



# Verified Carbon Standard

## SUSTAINABLE AGRICULTURAL PRACTICES FOR CARBON SEQUESTRATION BY ORGANIC AND NATURAL FARMING GROUPS

Document Prepared by



Contact Information

<b>Project Title</b>	Sustainable Agricultural Practices for carbon sequestration by Organic and Natural farming groups
<b>Version</b>	2.0
<b>Date of Issue</b>	18/04/2022
<b>Prepared By</b>	Kanaka Management Services Private Limited
<b>Contact</b>	No.271, 1 <sup>st</sup> B Main, SF 407, 4 <sup>th</sup> Phase, Yelahanka New Town, Bengaluru-560064, India. Contact name: Mrs. K. Easwari Yesu Rani Email: <a href="mailto:info@kms-group.com">info@kms-group.com</a> Phone: +91-9535888854 Website: <a href="http://www.kms-group.com">http://www.kms-group.com</a>

# CONTENTS

---

- 1 PROJECT DETAILS..... 4**
  - 1.1 Summary Description of the Project ..... 4
  - 1.2 Sectoral Scope and Project Type ..... 5
  - 1.3 Project Eligibility ..... 5
  - 1.4 Project Design ..... 6
  - 1.5 Project Proponent ..... 7
  - 1.6 Other Entities Involved in the Project ..... 8
  - 1.7 Ownership ..... 8
  - 1.8 Project Start Date ..... 9
  - 1.9 Project Crediting Period ..... 9
  - 1.10 Project Scale and Estimated GHG Emission Reductions or Removals ..... 9
  - 1.11 Description of the Project Activity ..... 11
  - 1.12 Project Location ..... 14
  - 1.13 Conditions Prior to Project Initiation ..... 17
  - 1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks ..... 23
  - 1.15 Participation under Other GHG Programs ..... 23
  - 1.16 Other Forms of Credit ..... 23
  - 1.17 Sustainable Development Contributions ..... 24
  - 1.18 Additional Information Relevant to the Project ..... 24
  
- 2 SAFEGUARDS ..... 24**
  - 2.1 No Net Harm ..... 24
  - 2.2 Local Stakeholder Consultation ..... 25
  - 2.3 Environmental Impact ..... 29
  - 2.4 Public Comments ..... 29
  - 2.5 AFOLU-Specific Safeguards ..... 29
  
- 3 APPLICATION OF METHODOLOGY ..... 29**
  - 3.1 Title and Reference of Methodology ..... 30
  - 3.2 Applicability of Methodology ..... 30
  - 3.3 Project Boundary ..... 31
  - 3.4 Baseline Scenario ..... 32

3.5	Additionality .....	34
3.6	Methodology Deviations .....	34
<b>4</b>	<b>QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS .....</b>	<b>34</b>
4.1	Baseline Emissions.....	34
4.2	Project Emissions.....	34
4.3	Leakage .....	34
4.4	Net GHG Emission Reductions and Removals.....	34
<b>5</b>	<b>MONITORING .....</b>	<b>35</b>
5.1	Data and Parameters Available at Validation .....	35
5.2	Data and Parameters Monitored .....	35
5.3	Monitoring Plan .....	35
	<b>APPENDIX .....</b>	<b>36</b>

# 1 PROJECT DETAILS

## 1.1 Summary Description of the Project

One-third of the global soils are degraded, releasing 78 gigatons (Gt) of carbon-di-oxide into the atmosphere, which cost over 10% of the global GDP through lost biodiversity and ecosystem services (FAO 2019). Thus, reversing soil degradation is vital to feed a growing global population, protect biodiversity and help address the climate crisis. Soil Organic Carbon (SOC) content, being an energy source for soil biota, is a critical determinant of land degradation neutrality, agricultural productivity and climate change adaptation and mitigation. However, Indian soils are low in SOC in the top plow layer (0.2 meters). With an annual carbon emission of about 566 million tons, the required carbon sequestration rate for India would be about 23–28 per mile as against the global requirement of ‘4 per mile’ (Katyal, 2020). Considering only a marginal increase in forest area (0.56% between 2017-2019) (Forest Survey of India Report, 2019) and available 120.72 million ha of degraded land (ICAR/NAAS, 2010), there is an immediate need for rehabilitation measures for improving SOC stock. Enhancing SOC in agricultural soils has great potential to contribute to climate mitigation while also promoting soil health and resilience.

Karnataka is considered as a miniature of India as it exhibits most of the features of India in terms of climate, soil types, rainfall, crops grown, and a variety of natural resources. The agriculture system forms the backbone for the economic development, and it contributes 37 % of the total State Domestic Product. The proposed ‘**Sustainable Agricultural Practices for carbon Sequestration by Organic and Natural farming groups**’ activity implemented by Vedic Green Solutions (VGS), by about 42917 farmers and organic grower cooperatives overing 70,000 hectares of cropland in the state of Karnataka to be implemented in the first phase. The project aims at increasing the capacity of soil to sequester carbon, enhance the carbon sequestration by agroforestry practices such as planting of trees, reduce emissions from use of synthetic fertilizers and reduce emissions from burning of crop residue by application of **VCS methodology: VM0017 Sustainable Agricultural Land Management (SALM)**. Several SALM practices and technologies have been proven to reduce greenhouse gas emissions and prevent climate change by enhancing carbon storage in soils; preserving existing soil carbon; and reducing carbon dioxide, methane and nitrous oxide emissions. Some of those practices are conservation tillage, cover crops, enhanced crop rotations, residue retention, agroforestry and avoidance of crop residue burning. The project holistically aims at achieving sustainable management practices which improves soil health, reduces greenhouse gas (GHG) emissions and develop the socio-economic status of the project area. The project aims to reduce and sequester carbon leading to an estimated GHG

emission reductions or removals (tCO<sub>2</sub>e) of 556903 tCO<sub>2</sub>e / year. This projects climate benefits include emissions reduction or removals of approximately 22527745 (twenty-two million five hundred twenty-seven thousand forty-five) tCO<sub>2</sub>e over the lifetime of the project.

## 1.2 Sectoral Scope and Project Type

The sectoral scope of the project activity corresponds to VCS scope 14 “**Agriculture, Forestry and Other Land Use**” (AFOLU) and under the category “**Agriculture Land Management**” (ALM). Eligible ALM activities are those that reduce net GHG emissions on croplands and grasslands by increasing carbon stocks in soils and woody biomass and/or decreasing CO<sub>2</sub>, N<sub>2</sub>O and/or CH<sub>4</sub> emissions from soils. In the ALM category, this project falls under the following activity group:

**Improved Cropland Management (ICM):** This category includes practices that demonstrably reduce net GHG emissions of cropland systems by increasing soil carbon stocks, reducing soil N<sub>2</sub>O emissions, and/or reducing CH<sub>4</sub> emissions. Among this, the proposed project focuses on

a) Practices that increase soil carbon stocks are by increasing residue inputs to soils and/or reducing soil carbon mineralization rates, use of cover crops, enhanced crop rotations and introduction of agroforestry practices.

## 1.3 Project Eligibility

The Project is eligible under the scope of VCS Programme as described below:

The VCS Program provides the standard and framework for independent validation of projects and programs, and verification of GHG emission reductions and removals, based on ISO 14064-2:2006 and ISO 14064-3:2006. The scope of the VCS Program covers all those activities related to the generation of GHG emission reductions and removals, including jurisdictional programs and nested REDD+ projects. The scope does not include carbon footprint assessments or carbon neutrality claims. Participation is voluntary and based on objective criteria. The VCS Program is not discriminatory to project proponents, jurisdictional proponents, methodology element developers, validation/verification bodies, or VCU buyers, sellers, or brokers. Further, to describe and justify how the project is eligible under the scope of the VCS Program, Project Proponent uses the criteria listed in the section 2.1.1 of the VCS standard, v4.2.

The project activity is suitable to the application of the Approved VCS methodology VM0017: Adoption of Sustainable Agricultural Land Management (version 1.0). (Refer to the Section 3), which is approved under the VCS Program through the methodology approval process. Further, the project is eligible under the scope of the VCS standard v4.2 as summarised below:

- This is an eligible AFOLU project category under the VCS Program related to Agricultural Land Management Practices (ALM)

- The project applies a methodology eligible and approved under the VCS Program
- The implementation of this project activity is in line with the applicable law of the host country;
- This project does not convert native ecosystems to generate GHG reductions. The project area only contains cropland or degraded land for a minimum of 10 years before the project start date.
- This project does not occur on wetlands and does not drain native ecosystems or degrade hydrological functions.
- The project establishes additionality by use of Combined CDM Tool to identify baseline scenario and Demonstrate additionality Version 7.0
- Non-performance risk will be analyzed in accordance with the VCS Program document AFOLU Non-Permanence Risk Tool.

## 1.4 Project Design

The proposed project is a grouped project.

The project activity accelerates climate neutrality through market mechanisms, providing expertise to value native vegetation and encourage reforestation through various training and awareness program, encourage farmers to adopt best agricultural practices, agro-forestry system from time to time, dissimulation of knowledge gain from Remote Sensing/GIS study on existing status of organic carbon content in the participants land and recommendations to members on carbon fixation in the soil through various steps from time to time, rewarding farmers for their contribution to nature preservation.

### Eligibility Criteria

The project is a grouped project. The eligibility criterion for addition of new instances is as follows:

No.	Eligibility criterion – Category	Eligibility criteria and how it will be met at the time of inclusion.
1	Geographic Boundary	The geographical boundary of the new instance must be within the State of Karnataka. Detailed documentation regarding the exact geographical location such as GPS coordinates will be provided.
2	Ownership	Similar criteria as stated in the section 1.7 of the VCS PD will be applicable, based on which the relevant new project areas will be included into the project.

3	Approval and authorization	Approval and authorization as mentioned from time-to-time. However, the present Government requirements as mentioned in 1.7 of the VCS PD.
4	Double Counting	Emission reductions claimed by each of the instances under the grouped project should be unique and not counted more than once. The unique geographical location can be cross verified which will ensure that there is no double counting. The same will also be verified through Undertaking from the PP confirming that instance is not an individual project or part of any other grouped project.
5	Start Date	Date on which activities conforming to the definition of start date as per VCS requirements in the instance were started, which shall be after start date of the grouped project.
6	Applicability of the methodologies	Latest version of methodology VM0017 and its associated tools shall be applicable.
7	Additionality	Criteria as specified in the grouped project document shall be met
8.	Classification of land cover types	Criteria as specified in the grouped project document shall be met
9.	Baseline scenario establishment	Criteria and steps as specified in the grouped project document shall be met
10.	Quantification of GHG emission	Criteria and steps as specified in the grouped project document shall be met
11.	Monitoring of GHG removals	Criteria and steps as specified in the grouped project document shall be met

## 1.5 Project Proponent

<b>Organization name</b>	Vedic Green Solutions
<b>Contact person</b>	Mr. K.S.M.Raju
<b>Title</b>	Director
<b>Address</b>	1 <sup>st</sup> cross, Rayaradoddy, Ramanagara, Karnataka – 562159
<b>Telephone</b>	

<b>Email</b>	<a href="mailto:info.gomathe@gmail.com">info.gomathe@gmail.com</a>
<b>Organization name</b>	Kanaka Management Services Private Limited
<b>Contact person</b>	Mrs. K. Easwari Yesu Rani
<b>Title</b>	Director
<b>Address</b>	No.271, 1st B Main, SFS 407, 4th Phase, Yelahanka New Town, Bengaluru – 560064, India
<b>Telephone</b>	+91 9535888854
<b>Email</b>	<a href="mailto:info@kms-group.com">info@kms-group.com</a>

## 1.6 Other Entities Involved in the Project

<b>Organization name</b>	NA
<b>Role in the project</b>	NA
<b>Contact person</b>	NA
<b>Title</b>	NA
<b>Address</b>	NA
<b>Telephone</b>	NA
<b>Email</b>	NA

## 1.7 Ownership

### Land Ownership:

The land parcels adopting the project activity belongs to the individual farmers and the status of land is private land. The legal title of the land parcels is held with individual farmers and is indicated through the land certificate records available with the local authority (Tahsildars) of the Karnataka state. The information can also be accessed through the online portal <https://landrecords.karnataka.gov.in/> respectively.

### Project Ownership

The ownership of the project. i.e., solely for the ‘Rights of access to the Carbon Credits’ – a participation agreement has been established between the farmers community associated with cooperative societies and the project proponent declaring that the carbon credits generated by the implementation of the project activity, is exclusively allocated to the developer of the Project. Under this agreement, the farmers community is committed not to assert any property rights over the carbon credits generated and/or to be generated by the Project.

Besides, the project proponent commits to support farmers community, to pursue best agricultural practices, contributing to efficient use of natural resources and low-carbon production.

## 1.8 Project Start Date

Project start date is 01.10.2017. Based on VCS requirements, the start date is based on the initiation of the implementation of SALM practices in the farm level. The earliest date of the farmer adopting the practice of SALM and signing the agreement with the project developer is hence considered as the appropriate start date.

## 1.9 Project Crediting Period

Project start date	01.10.2017
Project end date	30.09.2057
Total no. of. Crediting years	40 years

## 1.10 Project Scale and Estimated GHG Emission Reductions or Removals.

The scale of the project and estimated GHG emission reductions/removals for over 40 years are shown in the table below:

- <20,000 tCO<sub>2</sub>e/year
- 20,000 – 100,000 tCO<sub>2</sub>e/year
- 100,001 – 1,000,000 tCO<sub>2</sub>e/year
- >1,000,000 tCO<sub>2</sub>e/year

Project Scale	
Project	
Large project	×

Estimated GHG emission reduction or removal (tCO<sub>2</sub>e) from the first instance project activity.

Year	Estimated GHG emission reductions or removals (tCO <sub>2</sub> e)
2017*	251625
2018	556903
2019	556903
2020	556903
2021	556903
2022	556903
2023	556903
2024	556903
2025	556903
2026	556903
2027	556903
2028	556903
2029	556903
2030	556903
2031	556903
2032	556903
2033	556903
2034	556903
2035	556903
2036	556903
2037	556903
2038	556903

2039	556903
2040	556903
2041	556903
2042	556903
2043	556903
2044	556903
2045	556903
2046	556903
2047	556903
2048	556903
2049	556903
2050	556903
2051	556903
2052	556903
2053	556903
2054	556903
2055	556903
2056	556903
2057	556903
<b>Total estimated ERs</b>	<b>22527745</b>
<b>Total number of crediting years</b>	<b>40</b>
<b>Average annual ERs</b>	<b>556903</b>

### 1.11 Description of the Project Activity

The purpose of this project activity is to promote SALM practices for mitigation of degraded lands and greenhouse gas emission and build adaptive capacity of farmers to be able to cope with impacts of climate change. Therefore, the project proposes social, economic and environmental benefits arise from implementation of the activities. Capacity building for the farmers and train

them on the methods to increase soil organic carbon, appoint expert consultant to develop a project, conduct audits and trade the carbon credits and to incentives to organic farmers. The following table illustrates the agro climatic zone wise area covered for the implementation of the sustainable agricultural practices. The project is not located within a jurisdiction covered by a jurisdictional REDD+ program.

<b>Agro Climatic Zones</b>	<b>Area (in hectares)</b>
Central Dry	5512.10
Coastal Zone	3248.60
Eastern Dry	7870.77
Hilly Zone	10313.60
North Eastern Transition	2212.10
North Eastern Dry	2655.10
Northern Dry	15382.77
Northern Transition	6332.77
Southern Dry	9635.27
Southern Transition	6836.93

## **Methodology**

A soil carbon project aims to help farmers manage their soils and enhance soil carbon level in a more sustainable and profitable manner. Soil sampling and testing provides an estimate about the soil nutrition, health and soil carbon level. An increase in measured soil carbon benefits the farmers through more productivity. VGS promotes the following SALM activities among the farming communities to enhance soil fertility and crop productivity.

### **SALM Project activities**

#### **Application of Organic manure / Fertilizer**

Organic agriculture has a particular sequestration potential as it follows the key principle of tight nutrient and energy cycles through organic matter management in soils. This is achieved through improved practices in cropland management and in agro-forestry. Various long-term trials provide evidence that the regular addition of organic materials to the soil is the only way to maintain or even increase soil organic carbon (SOC). The systematic development and application of organic fertilization technologies has been the domain of Organic Agriculture for many decades and outstanding results have been achieved so far. Key issues of technology development have been:

1. To optimize the quantity and application of organic manure. A close integration of crop production and animal husbandry and the systematic recycling of organic waste are basic elements.
2. To improve organic waste processing techniques to obtain high quality manure. Through composting of animal and plant residues losses in the humification process are minimized and a higher proportion of the solid humus fraction is achieved.

Although many of these practices are most associated with organic farming, they are recommended management practices for all farms because they build soil organic matter, which has far reached benefits for plant health and farm sustainability. These practices minimize biota disturbance and erosion losses while incorporating carbon rich amendments and retaining the biomass of roots and shoots, all of which contribute to carbon sequestration by photosynthetic removal and retention of atmospheric CO<sub>2</sub> in soil organic matter. These practices result from management decisions regarding cropping, amendments and tillage within the wider scope of a systems approach to farming that rejects synthetic inputs.

### **Cover Crops**

At least half of the cropland carbon is fixed aboveground in plant biomass, making cover cropping and residue retention clear necessities for carbon sequestration. Cover crops can be temporary crops planted between main cash crops, nutrient catch-crops, or perennial mulches. Cover crops increase soil carbon, reduce nitrogen leaching and discourage wind and water erosion. A wide range of additional benefits accrue with the use of cover crops: reduced weed pressure, decreased water runoff, improved soil structure and water infiltration, reduced evaporation and, in legume systems, atmospheric nitrogen fixation, which is often advantageous to the subsequent main crop. Due to their longer leaf stage and more complex root systems, perennial cover crops, or living mulches, are an additional boon to soil carbon sequestration.

### **Enhanced Crop Rotations**

Moving crop rotations away from monoculture with fallow and towards polyculture with no fallow increases soil biodiversity and sequesters carbon. For instance, switching a wheat-fallow rotation to a wheat-sunflower or wheat-legume rotation was found to increase soil organic carbon stocks significantly and a continuous barley system more than doubled soil carbon stocks compared to a barley-fallow system. Integrating seeded grass species as cover crops, living mulches, or in rotation is a powerful means of increasing soil carbon due to the deep, bushy root systems of many of these perennials. Continuous cover, which also increases soil microbial biomass carbon by ensuring available energy and root hosts for bacteria and fungi.

### **Residue Retention**

Cover crops also play a significant role in soil sequestration when their plant and root residues are retained rather than removed or burned. These residues are the forerunners to soil organic matter. Residue removal, whether of the main crop or a cover crop, have become common to produce bioenergy. This practice depletes soil organic matter. Conversely, retention of crop residue, which is common in no-till systems, is a significant driver of soil carbon accumulation.

### Agroforestry

Agroforestry a management system that integrates trees in the agricultural landscape. It holds the biggest potential of agricultural carbon sequestration in tropical countries. The soil-based ecosystem services in agroforestry are carbon transformation, nutrient cycling, regulation of soil erosion, soil structure maintenance, symbiotic interactions, enhancement of soil microclimate. The practices of agroforestry help to improve the soil physio-chemical and biological properties by continuous addition of litter in the soil surface. Since SOC is having the largest contribution in carbon pool among the terrestrial ecosystem, which is estimated to be over 1550 Pg C at 1m soil depth. Considering the potential of soil ecosystem to store carbon, it is attracting considerable attention to curb the issues of climate change in near future. The practices of agroforestry involving the minimal disturbance of soil and continuous cover of litter helps in stabilizing the soil organic and making the room for vast carbon sequestration opportunities in the soil.

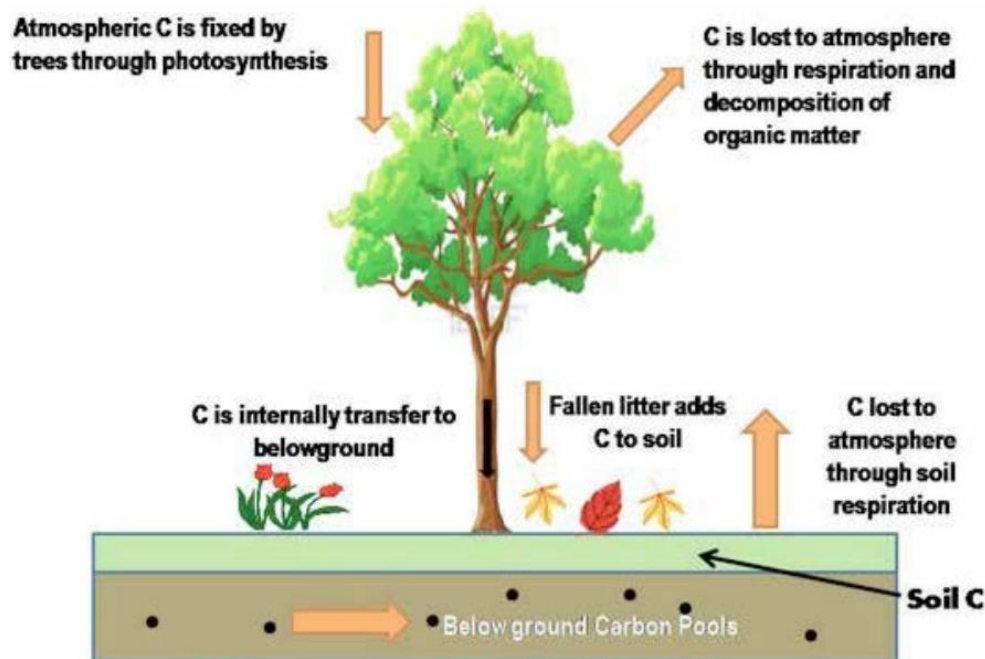


Fig .1 Carbon sequestration process in an agroforestry system (adapted from Ram Newaj et al.51)

## 1.12 Project Location

The project area, Karnataka State is situated between 11°40' N and 18°27' N latitude and 74°5' E and 78°33' E longitude in the center of western peninsular India. For the administrative purpose the State is divided into 31 districts, which are subdivided into 227 taluks (Figure 1). The physical features of the state include coastal plains, western ghats and plateau enabling it to grow a variety of crops.

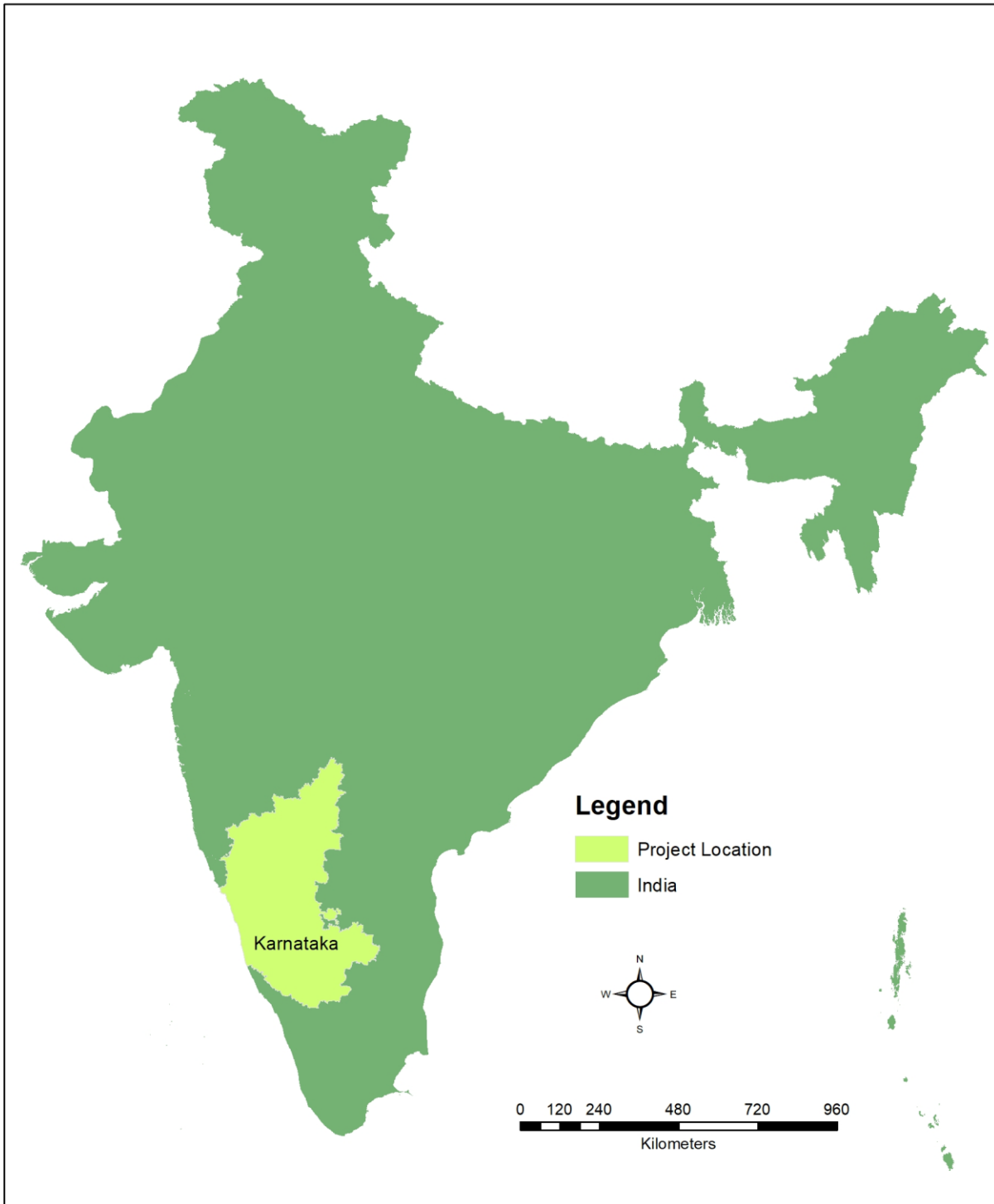


Fig. 2 Location map of the project activity

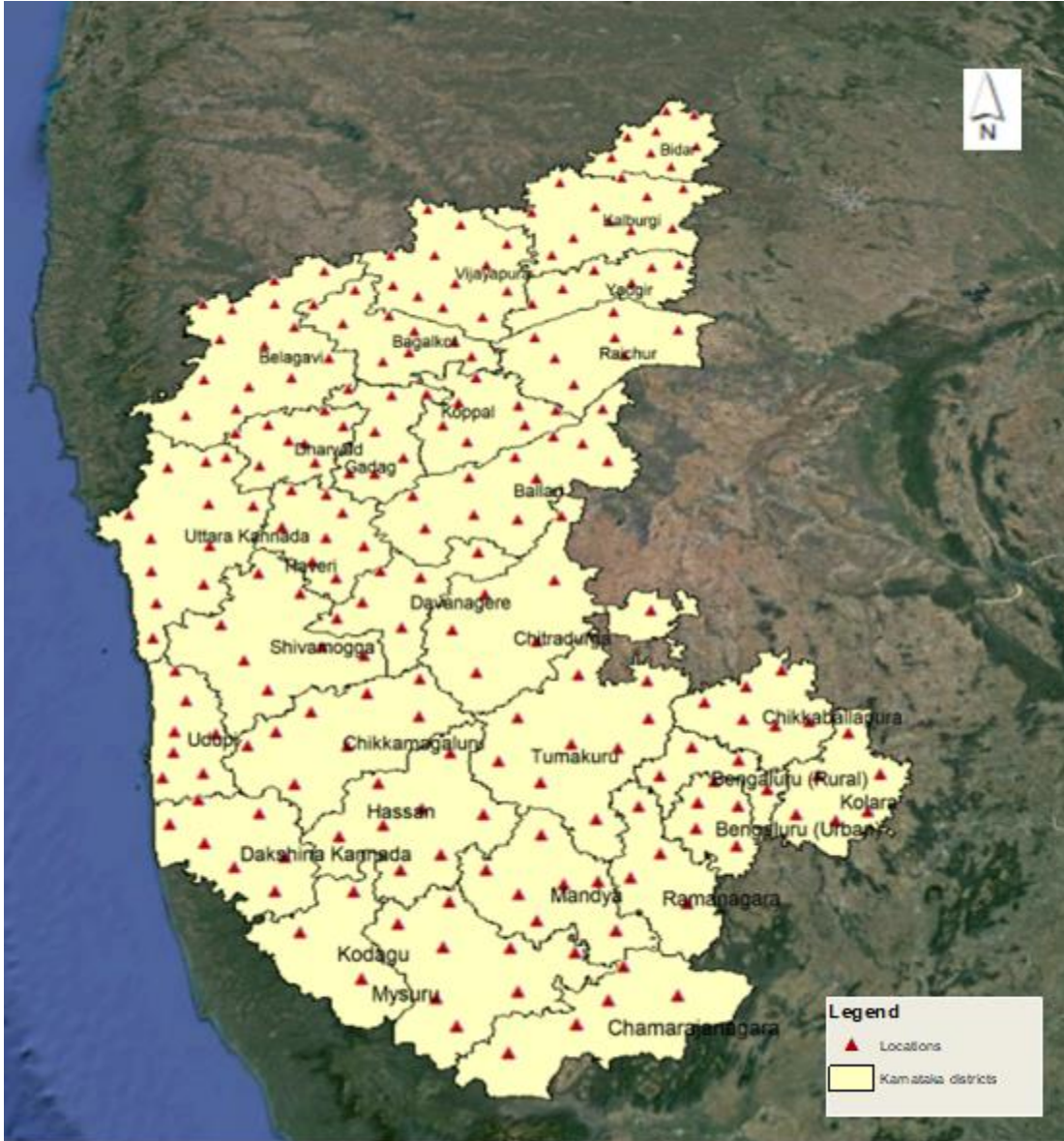


Fig .3 Spatial distribution of project location

### 1.13 Conditions Prior to Project Initiation

The baseline scenario of the project area is the same as the conditions existing prior to the project initiation.

#### Topography

Karnataka comprises of varied topographical structures that includes high mountains, plateaus, residual hills and coastal plains. The State is enclosed by chains of mountains to its west, east and south. It consists mainly of plateau which has higher elevation of 600 to 900 metres above

mean sea level. The entire landscape is undulating, broken up by mountains and deep ravines. Plain land of elevation less than 300 metres above mean sea level is found only in the narrow coastal belt, facing the Arabian Sea. There are quite a few high peaks both in Western and Eastern Ghat systems with altitudes more than 1,500 metres. A series of cross-sections drawn from west to east across the Western Ghat generally exhibit, a narrow coastal plain followed to the east by small and short plateaus at different altitudes, then suddenly rising upto great heights. Then follows the gentle east and east-north-west sloping plateau.

## Soils

The main soil types of Karnataka State are:

**Red Soils** which are shallow to deep, well drained to excessively drained and gravelly or non-gravelly and are characterized by accumulation of clay. The surface texture ranges from loamy sand to sandy clay loam and sub-soil texture from sandy clay loam to sandy clay and clay. The red soils cover nearly 37.3% of the total geographical area of the State and are distributed in all the districts except Bidar.

**Laterite Soils** cover an area of about 6.16% of the total geographical area of the State. Lateritic soils of Bangalore, Kolar, Bidar and Gulbarga have been formed under paleoclimate and form a plateau that is presently under disintegration. The laterite soils of malnad i.e., Belgaum, Hassan, Chikmagalur, Uttara Kannada, Udupi and Kodagu districts have developed under the sub-humid and humid climate. They occur as plateau at the foothills of Western Ghats and have developed on gneisses, schists and phyllites.

**Black Soils** occupy around 27.77% of total geographical area of the State. They occur on plateau summits, slopes and valleys developed from basalt in northern Karnataka. They are also known as swell-shrink soils. This is due to alternative wetting and drying process. The infiltration rate and hydraulic conductivity of black soils is very low. Based on soil depth, these soils are grouped as shallow, medium and deep black soils.

**Alluvial Soils** are present in the Western Ghats and Deccan plateau and are transported from higher elevated areas by the flowing water and deposited in valleys and low lands. These soils occupy nearly 15.74% of the total geographical area of the State. Majority of the area is under irrigation in the plateau region and is under rain-fed cultivation in malnad and the Western Ghats. The alluvial soils are generally very deep, moderately well drained to imperfectly drained and well drained. They have textures of loam to clay loam, clay and cracking clay, stratified with light and heavy textures.

**Brown Forest Soils** occur mainly in the Western Ghats under forests, in humid and sub-humid climate. They cover 6% of the total geographical area and have developed on granites, gneisses and schists. They are deep to moderately deep, well drained to excessively drained and have sandy clay to clay and sandy loam surface soils and clay to sandy clay sub-soil with high content of clay.

**Coastal Soils** occur in the West Coast of Karnataka between the Western Ghats and the Arabian Sea. They occupy approximately 3.9% of the total geographical area of the State. They are of two types viz., a) Coastal laterite soils and b) Coastal alluvial soils.

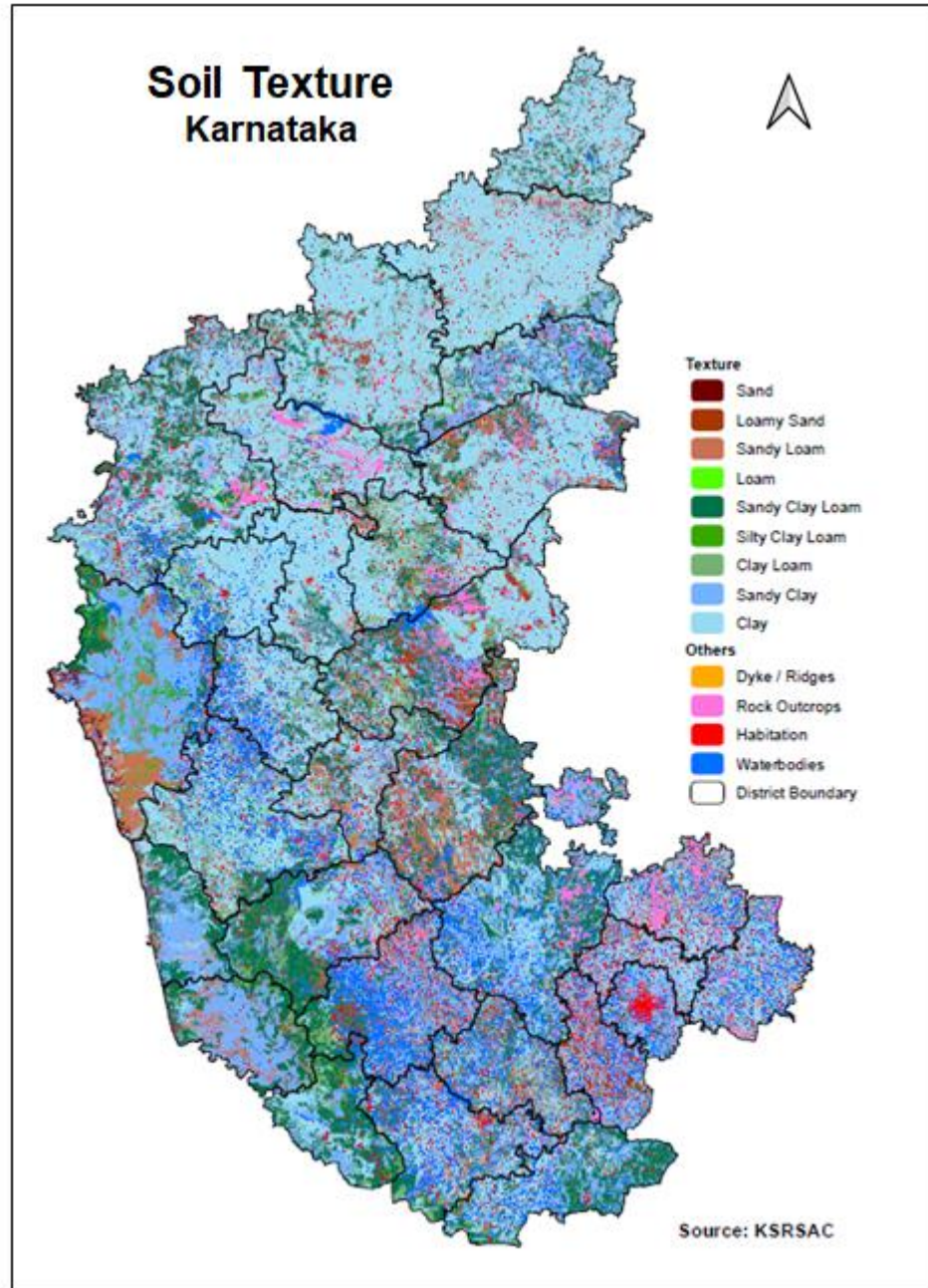


Fig. 4 Soil texture map of the project activity

### Hydrology

There are six river basins in the State of Karnataka – Cauvery, Krishna, Godavari, West flowing – Cape Comorin to Sharavathy and Sharavathy to Taphthi and between Cauvery and Krishna (Pennar, Palar). Major area of the State lies in the Krishna basin. In the Western Ghats and malnad regions, the drainage network is dense. Rivers Krishna and Godavari flow from Maharashtra State, whereas rivers Cauvery, Palar and Pennar rise in the State. The West flowing rivers rise in the Western Ghats and finally, find their way into the Arabian Sea.

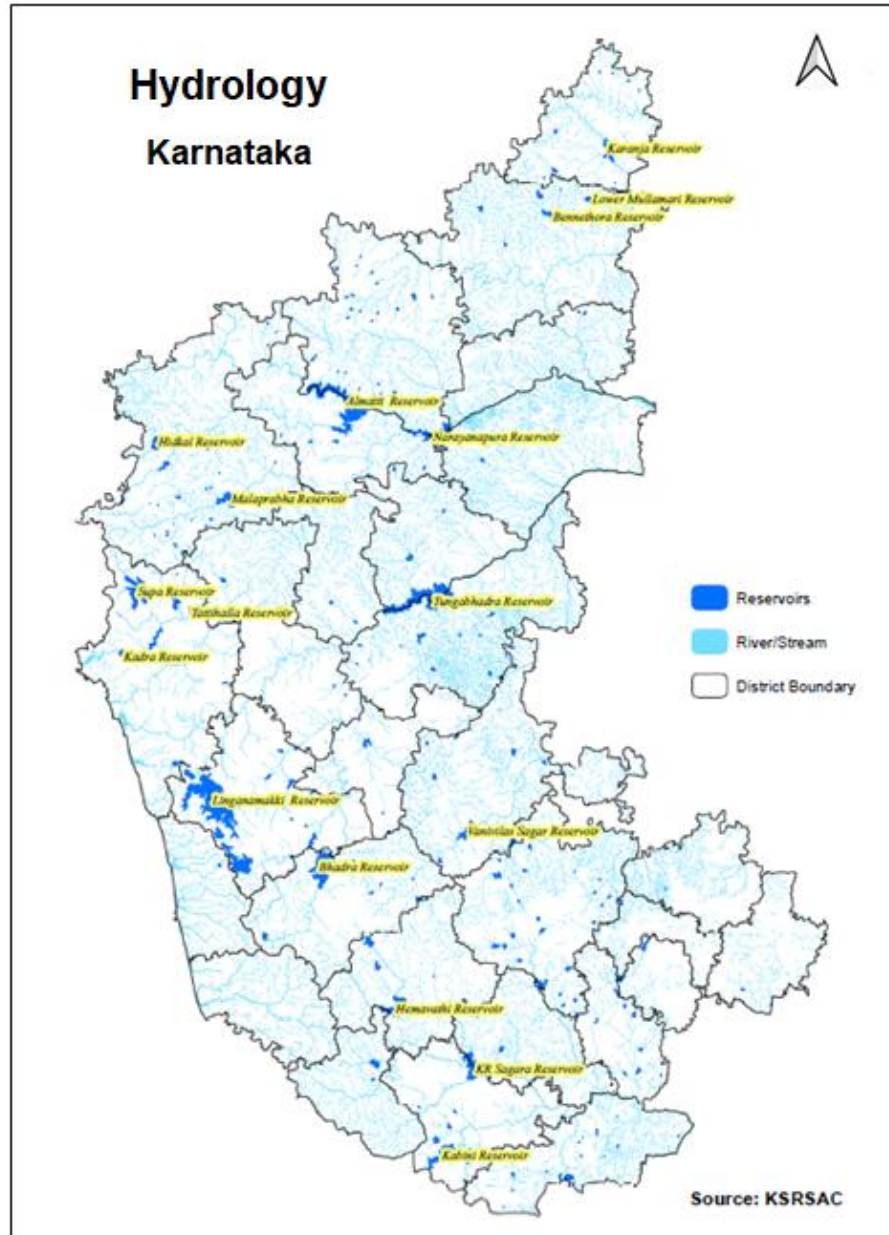


Fig. 5 Hydrology map of the project activity

## Climate

The climate of the State is determined mainly by the geographical location with respect to the sea, monsoon winds and physiography. Karnataka State has very moist monsoon climate on the West Coast, semi-arid climate in the Western Ghats and Malnad areas, and arid (very warm) climate in the central and northern districts. The year is divided into four seasons viz., Summer season from March to May; South-West monsoon from June to September; North-East monsoon season from October to December; and Winter season from January to February. In the North-East monsoon season, the wind regime changes from South-West or West to North-East. This is the season during which occasional depressions and cyclones from Bay of Bengal strikes the Chennai Coast and move towards West or North-West, causing widespread rain over the southern parts of the State.

## Vegetation

The main vegetation categories in Karnataka are mentioned below:

### i) Evergreen and Semi-evergreen

An evergreen forest is a forest consisting entirely or mainly of evergreen trees that retain green foliage all year round and Semi-evergreen forests are generally considered as a transitional stage between evergreen and moist deciduous forests. These forests are characterised by ever-green trees mixed with deciduous having typical features like less dense canopy, green garioussness, frequent buttressed trunks, thicker and rougher barks, and heavy climbers. Ex: *Dipterocarpus indicus*, *Hopea parivflora*, *Myristica fauna*, *Gymnacranthera canarica*, *Vateria indica* etc.

### ii) Moist Deciduous

Temperate deciduous forests are located in the areas that has moderate rainfall and temperature and with cold winters. These are the typical monsoon forests in areas where the amount of annual rainfall ranges between 100 cm and 150 cm with mean annual temperature of 24°C to 27°C, and humidity percentage of 60 to 80. They mostly occur along the eastern slopes of the Western Ghats, north-eastern part of the Peninsula . teak (*Tectona gradis*) are commercially the most significant species; occupying the relatively wetter north-eastern parts of the Peninsula. Ex: *Terminalia*, *Largerstroemia*, *preterocarpus*, *Xylia*, *Tectona* and *Anogeissus* etc.

### iii) Dry Deciduous Forest

The tropical deciduous forests shed leaves during December (in Northern Hemisphere) as water becomes scarce. This type is a degraded version of the moist deciduous. It occupies a vast area of the country between moist deciduous (in the east) and tropical thorn (in the west) forests. Ex: *Acacias*, *Hardwikicia*, *Neem*, *Pongamia*, *Somida*, *Santalalam albam*, *Ficus* etc.

**iv) Scrub and Thorny Forest**

These forests are confined to areas where the rainfall is very low. Here due to paucity of rainfall the trees are stunted with large patches of coarse grasses. The typical vegetation consists of widely spaced acacias, euphorbias including the typical spiny and thorny varieties and clumps of wild palms (Phoenix Sylvester's) here and there. Ex: Acacia species, Balanites roxburghii, Cordia myxa, Capparis spp., Prosopis spp., Azadirachta indica, Cassia fistula, Diospyros chloroxylon, Carissa carandas, and Phoenix sylvestris etc.

**v) Un-wooded**

These forests are mainly grass lands and waste land.

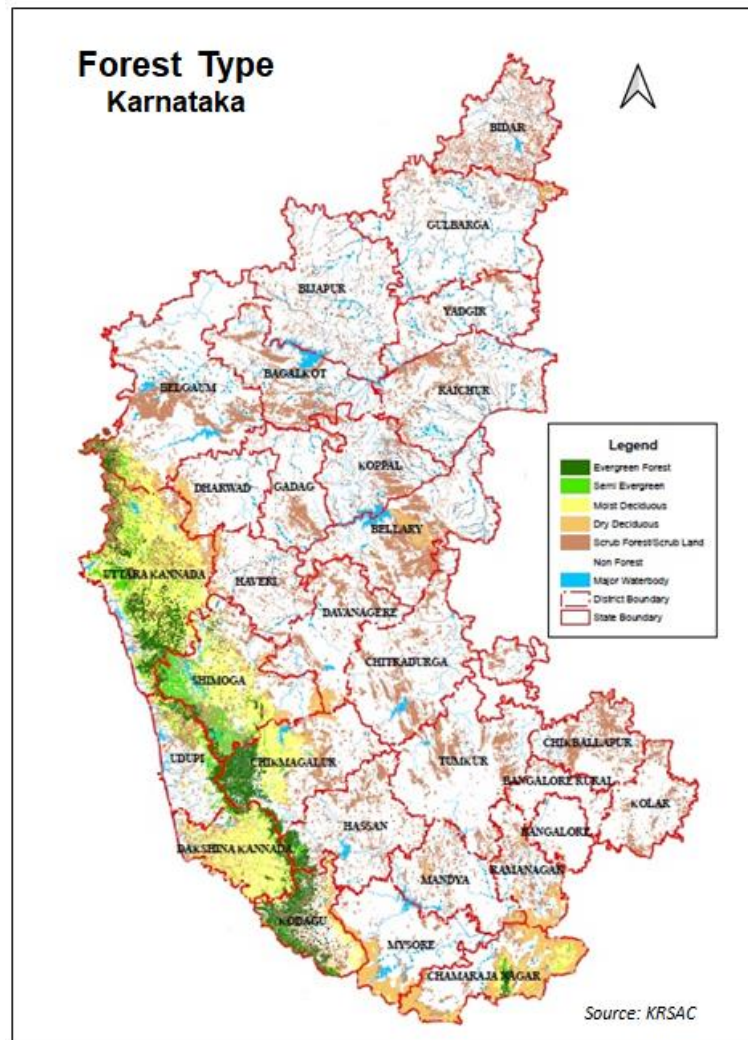


Fig 6. Forest type map of the project activity

### Ecosystem Type

The climate of Karnataka is Semi-tropical with an average annual rainfall of 1355 mm. The forest type in Karnataka is evergreen and semi-evergreen, moist deciduous, dry deciduous, scrub and thorny forest and un-wooded forest. The common type of soil groups found are red soil, black soil, lateritic soil and black soils.

- Current and historical land-use: The condition prior to the project initiation in the project area is crop land or agriculture land.
- Has the land been cleared of native ecosystems within 10 years of the project start date?  
 Yes                       No

## 1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

The SALM project activity follows all the applicable legal and regulatory requirements. Currently no laws and regulations prevent or enforce the project activity or baseline land use scenarios. The applicability of the Central and State Government laws and regulations which are implemented are scrutinized.

The following are the list of laws & regulations in which the project activity follows.

- a. The Indian Forest Act, 1927
- b. Forest (Conservation) Act, 1980
- c. Environment (Protection) Act, 1986
- d. Farmers & Farm Workers Commission Act ,2017
- e. The Karnataka Agricultural Pests and Diseases Act, 1968 (1 of 1969).
- f. The Karnataka Forest Act, 1963
- g. The Karnataka Preservation of Tress Act,1976

## 1.15 Participation under Other GHG Programs

### 1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The project has not been registered or seeking registration under any GHG programs.

### 1.15.2 Projects Rejected by Other GHG Programs

The project has not been registered or seeking registration under any other GHG programs.

## 1.16 Other Forms of Credit

### 1.16.1 Emissions Trading Programs and Other Binding Limits

The net GHG emission reduction or removal generated by this project is voluntary and, will not be used for compliance with an emission trading program, or to meet binding limits on GHG

emissions. The project activity is an agricultural project, and it is not eligible under the Kyoto Protocol because there are no emission trading limits for agriculture projects in Non-Annex I countries.

Does the project reduce GHG emissions from activities that are included in an emissions trading program or any other mechanism that include GHG allowance trading?

Yes

No

### 1.16.2 Other Forms of Environmental Credit

The project is not planning to participate under any other forms of environmental credits.

Has the project sought or received another form of GHG-related credit, including renewable energy certificates?

Yes

No

## 1.17 Sustainable Development Contributions

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.1)

## 1.18 Additional Information Relevant to the Project

### Leakage Management

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.1)

### Commercially Sensitive Information

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.1)

### Further Information

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.1)

# 2 SAFEGUARDS

## 2.1 No Net Harm

There are no negative community impacts and hence there is no need for mitigation.

## 2.2 Local Stakeholder Consultation

The district level exhaustive meetings were held and the meetings with stakeholders with all the members, further reviews are conducted in all the district project areas

S. No.	District Name	Local Stakeholder Meeting conducted
1	Bagalakote	Between May to July 2017
2	Bengaluru	
3	Bengaluru Rural	
4	Belagavi	
5	Bellary	
6	Bidar	
7	Chamarajanagar	
8	Chikkamagalur	
9	Chitradurga	
10	Dakshina Kannada	
11	Davanagere	
12	Dharwad	
13	Gadag	
14	Kalaburagi	
15	Hassan	
16	Haveri	
17	Kodagu	
18	Kolar	
19	Koppal	
20	Mandya	
21	Mysore	
22	Raichur	
23	Ramanagara	
24	Shivamogga	
25	Tumkur	
26	Udupi	
27	Uttara Kannada	

28	Vijayapura	
----	------------	--

Different kinds of stakeholders are concerned by the proposed project activities:

- the farmers
- their communities
- the representatives
  - the farmer societies
  - -Non-Governmental Organization, etc.

First, VGS introduced the idea of the ALM in 2017 in different districts of Karnataka. Then, each Entity socialized the project in each community through participative meetings. Farmers willing to voluntarily participate to the project were registered in these preliminary meetings. Each interested farmer was then individually visited, in order to assess eligibility and his land, to conduct biophysical evaluation of the area, to determine the planting models and the choice of species.

As the project was designed and proposed in a participative way, and because it is managed by each Entity in a very cooperative way, each farmer can at any time give advice or recommendations, as a full owner of the project via his Project Entity.

The project proponent explained the process to stakeholder and community members about VCS Program validation and verification and the validation/verification body's site visit. The project proponent requested all the stakeholder cooperation to VVB during the validation process.

Summary of the comments received:

The project is generally well accepted:

- Farmers are proud to be part of a climate change mitigation program.
- The producers also declared they were very interested by the possibility of developing projects of carbon sequestration. The project will help them access this new market.

Some doubts or requests were taken into account:

- a. Will a real efficient monitoring process be implemented? (they've heard of or known other projects led by other entities that did not include follow up in the long run)
- b. Will the farmers receive trainings about agroforestry and forestry practices?
- c. The farmers requested additional species to be planted

Report on how due account was taken of any comments received:

In the project development, all these questions were taken into account:

- a. A monitoring plan has been developed and the cooperative is highly conscious that a monitoring in the long run is crucial for the development and permanence of the project.
- b. The farmers will receive trainings as detailed in the farmers training plan.

c. The choice was made in agreement with farmers' choice, seedlings availability, and species-site matching.







### 2.3 Environmental Impact

The VGS Project team has not identified any major risk or impact to any local stakeholders, to their property rights and natural resources.

### 2.4 Public Comments

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.1)

### 2.5 AFOLU-Specific Safeguards

The VGS Project team has not identified any major risk or impact to any local stakeholders, to their property rights and natural resources. The baseline survey indicated an very low risk based on the population surveyed. Most of the communities welcomed the initiatives of the project. However, the identification of risks will be ongoing process throughout the project implementation.

## 3 APPLICATION OF METHODOLOGY

### 3.1 Title and Reference of Methodology

Approved VCS methodology VM0017: Adoption of Sustainable Agricultural Land Management (version 1.0)

### 3.2 Applicability of Methodology

This methodology is applicable to projects that introduce sustainable agriculture land management practices (SALM) into an agricultural landscape subject to the following conditions:

Applicability conditions	Explanation
a) Land is either cropland and grassland at the start of the project	The land under the project activity and its project instance are designated for agricultural purpose only. Section 1.3 of the VCS PD describes the historical land use of the project activity instance which confirms the land as cropland.
b) The project does not occur on wetlands	As already established the project activity falls in cropland category and therefore does not occur on wetlands.
c) The land is degraded and will continue to be degraded or continue to degrade	As the project activity is implemented on the farmlands it is a crop land. The historical trends have shown the decrease in the fertility of the soil due to the unsustainable agricultural practices and in the absence of the project will lead to the degradation of the farmland.
d) The area of land under cultivation in the region is constant or increasing in absence of the project;	The area under crop land has shown a constant trend in the project area.
e) Forest land, as defined by the national CDM forest definition, in the region is constant or decreasing over time;	The forest cover in the State, remains constant according to the Forest Survey of India (FSI) annual report. The forest cover of the project area occupies 16.13% of the total geographical area and historical trends prior to the project start date indicates it to remain constant.

<p>f) There must be studies (for example, scientific journals, university thesis, local research studies or work carried out by project proponents) that demonstrate that the use of the RothC model is appropriate for: (a) the IPCC climatic regions of 2006 IPCC AFOLU Guidelines, or (b) the agro-ecological zone (AEZ) in which the project is situated.</p>	<p>According to IPCC climate regions, the project activity instance is in tropical dry climate zone. The following studies have been selected to demonstrate that the application of the RothC model is appropriate and that the model is validated for similar AEZs/ climate regions.</p> <p>* Jha, et al. (2021) - This study assessed the effect of various combinations of cropland nutrient management for three major cropping systems viz., wheat, rice and maize in North-Western Punjab state of India. The study concluded that ROTH C model can effectively predict soil carbon dynamics under Indian environmental and climatic conditions by providing accurate initialization and parametrization of the model.</p> <p>* Bhattacharya, et al. (2011) - This study analyzed the effect of land use management including manure application on total organic content of soil in Indore district of Madhya Pradesh state, India. Application of RothC model in this study revealed that supplement of organic materials coupled with fertilizers can increase the SOC sequestration. Hence the applicability condition is met.</p>
---	---

Further, the following tools have been applied in line with the methodology:

- The project establishes additionality by use of Combined CDM Tool to identify baseline scenario and Demonstrate additionality Version 7.0

AFOLU Non-Permanence Risk Tool v4.0, published on 19-September-2019.

### 3.3 Project Boundary

Source		Gas	Included?	Justification/Explanation
Baseline	Organic fertilizer	CO <sub>2</sub>	No	Negligible emission from application of organic fertilizer, hence not considered
		CH <sub>4</sub>	No	Negligible emission from application of organic fertilizer, hence not considered
		N <sub>2</sub> O	Yes	Considered as emission from use of synthetic fertilizer

Source		Gas	Included?	Justification/Explanation
	Biomass burning	CO <sub>2</sub>	No	Considered as crop burning is prevalent
		CH <sub>4</sub>	Yes	Negligible emission, hence not considered
		N <sub>2</sub> O	Yes	Negligible emission, hence not considered
Project	Soil organic (SOC)	CO <sub>2</sub>	Yes	Considered as organic carbon is sequestered by use of organic fertilizer
		CH <sub>4</sub>	No	Negligible emission from application of organic fertilizer
		N <sub>2</sub> O	No	Negligible emissions from application of organic fertilizer, hence not considered
	Aboveground biomass	CO <sub>2</sub>	Yes	Considered as trees sequester CO <sub>2</sub> as part of the agroforestry
		CH <sub>4</sub>	No	Negligible emissions, hence not considered
		N <sub>2</sub> O	No	Negligible emissions, hence not considered
Belowground biomass	CO <sub>2</sub>	Yes	Considered as trees sequester CO <sub>2</sub> as part of the agroforestry	
	CH <sub>4</sub>	No	Negligible emissions, hence not considered	
	N <sub>2</sub> O	No	Negligible emissions, hence not considered	

### 3.4 Baseline Scenario

According to the VM0017 methodology, the project proponent shall use the most recent version of the combined tool to identify the baseline scenario and demonstrate the additionality in A/R CDM project activities. The baseline scenario is recognized as existing or historical land management practices. Thus, the initial project activity instance is using the tool - “Combined tool to identify the baseline scenario and demonstrate additionality Version 7.0.

#### Step 1: Identification of alternative scenarios to the proposed VCS SALM project activity

##### Sub-step1a. Identification of alternative land use scenarios to the proposed project activity

The following alternatives are considered:

1. Land use will continue to be agricultural with unsustainable practices, which will lead to the loss in soil nutrients and degradation
2. Adoption of sustainable agricultural land management practices by considering incentives from the carbon revenues (project activity)

The following are analysed as the alternative land uses to the project activity which are in compliance with all applicable legal and regulatory requirements in India.

1. Land use will continue as pre-project land use- marginal cultivation, fallow, barren lands
2. Adoption of sustainable agricultural land management practices (project activity)

## **Step 2: Barrier analysis**

### **Sub-step 2a. Identification of barriers that would prevent the implementation of at least one alternative land use scenarios**

The barriers that are considered plausible for the implementation are:

Investment barriers, Institutional barriers, Technological barriers, Barriers related to local tradition; Barriers due to prevailing practice; Barriers due to local ecological conditions

### **Sub-step 2b: Elimination of land use scenarios that are prevented by the identified barriers**

The scenario 2 which is the implementation of SALM has technological, prevailing practice and local traditions which create a barrier for its voluntary adoption by the farmers. Further, access to finance to implement the SALM practices also exist.

**Outcome of Sub-step 2b:** The land use types that are not prevented by any barriers are as follows.

Alternative 1: Land use will continue as pre-project land use which is unsustainable ALM techniques which will lead to degradation of fertile crop land.

### **Sub-step 2c. Determination of baseline scenario.**

After passing the barrier the continuation existing land use is the baseline scenario. Hence Step 4: Common practice test is further applied to assess additionality.

### 3.5 Additionality

For the Demonstration and assessment of additionality the STEP 4 of the Tool “Combined tool to identify the baseline scenario and demonstrate additionality as above has been used.

#### **Step 4: Common practice test**

The proposed SALM Project activity is the first of its kind in the region of Karnataka to propose carbon credits. Hence as it is not a common practice, and it is additional.

### 3.6 Methodology Deviations

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.1)

## 4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

### 4.1 Baseline Emissions

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.1)

### 4.2 Project Emissions

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.1)

### 4.3 Leakage

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.1)

### 4.4 Net GHG Emission Reductions and Removals

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.1)

## 5 MONITORING

### 5.1 Data and Parameters Available at Validation

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.1)

### 5.2 Data and Parameters Monitored

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.1)

### 5.3 Monitoring Plan

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.1)

# APPENDIX

## Project Photos (Stakeholders meeting and training)























