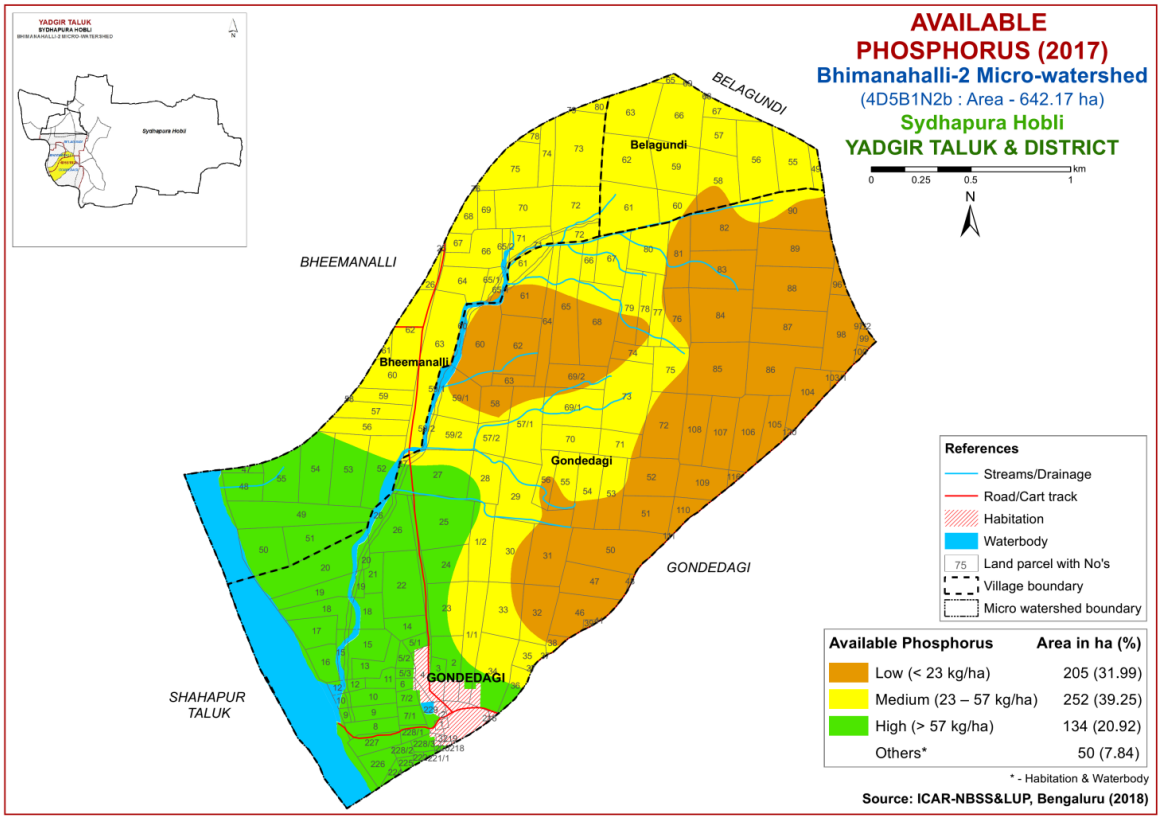



Fig.6.4 Soil Available Phosphorus map of Bhimanahalli-2 Microwatershed

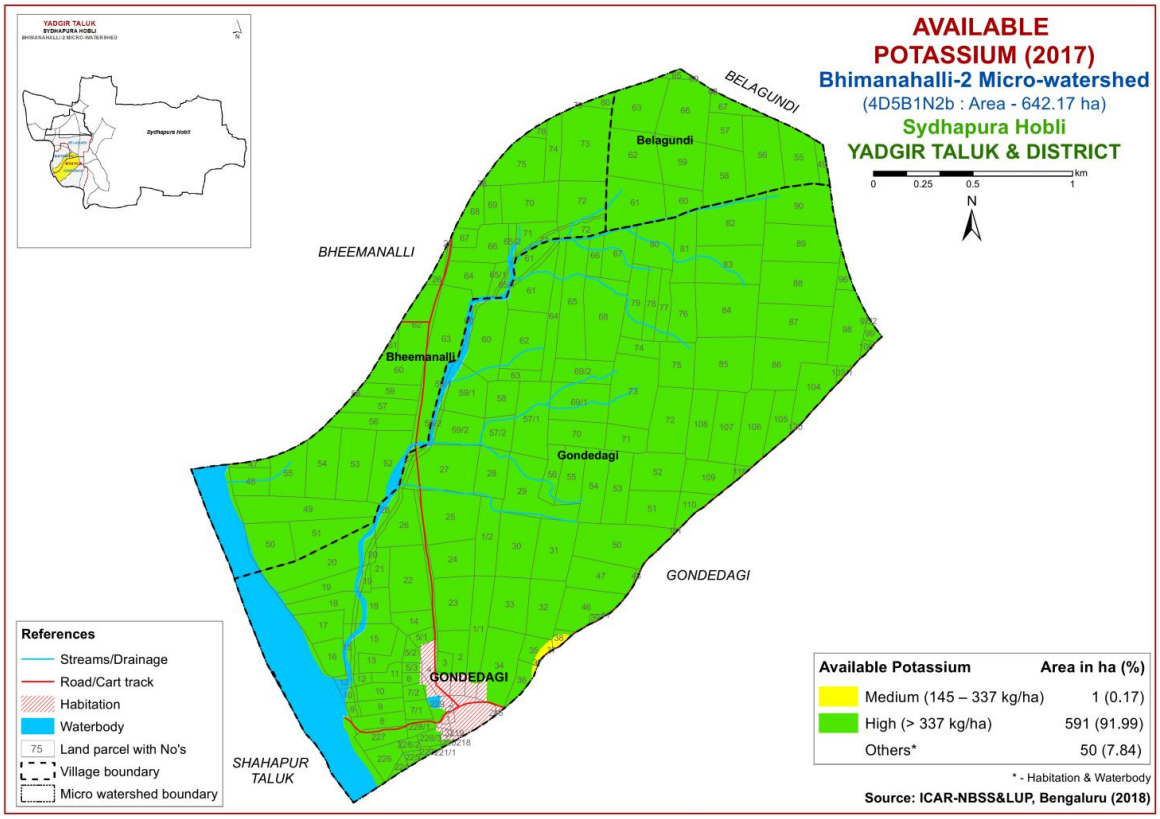



Fig.6.5 Soil Available Potassium map of Bhimanahalli-2 Microwatershed

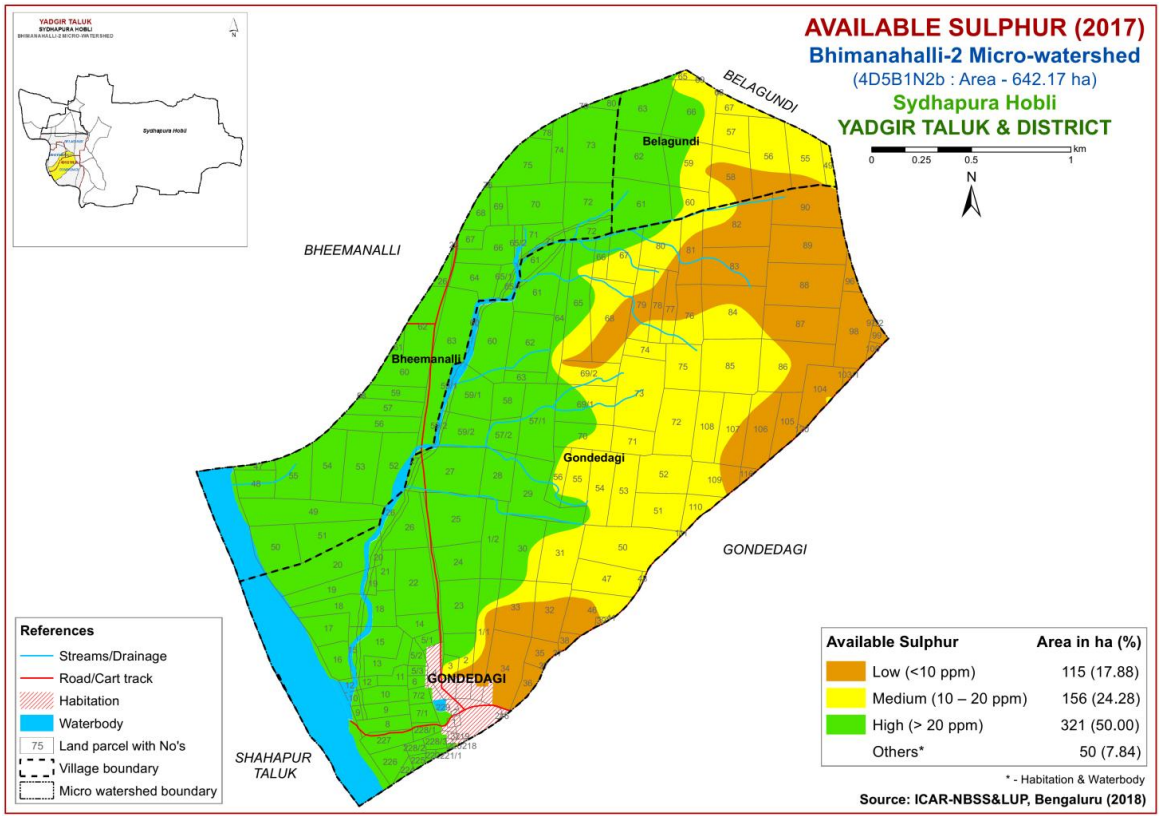



Fig.6.6 Soil Available Sulphur map of Bhimanahalli-2 Microwatershed

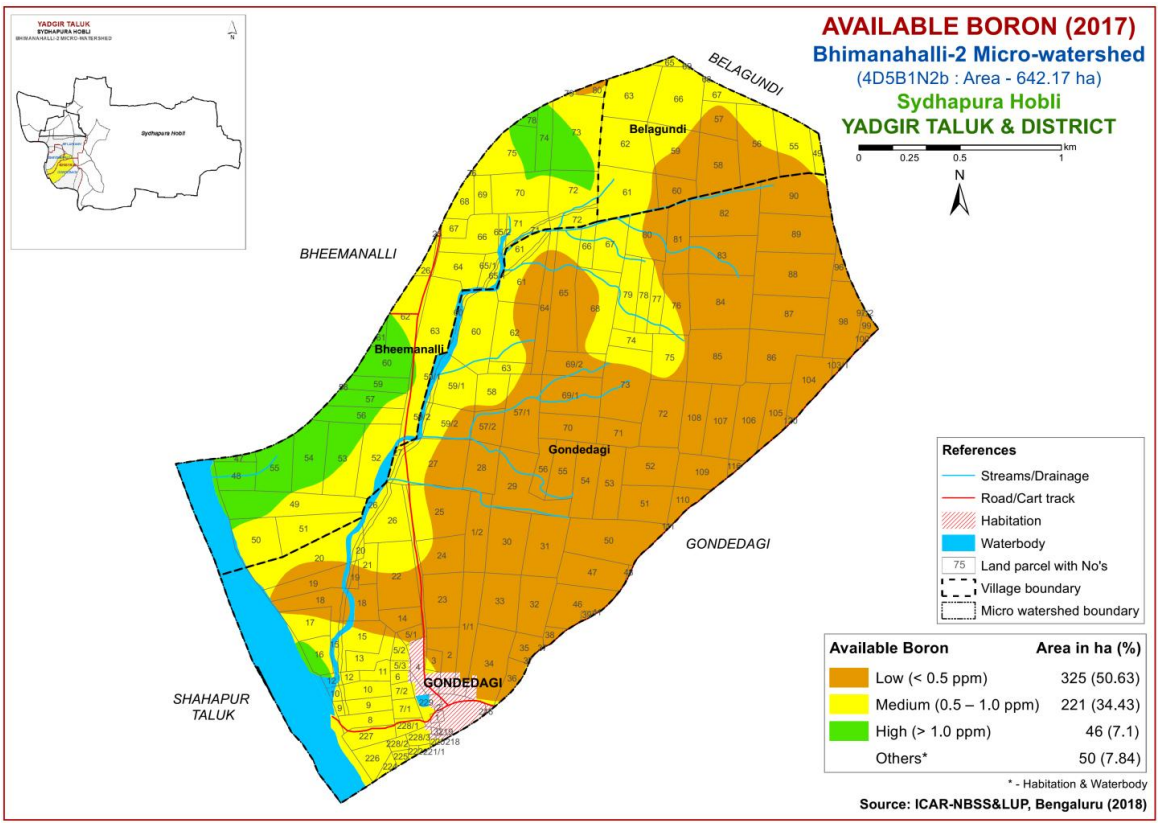



Fig.6.7 Soil Available Boron map of Bhimanahalli-2 Microwatershed

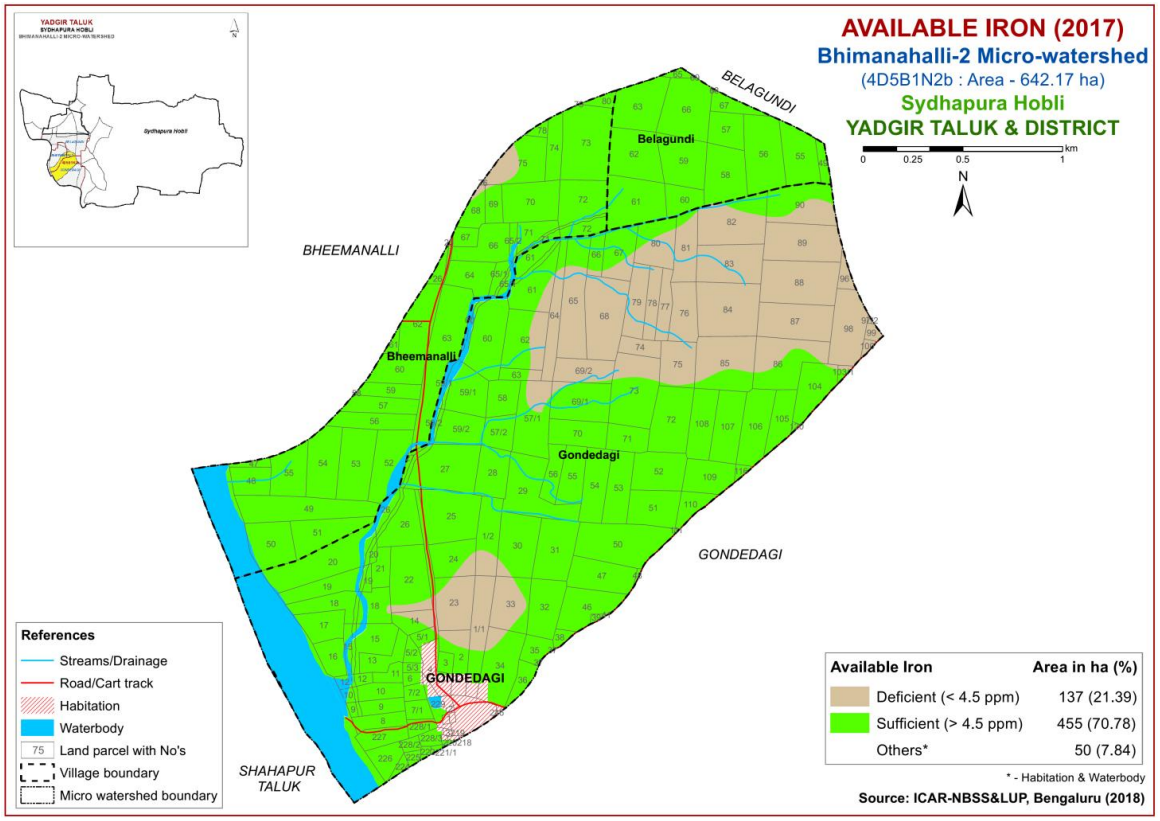



Fig.6.8 Soil Available Iron map of Bhimanahalli-2 Microwatershed

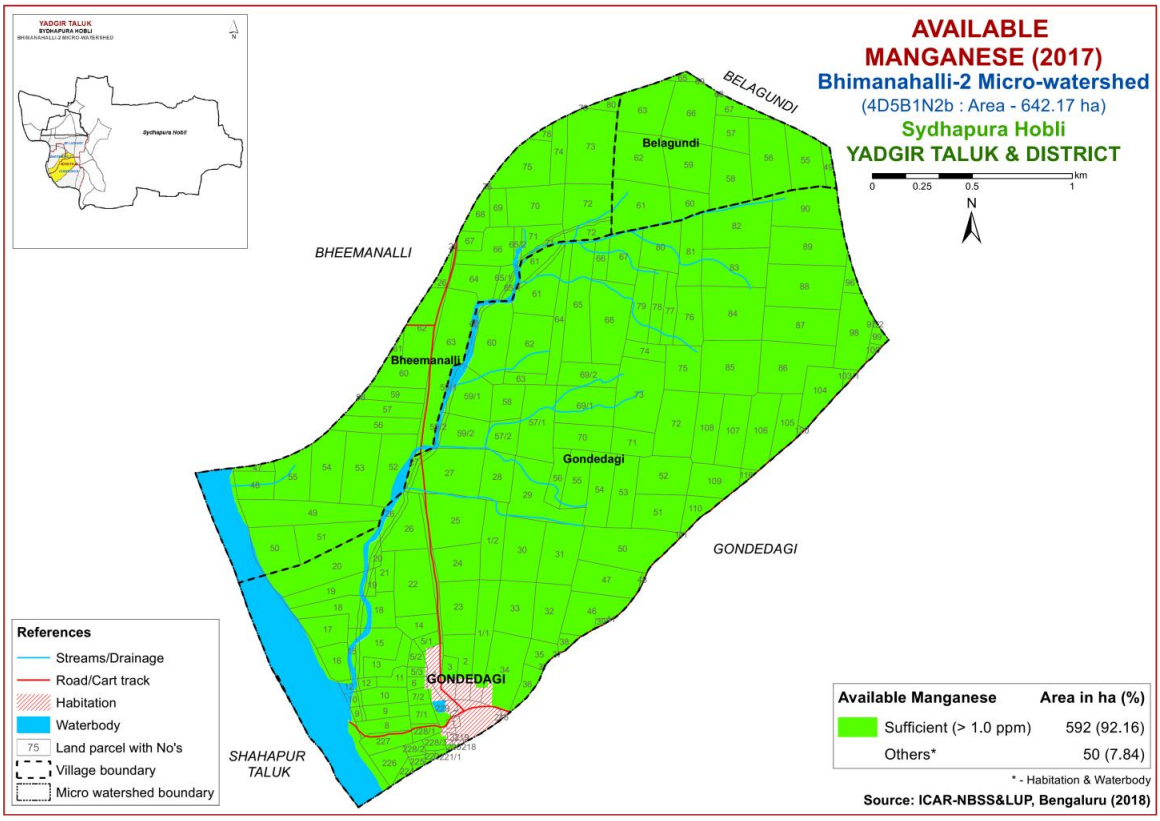



Fig.6.9 Soil Available Manganese map of Bhimanahalli-2 Microwatershed

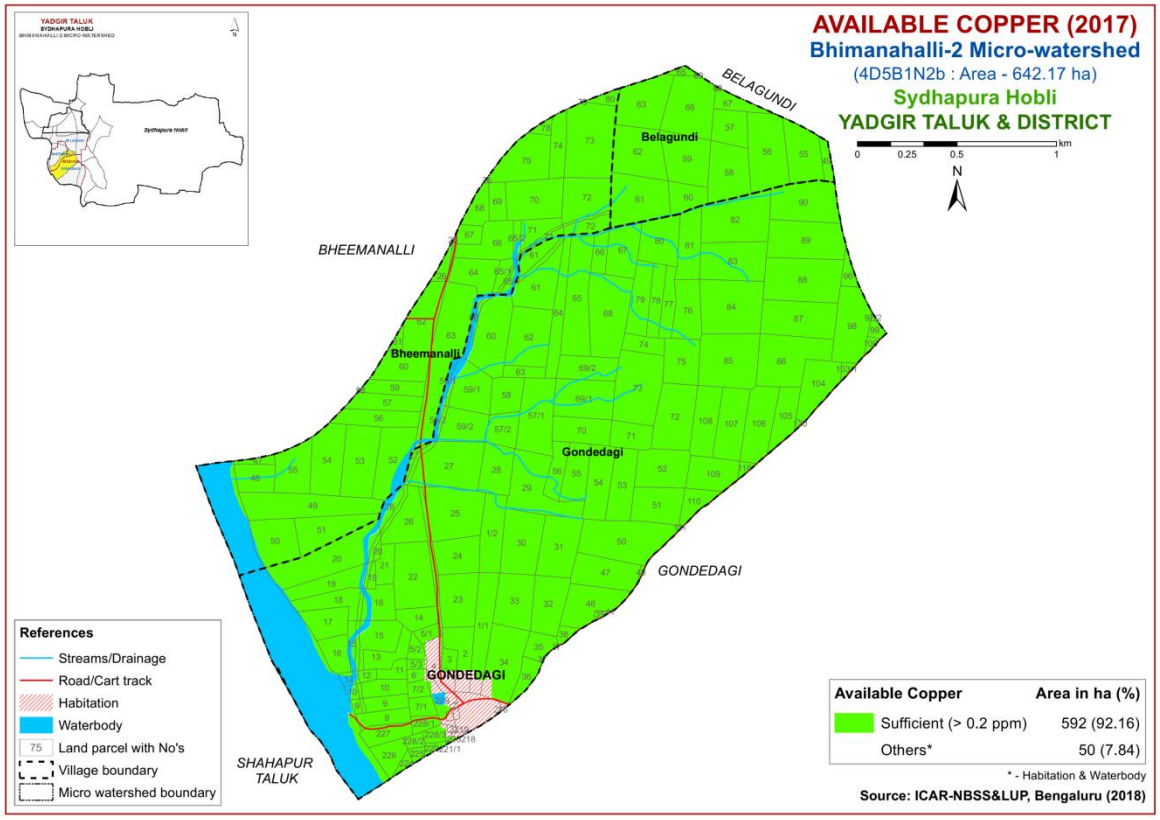



Fig.6.10 Soil Available Copper map of Bhimanahalli-2 Microwatershed

## 6.11 Available Zinc

Available zinc content is deficient (<0.6 ppm) in a maximum area of 390 ha (61%) and is distributed in the major part of the microwatershed. An area of 202 ha (31%) is sufficient (>0.6 ppm) and is distributed in the northwestern, western, central, southwestern and southern part of the microwatershed (Fig 6.11).

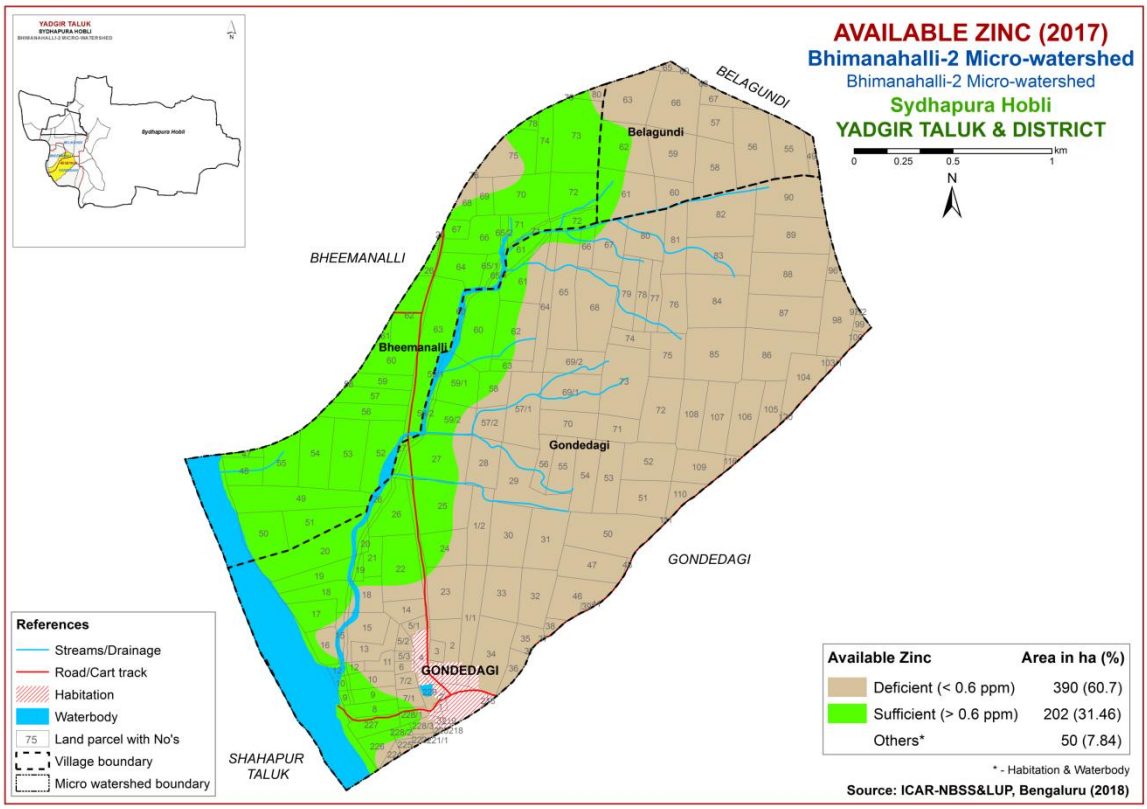



Fig.6.11 Soil Available Zinc map of Bhimanahalli-2 Microwatershed

*Chapter 7*

# LAND SUITABILITY FOR MAJOR CROPS

The soil and land resource units (soil phases) of Bhimanahalli-2 microwatershed were assessed for their suitability for growing food, fodder, fibre and other horticulture crops by following the procedure as outlined in FAO, 1976 and 1983. Crop requirements were developed for each of the crop from the available research data and also by referring to Naidu *et. al.* (2006) and Natarajan *et. al* (2015). The 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, N1 and N2 are divided into subclasses based on the kinds of limitations encountered. The limitations that affect crop production are 'c' for erratic rainfall and its distribution and length of growing period (LGP), 'e' for erosion hazard, 'r' for rooting condition, 't' for lighter or heavy texture, 'g' for gravelliness or stoniness, 'n' for nutrient availability, 'l' for topography, 'm' for moisture availability, 'w' for drainage, 's' for sodium and 'z' for calcareousness. These limitations are indicated as lower case letters to the Class symbol. For example, moderately suitable lands with the limitations of soil depth and erosion are designated as S2re. For the microwatershed, the soil mapping units were evaluated and classified up to subclass level.

Using the above criteria, the soil map units of the microwatershed were evaluated and land suitability maps for 26 major agricultural and horticultural crops were generated. The detailed information on the kind of suitability of each of the soil phase for the crops assessed are given village/ survey number wise for the microwatershed in Appendix-III.

## 7.1 Land Suitability for Sorghum (*Sorghum bicolor*)

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

Highly suitable (Class S1) lands for growing sorghum occur in a maximum area of 561 ha (87%) and is distributed in the major part of the microwatershed. Moderately suitable (Class S2) lands occur in an area of 31 ha (5%) and are distributed in the southern part of the microwatershed.

**Table 7.1 Soil-Site Characteristics of Bhimanahalli-2 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 ($dSm^{-1}$) | ESP (%) | CEC [Cmol $p^{+}$)$kg^{-1}$] | BS (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sur-face | Sub-surface | Surface (%) | Sub-surface (%) | | | | | | | | |
| HLGiB2 | 866 | 150 | WD | 50-75 | sc | scl | - | - | 51-100 | 1-3 | moderate | 8.49 | 0.18 | 0.69 | 8.80 | 100 |
| BMNmB2 | 866 | 150 | MWD | >150 | c | c | - | - | >200 | 1-3 | moderate | 8.20 | 0.28 | 0.65 | 52.70 | 100 |
| TMKiB2 | 866 | 150 | MWD | >150 | sc | c | - | - | >200 | 1-3 | moderate | 9.60 | 0.35 | 16.57 | 21.83 | 100 |

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

**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. Well 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 |

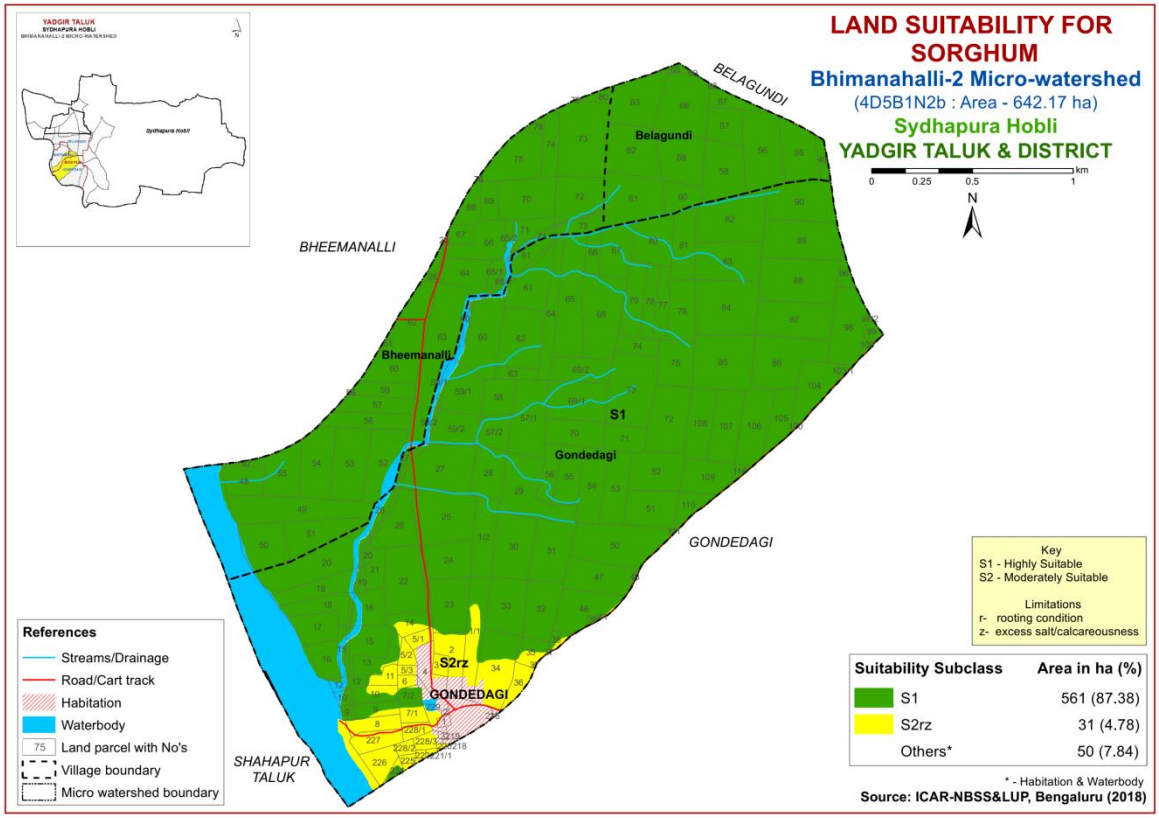



Fig. 7.1 Land Suitability map of Sorghum

## 7.2 Land Suitability for Maize (*Zea mays*)

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

There are no highly suitable (Class S1) lands available for growing maize in the microwatershed. Moderately suitable (Class S2) lands occur in the entire area of the

microwatershed with minor limitations of texture, rooting depth, calcareousness and drainage.

**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 | |

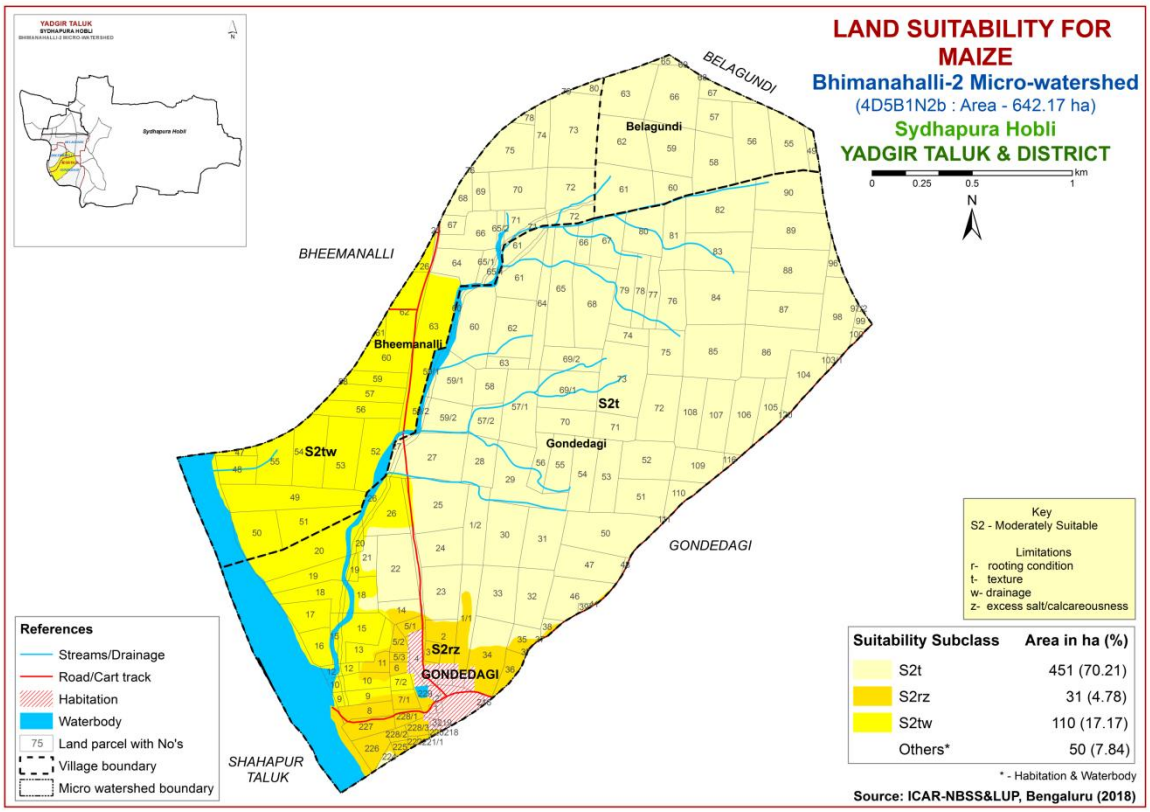



Fig. 7.2 Land Suitability map of Maize

## 7.3 Land Suitability for Bajra (*Pennisetum glaucum)*

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

There are no highly (Class S1) suitable lands available for growing bajra in the microwatershed. Entire area of about 592 ha (92%) is moderately suitable (Class S2) for growing bajra. They have minor limitations of texture, rooting depth, calcareousness and drainage.

**Table 7.4 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. Well 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 |

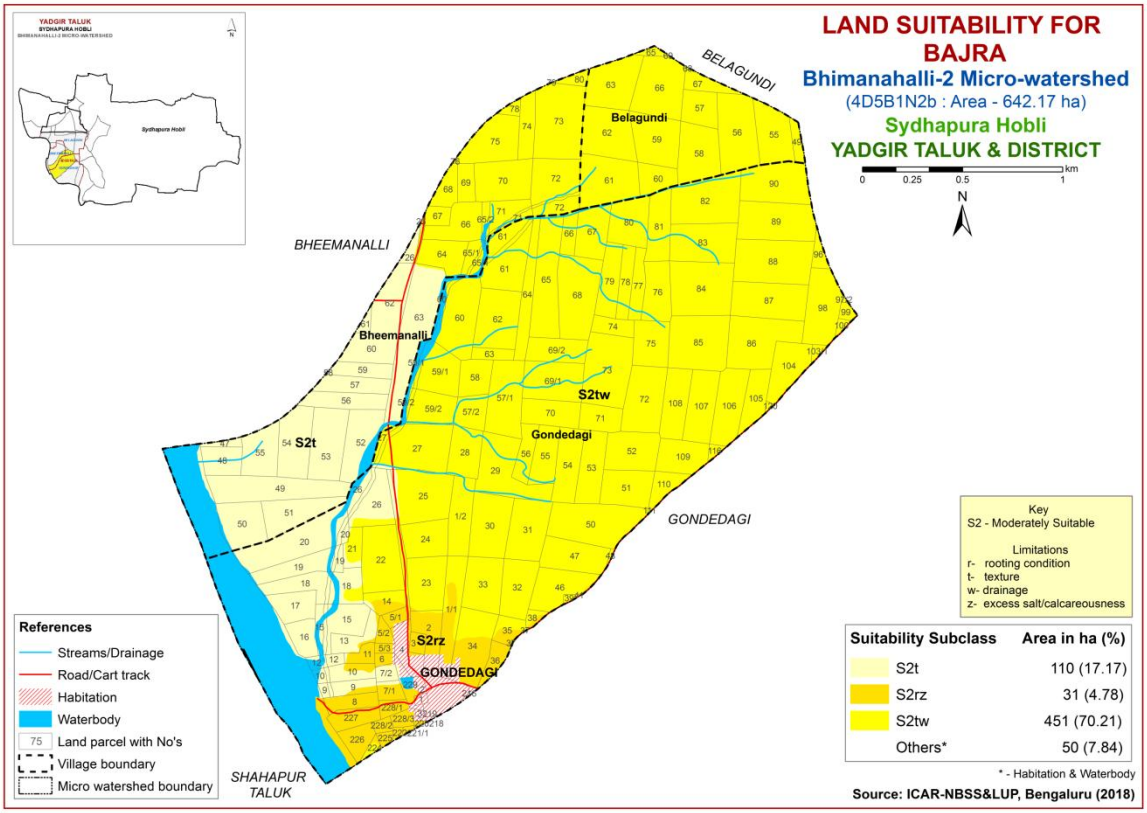



Fig. 7.3 Land Suitability map of Bajra

## 7.4 Land Suitability for Groundnut (*Arachis hypogaea*)

Groundnut is one of the major oilseed crop grown in an area of 6.54 lakh ha in Karnataka in most of the districts either as rainfed or irrigated crop. The crop

requirements for growing groundnut (Table 7.5) were matched with the soil-site characteristics (Table 7.1) of the soils of the microwatershed and a land suitability map for growing groundnut was generated. The area extent and their geographic distribution of different suitability subclasses in the microwatershed are given in Figure 7.4.

**Table 7.5 Crop 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 drained | Imperfectly drained | Poorly drained |
| Soil reaction | pH | 6.0-8.0 | 8.1-8.5,5.5-5.9 | >8.5,<5.5 | |
| Surface soil texture | Class | l, cl,sil,sc, sicl | sc, sic, c, | s,ls,sl,c(>60%) | s,fragmental |
| Soil depth | cm | >75 | 50-75 | 25-50 | <25 |
| Gravel content | % vol. | <35 | 35-50 | >50 | |
| $CaCO_3$ in root zone | % | High | Medium | low | |
| Salinity (EC) | $dSm^{-1}$ | <2.0 | 2.0-4.0 | 4.0-8.0 | |
| Sodicity (ESP) | % | <5 | 5-10 | >10 | |

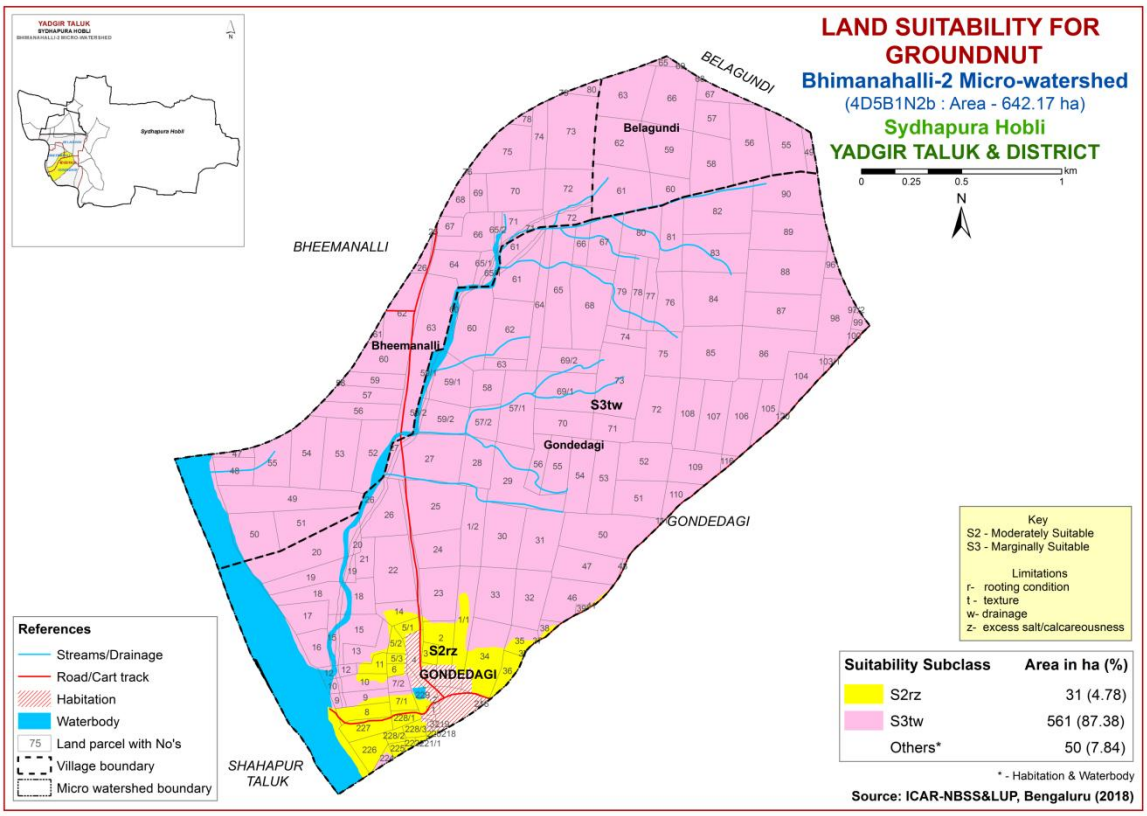



Fig. 7.4 Land Suitability map of Groundnut

There are no highly suitable (Class S1) lands available for groundnut cultivation in the microwatershed. Moderately suitable (Class S2) lands occur in an area of 31 ha (5%) and are distributed in the southern part of the microwatershed. They have minor limitations of rooting depth and calcareousness. Marginally suitable lands (Class S3) for growing groundnut occupy a maximum area of 561 ha (87%) and are distributed in the major part of the microwatershed with moderate limitations of texture and drainage.

### 7.5 Land Suitability for Sunflower (*Helianthus annus*)

Sunflower is one of the most important oilseed crop grown in an area of 4.1 lakh ha in the State in all the districts. The crop requirements for growing sunflower (Table 7.6) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing sunflower was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.5.

Highly suitable (Class S1) lands for growing sunflower occupy a maximum area of 451 ha (70%) and are distributed in the major part of the microwatershed. An area of about 110 ha (17%) is moderately suitable (Class S2) for sunflower and are distributed in the western, southwestern and southern part of the microwatershed. They have minor limitations of rooting depth and drainage. About 31 ha (5%) is marginally suitable (Class S3) and is distributed in the southern part of the microwatershed with moderate limitations of rooting depth and calcareousness.

**Table 7.6 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 rained | Imperfectly drained | Poorly drained |
| Soil reaction | pH | 6.5-8.0 | 8.1-8.55.5-6.4 | 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) | dS $m^{-1}$ | <1.0 | 1.0-2.0 | >2.0 | |
| Sodicity (ESP) | % | <10 | 10-15 | >15 | |

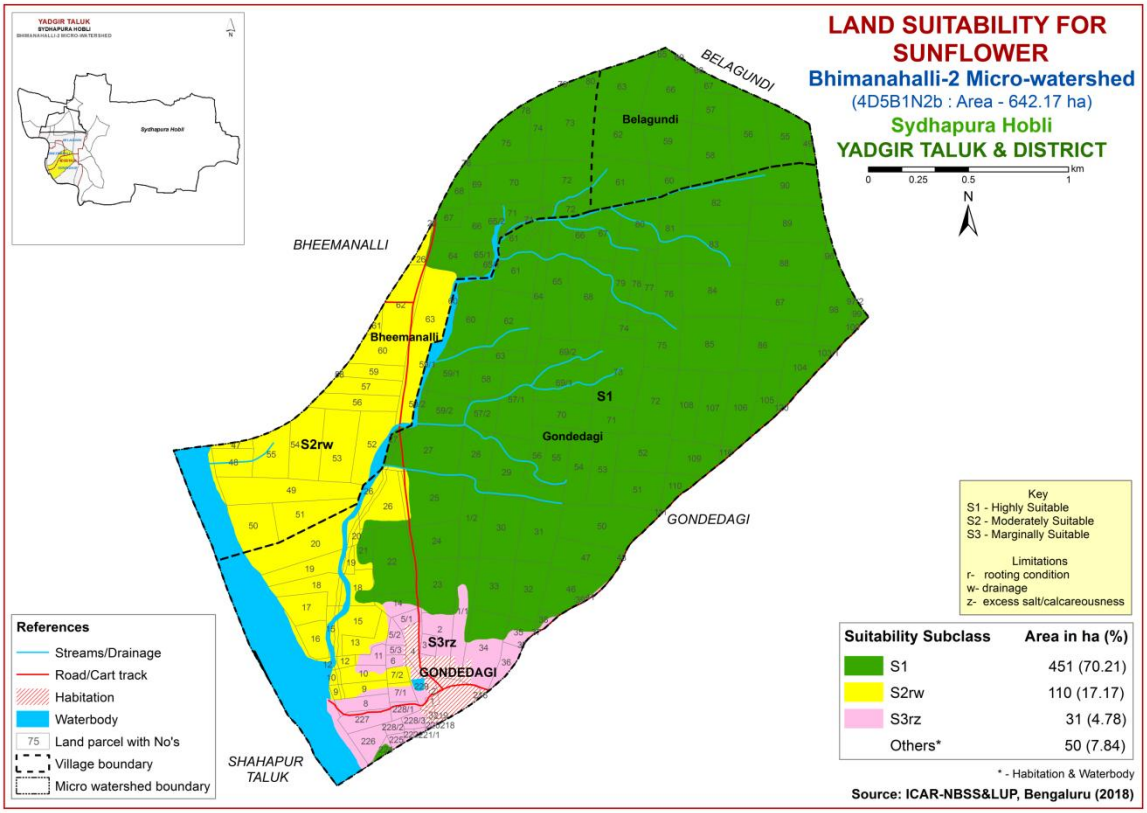



Fig. 7.5 Land Suitability map of Sunflower

### 7.6 Land suitability criteria for Red gram (*Cajanus Cajan)*

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

**Table 7.7 Land 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. 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 |
| Sub Surface soil texture | Class | l,scl,sil,cl,sl | sicl, sic, c(m) | ls | |
| Soil depth | cm | >100 | 75-100 | 50-75 | <50 |
| Gravel content | % vol. | <15 | 15-35 | 3-60 | >60 |
| Salinity (EC) | ds $m^{-1}$ | <1.0 | 1.0-2.0 | >2.0 | |
| Sodicity (ESP) | % | <10 | 10-15 | >15 | |

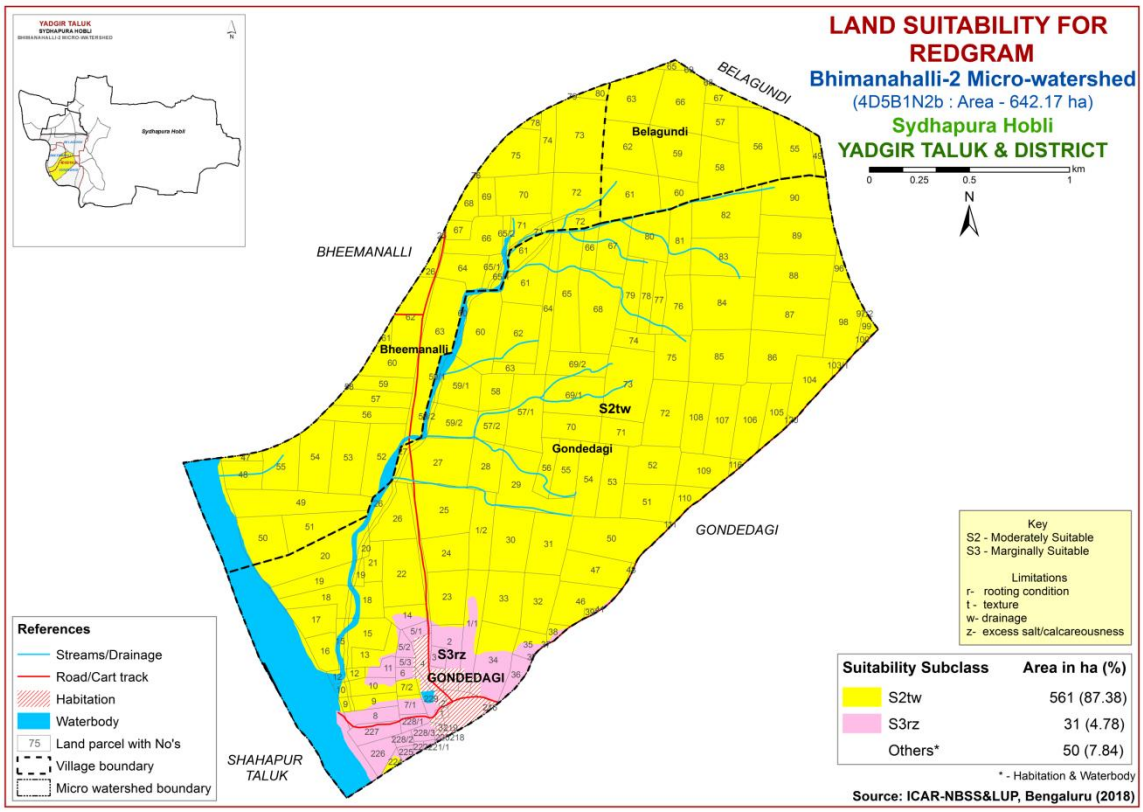



Fig. 7.6 Land Suitability map of Redgram

No highly suitable (Class S1) lands are available for growing redgram in the microwatershed. Maximum area of about 561 ha (87%) is moderately suitable (Class S2) for growing redgram and is distributed in the major part of the microwatershed. They have minor limitations of texture and drainage. Marginally suitable lands (Class S3) for growing redgram occupy an area of about 31 ha (5%) and occur in the southern part of the microwatershed. They have moderate limitations of rooting depth and calcareousness.

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

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

Highly (Class S1) suitable lands for growing Bengal gram occupy a maximum area of 561 ha (87%) and are distributed in the major part of the microwatershed. About 31 ha (5%) area is moderately suitable (Class S2) and is distributed in the southern part of the microwatershed with minor limitations of rooting depth and calcareousness.

**Table 7.8 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; imperfectly 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 | |

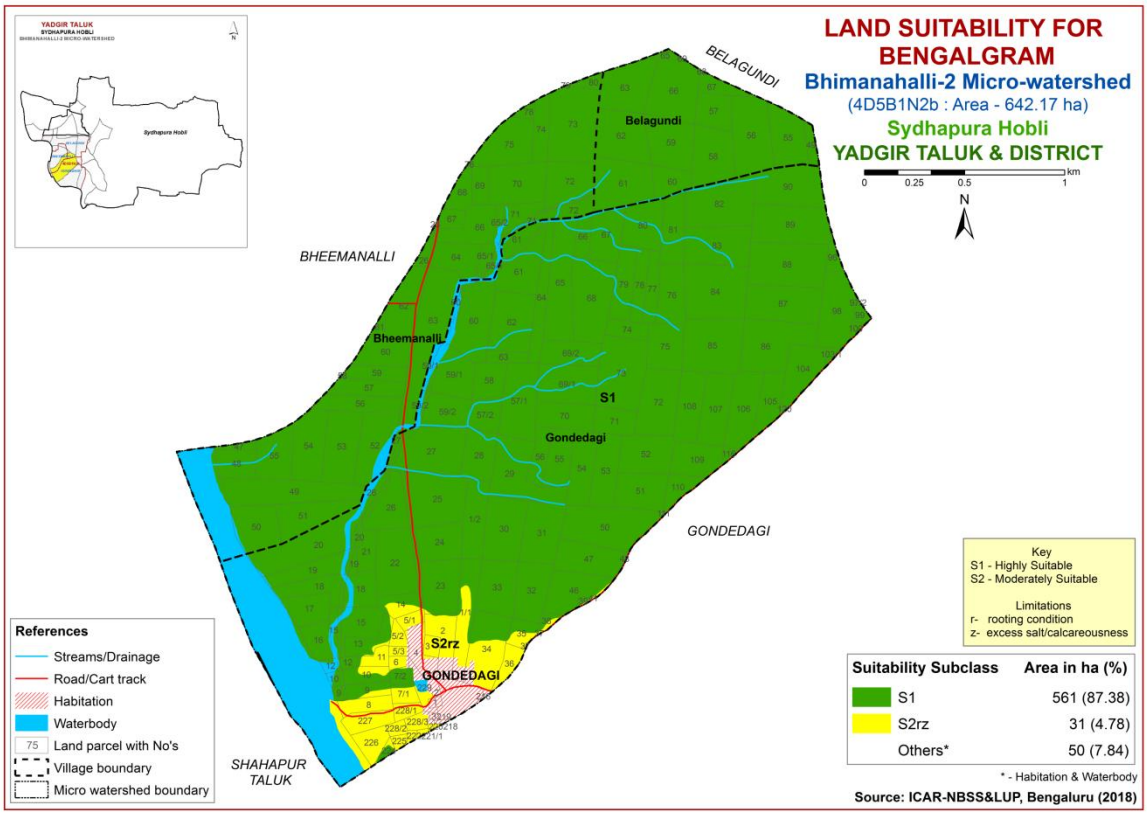



Fig. 7.7 Land Suitability map of Bengal gram

## 7.8 Land Suitability for Cotton (*Gossypium hirsutum*)

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

distribution of different suitability subclasses in the microwatershed is given in Figure 7.8.

Highly suitable (Class S1) lands for growing cotton crop occupy a maximum area of 561 ha (87%) and are distributed in the major part of the microwatershed. Moderately suitable (Class S2) lands occupy an area of 31 ha (5%) and is distributed in the southern part of the microwatershed with minor limitations of rooting depth and calcareousness.

**Table 7.9 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 |

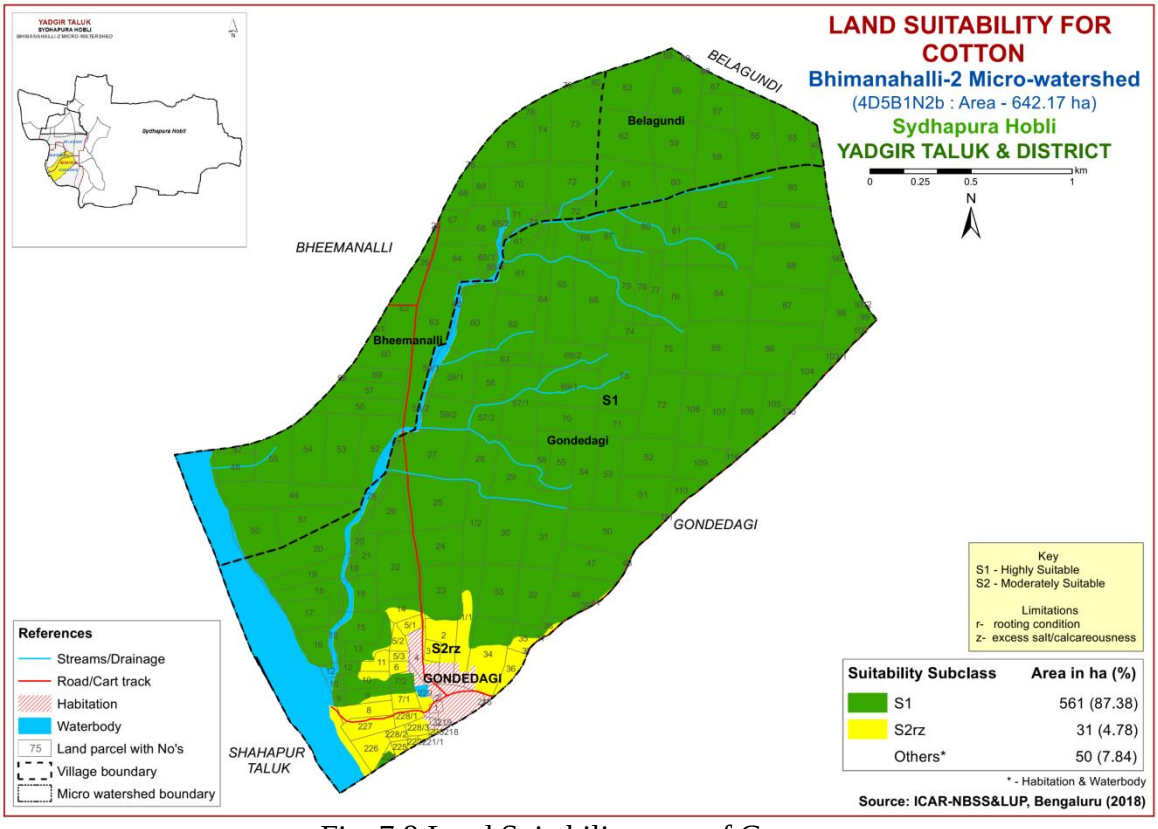



Fig. 7.8 Land Suitability map of Cotton

### 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.

**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 temp. 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 | |

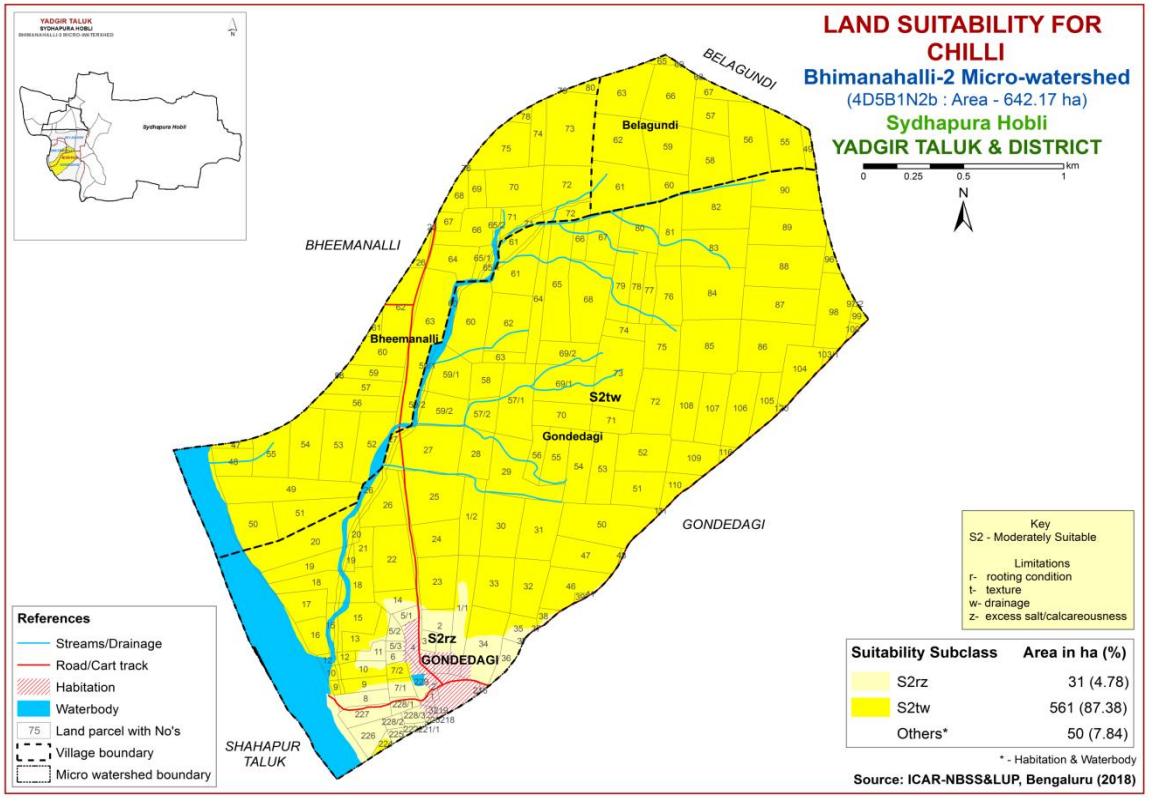



Fig 7.9 Land Suitability map of Chilli

There are no highly (Class S1) suitable lands available for growing chilli crop in the microwatershed. Entire area of the microwatershed is moderately suitable (Class S2) for growing chilli crop. They have minor limitations of texture, rooting depth, calcareousness and drainage.

### 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.

There are no highly (Class S1) suitable lands available for growing tomato in the microwatershed. Moderately suitable (Class S2) lands occur in a maximum area of 482 ha (75%) and are distributed in the major part of the microwatershed with minor limitations of texture, rooting depth, calcareousness and drainage. An area of about 110 ha (17%) is marginally suitable for tomato (Class S3). They have moderate limitations of drainage and texture and is distributed in the southwestern, western and southern part of the microwatershed.

**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 |

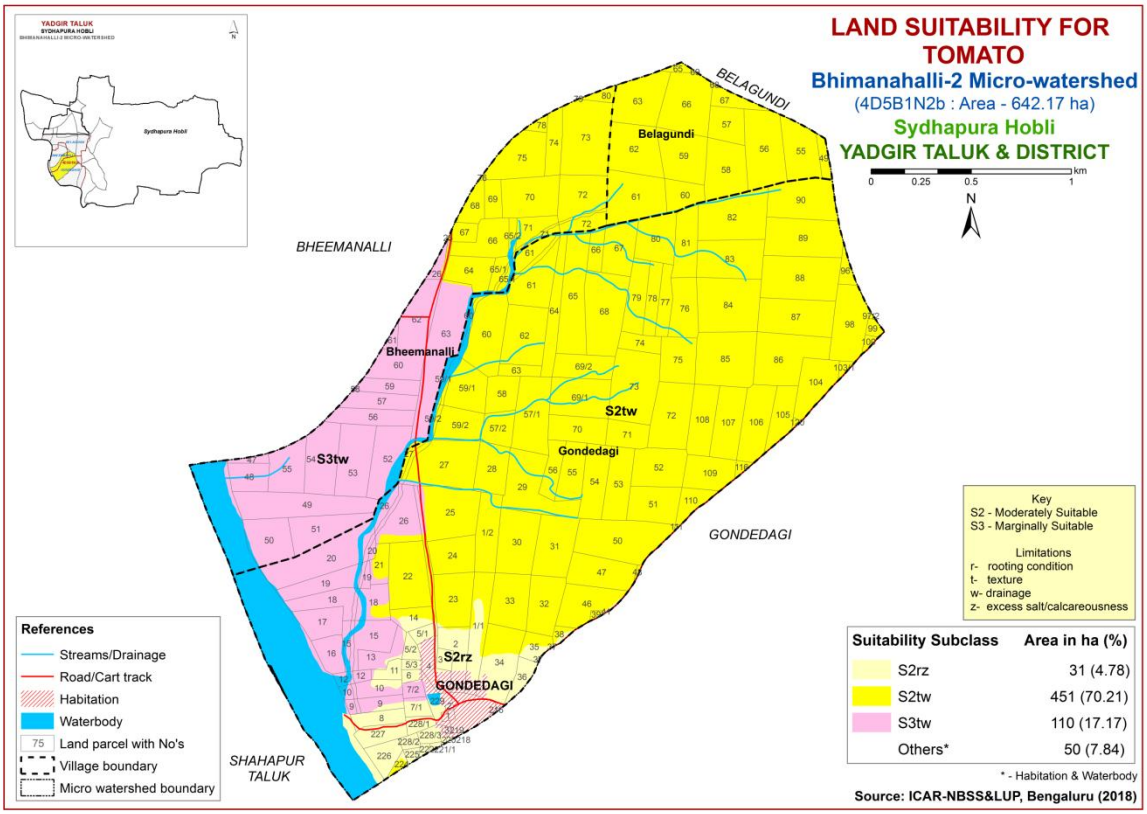



Fig 7.10 Land Suitability map of Tomato

### 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 available for growing drumstick in the microwatershed. Maximum area of about 561 ha (87%) is moderately suitable (Class S2) for drumstick in the microwatershed and is distributed in the major part of the microwatershed. They have minor limitations of texture and drainage. An area of about 31 ha (5%) is marginally suitable and is distributed in the southern part of the microwatershed with moderate limitations of rooting depth and calcareousness.

**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 |
| | Gravelcontent | % vol. | 0-35 | 35-60 | 60-80 | >80 |
| Erosion | Slope | % | 0-3 | 3-10 | - | >10 |

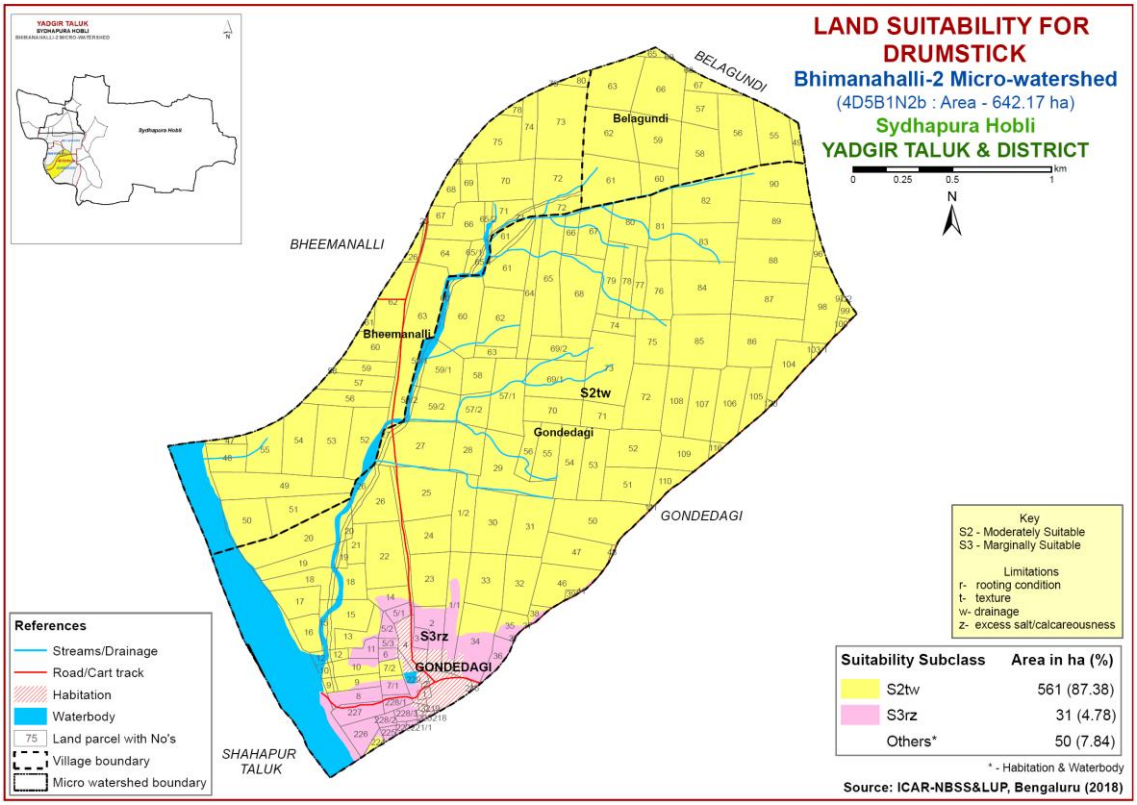



Fig 7.11 Land Suitability map of Drumstick

## 7.12 Land suitability for Mango (*Mangifera indica*)

Mango is one of the most important fruit crop grown in an area of 1.73 lakh ha in almost all the districts of the State. The crop requirements (Table 7.13) for growing mango were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing mango was generated. The area extent and their geographic distribution of different suitability subclasses in the microwatershed is given in Figure 7.12.

There is no highly suitable (Class S1) and moderately suitable (Class S2) lands available for growing mango in the microwatershed. Maximum area of 561 ha (87%) is marginally suitable (Class S3) for growing mango with moderate limitations of drainage and texture. Not suitable (class N1) lands occupy an area of 31 ha (5%) and are distributed in the southern part of the microwatershed with severe limitations of rooting depth and calcareousness.

**Table 7.13 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 | Temp. 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 imperf.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 | 7.6-8.5,5.0-5.4 | 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 | |

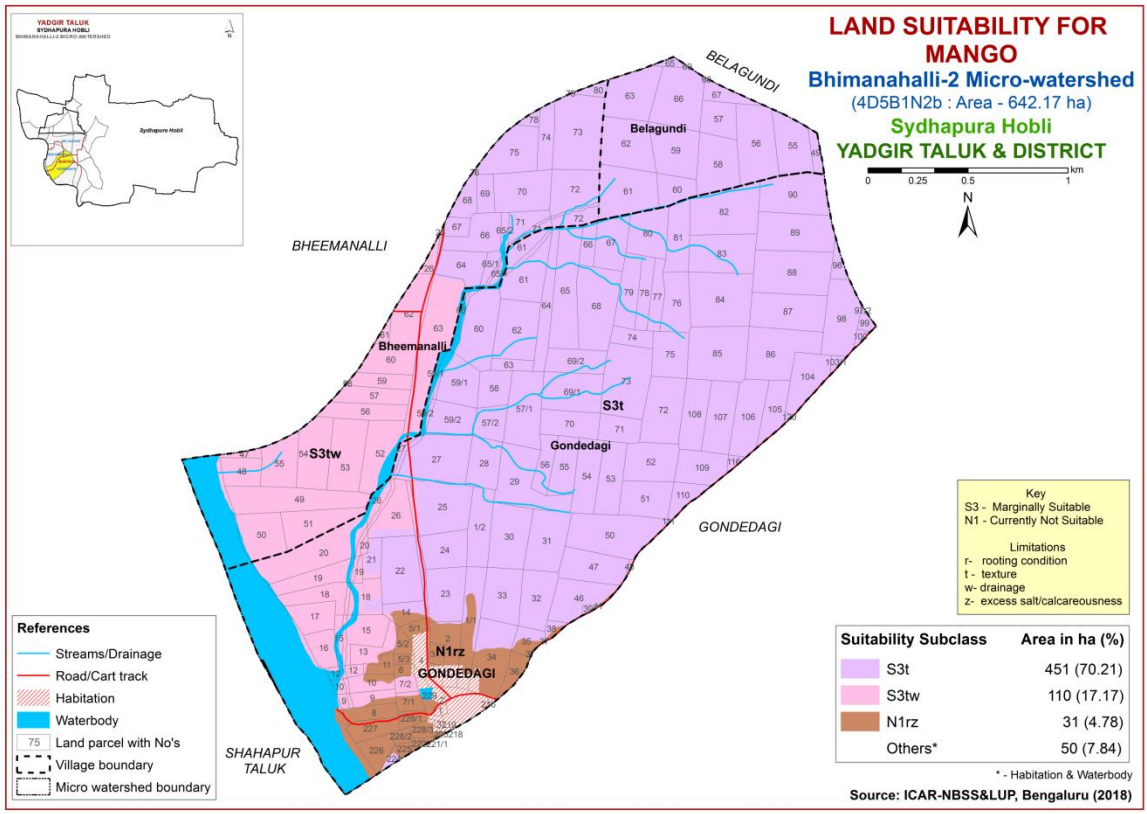



Fig. 7.12 Land Suitability map of Mango

### 7.13 Land suitability for Guava (*Psidium guajava*)

Guava is one of the most important fruit crop grown in an area of 6558 ha in almost all the districts of the State. The crop requirements (Table 7.14) for growing guava were matched with the soil-site characteristics (7.1) and a land suitability map for growing guava was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.13.

No highly (Class S1) and moderately suitable (Class S2) lands available for growing guava in the microwatershed. Marginally suitable (Class S3) lands cover entire area of about 592 ha (92%). They have moderate limitations of texture, rooting depth, calcareousness and drainage.

**Table 7.14 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 in growing season | $^0$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 |

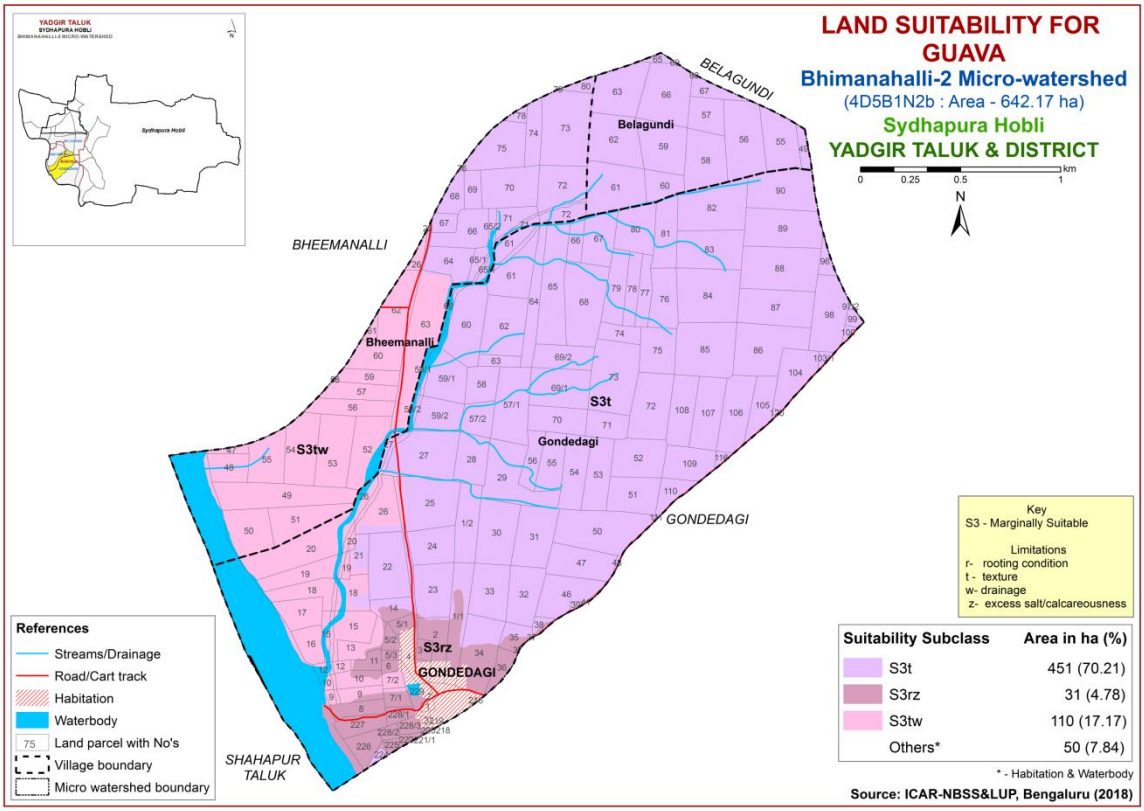



Fig. 7.13 Land Suitability map of Guava

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

Sapota is one of the most important fruit crop grown in an area of 29373 ha in almost all the districts of the State. The crop requirements (Table 7.15) for growing sapota were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing sapota was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed are given in Figure 7.14.

No highly (Class S1) and moderately suitable (Class S2) lands available for growing sapota in the microwatershed. Entire area of about 592 ha (92%) is marginally suitable (Class S3) for growing sapota. They have moderate limitations of texture, rooting depth, calcareousness and drainage

**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 availability | 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 |

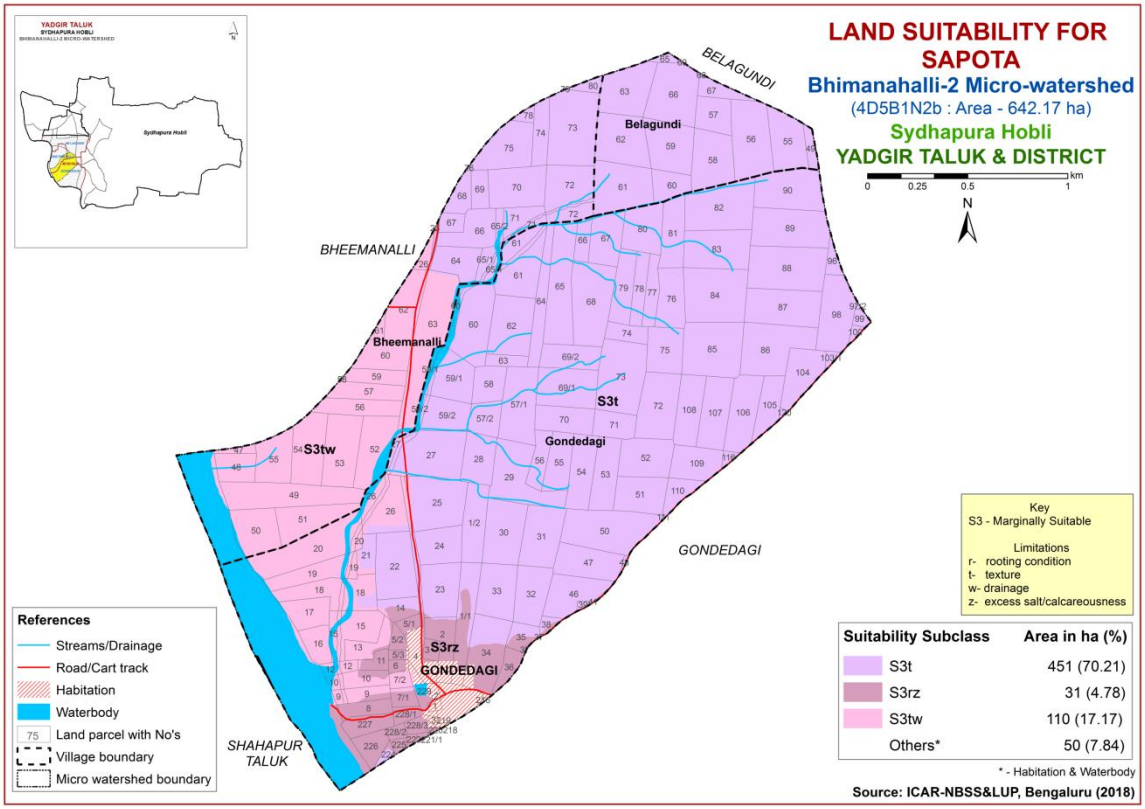



Fig. 7.14 Land Suitability map of Sapota

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

Pomegranate is one of the most important fruit crop commercially grown in about 18488 ha in Karnataka, mainly in Bijapur, Bagalkot, Koppal, Gadag and Chitradurga districts. The crop requirements for growing pomegranate (Table 7.16) 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 7.15.

**Table 7.16 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 | $^0$C | 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 | |

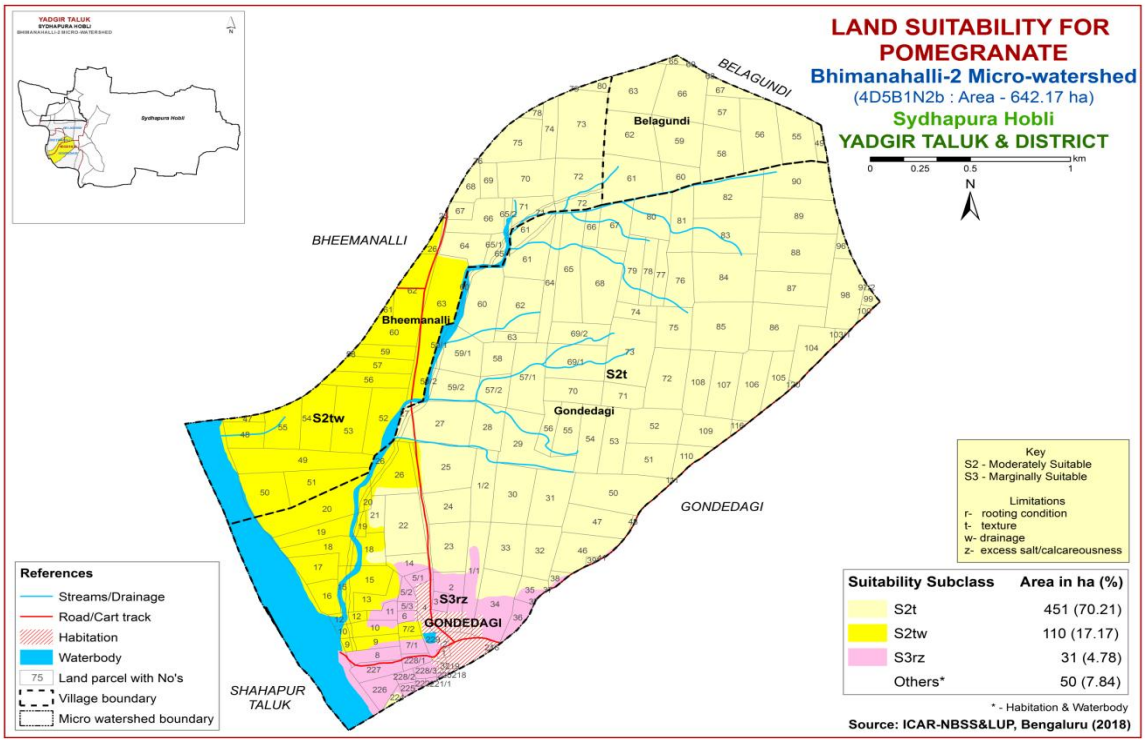



Fig 7.15 Land Suitability map of Pomegranate

No highly (Class S1) suitable lands available for growing pomegranate in the microwatershed. Maximum area of about 561 ha (87%) is moderately suitable (Class S2) for growing pomegranate and is distributed in the major part of the microwatershed. They have minor limitations of texture and drainage. Marginally suitable (Class S3) lands occupy an area of about 31 ha (5%) and are distributed in the southern part of the microwatershed with moderate limitations of rooting depth and calcareousness.

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

Musambi is one of the important fruit crop grown in an area of 3446 ha in almost all the districts of the State. The crop requirements for growing musambi (Table 7.17) 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 7.16.

**Table 7.17 Crop suitability criteria for Musambi**

| 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. to imper. 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 | 5.5-6.47.6-8.0 | 4.0-5.4,8.1-8.5 | <4.0,>8.5 |
| Rooting conditions | Soil depth | cm | >150 | 100-150 | 50-100 | <50 |
| | Gravel content | % vol. | Non gravelly | 15-35 | 35-55 | >55 |
| Erosion | Slope | % | <3 | 3-5 | 5-10 | |

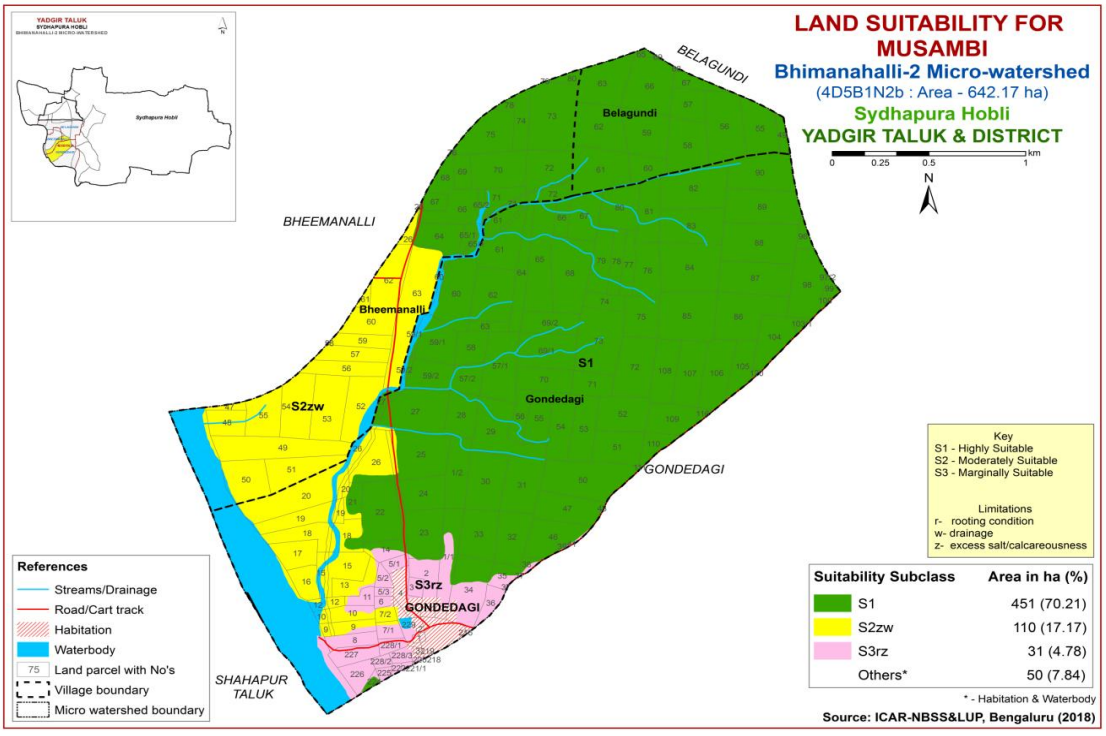



Fig. 7.16 Land Suitability map of Musambi

Highly suitable (Class S1) lands for growing Musambi occur in a maximum area of 451 ha (70%) and are distributed in the major part of the microwatershed. An area of about 110 ha (17%) is moderately suitable (Class S2) for growing Musambi and is distributed in the southern, southwestern and western part of the microwatershed with minor limitations of calcareousness and drainage. Marginally suitable lands occur in 31 ha (5%) and is distributed in the southern part of the microwatershed with moderate limitations of rooting depth and calcareousness.

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

Lime is one of the most important fruit crop grown in an area of 0.11 lakh ha in almost all the districts of the State. The crop requirements for growing lime (Table 7.18) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing lime was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7. 17.

Highly suitable (Class S1) lands for growing Lime occur in a maximum area of 451 ha (70%) and are distributed in the major part of the microwatershed. An area of about 110 ha (17%) is moderately suitable (Class S2) for growing lime and are distributed in the southwestern and western part of the microwatershed. They have minor limitations of drainage and calcareousness. Marginally suitable (Class S3) lands occur in 31 ha (5%) and are distributed in the southern part of the microwatershed with moderate limitations of rooting depth and calcareousness.

**Table 7.18 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 34calcareous | Upto 5 | 5-10 | >10 |
| Rooting conditions | 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 | |

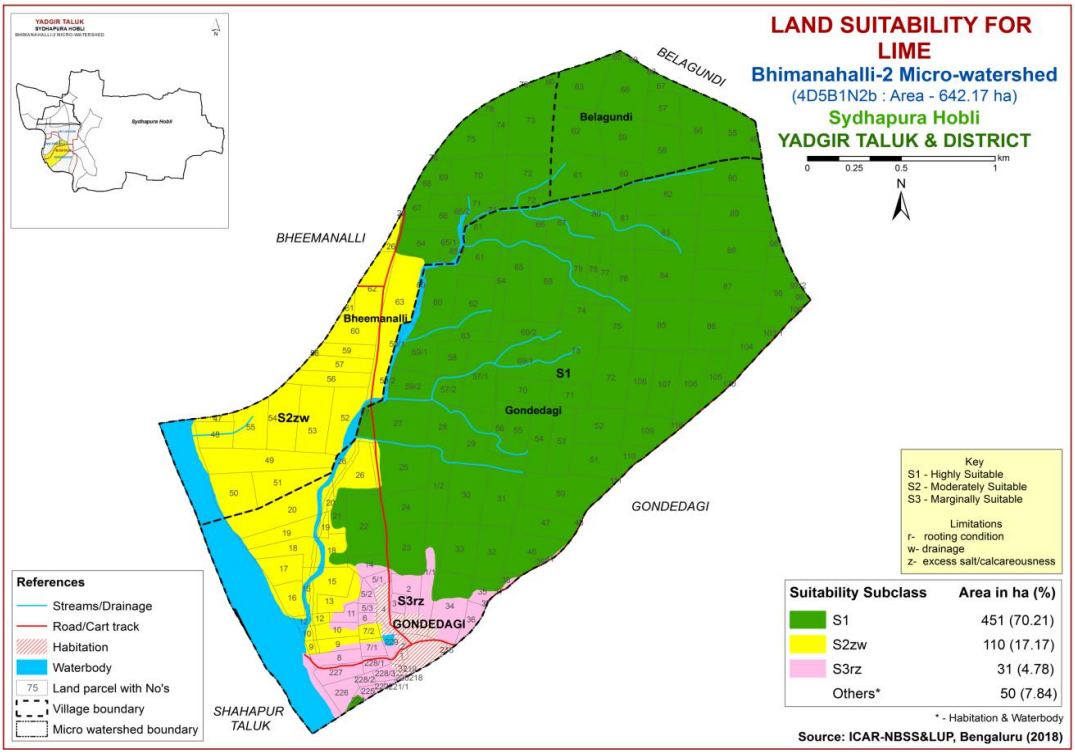



Fig. 7.17 Land Suitability map of Lime

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

Amla is one of the medicinal fruit crop grown in almost all the districts of the State. The crop requirements for growing amla (Table 7.19) 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 7.18.

Highly suitable (Class S1) lands for growing Amla occur in an area of 110 ha (17%) and are distributed in the southern, southwestern and western part of the microwatershed. Maximum area of about 482 ha (75%) has soils that are moderately suitable (Class S2) for growing Amla with minor limitations of texture, rooting depth and calcareousness and is distributed in the major part of the microwatershed.

**Table 7.19 Land 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 |

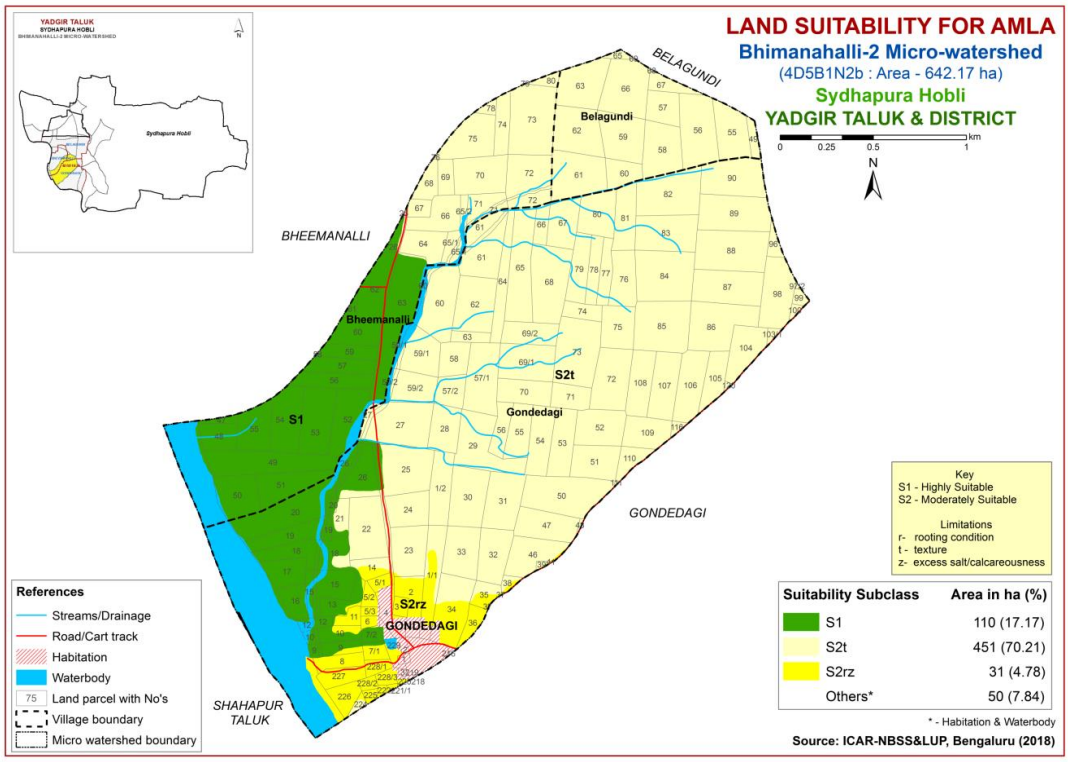



Fig. 7.18 Land Suitability map of Amla

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

Cashew is one of the most important plantation nut crop grown in an area of 0.7 lakh ha in almost all the districts of the State. The crop requirements for growing cashew (Table 7.20) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing cashew was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.19.

Entire area of 492 ha (92%) in the microwatershed is not suitable (Class N1) for cultivation of cashew and have severe limitations of texture and calcareousness.

**Table 7.20 Land 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 | sc,c(red),scl,cl, | - | ls, sl | c (black) |
| | 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 | |

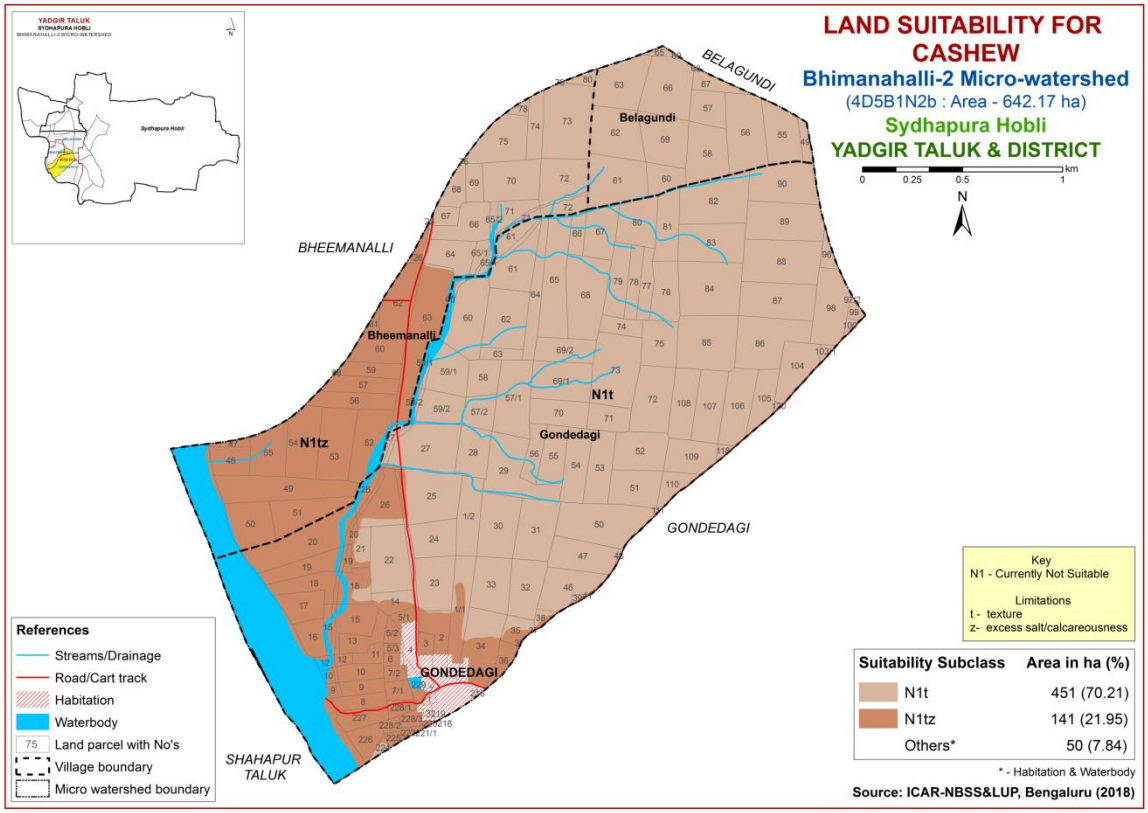



Fig. 7.19 Land Suitability map of Cashew

### 7. 20 Land Suitability for Jackfruit (*Artocarpus heterophyllus*)

Jackfruit is one of the most important fruit crop grown in an area of 5368 ha in almost all the districts of the State. The crop requirements for growing jackfruit (Table 7.21) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing jackfruit was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed are given in Figure 7.20.

No highly suitable (Class S1) and moderately suitable (Class S2) lands available for growing Jackfruit in the microwatershed. Marginally suitable (Class S3) lands occupy entire area of 592 ha (92%) with moderate limitations of drainage, calcareousness, rooting depth and texture.

**Table 7.21 Land 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 | V. Poorly |
| Nutrient availability | Texture | Class | scl,cl,sc,c(red) | - | sl,ls,c(black) | - |
| | pH | 1:2.5 | 5.5-7.3 | 5.0-5.5,7.3-7.8 | 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 | - |

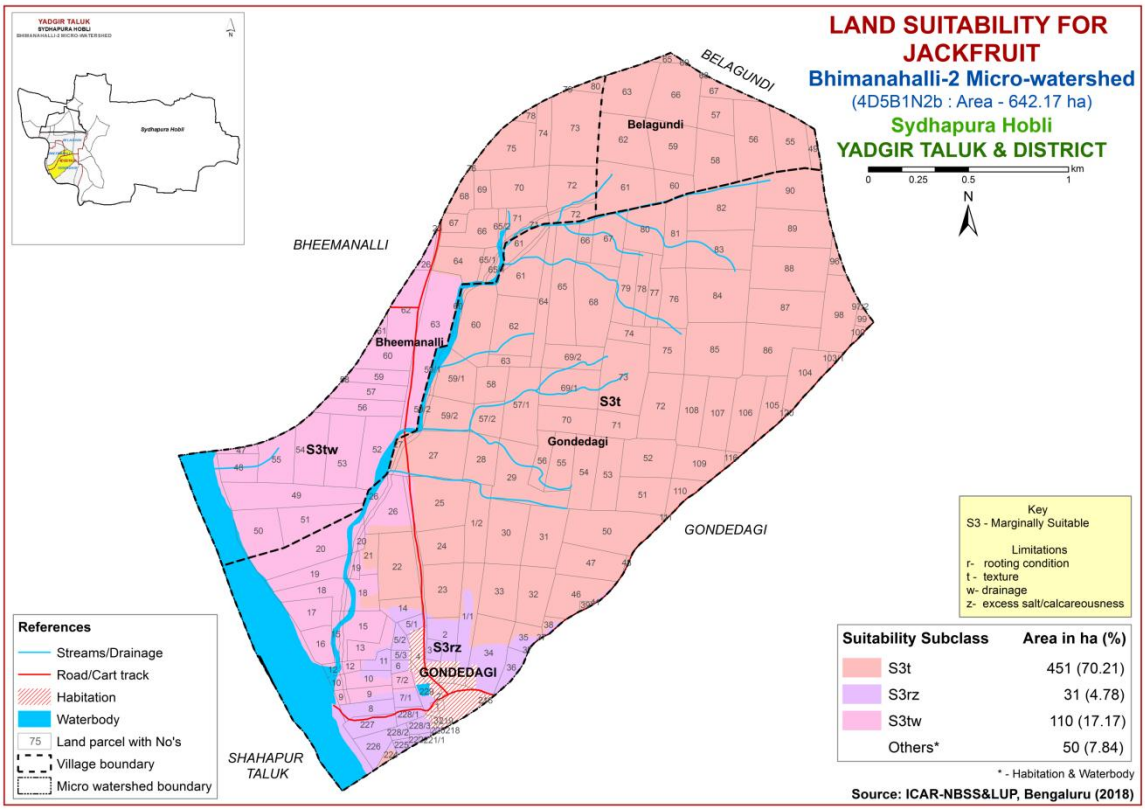



Fig. 7.20 Land Suitability map of Jackfruit

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

Jamun is an important fruit crop grown in almost all the districts of the State. The crop requirements for growing jamun (Table 22) 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 7.21.

No highly suitable (Class S1) lands available for growing Jamun in the microwatershed. Maximum area of about 561 ha (87%) is moderately suitable (Class S2) for growing Jamun and is distributed in the major part of the microwatershed with minor limitations of texture and drainage. Marginally suitable (Class S3) lands occur in an area of 31 ha (5%) and are distributed in the southern part of the microwatershed with moderate limitations of rooting depth and calcareousness.

**Table 7.22 Land 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 |
| | Gravelcontent | % vol. | <15 | 15-35 | 35-60 | >60 |
| Erosion | Slope | % | 0-3 | 3-5 | 5-10 | >10 |

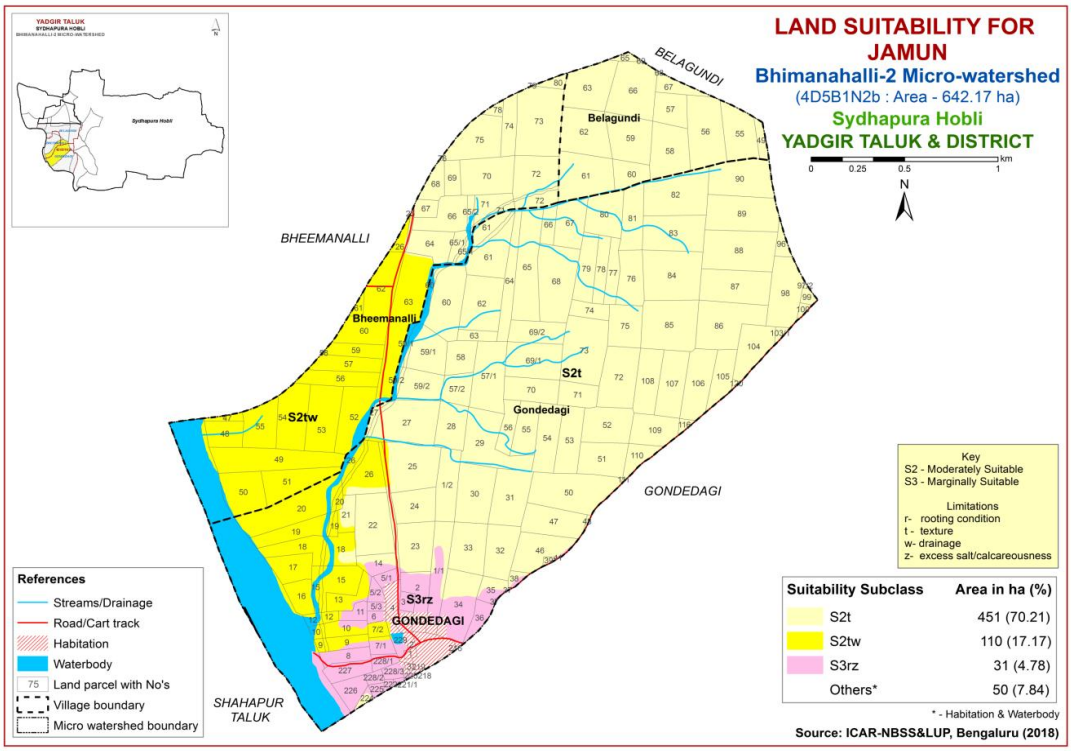



Fig. 7.21 Land Suitability map of Jamun

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

Custard apple is one of the most important fruit crop grown in almost all the districts of the State. The crop requirements for growing custard apple (Table7.23) 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 geographical distribution of different suitability subclasses in the microwatershed is given in Figure 7.22.

Maximum area of 561 ha (87%) in the microwatershed is highly suitable (Class S1) for growing custard apple and is distributed in the major part of the microwatershed. Moderately suitable (Class S2) lands occur in an area of 31 ha (5%) and are distributed in the southern part of the microwatershed with minor limitations of rooting depth and calcareousness.

**Table 7.23 Land 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 | |

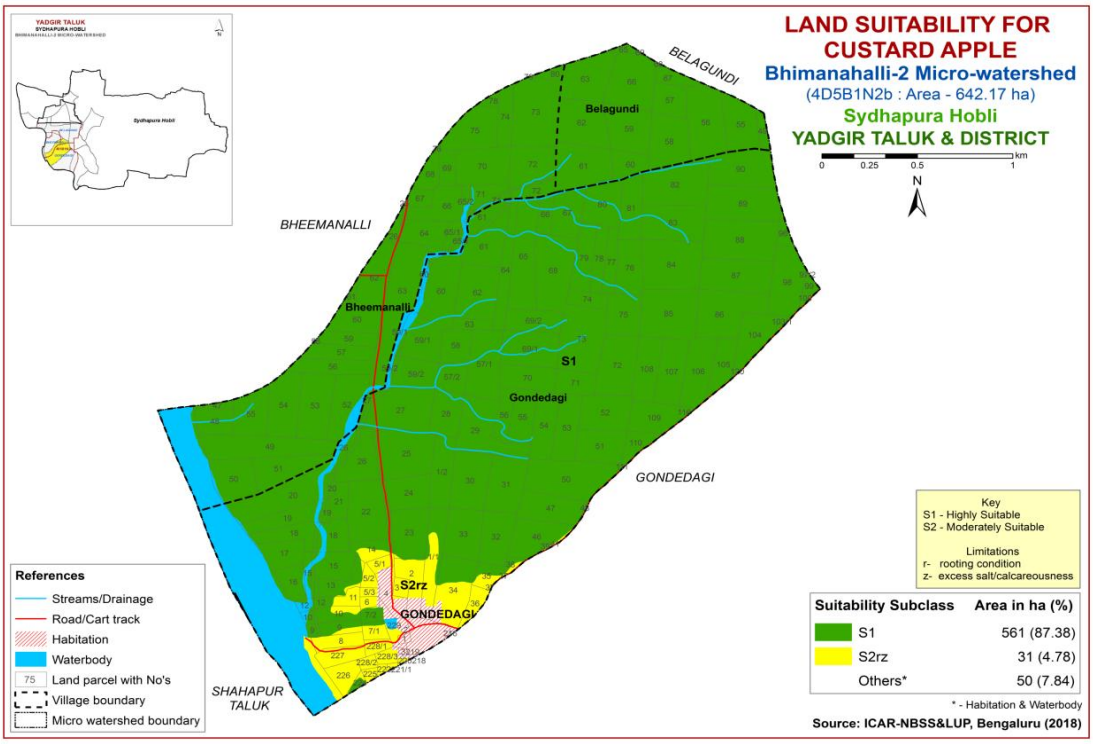



Fig. 7.22 Land Suitability map of Custard Apple

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

Tamarind is one of the most important spice crop grown in almost all the districts of the state. The crop requirements for growing tamarind (Table 7.24) were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing tamarind was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed is given in Fig. 7.23.

No highly suitable (Class S1) lands available for growing Tamarind in the microwatershed. Maximum area of about 561 ha (87%) is moderately suitable (Class S2) for growing Tamarind and are distributed in the major part of the microwatershed. They have minor limitations of texture and drainage. Not suitable (Class N1) lands occupy an area of 31 ha (5%) and are distributed in the southern part of the microwatershed with severe limitations of rooting depth and calcareousness.

**Table 7.24 Land 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 |

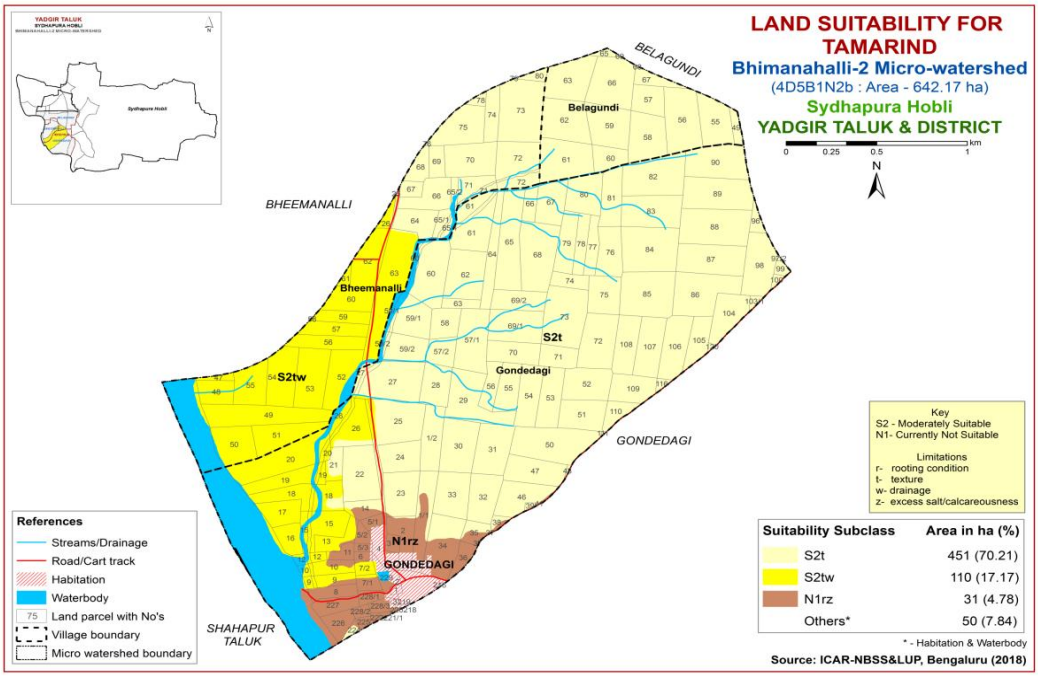



Fig. 7.23 Land Suitability map of Tamarind

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

Mulberry is one of the important leaf crop grown for rearing silk worms in about 1.6 lakh ha area in all the districts of the state. The crop requirements for growing mulberry (Table 7.25) 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 7.24.

No highly (Class S1) and moderately (Class S2) suitable lands available for growing mulberry in the microwatershed. Entire area of about 592 ha (92%) is marginally suitable (Class S3) for growing mulberry with moderate limitations of texture, rooting depth, calcareousness and drainage.

**Table 7.25 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 | 5.5-7.3 | 5.0-5.5,7.8-8.4 | 8.4-9.0 | >9.0 |
| 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 |

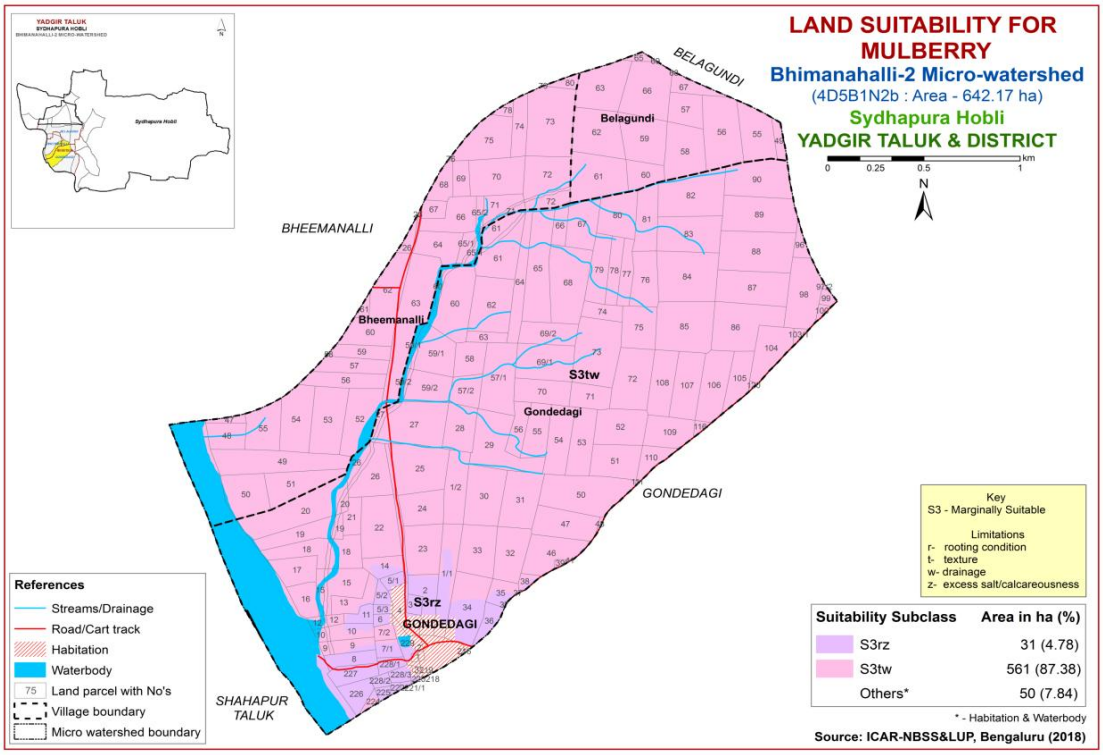



Fig 7.24 Land Suitability map of Mulberry

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

**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 | $^0$C | 18-23 | 17-15<br>24-35 | 35-40<br>10-14 | >40<br><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 |
| | Gravelcontent | % 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 | - |

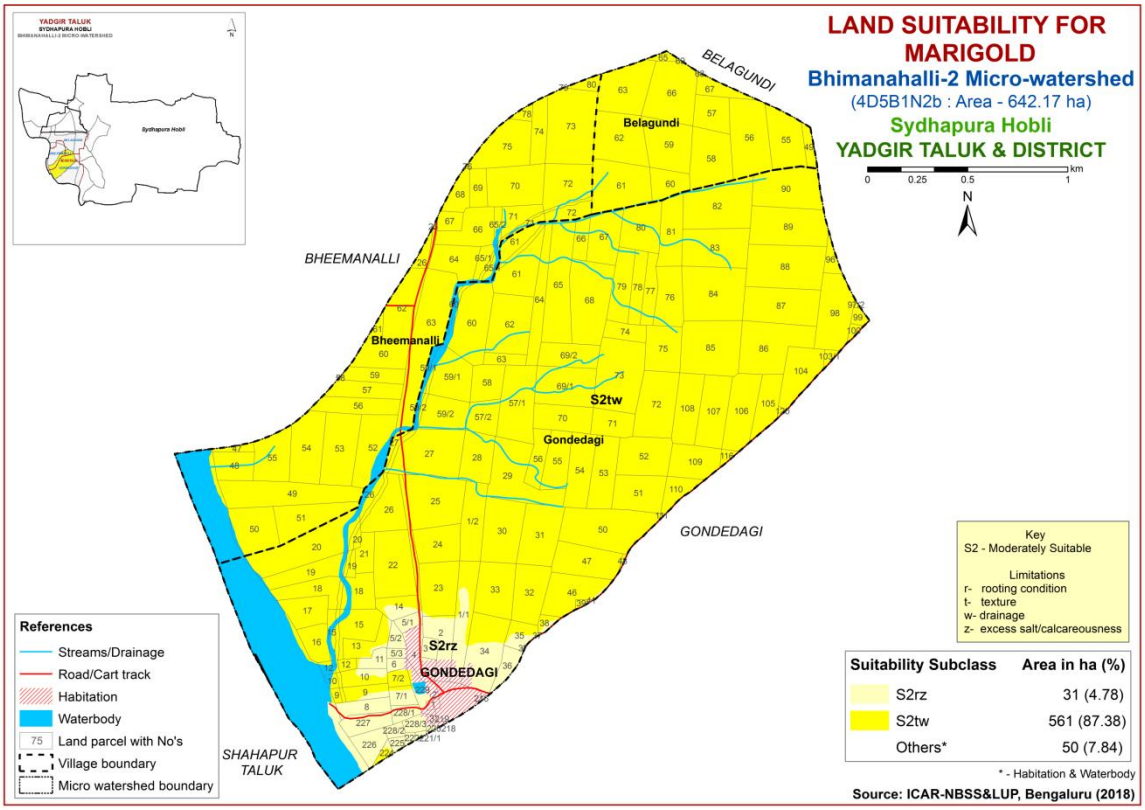



Fig. 7.25 Land Suitability map of Marigold

No highly suitable (Class S1) lands available for growing Marigold in the microwatershed. Entire area of about 592 ha (92%) is moderately suitable (Class S2) for growing Marigold. They have minor limitations of texture, rooting depth, calcareousness and drainage.

### 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 (Table 7.27) for growing chrysanthemum were matched with the soil-site characteristics (Table 7.1) and a land suitability map for growing chrysanthemum was generated. The area extent and their geographical distribution of different suitability subclasses in the microwatershed are given in Figure 7.26.

No highly suitable (Class S1) lands available for growing Chrysanthemum in the microwatershed. Entire area of about 592 ha (92%) is moderately suitable (Class S2) for growing Chrysanthemum. They have minor limitations of texture, rooting depth, calcareousness and drainage.

**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<br>24-35 | 35-40<br>10-14 | >40<br><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 | |

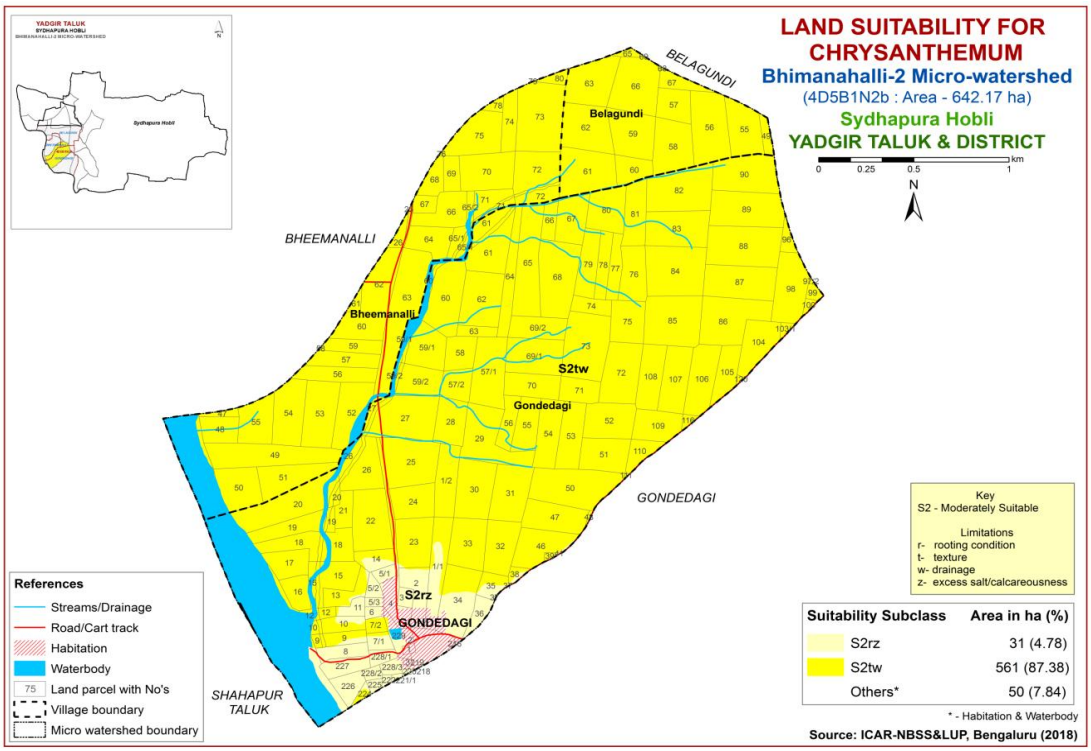



Fig. 7.26 Land Suitability map of Chrysanthemum

## 7.27 Land Management Units (LMU)

The 4 soil map units identified in Bhimanahalli-2 microwatershed have been grouped into 3 Land Management Units (LMU) 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. 7.28) has been generated. These Land Management Units are expected to behave similarly for a given level of management.

The 4 map units that have been grouped into 3 Land Management Units along with brief description of soil and site characteristics are given below.

| LMU NO. | Soil map units | Soil and site characteristics |
|---|---|---|
| 1 | 104.TMKiB2 | Very deep, lowland black clay soils, slopes 1-3%, non gravelly, moderate erosion |
| 2 | 62. BMNmB2<br>63. BMNmB2g1 | Very deep , black clay soils, slopes 1-3%, non gravelly to gravelly, moderate erosion |
| 3 | 17.HLGiB2 | Moderately shallow, black calcareous sandy clay to sandy clay loam soils, slopes 1-3%, non gravelly, moderate erosion |

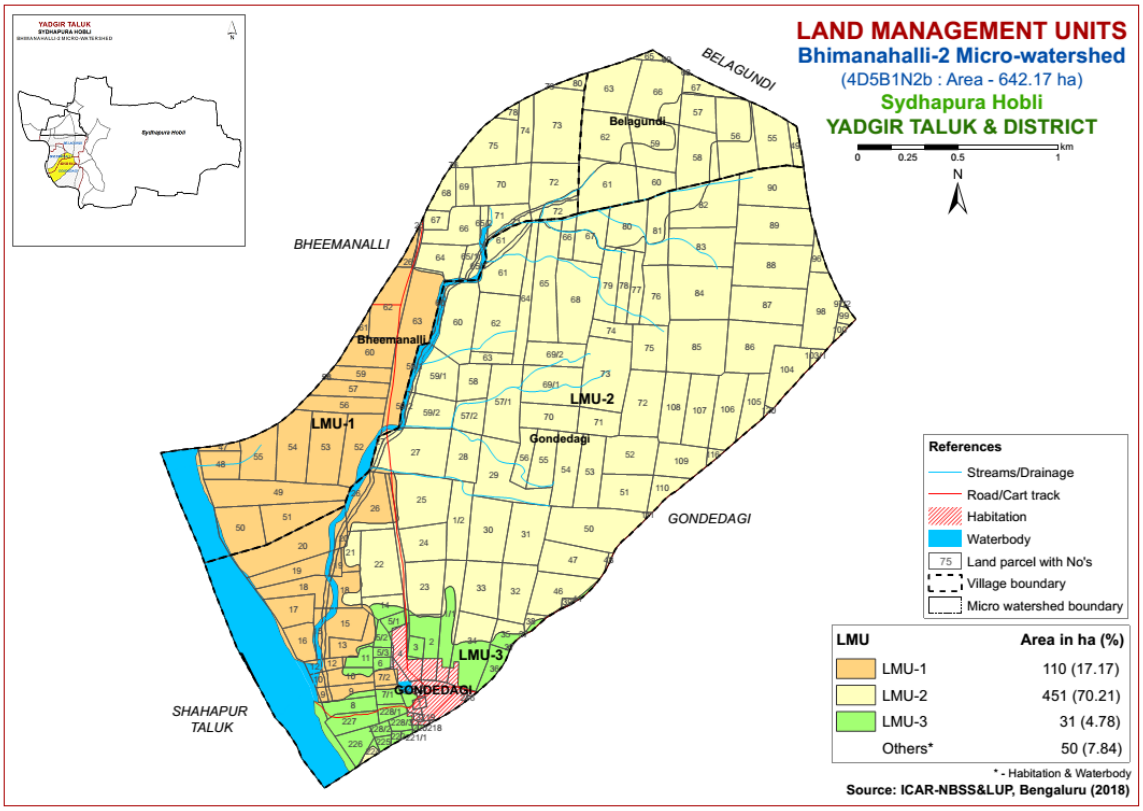



Fig. 7.28 Land Management Units Map Bhimanahalli-2 Microwatershed

## 7.28 Proposed Crop Plan for Bhimanahalli-2 Microwatershed

After assessing the land suitability for the 26 crops, the Proposed Crop Plan has been prepared for the 3 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 below in Table 7.29.

**Table 7.28 Proposed Crop Plan for Bhimanahalli-2 Microwatershed**

| LMU No | Mapping Units | Survey Number | Soil Characteristics | Field Crops | Horticulture Crops | Suitable Interventions |
|---|---|---|---|---|---|---|
| 1 | 104.TMKiB2 | **Bheemanalli:**26,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63 **Gondedagi:**7/2,9,10,12,13,15,16, 17,18,19,20,26 | Very deep, lowland black clay soils, slopes 1-3%, non gravelly, moderate erosion | Sunflower, Cotton, Bengal gram, Bajra | **Fruit crops:** Lime, Musambi, Amla, Jamun **Vegetables:** Drumstick, Chilli, Coriander **Flowers:** Marigold, Chrysanthemum | Application of FYM, Biofertilizers and micronutrients, suitable soil and water conservation practices |
| 2 | 62. BMNmB2 63. BMNmB2g1 | **Belagundi:**49,55,56,57,58,59,60, 61,62,63,65,66,67,68, 69 **Bheemanalli:**25,64,65/1,65/2,66,67,68,69,70,71,72,73,74,75,76,78,79,80 **Gondedagi:**1/2,14,21,22,23,24,25, 27,28,29,30,31,32,33,35,38,39,46,47,48,50,51,52,53,54,55,56,57/1,57/2,58,59/1,59/2,60,61,62,63,64,65,66,67,68,69/1,69/2,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,96,97/2,98,99,100,103/1,104, 105,106,107,108,109, 110, 111,116,120,224 | Very deep , black clay soils, slopes 1-3%, non gravelly to gravelly, moderate erosion | Sunflower, Sorghum, Maize, Soybean, Cotton, Bengal gram, Safflower, Linseed, Bajra | **Fruit crops:** Lime, Pomegranate, Musambi, Tamarind, Jamun, Amla, Custard apple **Vegetables:** Bhendi, Chilli, Drumstick, Cluster bean, Coriander **Flowers:** Marigold, Chrysanthemum | Application of FYM, Biofertilizers and micronutrients, drip irrigation, Mulching, suitable soil and water conservation practices |
| 3 | 17.HLGiB2 | **Gondedagi:**1/1,2,3,5/1,5/2,5/3,6,7/1,8,11,22,34,36,37,41,220,221/1,222,225,226,228/1,228/2,228/3 | Moderately shallow, black calcareous sandy clay to sandy clay loam soils, slopes 1-3%, non gravelly, moderate erosion | Maize, Sorghum, Groundnut, Bengal gram, Bajra | **Fruit crops:**, Amla, Custard apple, **Vegetables:** Tomato, Chilli, Coriander **Flowers:** Marigold, Chrysanthemum | Application of FYM, Biofertilizers and micronutrients, drip irrigation, Mulching, suitable soil and water conservation practices |

*Chapter 8*

# SOIL HEALTH MANAGEMENT

## 8.1 Soil Health

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

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

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

**The most important characteristics of a healthy soil are**

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

**Characteristics of Bhimanahalli-2 Microwatershed**

- The soil phases identified in the microwatershed belonged to the soil series of BMN 451 ha (70%), TMK 110 ha (17%) and HLG 31 ha (5%).
- As per land capability classification, entire area of the microwatershed falls under arable land category (Class II). The major limitations identified in the arable lands were soil, drainage/wetness and erosion.
- On the basis of soil reaction, about 32 ha (5%) is neutral (pH 6.5-7.3), 536 ha (84%) area is slightly to moderately alkaline (pH 7.3-8.4) and 24 ha (4%) is strongly alkaline (pH 8.4 - 9.0).

❖ **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. Amelioration of soils through the application of amendments (liming materials).

Liming materials:

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

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

**Alkaline soils**

(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 642 ha area in the microwatershed, the entire area is suffering from moderate erosion. These areas need immediate soil and water conservation and, other land development and land husbandry practices for restoring soil health.

**Dissemination of Information and Communication of Benefits**

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

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

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

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

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

- **Soil Depth:** The depth of a soil decides the amount of moisture and nutrients it can hold, what crops can be taken up or not, depending on the rooting depth and the length of growing period available for raising any crop. Deeper the soil, better for a wide variety of crops. If sufficient depth is not available for growing deep rooted crops, either choose medium or short duration crops or deeper planting pits need to be opened and additional good quality soil brought from outside has to be filled into the planting pits.
- **Surface Soil Texture:** Lighter soil texture in the top soil means, better rain water infiltration, less run-off and soil moisture conservation, less capillary rise and less evaporation losses. Lighter surface textured soils are amenable to good soil tilth and are highly suitable for crops like groundnut, root vegetables (carrot, raddish, potato etc) but not ideal for crops that need stagnant water like lowland paddy. Heavy textured soils are poor in water infiltration and percolation. They are prone for sheet erosion; such soils can be improved by sand mulching. The technology that is developed by the AICRP-Dryland Agriculture, Vijayapura, Karnataka can be adopted.
- **Gravelliness:** More gravel content is favorable for run-off harvesting but poor in soil moisture storage and nutrient availability. It is a significant parameter that decides the kind of crop to be raised.
- **Land Capability Classification:** The land capability map shows the areas suitable and not suitable for agriculture and the major constraints in each of the plot/survey number. Hence, one can decide what kind of enterprise is possible in each of these units. In general, erosion and soil are the major constraints in Bhimanahalli-2 microwatershed.

- **Organic Carbon:** The OC content (an index of available Nitrogen) is high in (>0.75%) in about 271 ha (42%), medium (0.5-0.75%) in 206 ha (32%) and low in 115 ha (18%) area. In the areas that are low and medium in OC, needs to be further improved by applying farmyard manure and crop rotation with cereals and legumes or mixed cropping.
- **Promoting green manuring:** Growing of green manuring crops costs Rs. 1250/ha (green manuring seeds) and about Rs. 2000/ha towards cultivation that totals to Rs. 3250/- per ha. On the other hand, application of organic manure @ 10 tons/ha costs Rs. 5000/ha. The practice needs to be continued for 2-3 years or more. Nitrogen fertilizer needs to be supplemented by 25% in addition to the recommended level in 321 ha area where OC is low and medium (<0.5 - 0.75%). For example, for rainfed maize, recommended level is 50 kg N per ha and an additional 12 kg /ha needs to be applied for all the crops grown in these plots.
- **Available Phosphorus**: Available Phosphorus is low (<23 kg/ha) in an area of 205 ha (32%), medium (23-57 kg/ha) in 252 ha (39%) and high in 134 ha (21%) of the microwatershed. For all the crops, 25% additional P needs to be applied where available P is low and medium.
- **Available Potassium:** Available potassium is medium (145-337 kg/ha) in a small area of 1 ha (<1%) of the microwatershed and maximum area of about 591 ha (92%) is high (>337 kg/ha) in available potassium. All the plots, where available potassium is medium, for all the crops, additional 25% potassium should be applied.
- **Available Sulphur:** Available sulphur is a very critical nutrient for oilseed crops, it is high in a maximum area of 321 ha (50%), medium in 156 ha (24%) and low in 115 ha (18%). Low and medium areas need to be applied with magnesium sulphate or gypsum or Factamphos (p) fertilizer (13% sulphur) for 2-3 years for the deficiency to be corrected.
- **Available Boron:** An area of 46 ha (7%) is high in available boron, 221 ha (34%) is medium and 325 ha (51%) is low. For areas of low and medium, application of sodium tetra borate @ 10 kg/ha as soil application or 0.2 % borax as foliar spray is recommended.
- **Available Iron:** An area of about 455 ha (71%) is sufficient and 137 ha (21%) is under deficient in available iron in the microwatershed. For deficient areas, application of iron sulphate @ 25 ka/ha is recommended.
- **Available Zinc:** An area of about 390 ha (61%) is deficient in available zinc content. Application of zinc sulphate @25 kg/ha is to be recommended for these areas. About 202 ha (31%) is sufficient in available zinc content.
- **Soil Alkalinity:** About 560 ha (87%) area in the microwatershed has soils that are slightly to strongly alkaline. These areas need application of gypsum and wherever calcium is in excess, iron pyrites and element sulphur can be recommended. Management practices like treating repeatedly with good quality water to drain out the excess salts and provision of subsurface drainage and growing of salt tolerant crops like Casuarina, Acasia, Neem, Ber etc, are recommended.

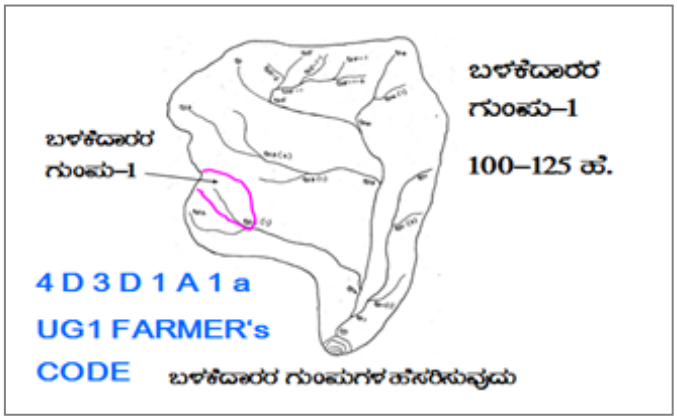
**Land Suitability for various crops:** Areas that are highly, moderately and marginally suitable and not suitable for growing various crops are indicated. Along with the suitability, various constraints that are limiting the productivity are also indicated. For example, in case of cotton, gravel content,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

*Chapter 9*

## SOIL AND WATER CONSERVATION TREATMENT PLAN

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

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




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

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

### Steps for Survey and Preparation of Treatment Plan

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

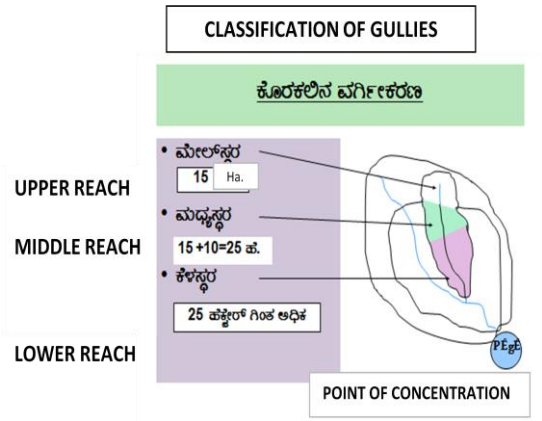
- Naming of user groups and farmers
- Identification of arable and non arable lands
- Identification of drainage lines and gullies
- Identification of non treatable areas
- Identification of priority areas in the arable lands
- Treatment plan for arable lands
- Location of water harvesting and recharge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

## 9.1 Treatment Plan

The treatment plan recommended for arable lands is briefly described below

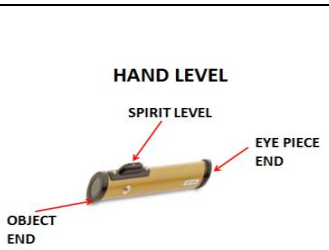
### 9.1.1 Arable Land Treatment

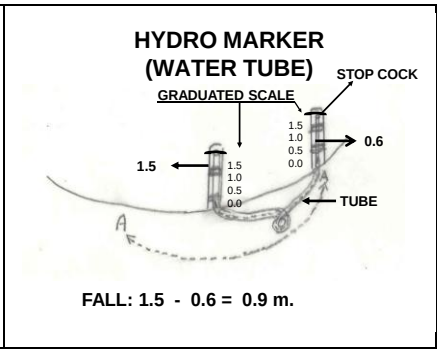
### A. BUNDING

| Steps for Survey and Preparation of Treatment Plan | | USER GROUP-1 |
|---|---|---|
| • Cadastral map (1:7920 scale) is enlarged to a scale of 1:2500 scale<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) | |

**Measurement of Land Slope**

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




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

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

**Note:** (i) The above intervals are maximum.

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

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

**Section of the Bund**

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

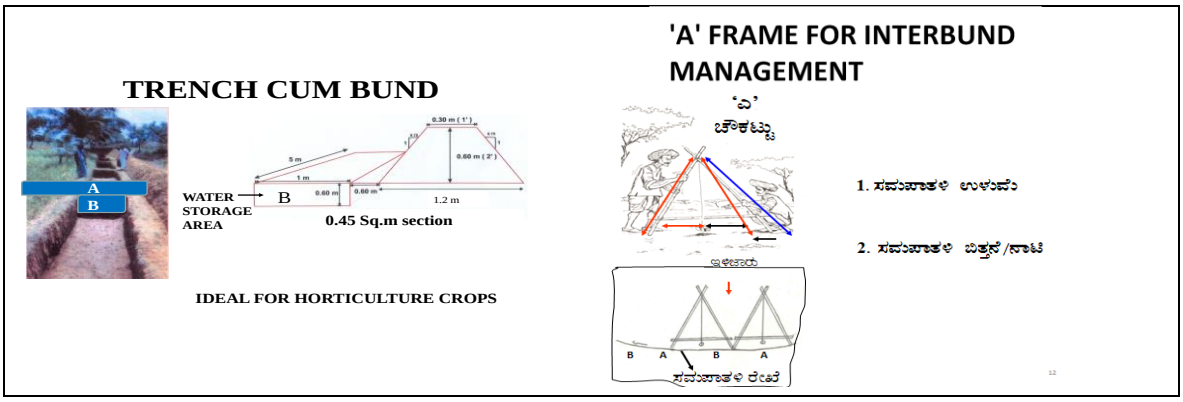
**Recommended Bund Section**

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

**Formation of Trench cum Bund**

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

Details of Borrow Pit dimensions are given below:



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

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

**B. Water Ways**

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

**C. Farm Ponds**

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

**D. Diversion Channel**

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

**9.1.2 Non-Arable Land Treatment**

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

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

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

## 9.2 Recommended Soil and Water Conservation Measures

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

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

A map (Fig. 9.1) showing soil and water conservation plan with different kinds of structures recommended has been prepared which shows the spatial distribution and extent of area. Entire area of about 592 ha (92%) needs Graded Bunding.

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

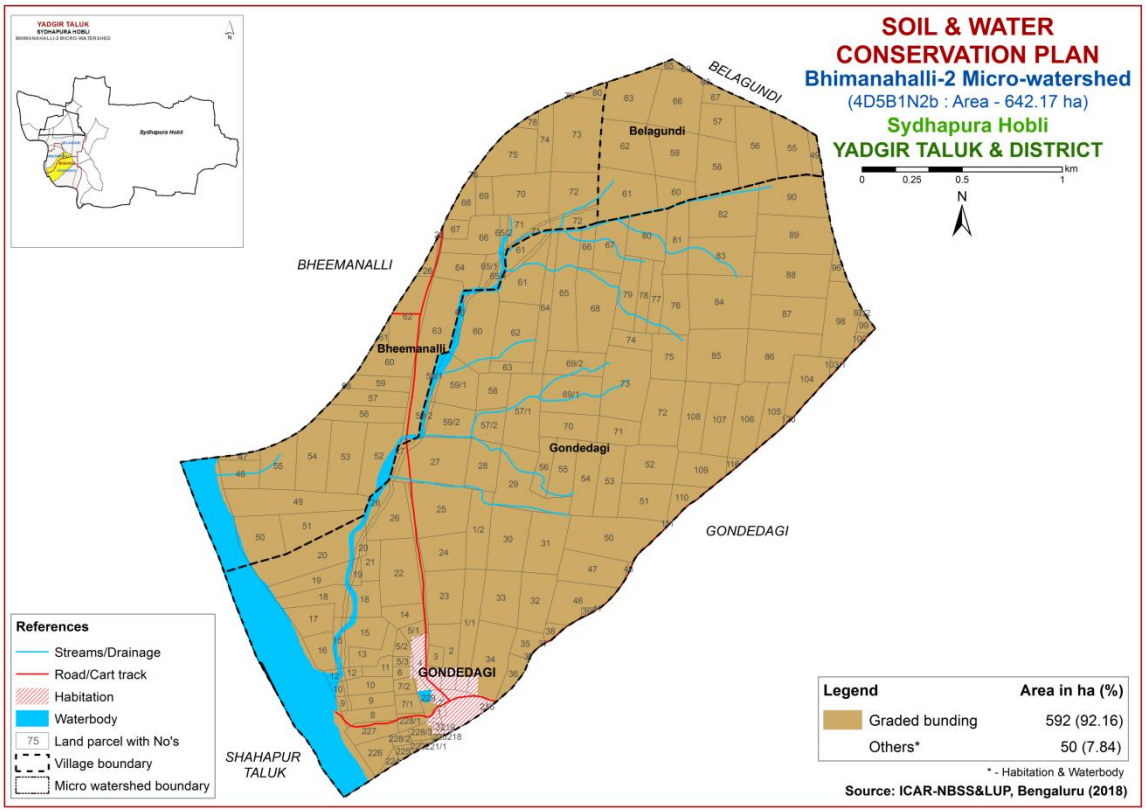



Fig. 9.1 Soil and Water Conservation Plan map of Bhimanahalli-2 Microwatershed

### 9.3 Greening of Microwatershed

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

It is recommended to open pits during the 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 Nerale (*Sizyzium cumini*) and Bamboo. Dry areas are to be planted with species like Honge, Bevu, Seetaphal *etc*.

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

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# Appendix I

## Bhimanahalli-2 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Belagundi | 49 | 1.01 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Belagundi | 55 | 4.85 | BMNmB2 | LMU-2 | 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 |
| Belagundi | 56 | 7.2 | BMNmB2g1 | LMU-2 | Very deep (>150 cm) | Clay | Gravelly (15-35%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Belagundi | 57 | 3.03 | BMNmB2g1 | LMU-2 | Very deep (>150 cm) | Clay | Gravelly (15-35%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Belagundi | 58 | 5.64 | BMNmB2g1 | LMU-2 | Very deep (>150 cm) | Clay | Gravelly (15-35%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Belagundi | 59 | 5.61 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Belagundi | 60 | 2.5 | BMNmB2g1 | LMU-2 | Very deep (>150 cm) | Clay | Gravelly (15-35%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Belagundi | 61 | 6.72 | BMNmB2g1 | LMU-2 | Very deep (>150 cm) | Clay | Gravelly (15-35%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Belagundi | 62 | 6.25 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Belagundi | 63 | 5.87 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Belagundi | 65 | 0.49 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Belagundi | 66 | 6.94 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Belagundi | 67 | 1.72 | BMNmB2 | LMU-2 | 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 |
| Belagundi | 68 | 0.03 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Belagundi | 69 | 0.01 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Bheemanalli | 25 | 0 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIes | Graded bunding |
| Bheemanalli | 26 | 0.86 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Bheemanalli | 47 | 0.63 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Bheemanalli | 48 | 2.76 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Bheemanalli | 49 | 7.78 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Bheemanalli | 50 | 4.88 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Bheemanalli | 51 | 4.83 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bheemanalli | 52 | 5.66 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy+Redgram (Pd+Rg) | Not Available | IIws | Graded bunding |
| Bheemanalli | 53 | 6.1 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy+Redgram (Pd+Rg) | Not Available | IIws | Graded bunding |
| Bheemanalli | 54 | 5.52 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy+Redgram (Pd+Rg) | Not Available | IIws | Graded bunding |
| Bheemanalli | 55 | 4.27 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Bheemanalli | 56 | 3.37 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Jowar+Paddy (Jw+Pd) | Not Available | IIws | Graded bunding |
| Bheemanalli | 57 | 2.95 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Bheemanalli | 58 | 0.03 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Bheemanalli | 59 | 2.19 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Bheemanalli | 60 | 3.72 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Bheemanalli | 61 | 0.55 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Bheemanalli | 62 | 4.97 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Bheemanalli | 63 | 10.31 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Bheemanalli | 64 | 3.46 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Bheemanalli | 65/1 | 1.59 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Bheemanalli | 65/2 | 0.69 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | Graded bunding |
| Bheemanalli | 66 | 3.97 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Bheemanalli | 67 | 1.19 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Bheemanalli | 68 | 1.93 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Bheemanalli | 69 | 1.67 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Bheemanalli | 70 | 5.63 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Bheemanalli | 71 | 2.32 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | Graded bunding |
| Bheemanalli | 72 | 6.35 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Bheemanalli | 73 | 8.87 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy+Redgram (Pd+Rg) | Not Available | IIes | Graded bunding |
| Bheemanalli | 74 | 2.5 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bheemanalli | 75 | 5.5 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Bheemanalli | 76 | 0.05 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Bheemanalli | 78 | 0.58 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Bheemanalli | 79 | 0 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Bheemanalli | 80 | 0.82 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 1 | 0.32 | Habitation | Others | Others | Others | Others | Others | Others | Others | Habitation | Not Available | Others | Others |
| Gondedagi | 1/1 | 5.05 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 2/1 | 4.37 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 2 | 3.46 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Gondedagi | 3 | 0.97 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Gondedagi | 4 | 2.52 | Habitation | Others | Others | Others | Others | Others | Others | Others | Habitation | Not Available | Others | Others |
| Gondedagi | 1/5 | 0.8 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIes | Graded bunding |
| Gondedagi | 2/5 | 0.84 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIes | Graded bunding |
| Gondedagi | 3/5 | 0.49 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | Graded bunding |
| Gondedagi | 6 | 0.59 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | Graded bunding |
| Gondedagi | 1/7 | 1.21 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIes | Graded bunding |
| Gondedagi | 2/7 | 0.88 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Gondedagi | 8 | 1.92 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIes | Graded bunding |
| Gondedagi | 9 | 1.9 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Gondedagi | 10 | 2.31 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Gondedagi | 11 | 1.13 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIes | Graded bunding |
| Gondedagi | 12 | 1.01 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIws | Graded bunding |
| Gondedagi | 13 | 2.33 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Gondedagi | 14 | 2 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIes | Graded bunding |

| Village | Survey No | Area (ha) | Soil Phase | LMU | Soil Depth | Surface Soil Texture | Soil Gravelliness | Available Water Capacity | Slope | Soil Erosion | Current Land Use | WELLS | Land Capability | Conservation Plan |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gondedagi | 15 | 4.19 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Gondedagi | 16 | 2.3 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Gondedagi | 17 | 3.06 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Gondedagi | 18 | 5.74 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Gondedagi | 19 | 3.94 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Gondedagi | 20 | 8.39 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Gondedagi | 21 | 1.71 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIes | Graded bunding |
| Gondedagi | 22 | 6.35 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIes | Graded bunding |
| Gondedagi | 23 | 4.97 | BMNmB2 | LMU-2 | 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 |
| Gondedagi | 24 | 3.97 | BMNmB2 | LMU-2 | 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 |
| Gondedagi | 25 | 7.08 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar+Redgram (Ct+Jw+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 26 | 5.2 | TMKiB2 | LMU-1 | Very deep (>150 cm) | Sandy clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIws | Graded bunding |
| Gondedagi | 27 | 7.74 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 28 | 3.83 | BMNmB2 | LMU-2 | 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 |
| Gondedagi | 29 | 7.15 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 30 | 6.05 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 31 | 5.69 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar+Redgram (Ct+Jw+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 32 | 4.62 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Gondedagi | 33 | 4.99 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 34 | 6.59 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar+Redgram (Ct+Jw+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 35 | 1.71 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 36 | 1.55 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Gondedagi | 37 | 0.06 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Gondedagi | 38 | 0.66 | BMNmB2 | LMU-2 | 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 |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gondedagi | 39 | 0.24 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 41 | 0.01 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Gondedagi | 46 | 4.76 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Gondedagi | 47 | 4.87 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 48 | 0.13 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Gondedagi | 50 | 8.4 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar+Redgram (Ct+Jw+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 51 | 4.47 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 52 | 4.99 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 53 | 4.39 | BMNmB2 | LMU-2 | 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 |
| Gondedagi | 54 | 4.46 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 55 | 3.46 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Gondedagi | 56 | 2.31 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | Graded bunding |
| Gondedagi | 57/1 | 6.39 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 57/2 | 2.51 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Gondedagi | 58 | 2.81 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Gondedagi | 59/1 | 4.86 | BMNmB2 | LMU-2 | 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 |
| Gondedagi | 59/2 | 3.91 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Gondedagi | 60 | 6.94 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 61 | 6.24 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 62 | 6.11 | BMNmB2 | LMU-2 | 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 |
| Gondedagi | 63 | 1.21 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | Graded bunding |
| Gondedagi | 64 | 3.8 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 65 | 7.53 | BMNmB2 | LMU-2 | 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 |
| Gondedagi | 66 | 1.55 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | Graded bunding |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gondedagi | 67 | 4.08 | BMNmB2g1 | LMU-2 | Very deep (>150 cm) | Clay | Gravelly (15-35%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 68 | 7.87 | BMNmB2 | LMU-2 | 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 |
| Gondedagi | 69/1 | 5.7 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 69/2 | 3.52 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 70 | 3.74 | BMNmB2 | LMU-2 | 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 |
| Gondedagi | 71 | 2.69 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Gondedagi | 72 | 6.25 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 73 | 8.08 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar+Redgram (Ct+Jw+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 74 | 1.78 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | Graded bunding |
| Gondedagi | 75 | 4.04 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 76 | 4.01 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 77 | 2.2 | BMNmB2 | LMU-2 | 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 |
| Gondedagi | 78 | 2.35 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Gondedagi | 79 | 3.58 | BMNmB2 | LMU-2 | 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 |
| Gondedagi | 80 | 4.49 | BMNmB2g1 | LMU-2 | Very deep (>150 cm) | Clay | Gravelly (15-35%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Gondedagi | 81 | 3.97 | BMNmB2g1 | LMU-2 | Very deep (>150 cm) | Clay | Gravelly (15-35%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 82 | 7.7 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 83 | 6.33 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 84 | 8.3 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 85 | 7.94 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Gondedagi | 86 | 7.54 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar+Redgram (Ct+Jw+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 87 | 6.63 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Gondedagi | 88 | 8.28 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 89 | 7.15 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |

| Village | Survey No | Area (ha) | Soil Phase | LMU | Soil Depth | Surface Soil Texture | Soil Gravelliness | Available Water Capacity | Slope | Soil Erosion | Current Land Use | WELLS | Land Capability | Conservation Plan |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gondedagi | 90 | 6.47 | BMNmB2 | LMU-2 | 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 |
| Gondedagi | 96 | 0.95 | BMNmB2 | LMU-2 | 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 |
| Gondedagi | 97/2 | 0.08 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 98 | 5.92 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 99 | 0.58 | BMNmB2 | LMU-2 | 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 |
| Gondedagi | 100 | 0.36 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 103/1 | 0.4 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton (Ct) | Not Available | IIes | Graded bunding |
| Gondedagi | 104 | 4.36 | BMNmB2 | LMU-2 | 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 |
| Gondedagi | 105 | 3.12 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Gondedagi | 106 | 5.23 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 107 | 5 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Redgram (Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 108 | 4.33 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Gondedagi | 109 | 3.91 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Gondedagi | 110 | 1.94 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 111 | 0.04 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 116 | 0.43 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Jowar (Ct+Jw) | Not Available | IIes | Graded bunding |
| Gondedagi | 120 | 0.14 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Cotton+Redgram (Ct+Rg) | Not Available | IIes | Graded bunding |
| Gondedagi | 216 | 0.05 | Habitation | Others | Others | Others | Others | Others | Others | Others | Habitation | Not Available | Others | Others |
| Gondedagi | 218 | 0.03 | Habitation | Others | Others | Others | Others | Others | Others | Others | Habitation | Not Available | Others | Others |
| Gondedagi | 219 | 0.17 | Habitation | Others | Others | Others | Others | Others | Others | Others | Habitation | Not Available | Others | Others |
| Gondedagi | 220 | 0.18 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIes | Graded bunding |
| Gondedagi | 221/1 | 0.18 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | Graded bunding |
| Gondedagi | 222 | 0.27 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIes | Graded bunding |
| Gondedagi | 224 | 0.51 | BMNmB2 | LMU-2 | Very deep (>150 cm) | Clay | Non gravelly (<15%) | Very high (>200 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIes | Graded bunding |

| Village | Survey No | Area (ha) | Soil Phase | LMU | Soil Depth | Surface Soil Texture | Soil Gravelliness | Available Water Capacity | Slope | Soil Erosion | Current Land Use | WELLS | Land Capability | Conservation Plan |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gondedagi | 225 | 0.46 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIes | Graded bunding |
| Gondedagi | 226 | 2.1 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIes | Graded bunding |
| Gondedagi | 227 | 2.2 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIes | Graded bunding |
| Gondedagi | 228 /1 | 1.03 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIes | Graded bunding |
| Gondedagi | 228 /2 | 0.63 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Not Available (NA) | Not Available | IIes | Graded bunding |
| Gondedagi | 228 /3 | 0.88 | HLGiB2 | LMU-3 | Moderately shallow (50-75 cm) | Sandy clay | Non gravelly (<15%) | Low (51-100 mm/m) | Very gently sloping (1-3%) | Moderate | Paddy (Pd) | Not Available | IIes | Graded bunding |
| Gondedagi | 229 | 1.71 | Habitation | Others | Others | Others | Others | Others | Others | Others | Habitation | Not Available | Others | Others |

# Appendix II

## Bhimanahalli-2 Microwatershed

## Soil Fertility Information

| Village | Survey No. | Soil Reaction | Salinity | Organic Carbon | Available Phosphorus | Available Potassium | Available Sulphur | Available Boron | Available Iron | Available Manganese | Available Copper | Available Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Belagundi | 49 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 – 0.75 %) | Medium (23 – 57 kg/ha) | High (> 337 kg/ha) | Medium (10 – 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Belagundi | 55 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 – 0.75 %) | Medium (23 – 57 kg/ha) | High (> 337 kg/ha) | Medium (10 – 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Belagundi | 56 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Belagundi | 57 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Belagundi | 58 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Belagundi | 59 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Belagundi | 60 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Belagundi | 61 | 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) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Belagundi | 62 | 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) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Belagundi | 63 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Belagundi | 65 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | Medium (23 – 57 kg/ha) | High (> 337 kg/ha) | Medium (10 – 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Belagundi | 66 | 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) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Belagundi | 67 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | Medium (23 – 57 kg/ha) | High (> 337 kg/ha) | Medium (10 – 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Belagundi | 68 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | Medium (23 – 57 kg/ha) | High (> 337 kg/ha) | Medium (10 – 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Belagundi | 69 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | Medium (23 – 57 kg/ha) | High (> 337 kg/ha) | Medium (10 – 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Bheemanalli | 25 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 26 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 47 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 48 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 49 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 50 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 51 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |

| Village | Survey No. | Soil Reaction | Salinity | Organic Carbon | Available Phosphorus | Available Potassium | Available Sulphur | Available Boron | Available Iron | Available Manganese | Available Copper | Available Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bheemanalli | 52 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 53 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 54 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 55 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | High (> 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 56 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 57 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 58 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 59 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 60 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 61 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 62 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 63 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 64 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 65/1 | 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) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 65/2 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 66 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 67 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 68 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 69 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 70 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 71 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 72 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 73 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 74 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |

| Village | Survey No. | Soil Reaction | Salinity | Organic Carbon | Available Phosphorus | Available Potassium | Available Sulphur | Available Boron | Available Iron | Available Manganese | Available Copper | Available Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bheemanalli | 75 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Bheemanalli | 76 | 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) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Bheemanalli | 78 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 79 | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Bheemanalli | 80 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 1 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Gondedagi | 1/1 | 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) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 2/1 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 2 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 3 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | Medium (10 – 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 4 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Gondedagi | 1/5 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 2/5 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 3/5 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 6 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 1/7 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 2/7 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 8 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 9 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 10 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 11 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 12 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 13 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 14 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 15 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |

| Village | Survey No. | Soil Reaction | Salinity | Organic Carbon | Available Phosphorus | Available Potassium | Available Sulphur | Available Boron | Available Iron | Available Manganese | Available Copper | Available Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gondedagi | 16 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 17 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 18 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 19 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 20 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 21 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 22 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 23 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 24 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 25 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 26 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 27 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 28 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 29 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 30 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 31 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 32 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 33 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (> 0.75 %) | Medium (23 – 57 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 34 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 35 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 36 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 37 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 38 | Neutral (pH 6.5 – 7.3) | Non saline (<2 dsm ) | Medium (0.5 – 0.75 %) | Low (< 23 kg/ha) | Medium (145 – 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 39 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |

| Village | Survey No. | Soil Reaction | Salinity | Organic Carbon | Available Phosphorus | Available Potassium | Available Sulphur | Available Boron | Available Iron | Available Manganese | Available Copper | Available Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gondedagi | 41 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 46 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 47 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 48 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 50 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 51 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 52 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 53 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 54 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 55 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 56 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 57/1 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 57/2 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 58 | Moderately alkaline (pH 7.8 – 8.4) | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 59/1 | Moderately alkaline (pH 7.8 – 8.4) | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 59/2 | 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) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 60 | Moderately alkaline (pH 7.8 – 8.4) | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 61 | Moderately alkaline (pH 7.8 – 8.4) | 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 (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 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) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 63 | Moderately alkaline (pH 7.8 – 8.4) | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 64 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 65 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 – 0.75 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 66 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 67 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 – 0.75 %) | Medium (23 – 57 kg/ha) | High (> 337 kg/ha) | Medium (10 – 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |

| Village | Survey No. | Soil Reaction | Salinity | Organic Carbon | Available Phosphorus | Available Potassium | Available Sulphur | Available Boron | Available Iron | Available Manganese | Available Copper | Available Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gondedagi | 68 | 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) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 69/1 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 69/2 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Medium (10 – 20 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 70 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 71 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 73 | 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) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 74 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Medium (10 – 20 ppm) | Medium (0.5 – 1.0 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 75 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Medium (23 – 57 kg/ha) | High (> 337 kg/ha) | Medium (10 – 20 ppm) | Medium (0.5 – 1.0 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 76 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 77 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Medium (23 – 57 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Medium (0.5 – 1.0 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 78 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Medium (23 – 57 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Medium (0.5 – 1.0 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 79 | 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) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 80 | 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) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 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) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 82 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 83 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 84 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Medium (10 – 20 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 85 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Medium (10 – 20 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 86 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 87 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 88 | 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) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 89 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 90 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |

| Village | Survey No. | Soil Reaction | Salinity | Organic Carbon | Available Phosphorus | Available Potassium | Available Sulphur | Available Boron | Available Iron | Available Manganese | Available Copper | Available Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gondedagi | 96 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 97/2 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 98 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 99 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 100 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Deficient (< 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 103/1 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 104 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 105 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 106 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 107 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Medium (10 – 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 108 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 109 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Medium (10 – 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 110 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Medium (10 – 20 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 111 | 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 (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 116 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 120 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Low (< 0.5 %) | Low (< 23 kg/ha) | High (> 337 kg/ha) | Low (<10 ppm) | Low (< 0.5 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 216 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Gondedagi | 218 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Gondedagi | 219 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Gondedagi | 220 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 221/1 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | Medium (0.5 – 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 222 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 – 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 224 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 – 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 225 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | Medium (0.5 – 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 226 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 227 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |

| Village | Survey No. | Soil Reaction | Salinity | Organic Carbon | Available Phosphorus | Available Potassium | Available Sulphur | Available Boron | Available Iron | Available Manganese | Available Copper | Available Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gondedagi | 228/1 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 228/2 | Moderately alkaline (pH 7.8 – 8.4) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Sufficient (> 0.6 ppm) |
| Gondedagi | 228/3 | Slightly alkaline (pH 7.3 – 7.8) | Non saline (<2 dsm ) | High (> 0.75 %) | High (> 57 kg/ha) | High (> 337 kg/ha) | High (> 20 ppm) | Medium (0.5 – 1.0 ppm) | Sufficient (> 4.5 ppm) | Sufficient (> 1.0 ppm) | Sufficient (> 0.2 ppm) | Deficient (< 0.6 ppm) |
| Gondedagi | 229 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |

# Appendix III

## Bhimanahalli-2 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 | Drum stick | Mulberry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Belagundi | 49 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Belagundi | 55 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Belagundi | 56 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Belagundi | 57 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Belagundi | 58 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Belagundi | 59 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Belagundi | 60 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Belagundi | 61 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Belagundi | 62 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Belagundi | 63 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Belagundi | 65 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Belagundi | 66 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Belagundi | 67 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Belagundi | 68 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Belagundi | 69 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Bheemanalli | 25 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Bheemanalli | 26 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 47 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 48 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 49 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 50 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 51 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 52 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 53 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 54 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 55 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 56 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 57 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 58 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 59 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 60 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 61 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 62 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 63 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2tw | S2t | S2tw | S3tw |
| Bheemanalli | 64 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Bheemanalli | 65/1 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Bheemanalli | 65/2 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Bheemanalli | 66 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Bheemanalli | 67 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Bheemanalli | 68 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | 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 | Drum stick | Mulberry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bheemanalli | 69 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Bheemanalli | 70 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Bheemanalli | 71 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Bheemanalli | 72 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Bheemanalli | 73 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Bheemanalli | 74 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Bheemanalli | 75 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Bheemanalli | 76 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Bheemanalli | 78 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Bheemanalli | 79 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Bheemanalli | 80 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 1 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Gondedagi | 1/1 | 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 |
| Gondedagi | 2/1 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 2 | 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 |
| Gondedagi | 3 | 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 |
| Gondedagi | 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 |
| Gondedagi | 1/5 | 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 |
| Gondedagi | 2/5 | 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 |
| Gondedagi | 3/5 | 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 |
| Gondedagi | 6 | 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 |
| Gondedagi | 1/7 | 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 |
| Gondedagi | 2/7 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 8 | 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 |
| Gondedagi | 9 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 10 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 11 | 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 |
| Gondedagi | 12 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 13 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 14 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 15 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 16 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 17 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 18 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 19 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 20 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 21 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 22 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 23 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 24 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 25 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 26 | S3tw | S2tw | S3tw | S1 | S3tw | S1 | S2tw | S2zw | S1 | S2rw | S2tw | S1 | S3tw | S1 | N1tz | S2tw | S2zw | S3tw | S2tw | S3tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 27 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 28 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | 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 | Drum stick | Mulberry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gondedagi | 29 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 30 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 31 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 32 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 33 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 34 | 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 |
| Gondedagi | 35 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 36 | 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 |
| Gondedagi | 37 | 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 |
| Gondedagi | 38 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 39 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 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 |
| Gondedagi | 46 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 47 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 48 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 50 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 51 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 52 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 53 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 54 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 55 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 56 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 57/1 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 57/2 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 58 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 59/1 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 59/2 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 60 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 61 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 62 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 63 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 64 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 65 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 66 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 67 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 68 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 69/1 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 69/2 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 70 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 71 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 72 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 73 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 74 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 75 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | 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 | Drum stick | Mulberry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gondedagi | 76 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 77 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 78 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 79 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 80 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 81 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 82 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 83 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 84 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 85 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 86 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 87 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 88 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 89 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 90 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 96 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 97/2 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 98 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 99 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 100 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 103/1 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 104 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 105 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 106 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 107 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 108 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 109 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 110 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 111 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 116 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 120 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 216 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Gondedagi | 218 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Gondedagi | 219 | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others | Others |
| Gondedagi | 220 | 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 |
| Gondedagi | 221/1 | 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 |
| Gondedagi | 222 | 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 |
| Gondedagi | 224 | S3t | S2t | S3t | S1 | S3t | S1 | S2t | S1 | S1 | S1 | S2tw | S2t | S3t | S1 | N1t | S2t | S1 | S3tw | S2tw | S2tw | S2tw | S2tw | S2t | S2tw | S2tw | S3tw |
| Gondedagi | 225 | 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 |
| Gondedagi | 226 | 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 |
| Gondedagi | 227 | 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 |
| Gondedagi | 228/1 | 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 |
| Gondedagi | 228/2 | 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 |
| Gondedagi | 228/3 | 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 |

| 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 | Drum stick | Mulberry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gondedagi | 229 | Others | Others | 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***

## *FINDINGS OF THE SOCIO-ECONOMIC SURVEY*

- *The survey was conducted in Bhimanahalli-2 is located at North latitude $16^0$ 32' 4.587" and $16^0$ 30' 8.645" and East longitude $77^0$ 13' 4.587" and $77^0$ 11' 53.709" covering an area of about 641.91 ha coming unde Bheemanahalli, Belagundi and Gondedagi Villages of Yadagiri taluk.*
- *Socio-economic analysis of Bhimanahalli-2 micro watersheds of Belagunda sub-watershed, Yadgiri taluk & District indicated that, out of the total sample of 35 farmers were sampled in Bhimanahalli-2 micro-watershed among households surveyed 10 (28.57%) were marginal, 8 (22.86%) were small, 9 (25.71 %) were semi medium, 3 (8.57 %) were medium and 1 (2.86 %) were large farmers. 4 landless farmers were also interviewed for the survey.*
- *The population characteristics of households indicated that, there were 87 (50.88%) men and 84 (49.12 %) were women. The average population of landless was 5.3, marginal farmers were 4.6, small farmers 5, semi medium farmers were 4.8, medium farmers were 5.7 and large farmers were 4.*
- *Majority of the respondents (43.27%) were in the age group of 16-35 years.*
- *Education level of the sample households indicated that, there were 32.16 per cent illiterates, 69.00 per cent pre university education and 3.51 per cent attained graduation.*
- *About, 60.00 per cent of household heads practicing agriculture and 40.00 per cent of the household heads were engaged as agricultural labourers.*
- *Agriculture was the major occupation for 34.50 per cent of the household members.*
- *In the study area, 85.71 per cent of the households possess katcha house and 2.86 per cent possess pucca house.*
- *The durable assets owned by the households showed that, 51.43 per cent possess TV, 5.71 per cent possess mixer grinder, 97.14 per cent possess mobile phones and 5.71 per cent possess motor cycles.*
- *Farm implements owned by the households indicated that, 17.14 per cent of the households possess plough, 2.86 per cent possess tractor, 11.43 per cent possess bullock cart and 2.86 per cent possess sprayer.*
- *Regarding livestock possession by the households, 2.86 per cent possess local cow.*
- *The average labour availability in the study area showed that, own labour men available in the micro watershed was 1.4, women available in the micro watershed was 1.26, hired labour (men) available was 9.29 and hired labour (women) available was 17.86.*
- *In the study area, about 0.58 per cent of the respondents migrated from the micro watershed in search of jobs with an average distance of 60.00 kms for about 5.00 months.*

- *Out of the total land holding of the sample respondents 52.06 per cent (47.64 ha) of the area is under dry condition and the remaining 47.94 per cent area is irrigated land.*
- *There were 10.00 live bore wells and 10.00 dry bore wells among the sampled households.*
- *Bore well was the major source of irrigation for 28.57 per cent of the households.*
- *The major crops grown by sample farmers are Paddy, Cotton, Jowar and cropping intensity was recorded as 100.00 per cent.*
- *Out of the sample households 77.14 percent possessed bank account and 14.29 per cent of them have savings in the account.*
- *About 97.14 per cent of the respondents borrowed credit from various sources.*
- *Among the credit borrowed by households, 76.47 per cent have borrowed loan from commercial banks and 5.88 per cent from co-operative/Grameena bank.*
- *Majority of the respondents (94.12%) have borrowed loan for agriculture purpose.*
- *Regarding the opinion on institutional sources of credit, 52.94 per cent of the households opined that credit helped to perform timely agricultural operations.*
- *The per hectare cost of cultivation for Paddy, Cotton and Jowar was Rs.36691.84 , 33964.25 and 21455.24 with benefit cost ratio of 1:1.3, 1: 1.6 and 1:1.7 respectively.*
- *Further, 28.57 per cent of the households opined that dry fodder was adequate.*
- *The average annual gross income of the farmers was Rs. 93602.86 in micro-watershed, of which Rs. 62488.57 comes from agriculture.*
- *Sampled households have grown 6 forestry trees together in the fields and back yards.*
- *About 42.86 per cent of the households shown interest to cultivate horticultural crops.*
- *Households have an average investment capacity of Rs. 4800.00 for land development and Rs. 5942.86 for irrigation facility.*
- *Source of funds for additional investment is concerned, 20.00 per cent depends on own funds.*
- *Regarding marketing channels, 5.71 per cent of the households have sold agricultural produce to the local/village merchants, while, 85.71 per cent have sold in regulated markets.*
- *Further, 17.14 per cent of the households have used tractor for the transport of agriculture commodity.*
- *Majority of the farmers (85.71%) have experienced soil and water erosion problems in the watershed and 82.86 per cent of the households were interested towards soil testing.*
- *Fire was the major source of fuel for domestic use for 80.00 per cent of the households and 17.14 per cent households has LPG connection.*

- *Piped supply was the major source for drinking water for 100.00 per cent of the households.*
- *Electricity was the major source of light for 100.00 per cent of the households.*
- *In the study area, 40.00 per cent of the households possess toilet facility.*
- *Regarding possession of PDS card, 100.00 per cent of the households possessed BPL card.*
- *Households opined that, the requirement of cereals (42.86%), pulses (31.43%) and oilseeds (17.14%) are adequate for consumption.*
- *Farming constraints experienced by households in the micro watersheds were lower fertility status of the soil (45.71%) wild animal menace on farm field (31.43%), frequent incidence of pest and diseases (40.00%), inadequacy of irrigation water (80.00%), high cost of fertilizers and plant protection chemicals (85.71%), high rate of interest on credit (80.00%), low price for the agricultural commodities (88.57%), lack of marketing facilities in the area (82.86%), inadequate extension services (5.71%), lack of transport for safe transport of the agricultural produce to the market (51.43%).*

*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, labor 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.

## 1. Description of the study area

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

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

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

## 2. Locale of the survey and description of the micro-watershed and

The study was conducted in Bhimanahalli-2 micro-watershed (Belagunda sub-watershed, Yadgiri taluk & District) is located at North latitude $16^0$ 32’ 4.587” and $16^0$ 30' 8.645" and East longitude $77^0$ 13’ 4.587" and $77^0$ 11’ 53.709”covering an area of about 641.91 ha bounded by unde Bheemanahalli, Belagundi and Gondedagi Villages.

## 3. Selection of the respondents for the study

The micro-watershed is marked with 320 square meters grids. One farmer from every alternate grid in the micro-watershed was selected for the study and interviewed for socio-economic data. Totally 35 households were interviewed for the survey.

## 4. The parameters considered for socio-economic survey of households

Two forms of data were collected from the micro-watershed which includes primary data from the farm households and secondary data about the villages under the micro-watershed jurisdiction.

The following parameters were considered for the primary data collection about the socio-economic data of the households, (1) Demographic information, (2) Farm and durable assets owned by households, (3) Livestock possession, (4) Labour availability, (5) Level of migration in the village, Land holding, (7) Cropping pattern, (8) Source of irrigation, (9) Borrowing status, (10) Cost of cultivation of major crops, (11) Economics of subsidiary activities, (12) Fodder availability, (13) Family annual income from different sources, (14) Horticulture and forestry species grown, (15) Additional investment capacity, (16) Marketing practices, (17) Status of soil and water conservation structure, (18) Access to basic needs and (19) Constraints and suggestion.

The following parameters were considered for the secondary data regarding the villages under the micro-watershed jurisdiction, (1) Number of villages in each micro-watershed jurisdiction, (2) Village wise number of households, (3) Geographical area of the villages, (4) Cultivable are a including rainfed and irrigated, (5) Number and type of house in each village, (6) Human and livestock population, (7) Facilities in the village such as roads, transport facility for conveyance, drinking water supply, street light and (8) Community based organizations in the villages.

## 5. Development of interview schedule and data collection

Taking into the consideration the objectives of the survey, an interview schedule was prepared after thorough consultation with the experts in the field of social sciences. A comprehensive interview schedule covering all the major parameters for measuring the socio-economic situation was developed.

## 6. Tools used to analyze the data

The statistical components such as frequency and percentage were used to analyze the data.

**Abbreviations used in the report**

LL=Landless
MF=Marginal Farmers
SF=Small farmers
SMF=Semi medium farmers
MDF=Medium farmers
LF=Large Farmers

*Chapter 4*

## FINDINGS OF THE SURVEY

This chapter deals with systematic presentation of results of the survey. Keeping in view the objectives, the salient features of the survey are presented under the following headings.

**Households sampled for socio-economic survey:** The data on households sampled for socio economic survey in Bhimanahalli-2 Micro watershed is presented in Table 1 and it indicated that 35 farmers were sampled in Bhimanahalli-2 micro-watershed among households surveyed 10 (28.57%) were marginal, 8 (22.86%) were small, 9 (25.71 %) were semi medium, 3 (8.57 %) were medium and 1 (2.86 %) were large farmers. 4 landless farmers were also interviewed for the survey.

**Table 1. Households sampled for socio economic survey in Bhimanahalli-2 micro-watershed**

| Sl. No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Farmers | 4 | 11.4 | 10 | 28.6 | 8 | 22.9 | 9 | 25.7 | 3 | 8.57 | 1 | 3 | 35 | 100 |

**Population characteristics:** The population characteristics of households sampled for socio-economic survey in Bhimanahalli-2 Micro watershed is presented in Table 2. The data indicated that, there were 87 (50.88%) men and 84 (49.12%) were women. The average population of landless was 5.3, marginal farmers were 4.6, small farmers 5, semi medium farmers were 4.8, medium farmers were 5.7 and large farmers were 4.

**Table 2. Population characteristics in Bhimanahalli-2 micro-watershed**

| Sl. No. | Particulars | LL (21) | | MF (46) | | SF (40) | | SMF (43) | | MDF (17) | | LF (4) | | All (171) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Men | 8 | 38.1 | 23 | 50 | 24 | 60 | 22 | 51.2 | 8 | 47.1 | 2 | 50 | 87 | 50.9 |
| 2 | Women | 13 | 61.9 | 23 | 50 | 16 | 40 | 21 | 48.8 | 9 | 52.9 | 2 | 50 | 84 | 49.1 |
| Total | | 21 | 100 | 46 | 100 | 40 | 100 | 43 | 100 | 17 | 100 | 4 | 100 | 171 | 100 |
| Average | | 5.3 | | 4.6 | | 5.0 | | 4.8 | | 5.7 | | 4.0 | | 4.9 | |

**Age wise classification of population:** The age wise classification of household members in Bhimanahalli-2 Micro watershed is presented in Table 3. The indicated that, 40 (23.39%) of population were 0-15 years of age, 74 (43.27%) were 16-35 years of age, 39 (22.81%) were 36-60 years of age and 18 (10.53 %) were above 61 years of age.

**Table 3: Age wise classification of members of the household in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (21) | | MF (46) | | SF (40) | | SMF (43) | | MDF (17) | | LF (4) | | All (171) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | 0-15 years of age | 7 | 33.3 | 13 | 28.3 | 11 | 27.5 | 7 | 16.28 | 2 | 12 | 0 | 0 | 40 | 23.39 |
| 2 | 16-35 years of age | 8 | 38.1 | 19 | 41.3 | 16 | 40 | 20 | 46.51 | 9 | 53 | 2 | 50 | 74 | 43.27 |
| 3 | 36-60 years of age | 4 | 19.1 | 9 | 19.6 | 10 | 25 | 11 | 25.58 | 3 | 18 | 2 | 50 | 39 | 22.81 |
| 4 | > 61 years | 2 | 9.52 | 5 | 10.9 | 3 | 7.5 | 5 | 11.63 | 3 | 18 | 0 | 0 | 18 | 10.53 |
| Total | | 21 | 100 | 46 | 100 | 40 | 100 | 43 | 100 | 17 | 100 | 4 | 100 | 171 | 100 |

**Education level of household members:** Education level of household members in Bhimanahalli-2 Micro watershed is presented in Table 4. The results indicated that, there were 32.16 per cent of illiterates, 35.67 per cent of them had primary school education, 0.58 per cent middle school education, 21.05 per cent high school education, 5.85 per cent of them had PUC education and 3.51 per cent attained graduation.

**Table 4. Education level of members of the household in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (21) | | MF (46) | | SF (40) | | SMF (43) | | MDF (17) | | LF (4) | | All (171) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Illiterate | 7 | 33.3 | 20 | 43.5 | 11 | 27.5 | 13 | 30.2 | 3 | 17.65 | 1 | 25 | 55 | 32.2 |
| 2 | Primary School | 8 | 38.1 | 20 | 43.5 | 13 | 32.5 | 13 | 30.2 | 7 | 41.18 | 0 | 0 | 61 | 35.7 |
| 3 | Middle School | 0 | 0 | 0 | 0 | 1 | 2.5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0.58 |
| 4 | High School | 4 | 19.1 | 5 | 10.9 | 9 | 22.5 | 11 | 25.6 | 6 | 35.29 | 1 | 25 | 36 | 21.1 |
| 5 | PUC | 1 | 4.76 | 0 | 0 | 4 | 10 | 4 | 9.3 | 0 | 0 | 1 | 25 | 10 | 5.85 |
| 6 | ITI | 0 | 0 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1.17 |
| 7 | Degree | 1 | 4.76 | 1 | 2.17 | 0 | 0 | 2 | 4.65 | 1 | 5.88 | 1 | 25 | 6 | 3.51 |
| Total | | 21 | 100 | 46 | 100 | 40 | 100 | 43 | 100 | 17 | 100 | 4 | 100 | 171 | 100 |

**Occupation of head of households:** The data regarding the occupation of the household heads in Bhimanahalli-2 Micro watershed is presented in Table 5. The results indicate that, 60.00 per cent of households heads were practicing agriculture, 40.00 per cent of the household heads were agricultural Labour.

**Table 5: Occupation of heads of households in Bhimanahalli-2 micro-watershed**

| Sl. No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Agriculture | 0 | 0 | 6 | 60 | 4 | 50 | 7 | 78 | 3 | 100 | 1 | 100 | 21 | 60 |
| 2 | Agricultural Labour | 4 | 100 | 5 | 50 | 3 | 37.5 | 2 | 22 | 0 | 0 | 0 | 0 | 14 | 40 |
| 3 | Government Service | 0 | 0 | 0 | 0 | 1 | 12.5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2.86 |
| 4 | Private Service | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2.86 |
| Total | | 4 | 100 | 12 | 100 | 8 | 100 | 9 | 100 | 3 | 100 | 1 | 100 | 37 | 100 |

**Table 6: Occupation of members of the household in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (21) | | MF (46) | | SF (40) | | SMF (43) | | MDF (17) | | LF (4) | | All (171) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Agriculture | 0 | 0 | 16 | 34.8 | 13 | 32.5 | 21 | 48.84 | 8 | 47 | 1 | 25 | 59 | 34.5 |
| 2 | Agricultural Labour | 8 | 38.1 | 11 | 23.9 | 4 | 10 | 5 | 11.63 | 2 | 12 | 0 | 0 | 30 | 17.5 |
| 3 | General Labour | 1 | 4.76 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1.75 |
| 4 | Government Service | 0 | 0 | 0 | 0 | 1 | 2.5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0.58 |
| 5 | Private Service | 0 | 0 | 1 | 2.17 | 0 | 0 | 0 | 0 | 1 | 5.9 | 0 | 0 | 2 | 1.17 |
| 6 | Student | 9 | 42.9 | 13 | 28.3 | 13 | 32.5 | 13 | 30.23 | 2 | 12 | 2 | 50 | 52 | 30.4 |
| 7 | Housewife | 3 | 14.3 | 5 | 10.9 | 7 | 17.5 | 4 | 9.3 | 4 | 24 | 1 | 25 | 24 | 14 |
| Total | | 21 | 100 | 46 | 100 | 40 | 100 | 43 | 100 | 17 | 100 | 4 | 100 | 171 | 100 |

**Occupation of the members of the household:** The data regarding the occupation of the household members in Bhimanahalli-2 Micro watershed is presented in Table 6. The

results indicate that, agriculture was the major occupation for 34.50 per cent of the household members, 17.54 per cent were agricultural labour, 1.75 per cent were general labour, 0.58 per cent were working in government sector, 30.41 per cent were working in pursuing education and 14.04 per cent were involved as housewife.

**Institutional Participation of household members:** The data regarding the institutional participation of the household members in Bhimanahalli-2 Micro watershed is presented in Table 7. The results show that, out of the total family members in the households 1.17 per cent of them are participating in diary Self Help Group and 2.34 of them were participating in NGOs**.**

**Table 7: Institutional Participation of household member in Bhimanahalli-2 micro-watershed**

| Sl. No. | Particulars | LL (21) | | MF (46) | | SF (40) | | SMF (43) | | MDF (17) | | LF (4) | | All (171) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Self Help Group | 0 | 0 | 0 | 0 | 1 | 2.5 | 0 | 0 | 1 | 5.88 | 0 | 0 | 2 | 1.17 |
| 2 | NGOs | 1 | 4.8 | 1 | 2.17 | 0 | 0 | 1 | 2.33 | 0 | 0 | 1 | 25 | 4 | 2.34 |
| 3 | No Participation | 20 | 95 | 45 | 97.8 | 39 | 97.5 | 42 | 97.7 | 16 | 94.12 | 3 | 75 | 165 | 96.5 |
| Total | | 21 | 100 | 46 | 100 | 40 | 100 | 43 | 100 | 17 | 100 | 4 | 100 | 171 | 100 |

**Type of house owned:** The data regarding the type of house owned by the households in Bhimanahalli-2 Micro watershed is presented in Table 8. The results indicate that, 11.43 percent possess thatched house, 85.71 per cent of the households possess katcha house and 2.86 per cent possess pacca house.

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

| Sl. No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Thatched | 2 | 50 | 1 | 10 | 1 | 12.5 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 11.43 |
| 2 | Katcha | 2 | 50 | 8 | 80 | 7 | 87.5 | 9 | 100 | 3 | 100 | 1 | 100 | 30 | 85.71 |
| 3 | Pucca/RCC | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2.86 |
| Total | | 4 | 100 | 10 | 100 | 8 | 100 | 9 | 100 | 3 | 100 | 1 | 100 | 35 | 100 |

**Durable assets owned by the households:** The data regarding the Durable Assets owned by the households in Bhimanahalli-2 Micro watershed is presented in Table 9. The results shows that, 51.43 per cent possess TV, 5.71 per cent possess mixer grinder, 5.71 per cent possess Bicycle, 5.71 per cent possess motor cycle and 97.14 per cent possess mobile phones.

**Table 9. Durable assets owned by households in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Television | 0 | 0 | 3 | 30 | 4 | 50 | 7 | 78 | 3 | 100 | 1 | 100 | 18 | 51.43 |
| 2 | Mixer/Grinder | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 11 | 1 | 33.3 | 0 | 0 | 2 | 5.71 |
| 3 | Bicycle | 0 | 0 | 0 | 0 | 1 | 12.5 | 0 | 0 | 0 | 0 | 1 | 100 | 2 | 5.71 |
| 4 | Motor Cycle | 0 | 0 | 1 | 10 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 0 | 2 | 5.71 |
| 5 | Mobile Phone | 4 | 100 | 10 | 100 | 8 | 100 | 8 | 89 | 3 | 100 | 1 | 100 | 34 | 97.14 |

**Average value of durable assets:** The data regarding the average value of durable assets owned by the households in Bhimanahalli-2 Micro watershed is presented in Table 10. The result shows that, the average value of television was Rs.4250.00, mixer grinder was Rs.1900.00, bicycle was Rs.2250.00, motor cycle was Rs. 32500.00, mobile phone was Rs.2291.00.

**Table 10. Average value of durable assets owned in Bhimanahalli-2 micro-watershed**

Average Value (Rs.)

| Sl.No. | Particulars | LL (4) | MF (10) | SF (8) | SMF (9) | MDF (3) | LF (1) | All (35) |
|---|---|---|---|---|---|---|---|---|
| 1 | Television | 0 | 4333 | 4000 | 4000 | 4833 | 5000 | 4250 |
| 2 | Mixer/Grinder | 0 | 0 | 0 | 2000 | 1800 | 0 | 1900 |
| 3 | Bicycle | 0 | 0 | 1500 | 0 | 0 | 3000 | 2250 |
| 4 | Motor Cycle | 0 | 35000 | 0 | 30000 | 0 | 0 | 32500 |
| 5 | Mobile Phone | 1625 | 1750 | 1750 | 3250 | 2066 | 5000 | 2291 |

**Farm implements owned:** The data regarding the farm implements owned by the households in Bhimanahalli-2 Micro watershed is presented in Table 11. About 11.43 per cent of the households possess Bullock Cart, 17.14 per cent possess plough and 8.57 per cent possess Seed/Fertilizer Drill and Sprinkler, 2.86 per cent possess Sprayer, 22.86 per cent possess Weeder, 2.86 per cent possess tractor.

**Table 11. Farm implements owned in Bhimanahalli-2 micro-watershed**

| Sl. No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3 | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Bullock Cart | 0 | 0 | 1 | 10 | 2 | 25 | 0 | 0 | 1 | 33.3 | 0 | 0 | 4 | 11.43 |
| 2 | Plough | 0 | 0 | 0 | 0 | 1 | 12.5 | 3 | 33.3 | 1 | 33.3 | 1 | 100 | 6 | 17.14 |
| 3 | Seed/Fertilizer Drill | 0 | 0 | 0 | 0 | 1 | 12.5 | 1 | 11.1 | 0 | 0 | 1 | 100 | 3 | 8.57 |
| 4 | Irrigation Pump | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 100 | 1 | 2.86 |
| 5 | Tractor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 100 | 1 | 2.86 |
| 6 | Sprayer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 100 | 1 | 2.86 |
| 7 | Weeder | 0 | 0 | 2 | 20 | 2 | 25 | 1 | 11.1 | 2 | 66.7 | 1 | 100 | 8 | 22.86 |

**Average value of farm implements:** The data regarding the average value of farm Implements owned by the households in Bhimanahalli-2 Micro watershed is presented in Table 12. The results show that the average value of plough was Rs.7250.00, bullock Cart was Rs.21875.00, sprayer was Rs.28000.00, weeder was Rs.102.00 and tractor Rs. 650000.

**Table 12. Average value of farm implements in Bhimanahalli-2 micro-watershed**

Average Value (Rs.)

| Sl.No. | Particulars | LL (4) | MF (10) | SF (8) | SMF (9) | MDF (3) | LF (1) | All (35) |
|---|---|---|---|---|---|---|---|---|
| 1 | Bullock Cart | 0 | 25000 | 18750 | 0 | 25000 | 0 | 21875 |
| 2 | Plough | 0 | 0 | 3000 | 2666 | 2500 | 30000 | 7250 |
| 3 | Seed/Fertilizer Drill | 0 | 0 | 3500 | 3500 | 0 | 40000 | 15666 |
| 4 | Irrigation Pump | 0 | 0 | 0 | 0 | 0 | 20000 | 20000 |
| 5 | Tractor | 0 | 0 | 0 | 0 | 0 | 650000 | 650000 |
| 6 | Sprayer | 0 | 0 | 0 | 0 | 0 | 28000 | 28000 |
| 7 | Weeder | 0 | 100 | 108 | 100 | 100 | 100 | 102 |

**Livestock possession by the households:** The data regarding the Livestock possession by the households in Bhimanahalli-2 Micro watershed is presented in Table 13. The indicate that, 22.86 per cent of the households possess bullocks, 2.86 per cent possess local cow, 2.86 per cent possess sheep, 5.71 per cent possess goat and 2.86 per cent were poultry birds.

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

| Sl. No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Bullock | 0 | 0 | 1 | 10 | 2 | 25 | 3 | 33 | 2 | 66.7 | 0 | 0 | 8 | 22.86 |
| 2 | Local cow | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2.86 |
| 3 | Sheep | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2.86 |
| 4 | Goat | 0 | 0 | 1 | 10 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 0 | 2 | 5.71 |
| 5 | Poultry birds | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 100 | 1 | 2.86 |

**Average Labour availability:** The data regarding the average labour availability in Bhimanahalli-2 Micro watershed is presented in Table 14. The indicated that, own labour men available in the micro watershed was 1.4, women available in the micro watershed was 1.26, hired labour (men) available was 9.29 and hired labour (women) available was 17.86.

**Table 14. Average labour availability in Bhimanahalli-2 micro-watershed**

| Sl. No. | Particulars | LL (4) | MF (10) | SF (8) | SMF (9) | MDF (3) | LF (1) | All (35) |
|---|---|---|---|---|---|---|---|---|
| | | N | N | N | N | N | N | N |
| 1 | Hired labour Female | 0 | 14.5 | 23.75 | 17.78 | 23.3 | 60 | 17.86 |
| 2 | Own Labour Female | 0 | 1.3 | 1.25 | 1.56 | 2 | 1 | 1.26 |
| 3 | Own labour Male | 0 | 1.4 | 1.38 | 1.78 | 2 | 2 | 1.4 |
| 4 | Hired labour Male | 0 | 7 | 10 | 10 | 15 | 40 | 9.29 |

**Adequacy of hired labour:** The data regarding the adequacy of hired labour in Bhimanahalli-2 Micro watershed is presented in Table 15. The results indicate that, 100.00 per cent of the household opined that hired labour was adequate.

**Table 15. Adequacy of hired labour in Bhimanahalli-2 micro-watershed**

| Sl. No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Adequate | 4 | 100 | 10 | 100 | 8 | 100 | 9 | 100 | 3 | 100 | 1 | 100 | 35 | 100 |

**Migration among the households:** The data regarding the migration (Table 16) indicate that, 0.58 percent of the population was being migrated from the micro watershed.

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

| Sl. No. | Particulars | LL (21) | | MF (46) | | SF (40) | | SMF (43) | | MDF (17) | | LF (4) | | All (171) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Migration | 0 | 0.00 | 0 | 0.00 | 1 | 2.50 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 1 | 0.58 |

**Average distance and duration of migration:** The data regarding the average distance and duration of migration (Table 17) indicate that, people migrated to a distance of 60 kms on an average for 5 months.

**Table 17. Average distance and duration of migration in Bhimanahalli-2 micro-watershed**

| Sl. No. | Particulars | LL (0) | MF (0) | SF (1) | SMF (0) | MDF (0) | LF (0) | All (1) |
|---|---|---|---|---|---|---|---|---|
| | | N | N | N | N | N | N | N |
| 1 | Avg. Distance (kms) | 0 | 0 | 60 | 0 | 0 | 0 | 60 |
| 2 | Avg. Duration (months) | 0 | 0 | 5 | 0 | 0 | 0 | 5 |

**Purpose of migration:** The data regarding the purpose of migration **(**Table 18) indicate that, 100.00 percent of them went for the purpose of job/wage/work.

**Table 18. Purpose of migration by members of households in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (0) | | MF (0) | | SF (1) | | SMF (0) | | MDF (0) | | LF (0) | | All (1) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Job/wage/work | 0 | 0 | 0 | 0 | 1 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 100 |
| Total | | 0 | 100 | 0 | 100 | 1 | 100 | 0 | 100 | 0 | 100 | 0 | 100 | 1 | 100 |

**Negative consequence of migration:** The information pertaining to the negative impact on migration of family members on the family are depicted in the table 19. The result revealed that, it was affected the higher workload for other members (100.00 %).

**Table 19. Negative consequences of migration in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (0) | | MF (0) | | SF (1) | | SMF (0) | | MDF (0) | | LF (0) | | All (1) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Construction of house | 0 | 0 | 0 | 0 | 1 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 100 |

**Distribution of land (ha):** The data regarding the distribution of land (ha) in Bhimanahalli-2 Micro watershed is presented in Table 20. The results indicate that, 24.80 ha (52.06%) of dry land and 22.84 ha (47.94 %) of irrigated land.

**Table 20. Distribution of land (ha) in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Dry | 0 | 0 | 4.74 | 78.28 | 11.35 | 100 | 8.71 | 54.22 | 0 | 0 | 0 | 0 | 24.8 | 52.06 |
| 2 | Irrigated | 0 | 0 | 1.32 | 21.72 | 0 | 0 | 7.36 | 45.78 | 8.9 | 100 | 5.26 | 100 | 22.84 | 47.94 |
| Total | | 0 | 100 | 6.05 | 100 | 11.35 | 100 | 16.07 | 100 | 8.9 | 100 | 5.26 | 100 | 47.64 | 100 |

**Average value of land (ha):** The data regarding the average land value (Rs./ha) in Bhimanahalli-2 Micro watershed is presented in Table 21. The results show that the average value of dry land was Rs.463452.44 and the average value of irrigated land was Rs.424579.13.

**Table 21. Average value of land (ha) in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | MF (10) | SF (8) | SMF (9) | MDF (3) | LF (1) | All (35) |
|---|---|---|---|---|---|---|---|---|
| | | N | N | N | N | N | N | N |
| 1 | Dry | 0 | 885909.5 | 413868.1 | 298281.5 | 0 | 0 | 463452.4 |
| 2 | Irrigated | 0 | 1824000 | 0 | 502695.3 | 291909.1 | 190000 | 424579.1 |

**Status of bore wells:** The data regarding the status of bore wells in Bhimanahalli-2 Micro watershed is presented in Table 22. The results indicate that, there were 10 De-functioning bore wells and 10 functioning bore wells among the sampled households in micro watershed.

**Table 22. Status of bore wells in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | MF (10) | SF (8) | SMF (9) | MDF (3) | LF (1) | All (35) |
|---|---|---|---|---|---|---|---|---|
| | | N | N | N | N | N | N | N |
| 1 | De-functioning | 0 | 2 | 0 | 6 | 2 | 0 | 10 |
| 2 | Functioning | 0 | 2 | 0 | 6 | 2 | 0 | 10 |

**Source of irrigation:** The data regarding the source of irrigation in Bhimanahalli-2 Micro watershed is presented in Table 23. The results that, bore well for 28.57 per cent of the households.

**Table 23. Source of irrigation in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Bore Well | 0 | 0 | 2 | 20 | 0 | 0 | 6 | 66.7 | 2 | 66.67 | 0 | 0 | 10 | 28.57 |

**Depth of water (Avg. In meters):** The data regarding the depth of water in Bhimanahalli-2 Micro watershed is presented in Table 24. The results revealed that, the depth of bore well was 10.89 meter.

**Table 24. Depth of water (Avg. In meters) in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | MF (10) | SF (8) | SMF (9) | MDF (3) | LF (1) | All (35) |
|---|---|---|---|---|---|---|---|---|
| | | N | N | N | N | N | N | N |
| 1 | Bore Well | 0 | 7.62 | 0 | 25.4 | 25.4 | 0 | 10.89 |

**Irrigated Area (ha):** The data regarding the irrigated area (ha) in Bhimanahalli-2 Micro watershed is presented in Table 25. The results indicate that, the availability of irrigation water was used for kharif crops was 22.85 ha.

**Table 25. Irrigated Area (ha) in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | MF (10) | SF (8) | SMF (9) | MDF (3) | LF (1) | All (35) |
|---|---|---|---|---|---|---|---|---|
| 1 | Kharif | 0 | 1.32 | 0 | 7.36 | 8.91 | 5.26 | 22.85 |
| Total | | 0 | 1.32 | 0 | 7.36 | 8.91 | 5.26 | 22.85 |

**Cropping pattern:** The data regarding the cropping pattern in Bhimanahalli-2 Micro watershed is presented in Table 26. The results indicate that, farmers have grown Paddy (22.85 ha), Cotton (21.52 ha), Jowar (3.29 ha).

**Table 26. Cropping pattern in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | MF (10) | SF (8) | SMF (9) | MDF (3) | LF (1) | All (35) |
|---|---|---|---|---|---|---|---|---|
| 1 | Kharif - Paddy | 0 | 1.32 | 0 | 7.36 | 8.91 | 5.26 | 22.85 |
| 2 | Kharif - Cotton | 0 | 3.93 | 8.87 | 8.72 | 0 | 0 | 21.52 |
| 3 | Kharif - Jowar | 0 | 0.81 | 2.48 | 0 | 0 | 0 | 3.29 |
| Total | | 0 | 6.06 | 11.36 | 16.08 | 8.91 | 5.26 | 47.66 |

**Cropping intensity:** The data regarding the cropping intensity in Bhimanahalli-2 Micro watershed is presented in Table 27. The results indicate that, the cropping intensity was 100.00 per cent.

**Table 27. Cropping intensity (%) in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | MF (10) | SF (8) | SMF (9) | MDF (3) | LF (1) | All (35) |
|---|---|---|---|---|---|---|---|---|
| 1 | Cropping Intensity | 0 | 100 | 100 | 100 | 100 | 100 | 100 |

**Possession of bank account and savings:** The data regarding the possession of bank account and saving in Bhimanahalli-2 micro-watershed is presented in Table 28. The results indicate that, 77.14 cent of the households posses bank account and 14.29 per cent of them have savings.

**Table 28. Possession of Bank account and savings in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Account | 2 | 50 | 7 | 70 | 7 | 87.5 | 8 | 88.89 | 2 | 66.67 | 1 | 100 | 27 | 77.14 |
| 2 | Savings | 0 | 0 | 2 | 20 | 2 | 25 | 1 | 11.11 | 0 | 0 | 0 | 0 | 5 | 14.29 |

**Borrowing status:** The data regarding the borrowing status in Bhimanahalli-2 micro-watershed is presented in Table 29. The results indicate that, 97.14 percent of the sample farmers have borrowed credit from different sources.

**Table 29. Borrowing status in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Credit Availed | 4 | 100 | 10 | 100 | 8 | 100 | 8 | 88.9 | 3 | 100 | 1 | 100 | 34 | 97.14 |

**Source of credit:** The data regarding the source of credit availed by households in Bhimanahalli-2 micro-watershed is presented in Table 30. The results shows that, 76.47 per cent have borrowed loan from commercial banks and 17.65 per cent have borrowed loan from Cooperative bank and 17.65 per cent have borrowed loan from Friends/Relatives, 5.88 per cent have borrowed loan from Grameena Bank, 5.88 per cent have borrowed loan from money lender.

**Table 30. Source of credit borrowed by households in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9 | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | N | % | N | % | N | % | N |
| 1 | Commercial Bank | 1 | 100 | 2 | 100 | 4 | 100 | 3 | 43 | 2 | 100 | 1 | 100 | 13 | 76.47 |
| 2 | Cooperative Bank | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 43 | 0 | 0 | 0 | 0 | 3 | 17.65 |
| 3 | Friends/Relatives | 0 | 0 | 1 | 50 | 1 | 25 | 1 | 14 | 0 | 0 | 0 | 0 | 3 | 17.65 |
| 4 | Grameena Bank | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 14 | 0 | 0 | 0 | 0 | 1 | 5.882 |
| 5 | Money Lender | 0 | 0 | 1 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5.882 |

**Avg. Credit amount:** The data regarding the avg. Credit amount in Bhimanahalli-2 micro-watershed is presented in Table 31. The results show that, farmers have borrowed Avg. Credit of Rs.28433.33 from different sources.

**Table 31. Avg. Credit amount in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (1) | MF (2) | SF (4) | SMF (7) | MDF (2) | LF (1) | All (17) |
|---|---|---|---|---|---|---|---|---|
| | | N | N | N | N | N | N | N |
| 1 | Average Credit | 15200 | 45000 | 25400 | 45000 | 25000 | 15000 | 28433.3 |

**Purpose of credit borrowed (institutional Source):** The data regarding the purpose of credit borrowed - Institutional Credit in Bhimanahalli-2 micro-watershed is presented in Table 32. The results indicate that, 94.12 per cent of the households have borrowed loan for agriculture.

**Table 32. Purpose of credit borrowed (institutional Source) by households in Bhimanahalli-2 micro-watershed**

| SN | Particulars | LL (1) | | MF (2) | | SF (4) | | SMF (7) | | MDF (2) | | LF (1) | | All (17) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Agriculture production | 0 | 0 | 2 | 100 | 4 | 100 | 7 | 100 | 2 | 100 | 1 | 100 | 16 | 94.1 |
| 2 | Household consumption | 1 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5.88 |

**Purpose of credit borrowed (Private Source):** The data regarding the purpose of credit borrowed – Private Source in Bhimanahalli-2 micro-watershed is presented in Table 33. The results indicate that, 100.00 per cent of the households have borrowed loan for agriculture.

**Table 33. Purpose of credit borrowed (Private Source) by households in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (0) | | MF (2) | | SF (1) | | SMF (1) | | MDF (0) | | LF (0) | | All (4) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Agriculture production | 0 | 0 | 2 | 100 | 1 | 100 | 1 | 100 | 0 | 0 | 0 | 0 | 4 | 100 |

**Repayment status of household (institutional Source):** The data regarding the repayment status of credit borrowed from institutional Source by households in Bhimanahalli-2 micro watershed is presented in Table 34. The results indicate that, 100.00 per cent have unpaid.

**Table 34. Repayment status of household (institutional Source) in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (1) | | MF (2) | | SF (4) | | SMF (7) | | MDF (2) | | LF (1) | | All (17) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Un paid | 1 | 100 | 2 | 100 | 4 | 100 | 7 | 100 | 2 | 100 | 1 | 100 | 17 | 100 |

**Table 35. Repayment status of household (Private Source) in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (0) | | MF (2) | | SF (1) | | SMF (1) | | MDF (0) | | LF (0) | | All (4) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Un paid | 0 | 0 | 2 | 100 | 1 | 100 | 1 | 100 | 0 | 0 | 0 | 0 | 4 | 100 |

**Repayment status of household (Private Source):** The data regarding the repayment status of credit borrowed from private sources by households in Bhimanahalli-2 micro watershed is presented in Table 35. The results indicate that, 100 per cent of the households have unpaid.

**Opinion regarding institutional sources of credit:** The data regarding the opinion on institutional sources of credit in Bhimanahalli-2 micro watershed is presented in Table 36. The results indicate that, 52.94 per cent of the households opined that credit helped to perform timely agricultural operations, 47.06 per cent higher rate of interest.

**Table 36. Opinion regarding institutional sources of credit in Bhimanahalli-2 micro-watershed**

| Sl. No. | Particulars | LL (1) | | MF (2) | | SF (4) | | SMF (7) | | MDF (2) | | LF (1) | | All (17) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Helped to perform timely agricultural operations | 1 | 100 | 1 | 50 | 2 | 50 | 3 | 43 | 1 | 50 | 1 | 100 | 9 | 52.9 |
| 2 | Higher rate of interest | 0 | 0 | 1 | 50 | 2 | 50 | 4 | 57 | 1 | 50 | 0 | 0 | 8 | 47.1 |

**Opinion regarding Non- institutional sources of credit:** The data regarding the opinion on non-institutional sources of credit in Bhimanahalli-2 micro watershed is presented in Table 37. The results indicate that, 52.94 per cent of the households opined that credit helped to perform timely agricultural operations, 50.00 per cent higher rate of interest.

**Table 37. Opinion regarding Non- institutional sources of credit in Bhimanahalli-2 micro-watershed**

| Sl. No. | Particulars | LL (0) | | MF (2) | | SF (1) | | SMF (1) | | MDF (0) | | LF (0) | | All (4) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Helped to perform timely agricultural operations | 0 | 0 | 1 | 50 | 1 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 50 |
| 2 | Higher rate of interest | 0 | 0 | 1 | 50 | 0 | 0 | 1 | 100 | 0 | 0 | 0 | 0 | 2 | 50 |

**Cost of Cultivation of Paddy:** The data regarding the cost of cultivation (Rs/ha) of Paddy in Bhimanahalli-2 micro watershed is presented in Table 38.a. The results indicate that, the total cost of cultivation (Rs/ha) for Paddy was Rs. 36691.84. The gross income realized by the farmers was Rs. 48202.12. The net income from Paddy cultivation was Rs.11510.28, thus the benefit cost ratio was found to be 1:1.3.

**Table 38(a). Cost of Cultivation of Paddy in Bhimanahalli-2 micro-watershed**

| Sl.No | Particulars | | Units | Phy Units | Value(Rs.) | % to C3 |
|---|---|---|---|---|---|---|
| **I** | **Cost A1** | | | | | |
| 1 | Hired Human Labour | | Man days | 49.78 | 9864.34 | 26.88 |
| 2 | Bullock | | Pairs/day | 0.82 | 606.78 | 1.65 |
| 3 | Tractor | | Hours | 3.41 | 3034.23 | 8.27 |
| 5 | Seed Main Crop (Establishment and Maintenance) | | Kgs (Rs.) | 59.04 | 4671.94 | 12.73 |
| 8 | Fertilizer + micronutrients | | Quintal | 5.1 | 3722.79 | 10.15 |
| 9 | Pesticides (PPC) | | Kgs/liters | 1.98 | 2240.24 | 6.11 |
| 10 | Irrigation | | Number | 5.76 | 0 | 0 |
| 11 | Repairs | | | 0 | 200 | 0.55 |
| 12 | Msc. Charges (Marketing costs etc) | | | 0 | 537.5 | 1.46 |
| 13 | Depreciation charges | | | 0 | 782.34 | 2.13 |
| 14 | Land revenue and Taxes | | | 0 | 8.23 | 0.02 |
| **II** | **Cost B1** | | | | | |
| 16 | Interest on working capital | | | | 1332.2 | 3.63 |
| 17 | **Cost B1 = (Cost A1 + sum of 15 and 16)** | | | | 27000.6 | 73.59 |
| **III** | **Cost B2** | | | | | |
| 18 | Rental Value of Land | | | | 333.33 | 0.91 |
| 19 | **Cost B2 = (Cost B1 + Rental value)** | | | | 27333.93 | 74.5 |
| **IV** | **Cost C1** | | | | | |
| 20 | Family Human Labour | | | 23.08 | 5555.62 | 15.14 |
| 21 | **Cost C1 = (Cost B2 + Family Labour)** | | | | 32889.55 | 89.64 |
| **V** | **Cost C2** | | | | | |
| 22 | Risk Premium | | | | 466.67 | 1.27 |
| 23 | **Cost C2 = (Cost C1 + Risk Premium)** | | | | 33356.22 | 90.91 |
| **VI** | **Cost C3** | | | | | |
| 24 | Managerial Cost | | | | 3335.62 | 9.09 |
| 25 | **Cost C3 = (Cost C2 + Managerial Cost)** | | | | 36691.84 | 100 |
| **VII** | **Economics of the Crop** | | | | | |
| a. | Main Product | a) Main Product (q) | | 36.25 | 45912.77 | |
| | | b) Main Crop Sales Price (Rs.) | | | 1266.67 | |
| | By Product | e) Main Product (q) | | 2.29 | 2289.35 | |
| | | f) Main Crop Sales Price (Rs.) | | | 1000 | |
| b. | Gross Income (Rs.) | | | | 48202.12 | |
| c. | Net Income (Rs.) | | | | 11510.28 | |
| d. | Cost per Quintal (Rs./q.) | | | | 1012.27 | |
| e. | Benefit Cost Ratio (BC Ratio) | | | | 1:1.3 | |

**Cost of Cultivation of Cotton:** The data regarding the cost of cultivation (Rs/ha) of Cotton in Bhimanahalli-2 micro watershed is presented in Table 38.b. The results indicate that, the total cost of cultivation (Rs/ha) for Cotton was Rs. 33964.25. The gross income realized by the farmers was Rs. 54550.34. The net income from Cotton cultivation was Rs.20586.08, thus the benefit cost ratio was found to be 1:1.6.

**Table 38(b). Cost of Cultivation of Cotton in Bhimanahalli-2 micro-watershed**

| Sl.No | Particulars | Units | Phy Units | Value(Rs.) | % to C3 |
|---|---|---|---|---|---|
| **I** | **Cost A1** | | | | |
| 1 | Hired Human Labour | Man days | 40.85 | 7228.12 | 21.28 |
| 2 | Bullock | Pairs/day | 1.17 | 1008.21 | 2.97 |
| 3 | Tractor | Hours | 3.13 | 2801.15 | 8.25 |
| 4 | Machinery | Hours | 0 | 0 | 0 |
| 5 | Seed Main Crop (Establishment and Maintenance) | Kgs (Rs.) | 5.1 | 6996.07 | 20.6 |
| 6 | Seed Inter Crop | Kgs. | 0 | 0 | 0 |
| 7 | FYM | Quintal | 0 | 0 | 0 |
| 8 | Fertilizer + micronutrients | Quintal | 4.74 | 3354.74 | 9.88 |
| 9 | Pesticides (PPC) | Kgs / liters | 2.4 | 2649.03 | 7.8 |
| 10 | Irrigation | Number | 0 | 0 | 0 |
| 11 | Repairs | | 0 | 0 | 0 |
| 12 | Msc. Charges (Marketing costs etc) | | 0 | 0 | 0 |
| 13 | Depreciation charges | | 0 | 203.06 | 0.6 |
| 14 | Land revenue and Taxes | | 0 | 0 | 0 |
| **II** | **Cost B1** | | | | |
| 16 | Interest on working capital | | | 1559.98 | 4.59 |
| 17 | **Cost B1 = (Cost A1 + sum of 15 and 16)** | | | 25800.35 | 75.96 |
| **III** | **Cost B2** | | | | |
| 18 | Rental Value of Land | | | 283.33 | 0.83 |
| 19 | **Cost B2 = (Cost B1 + Rental value)** | | | 26083.68 | 76.8 |
| **IV** | **Cost C1** | | | | |
| 20 | Family Human Labour | | 20.62 | 4792.91 | 14.11 |
| 21 | **Cost C1 = (Cost B2 + Family Labour)** | | | 30876.6 | 90.91 |
| **V** | **Cost C2** | | | | |
| 22 | Risk Premium | | | 0 | 0 |
| 23 | **Cost C2 = (Cost C1 + Risk Premium)** | | | 30876.6 | 90.91 |
| **VI** | **Cost C3** | | | | |
| 24 | Managerial Cost | | | 3087.66 | 9.09 |
| 25 | **Cost C3 = (Cost C2 + Managerial Cost)** | | | 33964.25 | 100 |
| **VII** | **Economics of the Crop** | | | | |
| a. | Main Product | a) Main Product (q) | 11.72 | 54550.34 | |
| | | b) Main Crop Sales Price (Rs.) | | 4656.25 | |
| b. | Gross Income (Rs.) | | | 54550.34 | |
| c. | Net Income (Rs.) | | | 20586.08 | |
| d. | Cost per Quintal (Rs./q.) | | | 2899.08 | |
| e. | Benefit Cost Ratio (BC Ratio) | | | 1:1.6 | |

**Cost of Cultivation of Jowar:** The data regarding the cost of cultivation (Rs/ha) of Jowar in Bhimanahalli-2 micro watershed is presented in Table 38.c. The results indicate, the total cost of cultivation (Rs/ha) for Jowar was Rs.21455.24. The gross income realized by the farmers was Rs. 35739.50. The net income from Jowar cultivation was Rs. 14284.25, thus the benefit cost ratio was found to be 1:1.7.

**Table 38(c). Cost of Cultivation of Jowar in Bhimanahalli-2 micro-watershed**

| Sl.No | Particulars | | Units | Phy Units | Value(Rs.) | % to C3 |
|---|---|---|---|---|---|---|
| **I** | **Cost A1** | | | | | |
| 1 | Hired Human Labour | | Man days | 38.5 | 7353.15 | 34.27 |
| 2 | Bullock | | Pairs/day | 2.16 | 2003.73 | 9.34 |
| 3 | Tractor | | Hours | 2.44 | 2270.93 | 10.58 |
| 4 | Machinery | | Hours | 0 | 0 | 0 |
| 5 | Seed Main Crop (Establishment and Maintenance) | | Kgs (Rs.) | 9.74 | 438.41 | 2.04 |
| 6 | Seed Inter Crop | | Kgs. | 0 | 0 | 0 |
| 7 | FYM | | Quintal | 0 | 0 | 0 |
| 8 | Fertilizer + micronutrients | | Quintal | 2.98 | 2232.66 | 10.41 |
| 9 | Pesticides (PPC) | | Kgs /liters | 0 | 0 | 0 |
| 10 | Irrigation | | Number | 0 | 0 | 0 |
| 11 | Repairs | | | 0 | 0 | 0 |
| 12 | Msc. Charges (Marketing costs etc) | | | 0 | 0 | 0 |
| **II** | **Cost B1** | | | | | |
| 16 | Interest on working capital | | | | 320.53 | 1.49 |
| 17 | **Cost B1 = (Cost A1 + sum of 15 and 16)** | | | | 14619.4 | 68.14 |
| **III** | **Cost B2** | | | | | |
| 18 | Rental Value of Land | | | | 283.33 | 1.32 |
| 19 | **Cost B2 = (Cost B1 + Rental value)** | | | | 14902.74 | 69.46 |
| **IV** | **Cost C1** | | | | | |
| 20 | Family Human Labour | | | 18.86 | 4602.03 | 21.45 |
| 21 | **Cost C1 = (Cost B2 + Family Labour)** | | | | 19504.77 | 90.91 |
| **V** | **Cost C2** | | | | | |
| 22 | Risk Premium | | | | 0 | 0 |
| 23 | **Cost C2 = (Cost C1 + Risk Premium)** | | | | 19504.77 | 90.91 |
| **VI** | **Cost C3** | | | | | |
| 24 | Managerial Cost | | | | 1950.48 | 9.09 |
| 25 | **Cost C3 = (Cost C2 + Managerial Cost)** | | | | 21455.24 | 100 |
| **VII** | **Economics of the Crop** | | | | | |
| a. | Main Product | a) Main Product (q) | | 10.7 | 32816.78 | |
| | | b) Main Crop Sales Price (Rs.) | | | 3066.67 | |
| | By Product | e) Main Product (q) | | 2.44 | 2922.72 | |
| | | f) Main Crop Sales Price (Rs.) | | | 1200 | |
| b. | Gross Income (Rs.) | | | | 35739.5 | |
| c. | Net Income (Rs.) | | | | 14284.25 | |
| d. | Cost per Quintal (Rs./q.) | | | | 2004.95 | |
| e. | Benefit Cost Ratio (BC Ratio) | | | | 1:1.7 | |

**Adequacy of fodder:** The data regarding the adequacy of fodder in Bhimanahalli-2 Micro watershed is presented in Table 39. The results indicate that, 28.57 per cent of the households opined that dry fodder was adequate.

**Table 39. Adequacy of fodder in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Adequate-Dry Fodder | 0 | 0 | 2 | 20 | 2 | 25 | 4 | 44.4 | 2 | 66.7 | 0 | 0 | 10 | 28.57 |

**Average annual gross income:** The data regarding the annual gross income in Bhimanahalli-2 Micro watershed is presented in Table 40. The results indicate that, the farmers have annual gross income of Rs. 93602.86 in micro-watershed, of which Rs. 62488.57 is from agriculture itself.

**Table 40. Average annual gross income in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | MF (10) | SF (8) | SMF (9) | MDF (3) | LF (1) | All (35) |
|---|---|---|---|---|---|---|---|---|
| | | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. |
| 1 | Wage | 63750 | 24600 | 38750 | 14222.2 | 33333.3 | 50000 | 31114.3 |
| 2 | Agriculture | 0 | 37670 | 64100 | 69122.2 | 116833 | 325000 | 62488.6 |
| | Income(Rs.) | 63750 | 62270 | 102850 | 83344.4 | 150167 | 375000 | 93602.9 |

**Average annual Expenditure:** The data regarding the average annual expenditure in Bhimanahalli-2 Micro watershed is presented in Table 41. The results indicate that, the farmers have annual gross expenditure of Rs. 403212.30 in micro-watershed, of which Rs. 28000.00 is from agriculture itself.

**Table 41. Average annual Expenditure in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | MF (10) | SF (8) | SMF (9) | MDF (3) | LF (1) | All (35) |
|---|---|---|---|---|---|---|---|---|
| | | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. |
| 1 | Wage | 31250 | 11500 | 22142.9 | 10000 | 25000 | 35000 | 15428.6 |
| 2 | Agriculture | 0 | 18500 | 33375 | 29777.8 | 36666.7 | 150000 | 28000 |
| Total | | 31250 | 30000 | 55517.9 | 39777.8 | 61666.7 | 185000 | 403212 |

**Interest towards cultivation of horticulture crops:** The data regarding Table (42) indicates that, 42.86 per cent of the households shown interest to cultivate horticultural crops.

**Table 42. Interest towards cultivation of horticulture crops in Bhimanahalli-2 micro-watershed**

| Sl. No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Interested towards cultivation of horticulture crops | 0 | 0 | 1 | 10 | 4 | 50 | 8 | 88.9 | 2 | 67 | 0 | 0 | 15 | 42.9 |

**Forest species grown**: The data regarding forest species grown in Bhimanahalli-2 Micro watershed is presented in Table 43. The results indicate that, households have planted 4 neem trees, 2 acacia trees together in both field and backyard.

**Table 43. Forest species grown in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | F | B | F | B | F | B | F | B | F | B | F | B | F | B |
| 1 | Neem | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 |
| 2 | Acacia | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |

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

**Average additional investment capacity:** The data regarding average additional investment capacity in Bhimanahalli-2 Micro watershed is presented in Table 44. The results indicate that, households have an average investment capacity of Rs. 4800.00 for land development, Rs. 5942.86 for creation of irrigation facility, Rs.5742.86 for adoption of improved livestock breeds.

**Table 44. Average additional investment capacity of households in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | MF (10) | SF (8) | SMF (9) | MDF (3) | LF (1) | All (35) |
|---|---|---|---|---|---|---|---|---|
| | | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. |
| 1 | Land development | 0 | 2000 | 8875 | 6000 | 7666.67 | 0 | 4800 |
| 2 | Irrigation facility | 0 | 10000 | 0 | 11777.8 | 666.67 | 0 | 5942.86 |
| 3 | Improved crop production | 0 | 11000 | 2750 | 4666.67 | 9000 | 0 | 5742.86 |

**Source of funds for additional investment:** The data regarding source of funds for additional investment in Bhimanahalli-2 Micro watershed is presented in Table 45. The results indicate that, the sources of finance raised from Government subsidy for irrigation facility was 5.71.

**Table 45. Source of funds for additional investment in Bhimanahalli-2 micro-watershed**

| Sl.No | Item | Land development | | Irrigation facility | | Improved crop production | |
|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % |
| 1 | Government subsidy | 0 | 0 | 2 | 5.71 | 1 | 2.86 |

**Marketing of agricultural produce:** The data regarding marketing of the agricultural produce in Bhimanahalli-2 Micro watershed is presented in Table 46. The results indicated that, 100.00 percent of output of Cotton was sold in the market with average price of Rs. 4656.25; 80.00 percent of output of Jowar was sold in the market with average price of Rs. 3066.67; 99.12 percent of output of Paddy was sold in the market with average price of Rs. 1169.23.

**Table 46. Marketing of agricultural produce in Bhimanahalli-2 micro-watershed**

| Sl.No | Crops | Output obtained (q) | Output retained (q) | Output sold (q) | Output sold (%) | Avg. Price obtained (Rs/q) |
|---|---|---|---|---|---|---|
| 1 | Cotton | 218 | 0 | 218 | 100 | 4656 |
| 2 | Jowar | 35 | 7 | 28 | 80 | 3067 |
| 3 | Paddy | 795 | 7 | 788 | 99 | 1169 |

**Marketing channels used for sale of agricultural produce:** The data regarding marketing channels used for sale of agricultural produce in Bhimanahalli-2 Micro watershed is presented in Table 47. The results indicated that, 5.71 cent of the households have sold agricultural produce to the local/village merchants, 85.71 per cent of regulated market.

**Table 47. Marketing channels used for sale of agricultural produce in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Local/village Merchant | 0 | 0 | 1 | 10 | 0 | 0 | 1 | 11.1 | 0 | 0 | 0 | 0 | 2 | 5.71 |
| 2 | Regulated Market | 0 | 0 | 9 | 90 | 8 | 100 | 9 | 100 | 3 | 100 | 1 | 100 | 30 | 85.71 |

**Mode of transport of agricultural produce:** The data regarding mode of transport of agricultural produce in Bhimanahalli-2 Micro watershed is presented in Table 48. The results indicated that, 17.14 cent of the households have used tractor for the transport of agriculture commodity.

**Table 48. Mode of transport of agricultural produce in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Tractor | 0 | 0 | 2 | 20 | 1 | 12.5 | 1 | 11.1 | 1 | 33.3 | 1 | 100 | 6 | 17.14 |
| 2 | Truck | 0 | 0 | 8 | 80 | 7 | 87.5 | 9 | 100 | 2 | 66.7 | 0 | 0 | 26 | 74.29 |

**Incidence of soil and water erosion problems:** The data regarding incidence of incidence of soil and water erosion problems in Bhimanahalli-2 Micro watershed is presented in Table 49. The results indicate that, 85.71 per cent of the households have experienced soil and water erosion problems.

**Table 49. Incidence of soil and water erosion problems in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Soil and water erosion problems in the farm | 0 | 0 | 9 | 90 | 8 | 100 | 9 | 100 | 3 | 100 | 1 | 100 | 30 | 85.71 |

**Interest towards soil testing:** The data regarding Interest shown towards soil testing in Bhimanahalli-2 Micro watershed is presented in Table 50. The results indicated that, 82.86 per cent of the households were interested towards soil testing.

**Table 50. Interest regarding soil testing in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Interest in soil test | 0 | 0 | 8 | 80 | 8 | 100 | 9 | 100 | 3 | 100 | 1 | 100 | 29 | 82.86 |

**Soil and water conservation practices and structures adopted:** The data regarding soil and water conservation practices and structures adopted in Bhimanahalli-2 Micro

watershed is presented in Table 51. The results indicated that 20 per cent of farmers practicing Field Bunding as soil and water conservation practice.

**Table 51. Soil and water conservation practices and structures adopted in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Field Bunding | 0 | 0 | 3 | 30 | 2 | 25 | 0 | 0 | 1 | 33.3 | 1 | 100 | 7 | 20 |

**Status of soil and water conservation structures:** The data regarding status soil and water conservation structures adopted in Bhimanahalli-2 Micro watershed is presented in Table 52. The results indicated that, the households have adopted field bunding as a soil and water conservation structures out of which 42.86 per cent was in good condition, 42.86 per cent was slightly damaged and 14.29 percent were needs full replacement.

**Table 52. Status of soil and water conservation structures in Bhimanahalli-2 micro-watershed**

| Sl.No | Item | Good | | Slightly Damaged | | Full Replacement Required | |
|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % |
| 1 | Field Bunding | 3 | 42.86 | 3 | 42.86 | 1 | 14.29 |

**Agencies involved in the soil and water conservation structures:** The data regarding Agencies involved in the soil and water conservation structures adopted in Bhimanahalli-2 Micro watershed is presented in Table 53. The results indicated that, 20.00 per cent were done by Govt.

**Table 53. Agencies involved in the soil and water conservation structures in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Govt. | 0 | 0 | 3 | 30 | 2 | 25 | 0 | 0 | 1 | 33.3 | 1 | 100 | 7 | 20 |

**Usage pattern of fuel for domestic use:** The data on usage pattern of fuel for domestic use in Bhimanahalli-2 Micro watershed is presented in Table 54. The results indicated that, firewood was the major source of fuel for domestic use for 80.00 per cent of the households followed by LPG (17.14%) and Biogas (2.86 %).

**Table 54. Usage pattern of fuel for domestic use in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Fire Wood | 4 | 100 | 9 | 90 | 8 | 100 | 5 | 55.6 | 2 | 66.7 | 0 | 0 | 28 | 80 |
| 2 | Biogas | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 11.1 | 0 | 0 | 0 | 0 | 1 | 2.86 |
| 3 | LPG | 0 | 0 | 1 | 10 | 0 | 0 | 3 | 33.3 | 1 | 33.3 | 1 | 100 | 6 | 17.14 |

**Source of drinking water:** The data on source of drinking water in Bhimanahalli-2 Micro watershed is presented in Table 55. The results indicated that, piped waters supply was the major source for drinking water for 100 per cent of the households.

**Table 55. Source of drinking water in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Piped supply | 4 | 100 | 10 | 100 | 8 | 100 | 9 | 100 | 3 | 100 | 1 | 100 | 35 | 100 |

**Source of light:** The data on source of light in Bhimanahalli-2 Micro watershed is presented in Table 56. The results indicated that, electricity was the major source of light for 100.00 per cent of the households.

**Table 56. Source of light in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Electricity | 4 | 100 | 10 | 100 | 8 | 100 | 9 | 100 | 3 | 100 | 1 | 100 | 35 | 100 |

**Existence of sanitary toilet facility:** The data on availability of toilet facility in Bhimanahalli-2 Micro watershed is presented in Table 57. The results indicated that, 40.00 per cent of the households possess toilets.

**Table 57. Existence of sanitary toilet facility in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Sanitary toilet facility | 1 | 25 | 4 | 40 | 2 | 25 | 2 | 22 | 4 | 133 | 1 | 100 | 14 | 40 |

**Possession of PDS card:** The data regarding possession of PDS card in Bhimanahalli-2 Micro watershed is presented in Table 58. The results indicated that, 100.00 per cent of the households possessed BPL card.

**Table 58. Possession of PDS card in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | BPL | 4 | 100 | 10 | 100 | 8 | 100 | 9 | 100 | 3 | 100 | 1 | 100 | 35 | 100 |

**Participation in NREGA programme:** The data regarding Participation in NREGA programme in Bhimanahalli-2 Micro watershed is presented in Table 59. The results indicated that, only 25.71 per cent of the households have participated in NREGA programme.

**Table 59. Participation in NREGA programme in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Participation in NREGA programme | 2 | 50 | 3 | 30 | 1 | 12.5 | 2 | 22.2 | 1 | 33 | 0 | 0 | 9 | 25.7 |

**Adequacy of food items:** The data regarding adequacy of food items in Bhimanahalli-2 Micro watershed is presented in Table 60. The results indicated that, the extent of adequacy of food items for cereals, pulses, Oilseeds and vegetables were 42.86, 31.43, 17.14, 82.86 per cent respectively, similarly for Fruits (22.86%), milk (80.00%), Egg (8.57%) and Meat (5.71%).

**Table 60. Adequacy of food items in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Cereals | 1 | 25 | 6 | 60 | 2 | 25 | 5 | 55.6 | 1 | 33.33 | 0 | 0 | 15 | 42.86 |
| 2 | Pulses | 1 | 25 | 5 | 50 | 1 | 12.5 | 4 | 44.4 | 0 | 0 | 0 | 0 | 11 | 31.43 |
| 3 | Oilseed | 1 | 25 | 3 | 30 | 1 | 12.5 | 1 | 11.1 | 0 | 0 | 0 | 0 | 6 | 17.14 |
| 4 | Vegetables | 1 | 25 | 9 | 90 | 7 | 87.5 | 8 | 88.9 | 3 | 100 | 1 | 100 | 29 | 82.86 |
| 5 | Fruits | 0 | 0 | 4 | 40 | 1 | 12.5 | 3 | 33.3 | 0 | 0 | 0 | 0 | 8 | 22.86 |
| 6 | Milk | 1 | 25 | 7 | 70 | 8 | 100 | 8 | 88.9 | 3 | 100 | 1 | 100 | 28 | 80 |
| 7 | Egg | 0 | 0 | 0 | 0 | 3 | 37.5 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 8.57 |
| 8 | Meat | 0 | 0 | 0 | 0 | 1 | 12.5 | 1 | 11.1 | 0 | 0 | 0 | 0 | 2 | 5.71 |

**Inadequacy of food items:** The data regarding in adequacy of food items in Bhimanahalli-2 Micro watershed is presented in Table 61. The results indicated that, the extent of in adequacy of food items for cereals, pulses, Oilseeds and vegetables were 48.57, 60.00, 74.29, 8.57 and 82.86 per cent respectively, similarly for fruits (71.43%), milk (11.43%), egg (80.00%) and meat (82.86%).

**Table 61. Inadequacy of food items in Bhimanahalli-2 micro-watershed**

| Sl.No. | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Cereals | 0 | 0 | 4 | 40 | 6 | 75 | 4 | 44.4 | 2 | 66.67 | 1 | 100 | 17 | 48.57 |
| 2 | Pulses | 0 | 0 | 5 | 50 | 7 | 87.5 | 5 | 55.6 | 3 | 100 | 1 | 100 | 21 | 60 |
| 3 | Oilseed | 0 | 0 | 7 | 70 | 7 | 87.5 | 8 | 88.9 | 3 | 100 | 1 | 100 | 26 | 74.29 |
| 4 | Vegetables | 0 | 0 | 1 | 10 | 1 | 12.5 | 1 | 11.1 | 0 | 0 | 0 | 0 | 3 | 8.57 |
| 5 | Fruits | 1 | 25 | 6 | 60 | 8 | 100 | 6 | 66.7 | 3 | 100 | 1 | 100 | 25 | 71.43 |
| 6 | Milk | 0 | 0 | 3 | 30 | 0 | 0 | 1 | 11.1 | 0 | 0 | 0 | 0 | 4 | 11.43 |
| 7 | Egg | 1 | 25 | 10 | 100 | 5 | 62.5 | 9 | 100 | 3 | 100 | 0 | 0 | 28 | 80 |
| 8 | Meat | 1 | 25 | 10 | 100 | 7 | 87.5 | 8 | 88.9 | 3 | 100 | 0 | 0 | 29 | 82.86 |

**Table 62. Farming constraints experienced in Bhimanahalli-2 micro-watershed**

| SN | Particulars | LL (4) | | MF (10) | | SF (8) | | SMF (9) | | MDF (3) | | LF (1) | | All (35) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | Lower fertility status of the soil | 0 | 0 | 5 | 50 | 3 | 37.5 | 5 | 55.56 | 2 | 66.67 | 1 | 100 | 16 | 45.71 |
| 2 | Wild animal menace on farm field | 0 | 0 | 4 | 40 | 2 | 25 | 3 | 33.33 | 2 | 66.67 | 0 | 0 | 11 | 31.43 |
| 3 | Frequent incidence of pest and diseases | 0 | 0 | 3 | 30 | 5 | 62.5 | 3 | 33.33 | 2 | 66.67 | 1 | 100 | 14 | 40 |
| 4 | Inadequacy of irrigation water | 0 | 0 | 10 | 100 | 7 | 87.5 | 9 | 100 | 2 | 66.67 | 0 | 0 | 28 | 80 |
| 5 | High cost of Fertilizers and plant protection chemicals | 0 | 0 | 10 | 100 | 8 | 100 | 8 | 88.89 | 3 | 100 | 1 | 100 | 30 | 85.71 |
| 6 | High rate of interest on credit | 0 | 0 | 10 | 100 | 6 | 75 | 8 | 88.89 | 3 | 100 | 1 | 100 | 28 | 80 |
| 7 | Low price for the agricultural commodities | 0 | 0 | 10 | 100 | 8 | 100 | 9 | 100 | 3 | 100 | 1 | 100 | 31 | 88.57 |
| 8 | Lack of marketing facilities in the area | 0 | 0 | 10 | 100 | 6 | 75 | 9 | 100 | 3 | 100 | 1 | 100 | 29 | 82.86 |
| 9 | Inadequate extension services | 0 | 0 | 0 | 0 | 1 | 12.5 | 1 | 11.11 | 0 | 0 | 0 | 0 | 2 | 5.71 |
| 10 | Lack of transport for safe transport of the Agril produce to the market. | 0 | 0 | 7 | 70 | 6 | 75 | 3 | 33.33 | 1 | 33.33 | 1 | 100 | 18 | 51.43 |

**Farming constraints:** The data regarding farming constraints experienced by households in Bhimanahalli-2 Micro watershed is presented in Table 62. The results indicated that, lower fertility status of the soil was the constraint experienced by (45.71 %) per cent of the households, wild animal menace on farm field (31.43%), frequent incidence of pest and diseases (40.00%), inadequacy of irrigation water (80.00%), high cost of fertilizers and plant protection chemicals (85.71%), high rate of interest on credit (80.00%), low price for the agricultural commodities (88.57 %), lack of marketing facilities in the area (82.86%), inadequate extension services (5.71 %) and lack of transport for safe transport of the agricultural produce to the market (51.43%).

*Chapter 5*

## SUMMARY AND IMPLICATIONS

In order to assess the socio-economic condition of the farmers in the watershed 35 households located in the micro watershed were interviewed for the survey. The study was conducted in Bhimanahalli-2 micro-watershed (Belagunda sub-watershed, Yadgiri taluk & District) is located at North latitude $16^0$ 32' 4.587" and $16^0$ 30' 8.645" and East longitude $77^0$ 13' 4.587" and $77^0$ 11' 53.709"covering an area of about 641.91 ha bounded by unde Bheemanahalli, Belagundi and Gondedagi Villages.

Socio-economic analysis of Bhimanahalli-2 micro watersheds of Belagunda sub-watershed, Yadgiri taluk & District indicated that, out of the total sample of 35 farmers were sampled in Bhimanahalli-2 micro-watershed among households surveyed 10 (28.57%) were marginal, 8 (22.86%) were small, 9 (25.71 %) were semi medium, 3 (8.57 %) were medium and 1 (2.86 %) were large farmers. 4 landless farmers were also interviewed for the survey. The population characteristics of households indicated that, there were 87 (50.88%) men and 84 (49.12 %) were women. The average population of landless was 5.3, marginal farmers were 4.6, small farmers 5, semi medium farmers were 4.8, medium farmers were 5.7 and large farmers were 4. Majority of the respondents (43.27%) were in the age group of 16-35 years.

Education level of the sample households indicated that, there were 32.16 per cent illiterates, 69.00 per cent pre university education and 3.51 per cent attained graduation. About, 60.00 per cent of household heads practicing agriculture and 40.00 per cent of the household heads were engaged as agricultural labourers.

Agriculture was the major occupation for 34.50 per cent of the household members. In the study area, 85.71 per cent of the households possess katcha house and 2.86 per cent possess pucca house. The durable assets owned by the households showed that, 51.43 per cent possess TV, 5.71 per cent possess mixer grinder, 97.14 per cent possess mobile phones and 5.71 per cent possess motor cycles.

Farm implements owned by the households indicated that, 17.14 per cent of the households possess plough, 2.86 per cent possess tractor, 11.43 per cent possess bullock cart and 2.86 per cent possess sprayer. Regarding livestock possession by the households, 2.86 per cent possess local cow. The average labour availability in the study area showed that**,** own labour men available in the micro watershed was 1.4, women available in the micro watershed was 1.26, hired labour (men) available was 9.29 and hired labour (women) available was 17.86.

In the study area, about 0.58 per cent of the respondents migrated from the micro watershed in search of jobs with an average distance of 60.00 kms for about 5.00 months. Out of the total land holding of the sample respondents 52.06 per cent (47.64 ha) of the area is under dry condition and the remaining 47.94 per cent area is irrigated land. There

were 10.00 live bore wells and 10.00 dry bore wells among the sampled households. Bore well was the major source of irrigation for 28.57 per cent of the households.

The major crops grown by sample farmers are Paddy, Cotton, Jowar and cropping intensity was recorded as 100.00 per cent. Out of the sample households 77.14 percent possessed bank account and 14.29 per cent of them have savings in the account. About 97.14 per cent of the respondents borrowed credit from various sources. Among the credit borrowed by households, 76.47 per cent have borrowed loan from commercial banks and 5.88 per cent from co-operative/Grameena bank.

Majority of the respondents (94.12%) have borrowed loan for agriculture purpose. Regarding the opinion on institutional sources of credit, 52.94 per cent of the households opined that credit helped to perform timely agricultural operations.

The per hectare cost of cultivation for Paddy, Cotton and Jowar was Rs.36691.84 , 33964.25 and 21455.24 with benefit cost ratio of 1:1.3, 1: 1.4 and 1:1.7 respectively. Further, 28.57 per cent of the households opined that dry fodder was adequate.

The average annual gross income of the farmers was Rs. 93602.86 in micro-watershed, of which Rs. 62488.57 comes from agriculture. Sampled households have grown 6 forestry trees together in the fields and back yards. About 42.86 per cent of the households shown interest to cultivate horticultural crops.

Households have an average investment capacity of Rs. 4800.00 for land development and Rs. 5942.86 for irrigation facility. Source of funds for additional investment is concerned, 20.00 per cent depends on own funds. Regarding marketing channels, 5.71 per cent of the households have sold agricultural produce to the local/village merchants, while, 85.71 per cent have sold in regulated markets. Further, 17.14 per cent of the households have used tractor for the transport of agriculture commodity.

Majority of the farmers (85.71%) have experienced soil and water erosion problems in the watershed and 82.86 per cent of the households were interested towards soil testing. Fire was the major source of fuel for domestic use for 80.00 per cent of the households and 17.14 per cent households has LPG connection. Piped supply was the major source for drinking water for 100.00 per cent of the households.

Electricity was the major source of light for 100.00 per cent of the households. In the study area, 40.00 per cent of the households possess toilet facility. Regarding possession of PDS card, 100.00 per cent of the households possessed BPL card. Households opined that, the requirement of cereals (42.86%), pulses (31.43%) and oilseeds (17.14%) are adequate for consumption.

Farming constraints experienced by households in the micro watersheds were lower fertility status of the soil (45.71%) wild animal menace on farm field (31.43%), frequent

incidence of pest and diseases (40.00%), inadequacy of irrigation water (80.00%), high cost of fertilizers and plant protection chemicals (85.71%), high rate of interest on credit (80.00%), low price for the agricultural commodities (88.57%), lack of marketing facilities in the area (82.86%), inadequate extension services (5.71%), lack of transport for safe transport of the agricultural produce to the market (51.43%).

**Implications of the survey**

- ✓ Result indicated that, there were 32.16 per cent were illiterate hence, extension methodologies such as demonstration, street play, drama, video shows will be effective in dissemination of the technologies in the micro watershed.
- ✓ The data indicate that, 85.71 per cent of the households possess katcha house. Hence, the development department while implementing the watershed plan should focus on agriculture to enhance the productivity of major crops in the area to increase the income of the farmers.
- ✓ Results indicated that the local institutional participation of the household members in the micro watershed is minimal hence, activities like membership campaign, awareness creation about the benefits of membership in local institutions and strengths of organized groups must be conveyed.
- ✓ Majority of the households in the watershed have experience in use of mobile phones, and television hence, these mass media can be effectively utilized for transfer of technology as well as for information dissemination.
- ✓ The farm machinery/implement possession in the micro watershed was found to be minimum the reasons may lack of knowledge or lack of financial ability which can be addressed through training on use of different farm implements, providing information on different sources of finance for purchase of farm implements.
- ✓ The possession of livestock such as crossbred cow found is less hence, farmers must be made aware of the benefits of crossbred cow in increased milk production.
- ✓ The possession of livestock such as sheep, goat and poultry was found to be low hence, farmers may be informed the role of subsidiary enterprises in enhancing the income and information on financial support for subsidiary activities.
- ✓ The data indicate that, job/work was the reason for all the migrants hence, farmers may be trained on profitable agriculture or self employment such has animal husbandry, plate making, sheep rearing, goat rearing, rabbit rearing with suitable information on sources of financial support.
- ✓ The results indicate that there was a change in quality of life due to migration hence, the developmental departments should take actions to arrest migration and to improve the quality of the life in rural areas.
- ✓ Households possess 24.80ha (52.06 %) of dry land and 22.84ha (47.94 %) of irrigated land hence, the availability of the dry land agricultural technologies such as short duration crops, high yielding drought resistance crop varieties, drip irrigation

technology and subsidy information will be helpful for the farmers to enhance the productivity of land and as well as farmers income.

- ✓ Few of the bore well in micro watershed found non functional hence, farmers may be trained on possibility of bore well rejuvenation.
- ✓ Bore well was major source of irrigation for 28.57 per cent of the households. Hence, in order to increase the area under irrigation as well as to increase the water use efficiency farmers may trained on drip irrigation and provide the information on subsidy for drip irrigation equipment's along with the information on different agencies which provides the financial assistance for drip irrigation.
- ✓ The cropping intensity in the micro watershed was found to be (100.00 %) hence, care must be taken by the implementing agency to bring uncultivated land into cultivation through suitable measures.
- ✓ Many of the household members have borrowed loan from cooperative banks which has higher rate of interest hence, farmers may be sensitized on the different sources of credit with lesser interest rate such SHGs etc.
- ✓ The results indicated the non availability of both green and dry fodder throughout the year hence, fodder development activities can be taken up in the micro watershed.
- ✓ The average annual gross income of the households Rs.62488.57 from agriculture, and Rs. 31114.29 from wages. Agriculture was found to be the major source of income for households hence; the development activities should focus on productivity enhancement, marketing arrangements and agricultural technology dissemination to have a direct impact on the farmers.
- ✓ The cultivation of forest species is found minimal hence, information and production technology related to agro-forestry and integrated farming system.
- ✓ The data indicated that, 85.71 per cent of the households have experienced soil and water erosion problems. Hence, those farmers who reported the soil and water erosion problems may be given attention while implementation of the watershed development plan.
- ✓ The data indicated that, 82.86 per cent of the households have interest in soil testing hence, farmers must be provided with the information on various institutions which are involved in soil testing for the benefit of the farmers.
- ✓ Except summer ploughing the adoption of other soil and water conservation structures is minimum hence, the farmers in the micro watershed should be sensitized on the use of different conservation structures for soil water conservation.
- ✓ Cereals and pulses found be adequate for per cent of the households respectively hence, farm households and the farm women must be trained on importance of balanced nutrition and role of vegetable, milk, egg, meat in balanced diet.
- ✓ Lower fertility status of the soil (45.71%), wild animal menace on farm field (31.43%), frequent incidence of pest and diseases (40.00%), high cost of fertilizers and plant protection chemicals (85.71%), high rate of interest on credit (80.00%), low

price for the agricultural commodities (88.57%), lack of marketing facilities in the area (82.86%), inadequate extension services (5.71%), lack of transport for safe transport of the agricultural produce to the market (51.43%) were the major farming constraints experienced hence, these constraints must be addressed immediately for the welfare of the farmers. Awareness to be created among the farmers to approach nearest KVKs/RSKs and other developmental departments for technical and for subsidized inputs and utilize the well established regulated markets, approaching the contract firms, direct markets to avoid the involvement of middlemen.