Akhil Bharatiya Maratha Shikshan Parishad's
Anantrao Pawar College of Engineering & Research

Survey No.117

DETAILED PROJECT REPOT (DPR)

1. EXECUTIVE SUMMARY

- **Project Name**: Building a Sustainable World Project, Jawali Village, Tal. Phaltan Dist. Satara, Maharashtra.
- **Project Phase I** : Jawali (Survey No.117)
- **Project**: Plantation of 1.5 Million Native Trees
- **Location**: Jawali Village, Phaltan Taluka, Satara District, Maharashtra.
- **Project Lead from IICARE Foundation** : Dr Santosh Bhosale , Director , IICARE Foundation
- **Project Area**: 2500 Acres / 1500 HA
- **Project Cost**: 1 Million USD (10:00 Crore) Approximatly.
- **Project Assigned to**: Civil Engineering Department, APCOER, Parvati Pune.
- **u** and students of Civil Engineering Department, APCOER.
- **Project Lead from APCOER: Prof. Ranjitsing Gaikwad, Dr. A.B.Shelar and Dr. R.R. Sorate of Civil Engg. Dept APCOER**

1.1 Introduction

The project outlined above involves the planting of 1.5 million Native trees in **1500 Ha** land cover requires detailed planning, design, and management to ensure successful implementation. The first step is a detailed mapping of the plantation area, followed by the installation of a tree grid and fencing. Architectural design planning will be done to achieve good design for the plantation area, with a focus on orchards, biodiversity, and fruit fodder fuel.

Water budgeting will be undertaken to determine the requirements of the plantation site, and water structures like farms, ponds, and wells will be created accordingly. Soil water conservation activities will also be undertaken as per the requirements of the area. The project also includes the establishment of a Centre of Excellence for Nursery with a goal of achieving

high quality, sapling required for plantation will be taken up, and the process of setting up the nursery will be undertaken. Soil water conservation activities will also be undertaken as per the requirements of the area.

Soil and Water Conservation improves soil quality and productivity. Increased fertility improves crop yields, reduces the need for chemical fertilizers, and saves money. Optimizes water infiltration. The main objective of soil moisture conservation is to minimize the amount of water last from the soils through evaporation & transpiration. Internal roads, electrical design, and IT requirements will also be planned based on the detailed mapping of the plantation area. Infrastructural spaces such as a research station, training station, and climate school will be planned, along with temporary living spaces and equipment set up. Micro-irrigation of the plantation area will also be taken up.

An institution will be established with a research and development focus, engaging with PhD students and the R&D organization. A 30-year study will be undertaken, and a detailed IT plan will be created for monitoring and evaluating efficiency. A video documentation project will also be taken up to document the project area's pre- and post-changes due to plantation. The overarching goal of the project is to plant high-quality saplings and achieve good design for the plantation area and biodiversity zone through an evidence-based plantation plan.

The afforestation project in any area should be carried out only after in-depth research and study based on the local geography. In addition, the selection of plant species shall be based on their adaptability to the surroundings. Afforestation has the potential for synergistic effects, such as improving the green cover in line with the country's climate change goals. It enhances the natural environment by attracting birds and animals. The afforested land acts as an oxygen bank and also acts as a carbon sink, leading to a reduced carbon foot print.

1.2 Objectives

- To develop and design orchard areas focusing on biodiversity.
- To study the feasibility of tree plantation (afforestation) in the Jawali watershed area based on the soil and other geographical characteristics.

- To create sustainable infrastructure using solar and non-conventional sources.
- To enrich Mother Earth and foster socio-economic growth within Jawali Village.
- To establish a Centre of Excellence for Nursery
- To establish a center for high-quality seedling cultivation.

1.3.Project Background

StudyArea :

The project area is near Jawali Village in Phaltan taluka of Satara District. Water shed area(Black Boundary):314 ha. Average Annual Rainfall of Phaltan tq.is540.70 mm.

Soil study of Jawli

Soil characteristics plays an important role in the assessment of afforestation. Based on the information provided, key soil characteristics are tabulated below:

Sr.No.	Soil Information	Class	Values
1	Soil type	Loamy	-
2	Soil Depth	Very Shallow	10-25 cm
3	Soil pH	Neutral	6.5-7.5
4	Soil drain	Well drain	-
5	Soil slope	Gently sloping	3-8 %

Table 1: Soil Study of Jawli

As the average annual rainfall of the subject area is low, irrigation is required for plants to sustain the growth. Based on the data provided in able-1, the loamy soil type indicates an

average water holding capacity, fairly resistant to the drought and can hold soil nutrients. The soil depth is very shallow,may indicate the presence of stone strata. The soil drainage capacity indicates good infiltration and aeration.

2. Steps Involved in a Project

Project

The project involves the plantation of 1.5 million native trees with a focus on achieving good design, biodiversity, and sustainable management. The project will require detailed planning, implementation, and management to ensure its success. The following strategy document outlines the steps required for the successful implementation of the project.

Step 1: Detailed Mapping of the Plantation Area

The first step will involve a detailed mapping of the plantation area. This will include the identification of suitable areas for plantation, as well as the identification of any areas that require special attention, such as areas prone to erosion. The mapping will also identify areas for the installation of a tree grid and fencing of the plantation area.

Step 2: Architectural Design Planning

Architectural design planning will be undertaken to achieve good design for the plantation area, with a focus on orchards, biodiversity, and fruit fodder fuel. This will involve the identification of suitable plant species, the creation of a planting plan, and the design of the plantation area to ensure that it is aesthetically pleasing and functional.

Step 3: Water Budgeting and Water Structures

Water budgeting will be undertaken to determine the requirements of the plantation site. Based on the water requirements, suitable water structures such as dams, ponds, and wells will be created. Soil water conservation activities will also be undertaken as per the requirements of the area.The expert planning,estimationg and constructing water structures will be done.

Step 4: Centre of Excellence for Nursery

The project will also include the establishment of a Centre of Excellence for Nursery, which will focus on achieving high-quality saplings. The process of setting up the nursery will be undertaken, and the variety of plants will be taken up.

Step 5: Internal Roads, Electrical Design, and IT Requirements

Internal roads, electrical design, and IT requirements will be planned based on the detailed mapping of the plantation area. Infrastructural spaces such as a research station, training station, and climate school will be planned, along with temporary living spaces and equipment setup. Micro-irrigation of the plantation area will also be taken up.

Step 6: Research and Development Institution

- An institution will be established with a research and development focus, setting up research and training stations, a climate school engaging with PhD students, and the R&D organization. A 30-year study will be undertaken, and a detailed IT plan will be created for monitoring and evaluating efficiency.

Step 7: Video Documentation Project

A video documentation project will be taken up to document the project area's pre- and post-changes due to the plantation. This will help in creating awareness about the project and its impact.

Conclusion:

The above strategy document outlines the steps required for the successful implementation of the project. The overarching goal of the project is to plant high-quality saplings and achieve good design for the plantation area and biodiversity zone through an evidence-based plantation plan. The project will require a significant amount of planning, implementation, and

management to ensure its success. However, the long-term benefits of the project will be significant, both in terms of environmental conservation and sustainable development.

3. Aspects to Consider

1. Land Selection: Soil type, topography, and accessibility.

2. Water Availability: Sources, storage, and irrigation systems.

3. Climate and Weather: Seasonal patterns, rainfall, temperature, and potential climate change impacts.

4. Soil Health: pH, nutrients, erosion, and conservation practices.

5. Biodiversity: Ensuring a diverse ecosystem and considering the plantation's impact on local fauna and flora.

6. Sustainability: Environmental, economic, and social dimensions.

7. Infrastructure: Roads, storage, processing units, housing, etc.

8. Technology Integration: Use of modern tech like drones, AI, or IoT for monitoring and optimization.

9.Community Engagement: Understanding and working with local communities.

10. Regulatory Compliance: Local laws, agricultural guidelines, and environmental regulations.

11. Financial Planning: Budgeting, potential funding sources, and ROI calculations.

12. Risk Management: Disease, pests, market fluctuations, climate events, etc.

13. Growth Strategy: Expansion, diversification, and scalability plans.

Considering all these aspects and experts ensures a holistic approach to the project, maximizing the chances of success and long-term sustainability.

Creating a long-term successful plantation involves careful consideration of both civil engineering and planning aspects. Here's a concise breakdown of what you'll need to consider:

❖ Civil Engineering Aspects

1. Site Assessment: Analyze the site's topography, soil conditions, drainage patterns, and any potential challenges like the presence of rock formations.

2. Water Management: Ensure efficient irrigation systems are in place, and evaluate the need for reservoirs, ponds, or dams.

3. Infrastructure: Design access roads, storage facilities, worker accommodations, and other necessary infrastructure.

4. Erosion Control: Implement measures like terracing, constructing retaining walls, or silt fences.

5. Drainage Systems: Design proper drainage systems to prevent waterlogging or potential flooding.

6. Soil Conservation: Depending on the crops, you might need to consider techniques such as contour plowing or the creation of windbreaks.

7. Renewable Energy: Evaluate the feasibility of integrating renewable energy sources, such as solar or wind, to power onsite operations.

❖ Planning Aspects:

1.Species Selection: Determine which plants or trees are best suited for the soil, climate, and objectives of the plantation.

2. Crop Rotation and Diversity: Plan for crop rotation to improve soil health and reduce pest risks.

3. **Sustainability**: Ensure that your practices are sustainable, both environmentally and economically.

4.**Labor and Training**: Plan for the workforce needed, and ensure they receive proper training for plantation tasks.

5. **Financial Planning**: Budget for initial investment costs, ongoing operational expenses, and expected revenue.

6. **Risk Assessment**: Identify potential risks, like diseases, pests, or market fluctuations, and develop mitigation strategies.

7. **Harvesting and Post-harvest Processing**: Plan for efficient harvesting techniques and post-harvest processes, like drying or milling.

8. **Marketing and Sales**: Develop a strategy for selling the plantation's produce, considering local markets, export potential, and value addition.

9.**Stakeholder Engagement**: Engage with local communities, governments, and potential investors to garner support and ensure the project's social acceptability.

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4. LOCATION ANALYSIS

गावपातळीवरील कृषि विकास आराखडा सन २०१२ -२३

कृषि सहायकाचे नाव - जावली मंडळ - सातारा

सर्वसाधारण माहिती

कृ.स.अंतर्गत समाविष्ट गावे आणि कृषि विषयक सर्वसाधारण माहिती –

तक्ता क्र.१

अनुक्रमांक अ.क्र	तपशील बाब	जिल्हा: सातारा तालुका- जावली			कोयनानगर एकुण
			आंबवडे	३	
१	भौगोलीक क्षेत्र(हे)	२९३६.४८	११८४.९३	०	४१२२.४१
	लागवडीखालील क्षेत्र	२१७८.९५	७३६.४३	०	२९१५.३८
२	बहुतीखालील क्षेत्र	५१७.५	५०८.३	०	१०२५.८
३	वनाखालील क्षेत्र	२२९.०८	३०२.९१	०	५२३.९९
५	पोटखराबा क्षेत्र	५३६.४५	९४५.५८		६८२.०३
४	पडीत जमीन क्षेत्र	७५७.५३	४४८.४९	०	१२०६.०२
६	फलबागेखालील क्षेत्र	२५.५	६१.३	०	८६.८
७	विहीर सिंचित क्षेत्र	४१२	३७७	०	७८९
८	कालवा सिंचित क्षेत्र	०	०	०	०
९	सरासरी पर्जन्यमान	३५०	३५०	०	७००
१०	लोकसंख्या	२१००	१९५०	०	४०५०
	पुरूष	१९००	१०००	०	२१००
	स्त्रीया	१०००	९५०	०	१९५०
	एकुण	२१००	१९५०	०	४०५०
११	खातेदार संख्या	१११२	११०३	०	२२१५
	२.हे.पेक्षा कमी	९४४	१०२०	०	१९६४
	२ हे.पेक्षा जास्त	१६८	८३	०	२५१
१२	अनु.जाती खातेदार संख्या	६०	३५	०	९५
१३	अनु.जमाती खातेदार संख्या	०	०	०	०
१४	पशुधन	१४५०	१३३५	०	२७८५
१५	औजारे	८०	६५	०	१४५
	१ ट्रक्टर	२०	२०	०	४०
	२ नागर	२०	१५	०	३५
	३ पेरणी यंत्र	२०	१५	०	३५
	४ रोटाव्हेटर	२०	१५	०	३५
१६	शेततलाव संख्या	२	२	०	४
१७	कृषि माल प्रक्रिया युनिट	०	०	०	०
१८	उपलब्ध मजुर संख्या	५०	३०	०	८०
१९	आरोग्यपत्रिकेनुसार निर्देशाक	०.९३	०.८३	०	१.७६
	नत्र	०.९३	०.८३	०	०.८८
	स्फुरद	१८.७४	१७.७४	०	१८.२४
	पालाश	२.८६	२.८६	०	२.८६
	सूक्ष्म मूलद्रव्ये			०	
२०	गावातील आत्महत्याग्रस्त	०	०	०	०
२१	गावातील आजी माजी सैनिक	१५	२५	०	४०

5. SPECIES SELECTION

१) टेकडीच्या वरच्या भागात :
मोठी झाडे , उदा. वड , कडू लिंब , पिंपळ ,बकाण व शिमारूबा मध्यभागात DEEP CCT व ३०टक्के बाबू लागवड करणे . DEEP CCT च्या बाजूस झाडे लावल्यास पाणी व ओलावा उपलब्ध होईल व जिवत झाडाचे प्रमाण जास्त राहील व Mortality कमी राहील.

२)मध्यभागात :
बिबा ,टेभुर्णी, करंज, कडूलिंब , कदंब , शिशू ,मोह व मध्यभागी बांबू लावणे (यातून उत्पन्न होईल)

३) पायथ्याशी : **Dry Land Horticulture**
सिताफळ , बोर, चिंच ,बिबा, करंज, आंबा ,निलगीरी, अशोक, गुलमोहोर , महोगणी व बाबू लावणे. ही सर्व झाडे DEEP CCT च्या काठावर लावल्यास Mortality कमी होईल तसेच प्रत्येक झाड लागवडीत ३० टक्के बांबू लागवड करणे सध्या शासकीय नियमानुसार बंधनकारक आहे व त्यापासून उत्पन्न सुध्दा मिळेल व जास्त कार्बन शोषून घेत असल्यामुळे व जास्त ऑक्सिजन देत असल्यामुळे भविष्यात कार्बन क्रेडीट कार्ड म्हणून जास्त महत्व राहील.

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Sr. No.	7/12 No.	Survey No.	Area (acre)	No. of trees (10 ft x 10 ft)	No. of trees on boundary	Total no. of plants	Area covered (acre)
				(excluding water stream area)			
1	117	Survey A	774.55	3,28,412	8,348	3,36,760	727.55
2	390B	Survey B	87.46	34,731	2,577	37,308	77.49
3	[illegible]	Survey C	9.77	2,655	603	3,258	5.30
4	95A	Survey D	36.44	12,445	1,422	13,867	33
5	82	Survey E	89.76	31,311	1,946	33,257	82.19
6	390A	Survey F	605	2,00,000	-	2,00,000	600
	181	**Total**	**997.98**	**6,09,554**	**14,896**	**6,24,450**	**1525.53**

Biomass and carbon stock are in high demand due to their ability to remove GHG gases from the atmosphere. These can be obtained from fast-growing tree plantations, which could be used for land rehabilitation, soil conservation, carbon sequestration and water conservation. Apart from these, tree plantation offers socioeconomic benefits, minimizing the poverty of local people, particularly in developing countries a need. Biomass and carbon stock is affected by several factors such as tree density, choice of tree species, growth rate, silvi cultural management, soil types, and availability of water and nutrient. Trees play a vital role in mitigating the diverse effects of environmental degradation and increasing CO2 concentration in the atmosphere, and also climate change. Therefore, to remove a high amount of GHG gases from the atmosphere, tree species with fast growth rates are preferred over other tree species. The high-density tree planting is a technique in which fast-growing tree species are planted at close spacing/ This offers higher growth, biomass, carbon sequestration. There are several indigenous tree species that are preferred to be planted in close spacing. Following is some of the models which can be used under sequestration projects based on objectives, soil types, and management. If you wanted to plant 1500000 trees on 1500 acres, 1500 trees are required to plant in one area at a spacing of 2×2 m. So based on the site, select the tree from the above mentioned. The

tentative plan to achieve the project goal is Rates of carbon sequestration per ha per year for fast growing tree species.
By considering, 5 tonnes of carbon sequestration / year / ha as min and 10 tonnes of Carbon sequestration / ha / year as maximum. The total 3000 tonnes Carbon sequestration per year to 6000 tonnes Carbon sequestration per year.

Sr No	Name of species	Spacing	Tree density (per ha)	Reference
1	Teak (*Tectona grandis*)	2×2 m 3×2 m	2500 1600	Jain & Ansari (2013)
2	Kadamb (*Anthocephalus cadamba*)	2×2 m 3×2 m 3×3 m	2500 1600 1111	Chandra (2011)
3	Shivan (*Gmelina arborea*)	2×2 m 3×2 m 3×3 m	2500 1600 1111	Singh et al. (2022) Swamy et al (2003)
4	Sissoo (*Dalbergia sissoo*)	3×2 m 3×3 m	1600 1111	Mukhopadhyay, S. and Masto (2016) Kanime et al (2013)
5	Arjun (*Terminalia arjuna*)	3×2 m 3×3 m	1600 1111	Jain & Singh (1998)
6	Red sander (*Pterocarpus santalinus*)	3×2 m 3×3 m	1600 1111	
7	*Melia dubia*	1.5 x1.5 2×2 m 3×2 m 3×3 m	4444 2500 1600 1111	Chavan et al (2022) Singh et al. (2022)
8	Nimbara (*Melia azedarach*)	1.5 x1.5 2×2 m 3×2 m 3×3 m	4444 2500 1600 1111	Satyavali et al (2017) Sri-ngernyuang (1990)

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9	Babul (*Acacia nilotica*)	3×2 m	1600 2000-3500	Rizvi et al (2014) Maguire et al (1990)	
10	Maharukh (*Ailanthus excelsa*)	2×2 m	2500	Balasubramanian (2017)	
11	Bombax ceiba	2×2 m	2500		
Sr No	Name of species	Spacing (m)	Tree per acres	Area to be planted (acre)	Total trees (nos)
1	Teak (*Tectona grandis*)	2×2 m	1000	100	100000
2	Kadamb (*Anthocephalus cadamba*)	2×2 m	1000	100	100000
3	Shivan (*Gmelina arborea*)	2×2 m	1000	100	100000
4	Sissoo (*Dalbergia sissoo*)	2×2 m	1000	150	150000
5	Arjun (*Terminalia arjuna*)	2×2 m	1000	100	100000
6	Red sander (*Pterocarpus santalinus*)	2×2 m	1000	50	50000
7	Melia dubia	2×2 m	1000	150	150000
8	Nimbara (*Melia azedarach*)	2×2 m	1000	200	200000
9	Babul (*Acacia nilotica*)	2×2 m	1000	200	200000
10	Maharukh (*Ailanthus excelsa*)	2×2 m	1000	100	100000
11	Semul (*Bombax ceiba*)	2×2 m	1000	50	50000
12	Khair (*Acacia catechue*)	2×2 m	1000	150	150000
14	Custard apple	1.5×1.05 m	1666	50	83300
			1051.231	1500	1533300

Species	Age (yr)	Tree density (trees ha $^{-1}$)	Net carbon sequestration rate (tonnes ha $^{-1}$ yr $^{-1}$)
Populus deltoides	8	500	12.61
Eucalyptus tereticornis	8	1111	12.79
Dalbergia sissoo	14	312	2.15
T. grandis	15	2500	5.42
Melia spp.	10	640	3.94
Terminalia arjuna	10	690	9.54
Pongamia pinnata	8	258	2.75
Alnus nepalensis	21	458	4.68
Dendrocalmus strictus	20	100	5.46
M. indica	10	400	0.38
Prosopis cineraria	19	45	0.46
Casuarina equisetifolia	20	1600	9.30
Emblica officinalis	12	100	0.47

6. PHASE OF PLANTATION

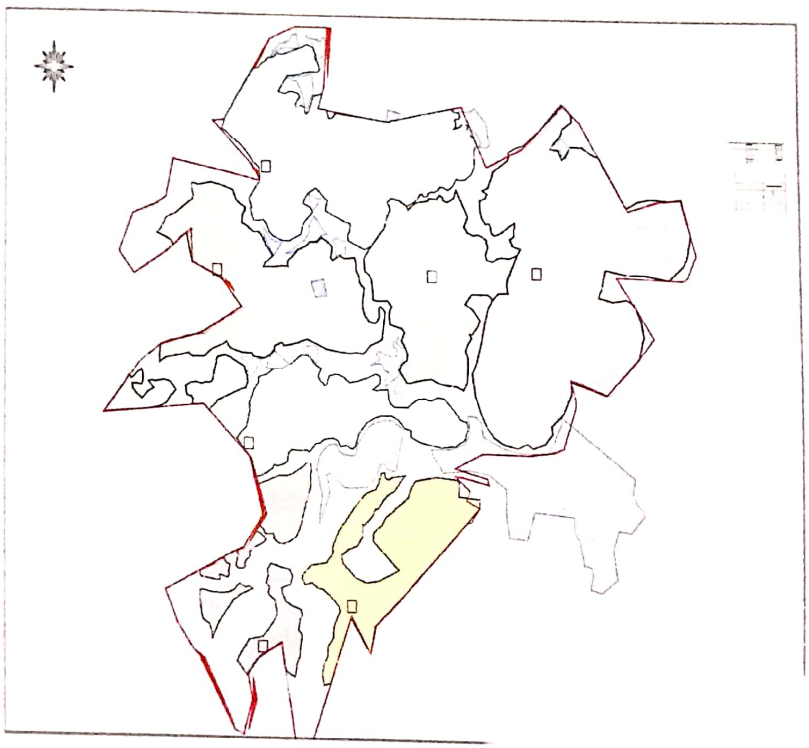

Fig.Kund Zones 117

7. Methodology

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Establishing a successful long-term plantation requires careful planning, and maps play a crucial role in that process. Here are some types of maps and information that should be considered when creating a long-term plantation:

1. **Topographical Maps**: This map shows the elevation and contour lines of a landscape. It is essential for understanding drainage patterns, slopes, and other physical features of the land.

2. **Soil Maps**: Detail the types, depths, pH, and fertility of the soils. This helps determine the best species for the plantation and any soil amendments required.

3. **Climatic Maps**: Highlight the region's climate details like rainfall, temperature, humidity, and frost dates.

4. **Water Source & Irrigation Maps**: Show natural water sources and potential areas for irrigation infrastructure.

5. **Accessibility & Infrastructure Maps**: Indicate existing roads, tracks, buildings, and other infrastructure. This helps in planning the plantation's logistics, access for labor and machinery, and potential harvest routes.

6. **Vegetation & Land Cover Maps**: Display current vegetation cover, which helps determine the current health of the ecosystem and areas that may need clearing.

7. **Pest & Disease Risk Maps**: Indicate areas of known infestations or diseases that could threaten the plantation.

8. **Land Ownership & Boundary Maps**: Clearly define the land's ownership, including any neighboring properties and potential land disputes.

9. **Zoning & Land Use Maps**: These maps ensure the plantation aligns with local regulations and guidelines.

10. **Biodiversity & Conservation Maps**: Highlight areas of high conservation value or habitats of endangered species. It is crucial for ensuring sustainable and environmentally responsible plantation management.

11. **Historical Land Use Maps**: Helps in understanding the previous land uses, which can influence soil health and potential challenges for the plantation.

12. **Hydrology Maps**: Display the flow of surface water, water tables, and any aquifers. This helps in understanding the availability and sustainability of water sources for irrigation.

13. **Fire Risk & Management Maps**: Indicate areas at risk of wildfires and potential firebreaks or buffer zones.

For a plantation site in the Satara Phaltan area of Maharashtra, India, the ideal Geographic Information System (GIS) outputs would depend on the goals of the project and the specific needs of the stakeholders. However, some common GIS outputs for plantation management can include:

1. *Land Suitability Analysis*: Using soil types, elevation, slope, and other variables to identify areas best suited for specific types of plants or crops.

2. *Soil Maps*: Highlighting soil composition, pH levels, fertility, and drainage capacity.

3. *Water Resources Map*: Indicating available water sources, groundwater tables, streams, and ponds.

4. *Climatic Data Overlay*: Showing rainfall patterns, temperature ranges, and humidity, which can affect plant growth.

5. *Topographic Maps*: Providing detailed terrain features like contours, slopes, and elevations, which can influence plantation layout and design.

6. *Infrastructure Map*: Displaying existing roads, paths, buildings, and utilities, which can impact plantation access and maintenance.

7. *Land Use/Land Cover Maps*: Highlighting current and historical land use patterns, which can give insights into areas that have been previously cultivated or left fallow.

8. *Pest and Disease Hotspot Maps*: Based on historical data, showing areas that have had recurrent pest or disease issues.

9. *Vegetation Index Maps*: Using remote sensing data to show plant health, vigor, and areas of stress.

10. *Hydrology Maps*: Highlighting drainage patterns, wetland areas, and potential flood zones.

11. *Biodiversity Maps*: Showcasing existing flora and fauna, which might be crucial for environmental impact assessments.

12. *Spatial Distribution of Seedlings*: For tracking the progress and health of young plants in the plantation.

13. *Remote Sensing Imagery*: High-resolution satellite or drone imagery can offer a visual overview of the plantation and detect anomalies or areas of interest.

14. *Boundary and Buffer Zone Maps*: Demarcating plantation boundaries, buffer zones, and conservation areas.

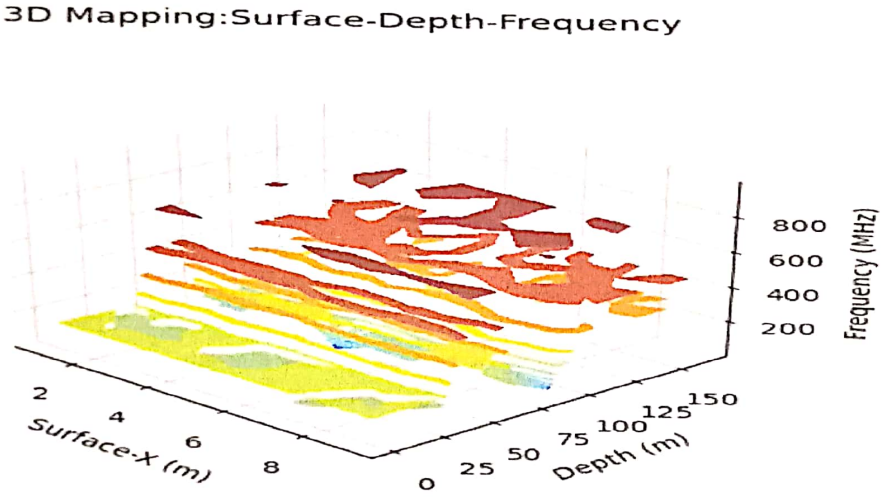
15. *Socio-economic Maps*: Showcasing nearby communities, land ownership, and areas of cultural importance. This can help in understanding the local socio-economic context and any potential conflicts or collaborations. Once these GIS outputs are

generated, they can be combined, analyzed, and visualized to make informed decisions regarding plantation management, conservation, and sustainable practices in the Satara Phaltan area. Once these maps are in place, they should be combined and overlaid using Geographic Information System (GIS) software to get a holistic view of the plantation area. This will provide a solid foundation for making informed decisions and adjustments over the life of the plantation. Scientific Project Management of Ecological Restoration of Gat no. 117, 181, 390 A & B at Jawali Village.

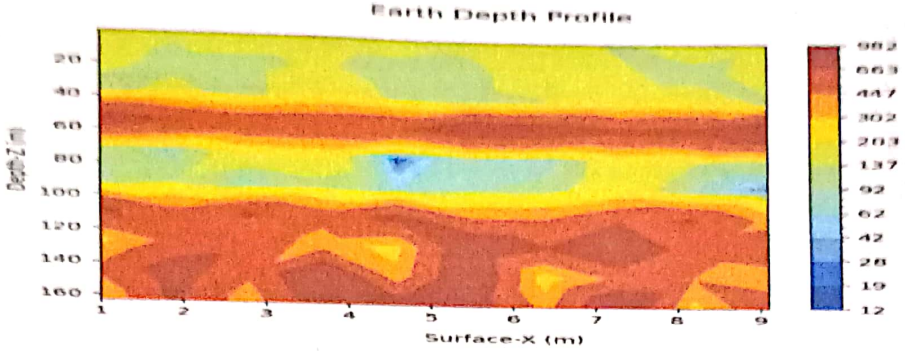
- Ground Water Survey Report for phalatan_chincholo_35 (Client)

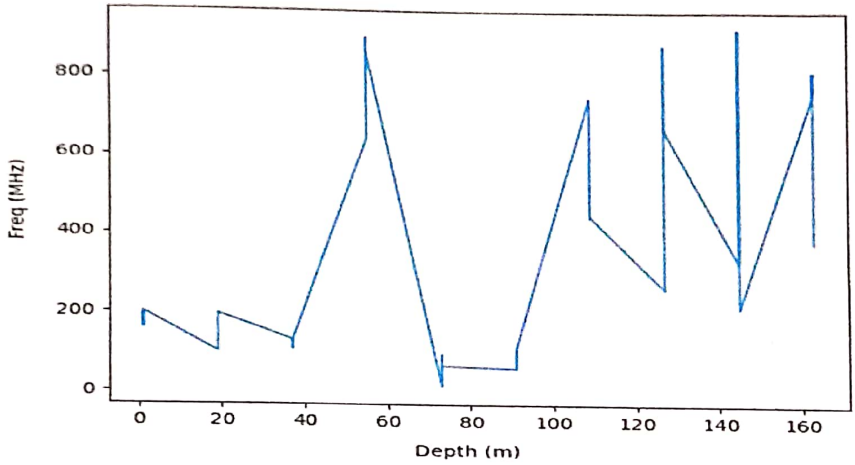
14 Oct 2023 (07:04:31).119340)

A survey of the geological structure and geography of the area, along the required tolerance, is conducted using the instrument 3D Mapping.The detailed report is as follows:

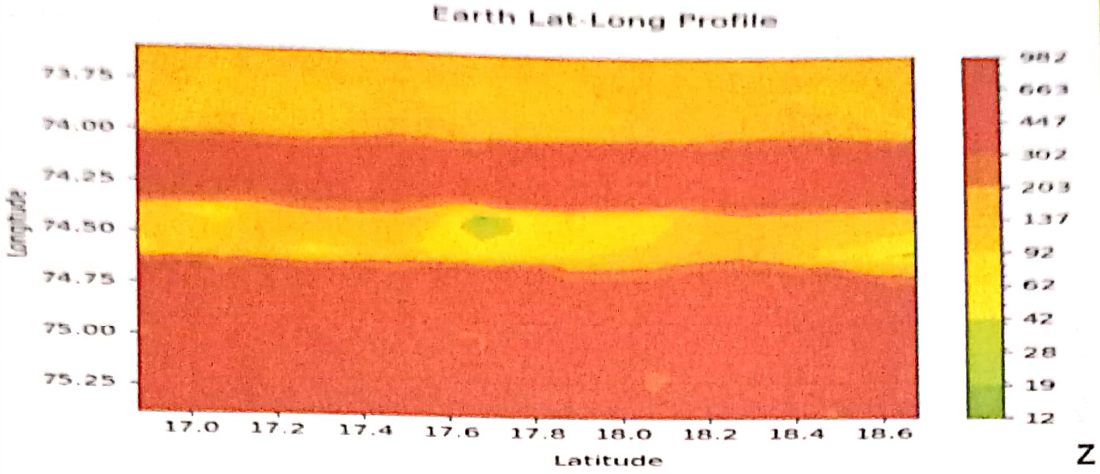


Survey NO.117





Survey NO.117



Survey Report for Phalatan Chincholo 35 (Client)

- **Customer Name:**Phalatan Chincholi 35
- **Surveyor Name**: SorateR_R
- **Latitude**: 17.8768751
- **Longitude**: 74.593009Surface Type: Level GroundSource 1 : 43.2 (m)
- **Source 2** : 68.4 (m)
- **Source 3** : 93.6 (m)
- **Source 4** : 118.8 (m)
- **Source 5** : 171.0 (m)TotalBHD:271.0(m)
- **Rock Strength Analysis**: 55 %Water Quantum: 3573 LPHWater Quality: 64 %
- **Salinity**: 70 %PermiabilityFactor:64%

Reports are generated based on the unit's inbuilt sensors which survey the geological structure,geography of the area and the required tolerance. Then the equipment does the

necessary calculationto arrive at result. Depending on the rock permiability factor,the quality,quantity and quantum ofwater is projected. This projection is true to (90 to 97 %), except where some Morphological Structuremay be in varied condition or any human errors encountered during survey.

For more information refer to: www.geophinex.com

Planning: Drip irrigation map.

Block No	Approx.Area (Acer)	Perimeter (Km)	No of Trees	Water Capacity Required (Lit)	Water Storage Capacity Generated(Lit)
1	160	4.32	128000	76 Lakh	1.5 Cr
2	112	3.35	89600	54 Lakh	1 Cr
3	178	4.6	142400	85 Lakh	1 Cr
4	120	4.43	96000	58 Lakh	1.5 Cr
5	177	3.62	141600	84 Lakh	80 Lakh
6					
7	135	3.8	64800	40 Lakh	1 Cr
			6.62 Lakh	3.97 Cr	6.8 Cr

Table 2 : Water Capacity for 117

Geological Study:

Topographical, Groundwater, Climate survey of the surveyed area at Jawali village.

1. Geological studies and Topographical survey

2. GIS analysis of the study area

3. Groundwater investigations using Electrical Resistivity Technique. It is recommended to have 4 ERT per acre for the highest accuracy. We are searching for 100 points throughout the available land area

4. Geochemical analysis of rock samples (XRF) is required for sample testing.

5. Climate survey to estimate rainfall and water availability.

6. Any part of the study that is required can be outsourced from agencies for a better evaluation of the study area.

7.The detailed hydrogeological, geological, and topographical report will cover the following points: demarcating with regard to.

• Demarcating worthy and non-worthy areas from a groundwater occurrence point of view.

• Locating exact spots for production bore wells, recharge bore wells, recharge cum production bore wells, and open dug wells.

• Estimate the quantity of rainwater that can be recharged per bore well.

• Study of the existing surface water bodies in the area.

• Determination suitable method for artificial recharge through storm water.

• Geochemical characterization of the lithology from the study area.

• GIS analysis of the study area for the creation of a 3D image and understanding the topography.

Total Project Management : Round o clock presence of the team and expertise from September 2023 to September 2027.

A. Ongoing planning activities for execution:

1. Costing and estimation of each activity.
2. Yearly Accomplishments based on Biodiversity & Geological recommendations
3. Scientific testing of soil water and nutrients.
4. Complete Biodiversity Survey & detailed report.
5. Creating the structure for safety measures in the face of climate challenges.
6. Complete Geology and Climate Survey & detailed report
7. Early Execution Plan
8. Marking of the zones on land with drawings.
9. Marking of the plots with drawings.
10. Marking the contour lines with drawings.
11. Designing the zone-wise plant mix with drawings.
12. Planning of the by-products management.
13. Zone wise by-products forecasting.

14. Utility management or en-cashing the by-products.

15. Marking Plot wise plant positions.

16. Scientific development of nursery for native and natural plants.

17. Creating a structure of plant records from the day of planting ongoingly.

18. Land development for maximum and natural plantation.

19. Optimum water management program.

20. Plantation program.

21. Bio compost production program.

22. Setting up a basic onsite testing laboratory with a lab assistant.

23. Human resource planning for every calendar period.

24. Material tools and equipment outsourcing plan.

25. Data recording and documentation structure.

26. Developing the profit centers from the perspective of by-products, environmental & biodiversity education, eco-tourism, creating occasions for the community to participate in ecological restoration events, promoting natural forestation.

Commercial hospitality management for guests and visitors.

28. Inventing innovative sustainable ideas to promote ecological rejuvenation.

29. Empowering and enabling the team and providing leadership in the field of Ecological

Restoration.

B. Weekly Management During the Execution and Plantation:

1. Weekly budgeting of the execution activity.
2. Weekly safety management from the climate challenges.
3. Zone-wise weekly checklist of tasks to fulfill the outcome.
4. Plot-wise weekly checklist to fulfill the outcome.
5. Plant-wise weekly checklist to fulfill the outcome.
6. Weekly recording of the zone with measures.
7. Weekly recording of the plot with measures.
8. Weekly recording of each plant with measures.
9. Weekly nutrition management.
10. Weekly water management zone and plot-wise.
11. Weekly plant watering management.
12. Weekly Bio Compost Production Management from the generated bio material.
13. Weekly testing of soil & water.
14. Weekly monitoring of pests and pest control.
15. Weekly data recording & documentation.
16. Weekly progress report.

17. Weekly empowering enabling session for the team and providing leadership for ecological restoration.

C. Ongoing weekly management after Plantation

1. Weekly budgeting of the management.
2. Weekly restoration in case of mortality.
3. Weekly alternative plan in case of failures.
4. Weekly safety management from the climate challenges.
5. Weekly byproduct resource management.
6. Weekly nursery management.
7. Weekly Bio compost production with measurements.
8. Weekly recording of each plant with measurements.
9. Weekly water management.
10. Weekly plant watering management.
11. Weekly human resource management.
12. Weekly Carbon Sequestration Measuring by inventing new ways to measure.
13. Weekly human resource management.
14. Weekly report with measurements.
15. Weekly hospitality management.
16. Daily maintenance management.

Implementation: Completed WORK

Maintainance management

8. Community Invovement

9. Collaborations:APCOER letter

10.Human Resourses

For long-term successful plantation, it's essential to integrate expertise from various professions and consider diverse aspects. Here's a list of professions, experts, and aspects to consider:

Professions & Experts:

1. **Agronomist**: For crop selection, soil health, and best agricultural practices.
2. **Civil Engineer**: To design infrastructure, roads, drainage systems, and other structures.
3. **Hydrologist**: For water source identification, water management, and irrigation.
4. **Soil Scientist**: To assess and manage soil fertility and address soil-related issues.
5. **Environmental Scientist**: For environmental impact assessments and sustainable practices.
6. **Forester**: If the plantation involves trees, for managing forest health and timber production.
7. **Entomologist**: To address pest-related issues and advise on integrated pest management.
8. **Plant Pathologist**: To diagnose and treat plant diseases.

9.**Meteorologist/Climate Scientist**: For understanding local climate patterns and predicting changes.

10. **Economist**: For financial planning, market analysis, and economic feasibility studies.

11. **Sociologist/Anthropologist**: To understand the social and cultural implications of the plantation, especially if it's in a community-centric area.

12. **Labor Specialist**: To manage workforce needs, rights, and training.

13. **Supply Chain Expert**: To optimize product movement, from farm to market.

14. **Marketing and Sales Professionals**: For market research and promoting products.

15. **Legal Expert**: For land acquisition, labor laws, and other legal compliance.

16. **GIS Specialist**: For mapping, land-use planning, and spatial analysis.

17. **Renewable Energy Consultant**: If integrating sustainable energy solutions.

18. **Wildlife Biologist**: If the plantation is near natural habitats, to ensure coexistence and minimize disruption.

19. **Architect /Landscape/ Planning Engineer.**

11. Expected Outcomes

The plantation of 1.5 million native trees will result in several benefits, including:

1. Improved Biodiversity: Planting native trees will enhance the biodiversity of the area, provide habitats for animals, and promote the restoration of the ecological balance.

2. Water Conservation: The water budgeting and soil water conservation activities will help conserve water, promote efficient use of resources, and enhance the soil's fertility.

3. Climate Change Mitigation: Planting trees will help mitigate the effects of climate change by reducing the carbon footprint, improving air quality, and preventing soil erosion.

4. Economic Development: The plantation will create job opportunities, promote entrepreneurship, and support local economic development.

5. The checklist of various biodiversity elements.e., plants and animals through systematic documentation will be obtained.

6. The species of conservation concern in the area can be highlighted and worked upon further to aid their conservation.

7. If the village comprises of Biodiversity Management Committee (BMC) under the Biological Diversity Act, 2002, the data documented can be incorporated into Peoples' Biodiversity Register of the village

12. Material Resourses

13. BUDGET AND FUNDING TOTAL COST FOR 117

14. Estimation and Costing

15. Challenges and Risk

16. Performance Indicator

17. Regulator Assessment and Maintainance

18. Sustainability impact on the environment

19. Long Term Plan

Long-term Vision:Consider the plantation's goals in the next 10, 20, or even 50 years. This might involve succession planning, expansion plans, or diversification strategies.Remember, a successful plantation not only considers the immediate needs of the crops but also the long-term sustainability and growth of the entire operation. Collaboration with local experts, communities, and stakeholders can also provide invaluable insights and support.

20. Environment and social impact.

ANNEXURES

IICARE FOUNDATION
CIN:U85300MH2022NPL377463

Date: 25th April 2023

Letter of Appointment

To,
The Principal,
Akhil Bhartiya Maratha Shikshan Parishad's ,
Anantrao Pawar College of Engineering & Research,
Parvati Ramana, Pune, Maharashtra.

Subject: Appointment for the "Building Sustainable World" Project at Jawali Village, Tal-phaltan Dist-Satara.

Dear Sir/Madam,

We are excited to announce the initiation of the ambitious "Building Sustainable World" project aimed at planting 1.5 million native trees in the Jawali Village, Phaltan Taluka, Satara District, Maharashtra, spanning across a vast 2,500 acres. This initiative is not only an endeavor to enrich our environment but also aims to drive socio-economic growth within the region.

In line with the project's grand vision and our determination to make it a success, we are in search of collaborations with reputed academic and professional institutions that possess expertise across diverse domains, including Soil Water Conservation, Farm Ponds Creation, Well Creation, Irrigation Network, Road Network, Zoning, and other Civil and Developmental Activities.

Tulsi Prerna, New Panvel (W), Navi Mumbai, Maharashtra, India, 410206
Contact : +919309777900, www.iicare.org

I) Legal Complainces

Maps and drawings

Acknowledgements

Thanks to Hon. Dr. Santosh Bhosale and ABMSP for the opportunity.

Dr. R.R. Sorate,Associate Professor of Civil Engineering. Dept and Team Lead

❖ References

I) Legal Complainces

Maps and drawings

Acknowledgements

Thanks to Hon. Dr. Santosh Bhosale and ABMSP for the opportunity.

Prof. Ranjitsing Gaikwad,
Asst. Professor, Civil Dept.

Dr. A.B.Shelar
Asso. Professor, Civil Dept.
QUALITY MANAGER

Dr. R.R. Sorate
HOD, Civil Dept.

Dr. S. B.Thakare
Principal, APCOER