IMPROVING LIVELIHOODS THROUGH AGROFORESTRY PLANTATIONS IN INDIA

Project title	Improving livelihoods through Agroforestry Plantations in India
Project ID	3560
Monitoring period	01-March-2018 to 30-September-2024
Crediting period	01-March-2018 to 29-February-2048
Original date of issue	29-April-2025
Most recent date of issue	06-January-2026
Version	5.0
VCS Standard Version	4.7
Prepared by	Infinite Environmental Solutions Limited

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1 PROJECT DETAILS

1.1 Summary Description of the Project

This project entitled "Improving livelihoods through agroforestry plantations in India" is a grouped project, with aims of sustainable implementation and management of Afforestation Reforestation and Revegetation activity that involves carbon sequestration on small, degraded land through *Mangifera indica* L. (Mango), *Psidium guajava* L. (Guava) and *Pterocarpus santalinus* Linn.f. (Red Sander) plantation activities in Andhra Pradesh, Tamil Nadu and Madhya Pradesh states of India. The project initially implemented in various district of Andhra Pradesh, Tamil Nadu and Madhya Pradesh on multiple small and marginal land parcels of farmers. Mango, Guava and Red Sander are planted in privately owned lands in the project area. The project is managed by Infinite Environmental Solutions Limited, which works closely with farmers and other stakeholders. The goal is to enhance carbon sequestration, provide economic benefits to local farmers, promote sustainable agricultural practices, and support the livelihoods of small-scale farmers. Additionally, the project aims to improve soil health and increase biodiversity in the region.[1]

The project is commencing from 01-March-2018 for the period of 30 year. Prior to the project initiation the project area was facing several challenges, like soil erosion due to synthetic fertilization, water scarcity, low productivity and the land under this project activity was degrading agriculture land with low productivity in Andhra Pradesh, Tamil Nadu and Madhya Pradesh, states of India. Prior to project initiation, land facing the problem of degradation with low productivity, high cost of cultivation[2], water supply[3] problems in the project area resultant to the degrading agriculture land with low productivity. Moreover, Madhya Pradesh, a landlocked state of India, receives most of its rainfall during the monsoon season, averaging only 95.2 cm, annually. Farmers in these states encounter challenges such as soil and water conservation, low per capita income, and dependence on rainfed farming. Therefore, project aim of the project is to establish a consistent and sustainable source of livelihood income for farmers. *Mangifera indica* (Mango) *Psidium guajava* (Guava) and *Pterocarpus santalinus* (Red Sander) are vital species in Nature

[1] Singh, S. L., & Sahoo, U. K. (2018). Mango-based agroforestry for biodiversity conservation and ecosystem restoration in Saiha District of Mizoram, In: Climate Change: Impact, Adaptation & Response in the Eastern Himalayas, (eds,) John Zothanzama, Benjamin L. Saitluanga, Lalnuntluanga, S.T. Lalzarzovi & R. Zonunsanga, Excel India Publishers, New Delhi, India, pp 62–66.

[2] Saidhar, R., Uma Devi, K., Vishnu Sankar Rao, D., & Srinivasa Rao, V. (2016). Constraint analysis of small farmers in agriculture in Guntur district of Andhra Pradesh. The Andhra Agriculture Journal, 63(4), 962-967.

[3] Kanagavalli, G., & Manida, M. (2020). Challenges and Opportunities to Improve the Livelihoods of Smallholder Farmers in Tamil Nadu. Journal of Shanghai Jiaotong University, 16(07), 312-321.

Based Solutions for the sequestration of atmospheric carbon dioxide.[4][5] Cultivating these species on privately owned lands provides farmers with economic incentives through carbon credit, diversifying their income streams and offering the potential for long-term financial gains. Additionally, these plantation activities promote sustainable agricultural practices, encourage community involvement, and raise awareness about climate change. Furthermore, Mango, Guava, and Red Sander trees are highly effective at absorbing greenhouse gases, making them valuable crops for combating climate change6[6] and playing a crucial role in carbon sequestration.[7] Therefore, the aim of project is to increase the carbon sequestration activity by proper management of Mango, Guava and Red Sander species in Andhra Pradesh, Tamil Nadu and Madhya Pradesh by addressing farmer challenges through fostering the socio-economic upliftment of small and marginal farmer communities.

Details of project Phase

Instance	Plantation type	Scale up capacity of project (ha)	Area Planted for PAI-1 (ha)	Location	Project start date	Project Proponent
Project Activity Instance (PAI)-1	Mango (*M. indica*)	4,000	687.27	Andhra Pradesh and Tamil Nadu	01-March-2018	Infinite Environmental Solutions Limited
	Red Sander (*P.santalinus*)		80.96	Andhra Pradesh		
	Guava (*P. guajava*)		125.83	Madhya Pradesh		

Out of 894.06 ha area under the first project instance, 687.27 ha area is under Mango plantation in Andhra Pradesh and Tamil Nadu, 80.96 ha is under Red Sander plantation in Andhra Pradesh, and 125.83 ha area is under Guava plantation in Madhya Pradesh planted from 2018 to 2023 by involving 2,052 farmers. The project does not only offer temporary employment opportunities to local communities during its implementation and maintenance phases but also contributes significantly to environmental benefits during the tenure.

[4] Haider, S. M. A., Ahmad, I., Majeed, K., & Hussain, M. (2024). Soil Organic Carbon Sequestration Potential and Its Sustainability Comparison Between Mango-based Agroforestry and Cropland Seeking Soil Fertility Parameters Under Climate Resilience. Water, Air, & Soil Pollution, 235(11), 682.

[5] Arunkumar, A. N. and Joshi, G. (2014). Pterocarpus santalinus (Red Sanders) an Endemic, Endangered Tree of India: Current Status, Improvement and the Future. /Journal of Tropical Forestry and Environment, 4(2):1-10.

[6] https://www.researchgate.net/profile/Ravindra Vattem/publication/338475773_Carbon_Sequestration_Potential_of_Mango_Orchards_in_India/links/5e574248299bf1bdb83e650f/Carbon-Sequestration-Potential-of-Mango-Orchards-in-India.pdf

[7] Singh, S. E. W. A. (2020). Carbon sequestration potential of red sander (Pterocarpus santalinus) plantations under different ages in Vellore and Thiruvallur districts of Tamil Nadu. Life Sci. Leaflets, 123, 1-10.

The primary focus is on enhancing tree cover, which aids in reducing greenhouse gases and storing carbon in form of biomass. This approach plays a vital role in mitigating climate change and increasing carbon sinks. Based on the ex-ante estimates of the 894.06 ha area (PAI-1), the estimated removal VCUs is 179,711 t CO2-e with annual removal of 5,990 t CO2-e over the 30 years of project crediting period (i.e., 01-March-2018 to 29-February-2048). The net anthropogenic GHG removal for first monitoring period (i.e., 01-March-2018 to 30-September-2024) is 65,813 tCO2e.

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
Validation/ verification	01-March 2018 to 30-September-2024	VCS	Carbon Check (India) Private Limited	Six years and Seven months

1.3 Sectoral Scope and Project Type

Sectoral scope	14; Agriculture, Forestry, and Other Land Use (AFOLU)
AFOLU project category[8]	AFOLU
Project activity type	Afforestation. Reforestation and Revegetation (ARR)

1.4 Project Eligibility

1.4.1 General eligibility

The proposed project meets all the requirements set forth in the VCS standard, VCS program and CDM methodology AR-ACM0003 “Afforestation and reforestation of lands except wetlands”, Version 2.0.

1. Section 2.1.1 of the VCS standard 4.7 explains scope of the VCS program. The project entitled “Improving Livelihoods through Agroforestry Plantations in India” lead to sequestration /removal of CO2 (one of the seven GHGs mentioned under the Kyoto protocol) in different pools of carbon in the form of AGB, BGB, SOC, litter and dead wood. Project activity is not excluded from the scope as per the table 1 given in the section 2.1.3 of the VCS standard 4.7.

2. AFOLU project is listed on 20-July-2022 and shall be validated before 12-July-2027 (As per 8 years deadline for ARR projects of any size). Project has been listed as under development and received no comment during the 30 days public comment period. Opening meeting

[8] *See Appendix 1 of the* VCS Standard

representing the beginning of the validation process started after the completion of 30 days public comment period.

3. Project activity is supported by the methodology approved under an approved GHG program. The project uses CDM approved large scale methodology AR-ACM0003 v2.0[9], as approved under the scope of the VCS for ARR projects. The project activity is a grouped project activity and PAI-1 covers 894.06 hectare of area during 2018 to 2023. PP intends to scale up the project up to 4,000 ha area which will lead to annual GHGs removal more than 16,000 tons of CO_2, as per CDM methodology booklet large scale methodology is applicable.

4. As per the VCS Eligible ARR projects may include harvesting in their management plan. The project area shall not be cleared of its native ecosystems within the 10-year period prior to the project start date.

1.4.2 AFOLU project eligibility

The project is eligible under the scope of the VCS Program as the project includes AFOLU activities (project category ARR), which are supported by a methodology approved under the VCS Program. The project shall comply with all rules and requirements stated in the following documents:

- Program guide Version 4.4[10]
- VCS Standard, Version 4.7[11]
- AFOLU Non-Permanence Risk Tool, v4.2[12]

Eligible conditions	Justification/description	Proof
1) Eligible ARR activities are those that increase carbon sequestration and/or reduce GHG emissions by establishing, increasing, or restoring vegetative cover (forest or non-forest) through the planting, sowing or human-assisted natural regeneration of woody vegetation.	According to the list of eligible AFOLU Projects described in Appendix 1 of VCS Standard Version 4.7, the present activity falls under the Afforestation, Reforestation and Revegetation (ARR) category. The project aims at establishing, increasing the vegetative cover through native tree species *Mangifera indica* L. (Mango), *Psidium guajava* L. (Guava) and *Pterocarpus santalinus* (Red Sander) which leads to carbon sequestration in aboveground	Please refer to section 1.12 of this document.

[9] https://cdm.unfccc.int/UserManagement/FileStorage/THNRJC15IW4K89UBE6DFZYX23OVP0Q

[10] https://verra.org/wp-content/uploads/2023/08/VCS-Program-Guide-v4.4.pdf

[11] VCS Standard, v4.7 (verra.org)

[12] https://verra.org/documents/afolu-non-permanence-risk-report-excel-calculation-tool-v4-2-updated-6-dec-2023/

	biomass, belowground biomass, litter, dead *wood and soil organic carbon (SOC).*	
2) Eligible ARR projects may include timber harvesting in their management plan	Harvesting and replanting activity is part of the project as per project implementation and management plan.	Refer Section 1.12 describes the project management plan.
3) The project area shall not be cleared of native ecosystems within the 10 years period prior to the project start date.	The project activity has not cleared any native ecosystem within the 10 years period prior to the project start date.	LULC map is given in section 1.14 of this document.

1.4.3 Transfer project eligibility

The section is not applicable, as the project is not registered and transferred from other GHG program. The project is only seeking registration under the VCS with ID 3560.

1.5 Project Design

Project activity has been implemented in three states of India, namely Andhra Pradesh, Tamil Nadu and Madhya Pradesh. Designed as a grouped project, it begins with PAI- 1, covering an area of 894.06 hectares. The land parcels chosen for these plantations were identified as degraded and continued to be degraded in the baseline with negligible vegetative cover. This land parcels are land standing history agricultural practice (Please refer the section 2.4.3). For future PAIs, project activities will be implemented only in the states of Andhra Pradesh, Tamil Nadu and Madhya Pradesh in India.

This grouped project activity adheres to the requirements set forth in Section 3.6 of the VCS Standard v4.7, ensuring compliance with the criteria for grouped projects.

☐ Single location or installation

☐ Multiple locations or project activity instances (but not a grouped project)

☒ Grouped project

Grouped Project Design

Project activity has been implemented in three states of India, namely Andhra Pradesh, Tamil Nadu and Madhya Pradesh. Designed as a grouped project activity, PAI-1 covers an area of 894.06 hectares. The selected land parcels were identified as degrading agriculture land with low productivity or areas that continue to remain degrading in their baseline. These land parcels are land standing history agricultural practice. The initial project activity instances have been implemented within these three states, which constitute the clearly defined geographic areas of the grouped project. Each project area is represented by geodetic polygons, as required under Section 3.11 of the VCS Standard. The project proponent confirms that any future inclusion of project areas whether within these three states only or where the same or a more conservative baseline scenario and additionality rationale can be demonstrated, in accordance with Section 3.6.10 of the VCS Standard, v4.7.

This grouped project activity fully adheres to the requirements set forth in Section 3.6 of the VCS Standard, v4.7, ensuring compliance with all criteria for grouped projects. The design allows the project to manage multiple areas under a single registration, provided each included area meets the defined degradation criteria and contributes to measurable carbon sequestration through afforestation efforts.

A) Eligibility criteria for grouped project

Description	Evaluation
A delineation of the geographic area(s) within which all project activity instances shall occur.	As outlined in Section 1.5, project boundary for grouped project is Andhra Pradesh Tamil Nadu and Madhya Pradesh, states of India and plans to scale up to the capacity of 4,000 ha. For PAI -1, project activity has been carried out in three states of India, namely Andhra Pradesh Tamil Nadu and Madhya Pradesh. The total area covers under PAI -1 is 894.06 ha. For future instances, the baseline scenario and rationale for additionality will be same as, or more conservative than those established for the initial PAIs.
One or more determinations of the baseline for the project activity in accordance with the requirements of the methodology applied to the project.	The PAI- 1 was implemented across Andhra Pradesh Tamil Nadu and Madhya Pradesh has established its baseline scenario following the AR-ACM0003 V 02.0 methodology, considering the land was degrading agriculture land with low productivity before intervention of plantation activity. The baseline determination ensures that, without the project these lands would have

	remained in degrading state. For future instance of the project, the baseline scenario and rationale used will be same or at least as conservative as those determined based on first PAI. As per AR-TOOL 14, baseline carbon stock for future PAIs can be considered zero because: 1. No baseline trees: PRA and satellite imagery show that the land is barren or used only for annual crops, with no shrubs or trees. 2. No impact from project: In PAI-1 there were no trees; in future PAIs, any baseline trees found will be identified separately and excluded from project ER calculations. 3. Separate monitoring: Baseline trees (if any in future PAIs) will not be inventoried with project trees but only monitored to confirm their continued existence. 4. Degraded cropland: The land undergoes seasonal clearing (90–180 days), so baseline shrub carbon stock is zero as per Clause 5.12(f). 5. No deadwood/litter: Degraded land without trees/shrubs does not accumulate deadwood or litter; hence these pools are zero. If the future Project Activity Instances (PAIs) do not meet the baseline conditions described above, the Project Proponent (PP) will restrict the inclusion of that land parcel in the project.
One or more demonstrations of additionality for the project activity in accordance with the requirements of the methodology applied to the project.	The land parcel(s) must demonstrate additionality as described in Section 3.5. For future instances of the project, the demonstration of additionality will follow the same approach, or be at least as conservative as that established for the first PAI.
One or more sets of eligibility criteria for the inclusion of new project activity instances at subsequent verification events.	• In addition to the eligibility criteria outlined in Section 1.4.2, land parcels included in the project activity must meet the following conditions: Must be a degrading agriculture land with low productivity • Must be in the geographical boundary of three state i.e. Andhra Pradesh, Tamil Nadu and Madhya Pradesh, where PAI-1 is implemented .

	• Shall not be cleared of native ecosystems within the 10 years period form activity start date • Privately owned lands must have clear possession and accessible boundaries, distinct from government-declared protected areas.
A description of the central GHG information system and controls associated with the project and its monitoring.	The operation division of PP oversees the governance of the GHG information system, controls, and monitoring associated with the project. The Whole-time Director (Operations), the Measurement, Reporting, and Verification (MRV) Team, along with the AFOLU expert are tasked with the responsibilities outlined in sections 6.3

B) Eligibility criteria for New Project Instances (PAI)

Eligibility Criteria	Evaluation
Meet the applicability conditions set out in the methodology applied to the project.	Each land parcel included in any future PAI shall meet all applicability conditions of the applied methodology (CDM AR-ACM0003, v2). For each new PAI: • The land included is not classified as wetland as per host country/international definitions. • Soil disturbance directly attributable to project activities does not exceed 10 percent of the project area, consistent with methodology limits on significant soil carbon impacts. • Shall also comply with the applicability conditions of the tools contained within the methodology (including AR-TOOLS 02, 03, 08, 12, 14, 15, 16, 19 and the VCS Non-Permanence Risk Tool). These criteria ensure that every PAI remains within the methodological boundaries validated for the grouped ARR project.
Use the technologies or measures specified in the project description.	All PAIs implement agroforestry activities categorized under ARR in accordance with the VCS AFOLU requirements, as detailed in Section 1.12 of the project description and deemed eligible under Program Standard 4.7, Appendix 1A.1. The project activities involve the establishment and management of agroforestry tree species on degraded or low-productivity

	agricultural located within the predefined grouped-project geographic boundary. While the overall approach remains consistent, the selection of tree species and specific agroforestry models may vary across PAIs based on farmer preferences, local ecological conditions, and site-specific soil characteristic.
Apply the technologies or measures in the same manner as specified in the project description.	All new PAIs are implemented using the same manner as defined in the initial PAI in the validated project description, including overall project design, management systems and monitoring approach. This includes adherence to the same fundamental agroforestry intervention logic (conversion of degrading agriculture land with low productivity to tree-based systems for climate mitigation and livelihood supports). Differences among PAIs are limited to location within the predefined geographic area and permissible variation in species mix or density, which do not change methodological applicability, baseline type, or additionality rationale. These variations do not affect the applicability of the methodology, the baseline scenario, which remains non-tree-based degrading agricultural land nor the additionality assessment. All plantation models constitute a clear departure from baseline practices and result in increased carbon stocks. Additionality is preserved because adoption of these models requires project-specific support that would not be available under the baseline scenario. All species and plantation models remain fully consistent with ARR agroforestry activities under the applied methodology, do not represent common practice within the defined geographic area, and are not independently financially viable without carbon

	revenue. Furthermore, they are consistent with the validated baseline scenario and do not affect the additionality rationale established for the initial PAI. Species or models that are already widely practiced, legally mandated, independently profitable, or subsidized to the extent that they are financially viable without carbon finance are explicitly excluded. Furthermore, species selection will be considered by the following criterion/criteria for new PAIs: ➢ Native or naturalized species will select for the plantation ➢ Optimum density will be considered as per selected species requirement ➢ Species for the new PAIs will be selected in accordance with the Silvi-horticultural model used in PAI-1.
Are subject to the baseline scenario determined in the project description for the specified project activity and geographic area.	For all PAIs, the baseline is degrading agriculture land with low productivity land under private ownership, not natural forest or long-term forestry. Project lands are owned or managed by small land farmers with a documented history of land with no evidence of recent conversion from natural forest. The future PAI according to the AR-TOOL 14, carbon stock in trees in the baseline can be accounted as zero if all of the following conditions are met: 1) The Baseline trees are neither harvested nor cleared, nor removed throughout the crediting period of Project activity. During the commencement of the Project Activity on the various small land parcels, the land is solely used for the agricultural practices having low productivity land. Based on the PRA and satellite imaginary there should be no evidence of shrub or trees in the bunds/boundary. These areas shall be traditionally used for cultivating annual agriculture crops. 2) The Baseline trees shall not suffer mortality because of competition from trees planted in the project, or damage because of implementation of the Project activity, at any

	time during the crediting period of the project activity. In PAI-1, there were no trees in the Project Area prior to the start of the project. In future PAIs if there are trees in the baseline it shall be identified and deducted from the project emission reduction calculation. 3) The Baseline trees are not inventoried along with the project trees in monitoring carbon stocks but their continued existence, consistent with the baseline scenario, is monitored throughout the crediting period of the Project activity. For PAI-1 there are no pre-project trees in the Project Area. In future if there are any trees it shall be not inventoried along with the project trees in monitoring carbon stocks but their continued existence, consistent with the baseline scenario, is monitored throughout the crediting period of the Project activity. 4) The land parcels involved in the project undergo degrading agricuture land with a periodic cycle of trees in the cycle of clearing and regrowing traditional crops, resulting in biomass oscillation for short duration. Consequently, as per AR-TOOL 14, clause 5.12(f), the change in carbon stock in shrubs ($\Delta C_{SHRUB\_BSL,t}$) in the baseline scenario is zero. The same shall be ensured in the future PAIs 5) Also baseline dead wood and litter shall be assumed to be zero due to the fact that the baseline scenario will be degraded land, which will not allow accumulation of dead wood and litter in the absence of trees/shrubs. The initial instance covers agroforestry activities across three Indian states. All future instances of the grouped project will also be restricted to these three states and will be included only if they meet the same baseline conditions and follow the additionality rationale established for the initial PAI. Baseline determination and additionality demonstration will be based on the initial project activities, ensuring eligibility for future instances as per VCS Standard v4.7, Section 3.6.16(2) and (3).

	For all PAIs, including future ones, baseline determination and additionality demonstration are anchored in the same underlying scenario of degraded, low-output agricultural land, and are applied in a manner that is the same as or more conservative than that used for the initial PAI, in line with VCS Standard v4.7 sections 3.6.16–3.6.17 on grouped projects. This ensures that no PAI is added whose baseline or additionality conditions fall outside the validated eligibility envelope of the grouped ARR agroforestry project.
Have characteristics with respect to additionality that are consistent with the initial phases for the specified project activity and geographic area.	All future PAIs must satisfy the same or a more conservative additionality demonstration as the initial PAI, following VCS Standard v4.7 grouped-project requirements on eligibility criteria and baseline/additionality determination. The following conditions apply to each new PAI: 1. The activity is not mandated by law (national, regional and local level) 2. Incentives from the planned sale of carbon credits was seriously considered in the decision to proceed with the project activity. 3. The PAI faces similar types of barriers as documented for the initial PAI, 4. The activity shall not be a common practice in the given area. The analysis of common practices, regulations, and historical trends covers the entire geographic area, applying to both the initial and future instances.
The PAI will utilize the same baseline scenario as described in Section 3.4 or a baseline scenario appropriate to the specified methodology for the geographic area defined in Section 1.13.	The Baseline determination and additionality demonstration for all project activity instances in a project, including any new project activity instances included in the grouped project, shall be combined and have the same standards applied. To meet the minimum eligibility criteria, the project will define geographic areas within each

	instance using geodetic polygons, as outlined in VCS Standard v4.7, Section 3.6.10. The initial instance covers agroforestry activities across three Indian states. All future instances of the grouped project will also be restricted to these three states and will be included only if they meet the same baseline conditions and follow the additionality rationale established for the initial PAI. Baseline scenario determination and additionality demonstration will be based on the initial project activities, ensuring eligibility for future instances as per VCS Standard v4.7, Section 3.6.16(2) and (3). The analysis of common practices, regulations, and historical trends covers the entire geographic area, applying to both the initial and future instances.

C) Eligibility criteria for Inclusion of New Project Activity Instances

Eligibility Criteria	Justification/Description
Occur within one of the designated geographic areas specified in the project description.	The Project Proponent confirms that the new project activity instances will fall within the designated geographical area Andra Pradesh, Tamil Nadu and Madhya Pradesh states of India, as specified in the project description.
Conform with at least one complete set of eligibility criteria for the inclusion of new project activity instances. Partial conformance with multiple sets of eligibility criteria is insufficient.	In addition to the eligibility criteria described in Section 1.4.2, land parcels included in the project activity must meet the following conditions: • The land must be degrading Agricultural land. • The land must lie within the geographic boundary of Andhra Pradesh, Tamil Nadu and Madhya Pradesh states in India. • The land must not have been cleared of native ecosystems within 10 years prior to each project activity instance start date. • For privately owned lands, clear ownership/possession and well-defined, accessible boundaries are required, and such

	lands must not overlap with any government-declared protected areas. All relevant details demonstrating compliance with the applicable eligibility criteria are provided in Sections 1.1, 1.12, and 1.13 of the Joint PD-MR, and Section 1.2 of the Non-Permanence Risk Report. Shall also comply with the applicability conditions of the tools contained within the methodology (including AR-TOOLS 02, 03, 08, 12, 14, 15, 16, 19 and the VCS Non-Permanence Risk Tool*).*
Be included in the monitoring report with sufficient technical, financial, geographic, and other relevant information to demonstrate conformance with the applicable set of eligibility criteria and enable evidence gathering by the validation/verification body.	All the relevant details related to the project activity demonstrate conformance with the applicable set of eligibility criteria is provided under section 1.1, ,1.12 and 1.13 of Joint PD MR and section 1.2 of Non-Permanence Risk Report.
Have evidence of project ownership, in respect of each project activity instance, held by the project proponent from the respective start date of each project activity instance.	Each new project activity instance will have evidence of project ownership in line with the eligibility criteria, For PA-1 contractual agreement between PP and Farmer evidences the project ownership held by project proponent from start date of each Project Activity instance.
Have a start date that is the same as or later than the grouped project start date.	Phases that will be included in the project will have a start date on or after the project start date i.e. 01-March-2018.
Only be eligible for crediting from the start date of the project activity instance or the start of the verification period in which they were added to the grouped project, through to the end of the total project crediting period.	PP confirms that the new project activity instances added will be eligible for crediting from the later start date of the project activity instance or the start of the activity. Each land parcel to be included in the new Project Activity instance will be eligible for crediting from the later of start date of the verification period in which they were added to the grouped project, through to the end of the total project crediting period.

Not be or have been enrolled in another VCS project.	Each land parcel eligible for inclusion in the new Project Activity instance must not be enrolled in another VCS project. This requirement is guaranteed through a Contractual Agreement and a specific legal declaration by the land parcel owners/farmers. The PP will ensure that there shall be no double counting of the credits generated from the present as well as the future PAIs from any compliance or voluntary activities/platform.
Adhere to the clustering and capacity limit requirements for multiple project activity instances set out in 3.6.8 – 3.6.9.	Project activity instances located within a 10-kilometer radius of another instance of the same project activity, managed by the same project proponent, must be considered part of a single project. Instances within this proximity cannot be distributed across multiple projects.
Additon of a new project proponent to the project	Where inclusion of a new project activity instance necessitates the addition of a new PP to the project, such instances shall be included in the grouped project description within two years of the project activity start date or, where the project activity is an AFOLU activity, within five years of the project activity instance start date. The procedure for adding new project proponents will be in line with VCS Registration and Issuance Process.

1.6 Project Proponent

Organization name	Infinite Environmental Solutions Limited
Contact person	Mr. Jimmy Rajdeo Sah
Title	COO (Chief Operating Officer)
Address	Plot Number 128 FB, Ring Road, Sector F, Scheme Number 94, Indore, Madhya Pradesh, India-452016
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Email	jimmy@infisolutions.org

1.7 Other Entities Involved in the Project

Organization name	Outreach Projects Private Limited
Role in the project	Project Implementer
Contact person	Sumeet Singhvi
Title	Director
Address	Plot Number 128 FB, Ring Road, Sector F, Scheme Number 94, Indore, Madhya Pradesh, India-452016
Telephone	+917314050176
Email	sumeet@infisolutions.org

Organization name	Mangrove Foundation of India
Role in the project	Project Implementer
Contact person	Mr. Meerasa S
Title	Managing Trustee
Address	Mangrove Foundation of India, No:42, Mosque Street, Jameelabath, Pulicat Post, Ponneri Taluk, Thiruvallur Dt, Tamil Nadu, India-601205
Telephone	9843746971
Email	mfapuliat@gmail.com

Organization name	Greenmile Agroforestry Private Limited
Role in the project	Project Implementer
Contact person	Mr. Praveen Goud
Title	Founder
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Telephone	8897374791
Email	greenilaforestry@gmail.com

1.8 Ownership

The implementation partners fully possess the project management rights through the assistance of project participants and contractual agreements with several small landowners. The project management activity is explained in this document's section 1.12. Land ownership of all the farmers involved in the project own their lands privately. The PP meets the ownership requirements of the VCS Program specifications as detailed in section 3.7 of the VCS Standard v4.7.[13] The project proponent, Infinite Environmental Solutions Limited, along with Implementation partner i.e., Mangrove Foundation of India (MFI), Greenmile Agroforestry Private Limited and Outreach Projects Private Limited detailed in Section 1.6 and 1.7 above holds the contractual right to the land within the project boundary for the Mango, Guava and Red Sander to be planted, and the associated GHG emission removals (carbon credit agreement). Farmers have vested rights to carbon credit with project implementer under a carbon credit contractual agreement. PP is allowed to validate, issue, and trade carbon credits. The PP will allocate carbon credit sales earnings to farmers in accordance with the contractual arrangement (carbon credit agreement). The land has been owned by locals and the land documents will be available in the case of individual landowners at the time of validation and verification to the Validation and Verification Body (VVB). Farmers under the project agreed to maintain and manage the plantation under the project activity for 40 years. Within the terms of this land agreement, Infinite Environmental Solutions Limited holds the legal right to control and operate program activities, as well as to all and any GHG emission removals generated by the project during the crediting period. These contracts are available to auditors as part of validation and subsequent verification events.

1.9 Project Start Date

Project start date	01-March-2018
Justification	In line with Section 3.8 of the VCS Standard v4.7, the project start date is defined as the commencement of first planting, as this marks the beginning of activities that directly result in GHG emission reductions or removals. PP has identified the start date based on the initiation of planting activities. Nursery purchase bills confirm that seedlings were procured starting on 01/03/2018, in accordance with best practices that recommend acquiring seedlings same days or 1 to 2 days prior to planting. In addition to the documentary records, geotagged photographs were used to corroborate the commencement of planting activities. These images, captured during the initial planting period, contain

[13] https://verra.org/wp-content/uploads/2024/03/VCS-Standard-v4.7.pdf

	embedded GPS coordinates, dates, and timestamps that align with the reported project start date of 01/03/2018. The photographic evidence complements the nursery procurement records and provides a visual confirmation of the timing of on-ground planting operations. The geotagged photographs are provided below as supporting evidence.   **Photo**: Geotagged photo showing planting activities at project site.

1.10 Project Crediting Period

Crediting period	☐ Seven years, twice renewable ☐ Ten years, fixed ☒ Other 30 year, renewable) (The project activity falls under the AFOLU; Hence, project crediting period length has been taken as per VCS standard requirement for AFOLU projects from section 3.9.3 to section 3.9.6)
Start and end date of first or fixed crediting period	1-March-2018 to 29-February-2048

1.11 Project Scale and Estimated GHG Emission Reductions or Removals

☒ < 300,000 tCO2e/year (project)

☐ ≥ 300,000 tCO2e/year (large project)

The table below for the current crediting period

Calendar year of crediting period	Estimated GHG emission reductions or removals (tCO_2e)
01-March-2018 to 31-December-2018	1,240
01-January-2019 to 31-December-2019	3,614
01-January-2020 to 31-December-2020	6,120
01-January-2021 to 31-December-2021	9,646
01-January-2022 to 31-December-2022	12,384
01-January-2023 to 31-December-2023	13,617
01-January-2024 to 31-December-2024	11,901
01-January-2025 to 31-December-2025	10,266
01-January-2026 to 31-December-2026	10,038
01-January-2027 to 31-December-2027	9,628
01-January-2028 to 31-December-2028	9,141
01-January-2029 to 31-December-2029	8,722
01-January-2030 to 31-December-2030	8,673
01-January-2031 to 31-December-2031	8,699
01-January-2032 to 31-December-2032	8,864
01-January-2033 to 31-December-2033	6,036
01-January-2034 to 31-December-2034	-3,070
01-January-2035 to 31-December-2035	-442
01-January-2036 to 31-December-2036	-8,299
01-January-2037 to 31-December-2037	-8,842
01-January-2038 to 31-December-2038	6,863
01-January-2039 to 31-December-2039	8,384
01-January-2040 to 31-December-2040	6,735

01-January-2041 to 31-December-2041	6,207
01-January-2042 to 31-December-2042	5,711
01-January-2043 to 31-December-2043	5,378
01-January-2044 to 31-December-2044	5,356
01-January-2045 to 31-December-2045	5,359
01-January-2046 to 31-December-2046	5,364
01-January-2047 to 31-December-2047	5,510
01-January-2048 to 29-Feburvary-2048	908
Total estimated ERRs during the first or fixed crediting period	**179,711**
Total number of years	**30**
Average annual ERRs	**5,990**

1.12 Description of the Project Activity

The project is a grouped initiative in which various agroforestry and horticultural tree species are planted by Infinite Environmental Solutions Limited (IESL), in collaboration with its implementation partners Mangrove Foundation of India (MFI), Greenmile Agroforestry Private Limited, and Outreach Projects Pvt. Ltd. by engaging local farmers at multiple locations in across project area. The primary objectives of the project are to improve farmers' livelihoods and to reduce atmospheric carbon dioxide through afforestation, reforestation, and revegetation (ARR) activities involving the plantation of agroforestry-horticultural tree species. The first Project Activity Instance (PAI-1), covering 894.06 hectares, was implemented in the states of Andhra Pradesh, Madhya Pradesh, and Tamil Nadu, with the targeted plantation area expected to expand further in the near future.

The overarching aim of the project is to restore degrading agriculture land with low productivity through plantation activities. By converting degrading agriculture land with low productivity into productive agroforestry systems, the project contributes to forest restoration, climate change mitigation, and provides additional income opportunities for farmers through fruit yields and non-timber forest products (NTFPs).

The grouped project aim to restore available 4,000 hectares of land of farmers, which is considered degrading agriculture land with low productivity, through ARR activity. Project will create direct positive impact on livelihoods of more than 2,052 farmer families, i.e. 9,110 individuals and indirect positive impacts on large number of individuals involved in various project implementation and allied activities.

Photo: Interaction with farmer during field visit

Project Activity area-1(PAI-1) Ha.					
Andhra Pradesh		Tamil Nadu		Madhya Pradesh	
Chittoor	676.79	Tiruvallur	10.48	Dhar	68.39
Prakasam	80.96			Ratlam	57.44

Mangrove Foundation of India (MFI), Greenmile Agroforestry Private Limited, and Outreach Projects Pvt. Ltd. are the implementing bodies of the plantation project entitled "Improving Livelihoods through Agroforestry Plantations in India." These organizations have entered into formal agreements with farmers to establish and oversee the plantations, thereby ensuring the project's longevity. The process of seedling recruitment has been carried out to keep the survival rate above 90%.

The project activities will achieve GHG removals with the plantation through the selected carbon pools (aboveground biomass, belowground biomass and Litter), thus contributing to the mitigation of climate change. Moreover, the project creates new employment opportunities and strives to protect worker safety and rights while maintaining a good relationship with local stakeholders which is a social co-benefit parameter of its implementation. The project also executes training related to the forest management of the planting area. The plantations have been conducted at multiple land parcels of states of Andhra Pradesh, Tamil Nadu and Madhya Pradesh, India.

The participants were informed about the need of project through the training and demonstrated with future impacts of climate change. Project activity will change the pre-project scenario which

was agriculture activity in degrading agriculture land to plantation activity. Subsistence farmers voluntarily choose to be a part of this activity due to less water availability in areas. Project participants shifted their activity from agriculture to agroforestry plantation.

Project has established procedures and guidelines to maintain a sustainable forest plantation that included forest management plan, that covers all stages after the land is notified.

Management Plan- Information management, GIS, Budgeting.

- **Planning:** Site layout, Species selection, Environment assessments, Stakeholder identification.
- **Plantation technologies**: Nursery, Land management, Marking and Pit preparation, Planting and Training and pruning management.
- **Plantation protection**: Integrated pest and disease management, Fire control, Training management.

Management system

The project activity consists of the plantation that will increase the vegetation cover of the project site. The plantation activity will provide employment for local/migrant people from yearly operational and maintenance of the plants. GPS was used to mark the attributes (Latitude and longitude) for location identification and better accuracy of the plantation location. Budgeting was done and discussed with relevant stakeholders about the future planning and availability of funds for future project management.

The technical details for plantation activity are as following:

Plantation technique for Mango, Guava and Red sander[14] [15]

Site preparation, planting techniques, plantation management are the major factors considered for the project activity.

Remote sensing is used to have a synoptic view of larger areas and to achieve faster as well as more accurate data interpretation. The company uses multiple online platforms to share the information for better support and reduce the risk of data loss. GPS was used to mark the attributes (Latitude and longitude) for location identification and better accuracy of the plantation location.

[14] https://agritech.tnau.ac.in/banking/pdf/Plantation%20Horticulture_Mango%20Cultivation.pdf
[15] ICFRE, 2019. Productivity Enhancement in Forestry Plantations. ICFRE User Manual – 01. Indian Council of Forestry Research and Education, Dehradun, India.

Site preparation: Land was prepared for planting by cleaning the debris and levelling the land by digging the pit.

Planting technique: A healthy, straight growing plant from reliable sources can be planted at the center of pits along with the ball of the earth intact during monsoon season in such a way that the roots are not expanded. Plants should be irrigated immediately after planting. Optimum pit size was 30 cm x 30 cm.

Irrigation: Newly planted seedlings/plants are watered frequently for proper establishment. After establishment, it can be done as and when needed as per the weather conditions. In case of fruit trees, irrigation at 10 to 15 days interval from fruit set to maturity.

Mortality Monitoring and Plant Replacement (Blanking) Activities: Newly planted Mango, Guava and Red sander in project area undergo mortality monitoring approximately 12 months and 24 months after planting. Such mortality is monitored at the plot level, and mortality replacement activities done to ensure survival rate more than 90 percent.

Species Selection- Species that were selected for plantation in this project activity are mentioned below. The company aims to grow high quality trees to produce timber, and non-timber products (fruits, and other). Additionally, these species can be suitable for a wide range of climatic conditions and soil types.

ARR plantation activity has been done using different plantation models for the appropriate growth and healthy management of the species as per general plantation manual and management modules. Pit sizes and spacing specific information are given in the tables below:

Common name	Botanical name	Spacing/model (m)	Pit size (cm)
Mango	*M. indica*	5×5, 5×7, 6×6, 6×8, 7×7, 8×8, 9×6 and 10×7	30x30
Guava	*P. guajava*	3×2, 3.5×2, 2.5×2 and 3.5×2.5	30x30
Red Sander	*P. santalinus*	3×3 and 3.5×3.5	30x30

Out of three above mentioned species, two species (Red Sander and Guava) are involved in harvesting. The project will replant during the monsoon season the same species in the same parcel of land after the harvesting of the plantation in its rotation cycle. Below are the details for harvesting species and their harvesting cycle included in the project activity and first project instance:

Sr. No.	Species	Scientific Name	Rotation age (years)
1.	Red Sander	*Pterocarpus santalinus*	15

2.	Guava	*Psidium guajava*	15

Nursery management: The Tree Breeding Centre is the facility where nursery operations take place. The seeds are nursed in trays which contain insert cups. The seeds are sown in the insert cups by means of hand sowing and a sowing machine. The trays with sown seeds are then taken to the greenhouse with shade netting. After germination of the seeds, the seedlings take some time in the greenhouse depending on the species and the growth rate.

Planting target- For the project activity and project first instance, proponents are targeting plantation of 4,000 ha.

Land preparation- Land was prepared for plantation before a month of plantation and weeds were removed manually.

Plantation- Planting is done just before the rainy season for better survival of the plants and it is ensured that 90% survival rate is maintained. All the plants were brought from nursery to field for direct plantation. Plants were planted with multiple spacing according to species. This activity is expected to be completed by the end of October of each planting year depending on the weather where possible. Soil is then placed around the roots, ensuring that the seedling remains in a vertical position and firmed down using the fingertips.

Plantation after harvesting: The current project involves two harvesting species i.e. Guava and Red Sander. The replantation involves no plowing and other soil preparation activities that result in large scale soil disturbance. The stump of the harvested trees will remain in situ and therefore, no stump removal is involved. The seedling will be planted in a pit having an area of 30cm×30cm= 900cm^2 following the same spacing.

Weed Control- It is noted that common weeds grow faster than newly planted trees and unless the weeds are controlled effectively. Weeding will be performed manually or mechanically or by hand. No chemical weedicide would be applied on the field.

Plantation protection- Plantation protection includes both natural resilience as well as anthropogenic resilience system. Natural resilience is the capacity of the biological system to maintain its structure and patterns of behavior with respect to external disturbances, thus resilience is the ability of a forest ecosystem to withstand such prospective disturbing forces. Anthropogenic resilience systems, on the other hand, involve human interventions and management practices aimed at enhancing the resilience of forest ecosystems. These practices are implemented to reduce the impact of human activities, such as deforestation, unsustainable logging, or land-use changes, on forest ecosystems. Anthropogenic resilience systems can

include measures such as protected area management, sustainable forestry practices, habitat restoration, and conservation strategies.

By considering and enhancing both natural resilience and anthropogenic resilience systems, forest protection efforts can contribute to the long-term sustainability and conservation of forests, ensuring their continued ecological integrity and the benefits they provide to both humans and the environment.

Fire control- Trainings are given to farmers and tools are provided to prevent the forest fires. Apart from training and tools, plantation areas are planned accordingly to minimize forest loss and reduce the spread of forest fires. One more step is also taken by maintaining the soil moisture to mitigate forest fires.

Pest and disease control– Organic pesticides and traditional methods are used to control pests in the plantation area. The Company actively employs a range of preventative and control methods to combat pests and disease. It aims to maintain a diversity of planting stock, to ensure that the genetic base of the plantation is wide and varied. The Company aims to avoid exposing trees to extreme temperatures or abnormally high or low levels of water or fertilizer, to eliminate unhygienic conditions and weeds wherever possible, and to remove dead or dying plants on a regular basis.

Organization Details

Infinite Environmental Solutions Limited

- Infinite Environmental Solutions Limited is designated to serve as the Project Proponent (PP), undertaking pivotal responsibilities and stewardship in the execution and oversight of the project's initiatives.
- Infinite Environmental Solutions Limited oversees collecting the necessary data in accordance with defined standards and processes. This entails the coordinated documenting of the NGO's planting efforts in the nursery, grouped by year beginning March 1, 2018, and including their corresponding geo-coordinates.
- Infinite Environmental Solutions Limited is committed to meticulously adhering to the procedural requirements of the chosen standard, as well as meticulously resolving emission attribute modifications mandated in national registries. It is also recognizing the importance of ensuring that Emission Reductions (ERs) are not accounted for under the local jurisdiction's Nationally Determined Contributions (NDC) commitments in response to potential requests from diverse stakeholders, including standards and

project buyers. To uphold the highest standards in project implementation and environmental stewardship, the organization is diligent in meeting and, if required, exceeding the expectations of these stakeholders.

- Throughout the project's crediting term, Infinite Environmental Solutions Limited will perform duties in relation to data collection, baseline assessment, carbon stock estimation, and other monitoring requirements.

- As a project proponent, Infinite Environmental Solutions Limited must have to register the project with Verified Carbon Standard (VERRA registry), as per the protocol, independent auditor will also be hired to carry out the project's validation and verification procedures.

Infinite Environmental Solutions Limited shall aid in undertaking all the required actions in the VERRA.

Mangrove foundation of India, Greenmile Agroforestry Private Limited and Outreach Projects Private Limited

- Implementer bodies are actively participated in the execution and facilitation of the Carbon Project, providing all necessary assistance throughout the planning, implementation, and management phases to ensure its successful completion.

- Implementer bodies are committed to assist Infinite Environmental Solutions Limited and the Auditor Team with essential logistical support during the duration of DOE visits, consultant engagements, and monitoring operations. Furthermore, the organization will actively participate in obtaining appropriate support letters from relevant government agencies as needed, guaranteeing a smooth and effective execution of the project's objectives.

- Implementer bodies are is devoted to making comprehensive efforts throughout the process of achieving the objectives of the project. Adopting a comprehensive approach that includes meticulous monitoring, thorough review, and proactive efforts to address potential difficulties is required. The organization's unwavering commitment to achieving project’s goals demonstrates its dedication to project management excellence and overall environmental effect.

Role of farmers:

- The farmers are encouraged to take care of the saplings and maintain them.

- They shall inform and encourage other farmers to plant more agroforestry tree species.
- Assist in regular monitoring, reporting and verification activities.

Photo: Team interaction for project management

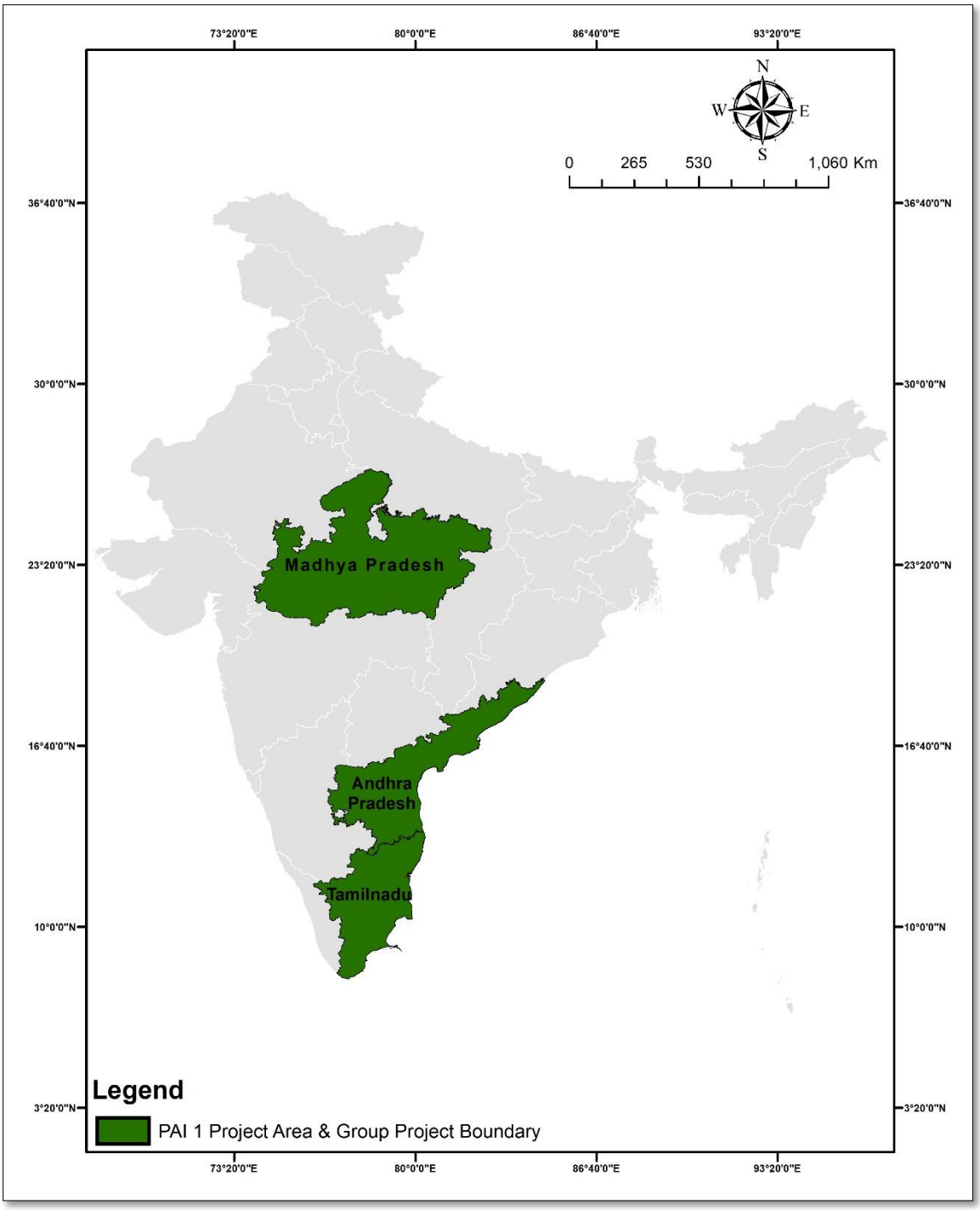
Future PAIs will be implemented using the same technologies, procedures, and management plans that were applied in the initial PAI under the ARR project activity. The project has developed a comprehensive Plantation Management Plan (PMP), which provides detailed guidelines covering all stages of plantation development and management following land notification.

The grouped project is not located in a boundary that is covered by jurisdictional REDD+ program.

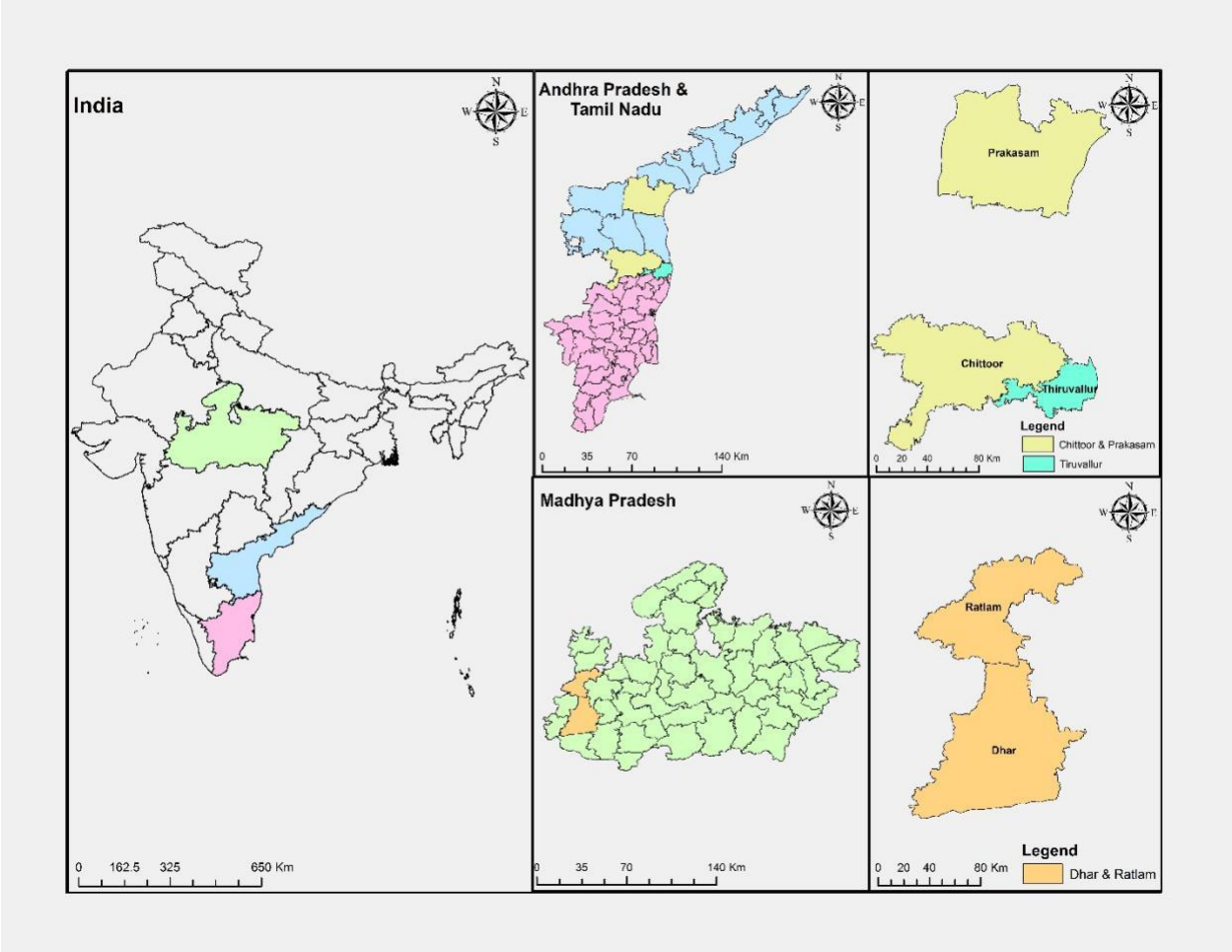
1.13 Project Location

The boundary of grouped project is only Andhra Pradesh, Tamil Nadu and Madhya Pradesh states of India. However, plantation activity for PAI-1 has been done in two (Chittoor, Prakasam) district of the Andhra Pradesh, one (Tiruvellur) district of Tamil Nadu and two (Dhar and Ratlam) districts of Madhya Pradesh, India.

Plantation year	Plantation area (ha)			Total (ha)
	Andhra Pradesh	Madhya Pradesh	Tamil Nadu	
2018	258.02	15.79	0.0	273.81
2019	137.21	20.0	0.20	157.41
2020	92.76	14.63	3.20	110.59
2021	105.32	43.96	0.39	149.67
2022	99.05	31.45	3.58	134.08
2023	65.39	0.00	3.11	68.5
Total	**757.75**	**125.83**	**10.48**	**894.06**



Map: Group project boundary



Map: PAI-1 location in Andhra Pradesh, Madhya Pradesh and Tamil Nadu

1.14 Conditions Prior to Project Initiation

The land before the implementation of the project activity was degrading agriculture land with low productivity which is owned by farmers and communities. Without the implementation of the project the land would continue to degrade resultant in low productivity. The conditions existing prior to the project initiation are like the Baseline scenario which are described in the Section 3.4

- Ecosystem type and Climate: Project area in the first phase is spread in Andhra Pradesh, Tamil Nadu and Madhya Pradesh states of India. Detailed table has been provided below for the ecosystem type and climate exist in the project area under Phase-1.

State	Major vegetation type	Ecosystem type	Temperature	Rainfall

Andhra Pradesh	As per Champion and Seth's classification the Forests of State fall under Southern Moist Mixed Deciduous Forest, Littoral Swamp Forest, Dry Teak Forest, Dry Red Sanders Bearing Forest, Southern Dry Mixed Deciduous Forest, Dry Deciduous Scrub, Dry Savannah Forest, Hardwickia Forest, Dry Bamboo Brakes, Souther Thorn Forest, Dry Scrub Forest, Tropical Dry Evergreen Forest types.[16]	The State has three physiographic zones, the hilly region having Nallamalai, Erramala hills and the Eastern Ghats having an altitude of 500 to 1400 m, the plateau having an altitude of 100 m to 1000 m and the deltas of rivers between the Eastern Ghats and the Sea Coast. Godavari, Krishna and Pennar are the 3 principal rivers of the State which drain into the Bay of Bengal.[17]	The climate of this State is generally dry with temperature ranging from 8 °C to 50 °C.[18]	The annual rainfall is about 500-1300 mm, received mainly from Southwest and Northeast monsoons.[19]
Tamil Nadu	Tamil Nadu includes a wide range of biomes, extending east from the south Western Ghats, montane rain forests in the Western Ghats through the south Deccan plateau, dry deciduous	Areas representing different types of ecosystems like dry deciduous forests, moist deciduous forests, degraded shrub lands, dry evergreen forests or thorn shrub and small pockets of semi evergreen forests, besides	The average temperature in the plains varies between a minimum of 21.6 °C to a maximum of 31.8 °C and in the hilly areas varies between a minimum of 9.4	The average rainfall varies between 900 and 1200 mm/y. Rainfall in the range of 3000-5,000 mm/y occurs in the Western Ghats while the rain shadow region of Coimbatore and

[16] https://forests.ap.gov.in/PDF/publications/SFR2014.pdf
[17] https://forests.ap.gov.in/PDF/publications/SFR2014.pdf
[18] https://forests.ap.gov.in/PDF/publications/SFR2014.pdf
[19] https://forests.ap.gov.in/PDF/publications/SFR2014.pdf

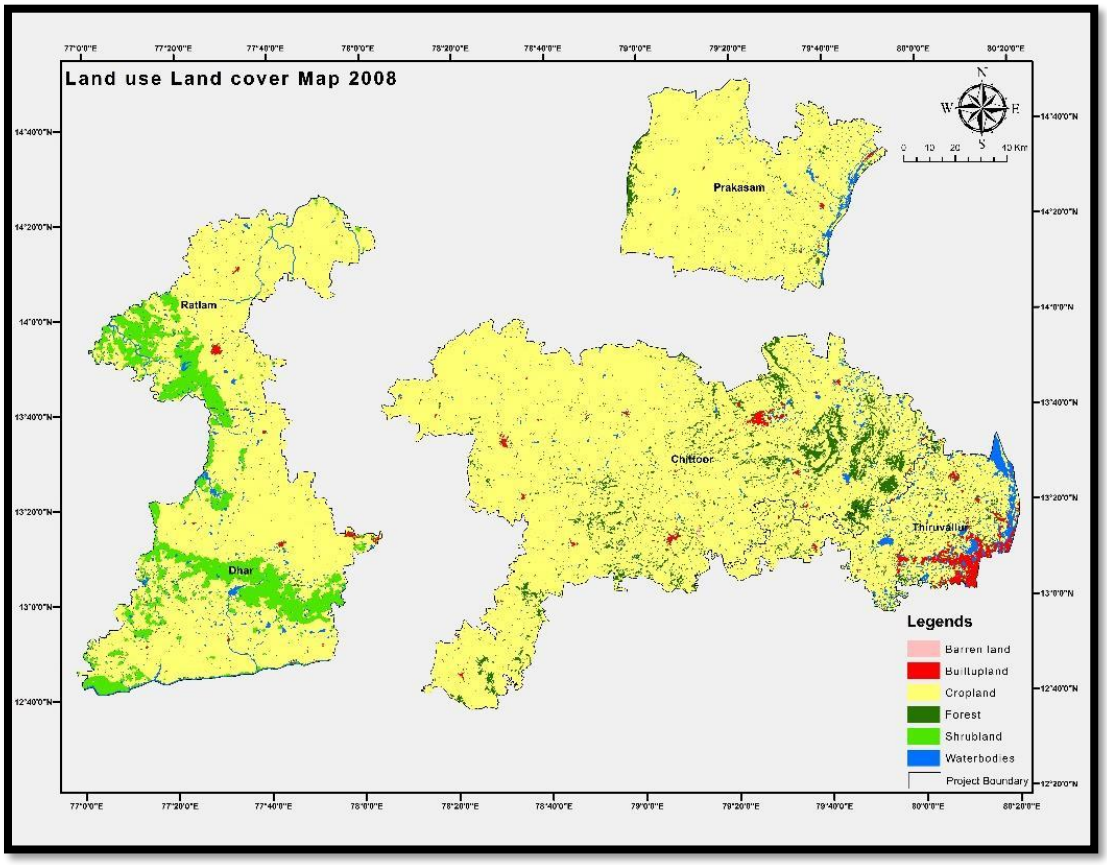
	forests and Deccan thorn scrub forests to tropical dry broadleaved forests and then to the beaches, estuaries, salt marshes, mangroves, and coral reefs of the Bay of Bengal.[20]	certain wetland ecosystems and freshwater bodies.[21]	°C to a maximum of 22.8 °C.[22]	adjacent areas receive less than 600 mm annually.[23]
Madhya Pradesh	Sub-tropical climatic conditions	Satpura range, Central Indian highland,	Summer starts during the month of April and continues till June with temperature going up to 42°C.	The Eastern part of the state receives higher rainfall (1,120 mm on an average) than the Northern and Western part (500 mm to 625 mm on an average)[24]

- Current and historical land-use: Prior to the implementation of the project activity, the lands in Phase-1 of the project activity were in a degrading agricultural land with low productivity in Andhra Pradesh, Tamil Nadu and Madhya Pradesh.

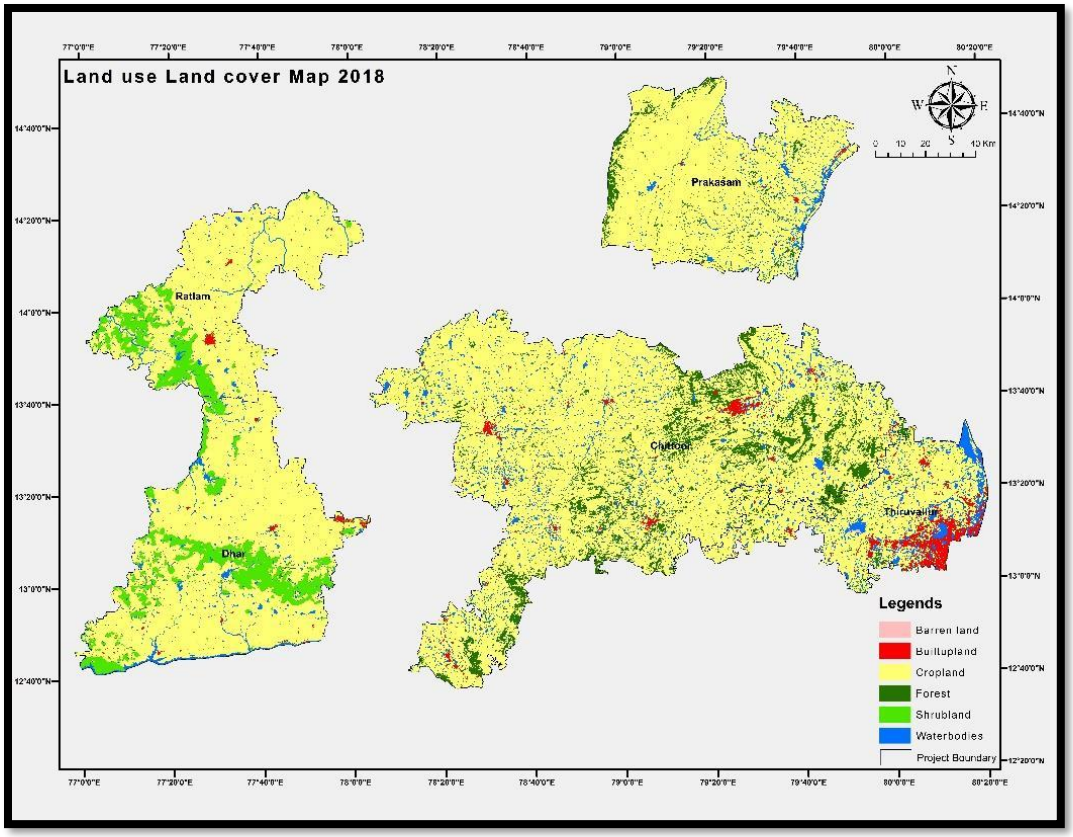
There was no evidence of presence of vegetative cover as described in section 3.4 baseline scenarios of this document. Without implementation of the project, the land would continue to degrade, exacerbating the existing environmental challenges. Moreover, in Tamil Nadu farmers having concern regarding the soil and water conservation, low income per capita as compare to other state, and climate change outbreaks made farming shift towards livelihood sustainability. However, with the implementation of the project, efforts are being made to rehabilitate and restore the degrading agriculture land, aiming to improve its overall condition and ecological health. By introducing Mango, Red sander and Guava plantation, the project aims to reverse the degradation process and promote revegetation. Moreover, in Madhya Pradesh farmers having concern regarding the soil and water conservation, low income per capita as compare to other

[20] https://forests.tn.gov.in/storage/tnfd/1.pdf
[21] https://forests.tn.gov.in/storage/tnfd/15.pdf
[22] https://forests.tn.gov.in/storage/tnfd/1.pdf
[23] https://forests.tn.gov.in/storage/tnfd/15.pdf
[24] https://forests.tn.gov.in/storage/tnfd/15.pdf

state, and rainfed farming resultant shift to livelihood sustainability. However, with the implementation of the project, efforts are being made to rehabilitate and restore the degraded land, aiming to improve its overall condition and ecological health. This proactive approach is crucial in mitigating the negative impact on the land and facilitating its recovery in a more sustainable and productive way.



Map: Land use scenario of project Area (Andhra Pradesh, Tamil Nadu and Madhya Pradesh)



Map: Land use scenario of project Area (Andhra Pradesh, Tamil Nadu and Madhya Pradesh)

- Other feature

State	Hydrology	Pedology	Topography
Andhra Pradesh	The Andhra Pradesh has 3 major river systems - Krishna, Godavari and Pennar with annual water yields of 22.99, 41.96 and 2.79 billion cubic meter, respectively. All the rivers in the State are seasonal, with bulk of the flow taking place during	The major soil types of Andhra Pradesh are Red soil, Black soil, Deltaic alluvial soils, Coastal alluvial soils, Laterite soil and Skeletal Soils.[26]	Location: North Latitude between 12°37' N and 19°55' N East Longitude Between 76°45' E and 84°46' E Physiographic: Coastal plain, Coastal Plains, Western peneplains.[27] Seven Agroclimatic zones: Krishna-Godavari Zone, North Coastal Zone, Southern Zone, Northern Telangana Zone, Southern Telangana Zone and Scarce Rainfall Zone of Rayalaseema, High Altitude and Local stakeholder Areas.[28]

[26] https://apenvis.nic.in/soil.html
[27] https://apenvis.nic.in/PHYSIOGRAPHY.html
[28] https://www.imdpune.gov.in/library/public/MetMONO%20Andhra%20pradesh.pdf

	the Southwest monsoon.[25]		
Tamil Nadu	The State is heavily dependent on monsoon rains. The total surface water potential of the state is 36 km or 24864 M cum. There are 17 major river basins in the State with 61 reservoirs and about 41,948 tanks. The utilizable groundwater recharge is 22,423 MCM.[29]	The major soil groups of Tamil Nadu are follows Red soils, Black soils, Laterite soils and Coastal soils.[30]	Location: North Latitude Between 8°5' and 13°35' East Longitude Between 76°15' and 80° 20' Physiography: The western, southern and the north western parts are hilly. The Western Ghats dominate the entire western border with Kerala. The eastern parts are fertile coastal plains and the northern parts are a mix of hills and plains. The central and the south-central regions are arid plains and receive less rainfall than the other regions.31[31] Agroclimatic zones: Tamil Nadu has been divided into seven agro-climatic zones viz., Northeastern zone, Northwestern zone, Western zone, Cauvery delta zone, Southern zone, High rainfall zone, Hill and high-altitude zone.[32]
Madhya Pradesh	Land locked state mostly depend upon the monsoon and rivers such as Narmada, Tapti, Chambal, and Sone	Black soil, red yellow soil, alluvial soil, mixed soil and kachari soil. Black soil cover 47 % of area of state[33]	State situates at latitude of 21°.06'N 26°.30'N and longitude of 74°.9'E to 82°48'E. The state is divided different physiographical namely plateaus and mountain ranges at altitude of 150 to 750 m. Agroclimatic zone: Zone – 9 (Western Plateau and Hills Region)

[25] https://apenvis.nic.in/water.html
[29] https://tnenvis.nic.in/Database/TN-ENVIS_791.aspx
[30]https://agritech.tnau.ac.in/agriculture/agri_soilgroups.html#:~:text=The%20major%20soil%20groups%20of,soils%20(3%20per%20cent)%20an
[31] https://www.slbctn.com/Geographical_Map_and_Location.aspx
[32] https://tnau.ac.in/tamil-nadu-agro-climatic-zones/
[33] Kullu, A., Mohanty, A., Prasad, B., Rajasmita, R., Dehury, P. P., Pani, P., ... & Paital, B. (2021). Soil Type as One of the Major Contributing Factors for Top Ten Agri-Producing States of India. Journal ISSN, 2766, 2276.

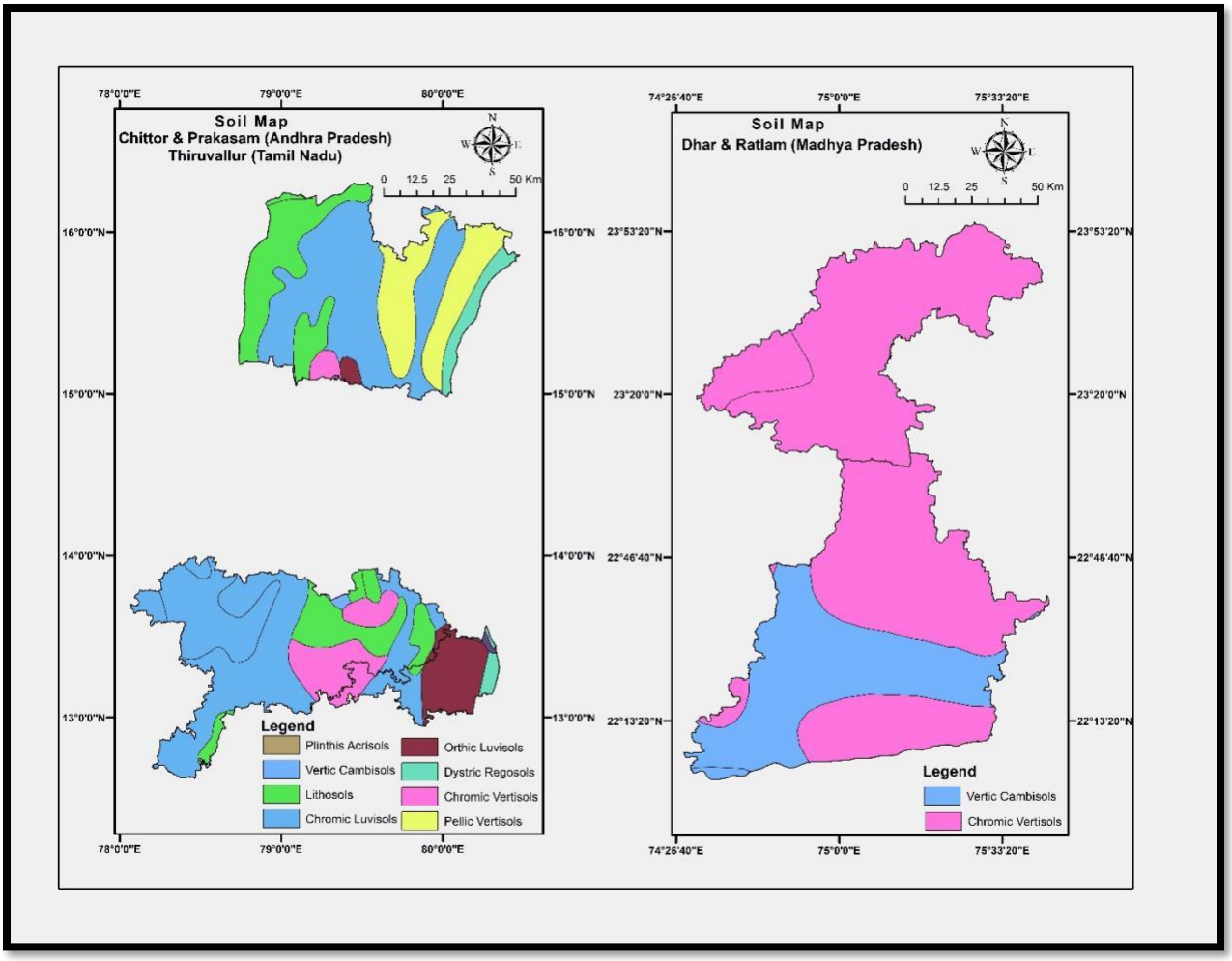


Figure: Soil map of PAI-1

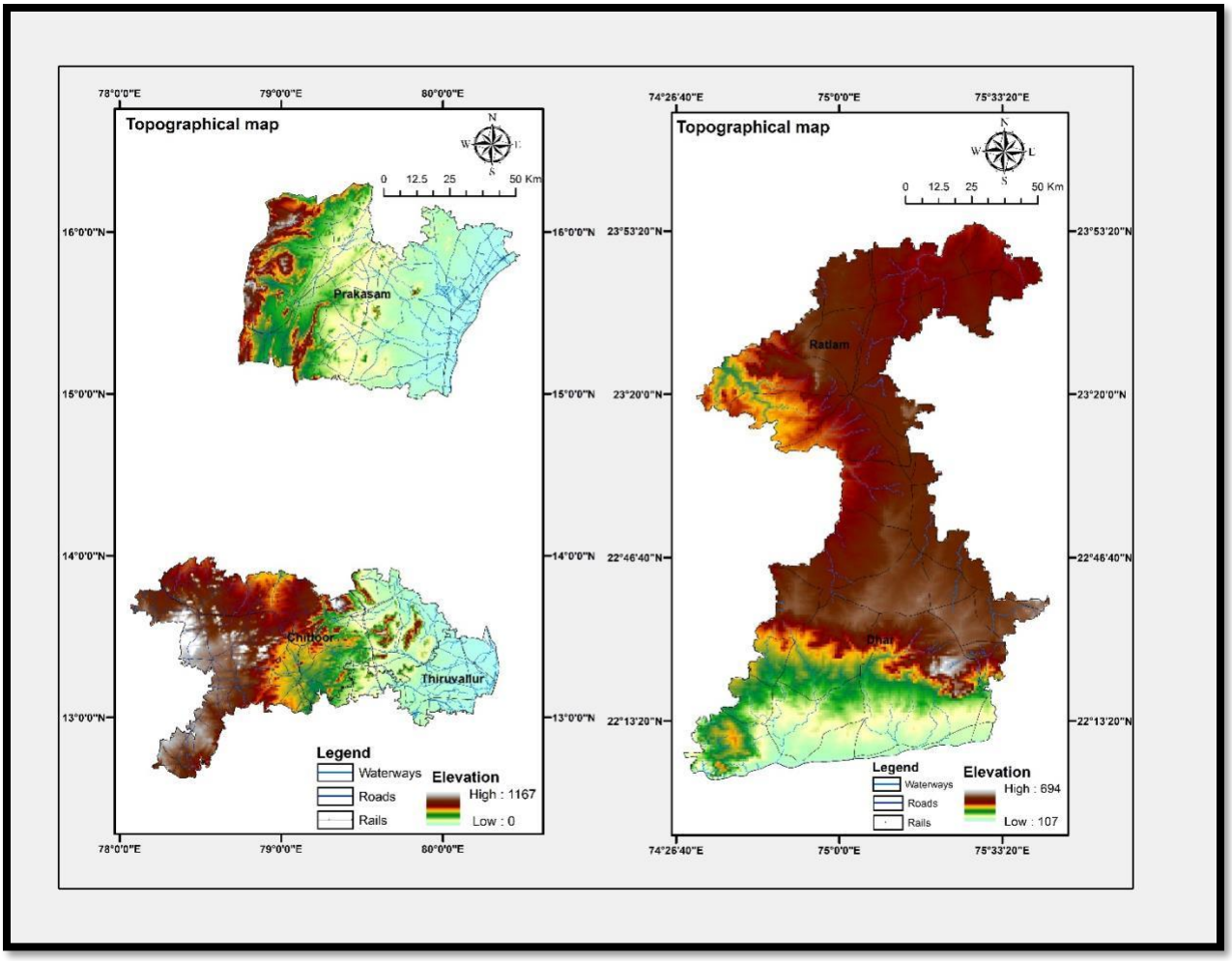


Figure: Topographical map of PAI-1

1.15 Compliance with Laws, Statutes and Other Regulatory Frameworks

There are no legally binding laws/ regulations enforcing or preventing the afforestation and reforestation activities in India. The afforestation /reforestation activities therefore are within the relevant, regional laws, statutes and regulatory frameworks.

India is a member of the UNFCCC (United Nations Framework Convention on Climate Change) and an active member of the ITTO (International Tropical Timber Organization). The Project complies with this regulatory framework, because in the AFOLU scope, Afforestation/ Reforestation is one of several mechanisms by which GHG emissions are expected to be reduced.

The project is compliant with the entire applicable national and regional legal framework of the Government of India. The development of the project is based on guidelines included in environmental regulations and laws in force in the country. In addition, the project responds to the Government's desire to promote forest plantations and the development of *M. indica*, *P. guajava* and *P. santalinus*.

National Government Laws	
Applicable Laws/Policies	**Justification**
Indian Forest Act, 1927[34]	The Government of India has the authority to regulate within any designated forest or wasteland, as follows: • The fragmentation of land for cultivation refers to sites within the afforestation project activity that were previously barren and were expressly chosen for afforestation rather than agricultural cultivation. • Deliberate setting fire to or clearance of vegetation did not occur or receive endorsement in the lands designated for the afforestation activity, which were barren prior to the project initiation. • The imposition of tariffs on timber and other forest produce is relevant to the project since it involves the sustainable gathering of Non-Timber Forest Products (NTFPs), which is covered by the Forest Rights Act, which protects indigenous people's rights. • The legislation governing the control of timber and other forest produce in transit is limited to occurrences involving the transfer of such commodities and, as such, does not apply to afforestation. Project implementation and management do not violate any section of the policy.
National Forest Policy 1988[35]	Major objectives of the policy which are being enhanced by the project are: • Increasing substantially the forest/tree cover in the country through massive afforestation and social forestry programmes, especially on all denuded, degraded and unproductive lands. • Meeting the requirements of fuelwood, fodder, minor forest produce and small timber of the rural and local stakeholder populations. • Creating a massive people's movement with the involvement of women, for achieving these objectives and to minimise pressure on existing forests. • Minor forest produce provides sustenance to local stakeholder population and to other communities residing in and around the

[34] https://www.ijllr.com/post/the-indian-forest-act-1927-a-natural-guardian
[35] https://pib.gov.in/newsite/erelcontent.aspx?relid=57051

	forests. Such produce should be protected, improved and their production enhanced with due regard to generation of employment and income. Project implementation and management do not violate any section of the policy.
National Agroforestry Policy, 2014[36]	The Government of India launched the National Agroforestry Policy (NAP) in 2014 under the mandate of the Union Ministry of Agriculture and Farmers Welfare to overcome obstacles in the adoption of agroforestry in the country and to provide many benefits, such as increasing food and nutrition, supplying fodder, fuel wood and timber for India's growing population. The NAP has identified various factors which have impeded the growth of the sector like non availability of quality planting material, prohibitive legal framework particularly for felling and transit regulations, inadequate extension mechanism etc.
Forest Conservation Act 1980[37]	Under the FCA 1980, following sections are relevant to the project. • Restriction on the de-reservation of forests or use of forest land for non-forest purpose. In the section 2.4 of FCA 1980 restricts any forest land or any portion thereof may be cleared of trees which have grown naturally in that land or portion, for the purpose of using it for afforestation. Project implementation and management do not violate the act.
Forest Right Act 2006[38]	Project implementation and management do not violate rights of indigenous peoples and objectives of FRA 2006.
	Andhra Pradesh Government Laws
Andhra Pradesh Forest Act, 1967	This act regulates the transit and possession of timber and other forest produce. It also prohibits or regulates the following: • Setting fire to land or forest produce • Granting pattas to land • Occupation, clearing, ploughing, or breaking up of land for cultivation • Cutting, sawing, conversion, and removal of trees • Hunting, shooting, fishing, poisoning of water, and setting traps or snares

[36] https://agricoop.nic.in/sites/default/files/National%20Agroforestry%20Policy%202014.pdf
[37] http://nbaindia.org/uploaded/Biodiversityindia/Legal/22.%20Forest%20(Conservation)%20Act,%201980.pdf
[38] https://forestrights.nic.in/doc/Act.pdf

Andhra Pradesh Forest (Amendment) Act, 2016 (Act No. 15 of 2016)[39]	• This Act amends several sections of the Andhra Pradesh Forest Act, 1967. • Amendments deal with administrative and legal proceedings, in particular dealing with the following issues: • competent authorities: income earnings or assets derived or obtained form or attributable to illegally acquitted sandal wood or Red Sanders wood or other scheduled tree; land property; offences and penalties; Vehicles involved in smuggling Red Sanders Wood/Sandal Wood/ Scheduled tree; Seizure or freezing of illegally acquired property; creation of Special Courts for trial of forest offences, etc.
The Tamil Nadu Preservation of Private Forest Act, 1949[40]	The Tamil Nadu Preservation of Private Forest Act, 1949, regulates the harvesting of trees on private forest lands to prevent indiscriminate deforestation. According to the Act: • Forest owners are required to obtain prior permission from a designated committee before felling trees, mortgaging, leasing, or selling forest lands. • Clear felling, where all trees in a designated area are cut down, is allowed under strict conditions. Specific blocks of forest land must be marked, and trees must meet certain girth and age requirements before being cut. • Selection felling, where only specific trees are harvested, must follow guidelines ensuring the forest is not over-exploited. • No more than seven trees per hectare can be cut, and second felling in the same area is only allowed after 15 years. • Applications for tree felling must include detailed information on tree species, girth, and plans for regeneration. • Felling near water bodies and on steep slopes is prohibited to prevent environmental degradation. • The Act also prescribes penalties for violations, including fines and imprisonment. • This framework ensures that private forests are managed sustainably, maintaining ecological balance.
The Tamil Nadu Forest Act, Act No. V Of 1882[41]	The Tamil Nadu Forest Act, 1882, governs the management and harvesting of trees on both government and private lands. • Reserved forests are protected, and tree felling requires government permission.

[39] https://www.fao.org/faolex/results/details/en/c/LEX-FAOC193472
[40] https://www.forests.tn.gov.in/acts

[41] https://forests.tn.gov.in/storage/tnfd/01_Tamil Nadu%20Forest%20Act%201882.pdf

	• Unauthorized clearing or harvesting is prohibited. The Act also regulates timber transit, requiring passes for moving timber. • Penalties for illegal tree felling or damaging forest resources include imprisonment and fines. It provides mechanisms for protecting private forests if needed for environmental reasons. • Disputes over forest rights, including tree harvesting, are resolved by special forest courts. Strict rules govern the collection and sale of forest produce.
The Tamil Nadu Hill Areas (Preservation of Trees) Act, 1955[42]	The Tamil Nadu Hill Areas (Preservation of Trees) Act, 1955, regulates tree cutting and land use in hill regions to prevent deforestation and soil erosion. • Cutting trees without written permission from a designated committee is prohibited. • Cultivation on steep slopes (greater than 1 in 3) is banned, and other slopes require permission with soil conservation conditions. • Those permitted to cut trees must regenerate an equal number of trees. • Violations can lead to imprisonment up to one year or fines. Appeals against committee decisions can be made to the government. The Act ensures environmental protection in hill areas.
Wildlife (Transit) (Tamil Nadu) Rules, 1991	These rules prohibit activities such as destroying wildlife or forests, setting fire, and grazing inside sanctuaries
Tamil Nadu Forest Policy 2018[43]	This policy aims to preserve wildlife, biodiversity, and genetic resources, and to restore degraded forests. It also aims to improve tree cover, manage coastal ecosystems, and augment water through watershed management.
Madhya Pradesh State Forest Policy (2005)[44]	Expanding forest tree covers area to make it one third of the geographical area Ensuring stability of the environment and ecological balance by developing government forests and private areas under forest cover through sustainable management of forests. To earmark 10 per cent of the forest area under intensive management for production of timber in order to reduce the gap between its demand and supply.

1.16 Double Counting and Participation under Other GHG Programs

[42] https://forests.tn.gov.in/storage/tnfd/02_Tamil Nadu%20Hill%20Area%20%28PT%29%20Act%201955.pdf

[43] https://forests.tn.gov.in/storage/tnfd/SFP_2018-Eng.pdf

[44] https://mpforest.gov.in/ecotourism/pdf/forestpolicy.pdf

1.16.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☐ Yes ☒ No

1.16.2 Registration in Other GHG Programs

Has the project registered under any other GHG programs?

☐ Yes ☒ No

Is the project active under the other program?

☐ Yes ☐ No

1.16.3 Projects Rejected by Other GHG Programs

Has the project been rejected by any other GHG programs?

☐ Yes ☒ No

1.17 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

1.17.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the *VCS Program Definitions* for definitions of emissions trading program and binding emission limit.

☐ Yes ☒ No

1.17.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the *VCS Program Definitions* for definition of GHG-related environmental credit system.

☐ Yes ☒ No

1.17.3 Supply Chain (Scope 3) Emissions

Do the project activities specified in Section 1.12 affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

1.18 Sustainable Development Contributions

1.18.1 Sustainable Development Contributions Activity Description

The project development plan defines the objectives of economic growth with employment generation and overcoming poverty and inequality, as well as the elimination of hunger. This requires the sustainable use of natural resources to ensure the well-being of future generations, the protection of natural resources, adaptation to climate change and comprehensive disaster risk management. Within this framework, the country is promoting actions aimed at afforestation, which is aligned with the practices of the project.

This is a voluntary project activity and it doesn't contribute to achieving any nationally stated sustainable development priorities. There is no compliance for monitoring and reporting the emission reduction and SDG contribution from the project activity.

The objectives are linked to several sustainable development goals (SDGs) as adopted by the United Nations (UN), which are shown below and links to the project contributions:

SDG	SDG GOALS
	The project contributes to reducing the proportion of the population living below the international poverty line by creating employment opportunities for diverse groups, including women, youth, and marginalized communities. By providing stable jobs and fair wages in both urban and rural areas, the project helps improve livelihoods and economic stability, thereby addressing poverty across various demographics and geographic locations.
	The project activity will provide employment to many people including men, women, and young people. The benefits of Project employment will be maximized through prioritizing local employment; working to align employment opportunities with local agricultural cycles, and ensuring that employment opportunities are equitably distributed within Project community timely training to the farmers for optimum survival rate, good productivity of plantation.
	The project activity will sequester tonnes of Carbon Dioxide (a major greenhouse gas) resulting in positive impacts on the environment, improve soil health, thereby contributing to climate change mitigation and aligning with the objective of SDG 13, which focuses on climate action
	Improved management of land as a result of adoption of good practices – thereby increasing the adaptive capacity of the plantation to climate change impacts. The plantation of trees of different species in the degraded uplands of individual farmers will not only provide additional income to the farmers but

will also help in improving the biodiversity of the entire area and hence the life on land. In addition, Trees hold on to the top layer of soil preventing its erosion and support further growth and survival of vegetation contributing to SDG 15 of 'Life on Land'.

Goal	Target of India	Project Activity Contribution
	Global SDG target 1.1.2 aims to reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.	The project creates direct employment for local community members at agreed-upon plantation labor wages, supporting India's SDG goal to reduce poverty by at least half.
	Global SDG target 8.5 aims to achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities.	The project creates direct employment for local community members at agreed plantation wages, helping India achieve its SDG targets of reducing poverty and ensuring decent work for all, including youth and women.
	This target corresponds to the global SDG target 13.1 which aims to strengthen resilience and adaptive capacity to climate-related hazards and natural disasters. The target has been set to 0 to imply that all States/UTs must be adequately prepared to ensure that no human life is lost due to extreme weather events.	The project creates direct employment for local community members at agreed plantation wages, helping India achieve its SDG targets of reducing poverty and ensuring decent work for all, including youth and women.
	National Afforestation and Eco-Development Board aims to achieve 33 percent of the geographical area in the country under forest and tree cover. Global SDG target 15.2 aims to promote the implementation of sustainable management of all types	The project aids the National Afforestation and Eco-Development Board's goal of achieving 33% forest and tree cover by actively increasing green cover in targeted areas. It also contributes to global SDG target 15.2 by promoting sustainable

	of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally. Average of the 3 best performing States has been set as the target.	forest management, halting deforestation, and restoring degraded lands, thereby enhancing ecosystem health and aligning with environmental sustainability goals.

1.18.2 Sustainable Development Contributions Activity Monitoring

The proposed plantation project contributes to the sustainable development of the degraded lands. The project activity consists of the plantation in Andhra Pradesh, Tamil Nadu and Madhya Pradesh across various districts that will increase the green cover of the project site. The project activity will create employment for local people by involving them in land preparation, planting, and regular maintenance of the plantation. The project results in the achievement of United Nations Sustainable Development Goals (SDGs), specifically SDGs numbering 1, 8, 13 and 15.

Table 1: Sustainable Development Contributions

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
1)	1.1	1.1.1 Proportion of the population living below the international poverty line by sex, age, employment status and geographic location (urban/rural)	Implemented activities to decrease	PAI-1 of this project activity generating the seasonal employment of 1,787-man days including both men and women who perform manual tasks and earn an average of US$ 1.50 per day.	Throughout the lifespan of the project, Plantation Activities are forecasted to provide a collective total of 25,000 seasonal job. This affords individuals the potential to earn around US$ 1.50 per day on average throughout the year, enhancing income prospects and supporting local communities.
2)	1.4	1.4.2 Proportion of total adult population with secure tenure rights to land, with legally recognized documentation and who perceive their rights to land as secure, by sex and by type of tenure	Implemented activities to increase	The project leads to various communities getting access to the plantation activities for fruits and timber products. All the 2,052 farmers involved in grouped plantation project activity have signed agreement with PP.	The village communities are the beneficiaries. All the 2,052 beneficiaries under this project activity in PAI-1 have signed agreement and, total 6000 farmers expected to participated in the project and will be benefitted through project activity. Moreover, PP ensuring land ownership, control over land, income through fruit produce and non-timber forest products (NTFP) and other forms of property.

3)	8.5	8.5.1 Average hourly earnings of employees, by sex, age, occupation and persons with disabilities	Implemented activities to increase	The PAI-1 has imparted training to individuals, SDG awareness training, Climate Change Awareness programs individuals and relevant stakeholders, under this grouped project, in PAI-1, around 1,787 people employments have been generated for plantation and management activity in the current monitoring period.	It is expected that that awareness program including SDG awareness, climate change awareness program will be conducted throughout the period of project. The entire project activity is expected to include 6000 farmers (with 26,640 individuals as members of farmer families), all to whom can generate additional income from carbon credits and produce.
4)	13.2	13.2.2 Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	By plantation of around 894.06 in PAI-1, this project is resulting to improve the air and soil quality by sequestration or removal of 65,813 tons of CO2 to create clean environment.	The total project activity expected to removal of 1,201,502 tCO2 of carbon dioxide over 4,000 ha area from the atmosphere over the lifetime of 30 years project.
5)	15.1	15.1.1 Forest area as a proportion of total land area	Implemented activities to increase	The project will promote sustainable use of terrestrial ecosystems, combat desertification, and halt and reverse land degradation and halt biodiversity loss by plantation of around 894.06 ha.	In total lifetime of the project, it will promote sustainable use of terrestrial ecosystems, combat desertification, and halt and reverse land degradation and halt biodiversity loss by plantation of around 4,000 ha.

1.19 Additional Information Relevant to the Project

Leakage Management

Plantation establishment did not result in displacement of grazing land. The project will economically sustain the community groups around the project region and at the same time contribute to the removals /reductions of the GHG emissions, thus aiding in climate change mitigation of the area.

PP has estimated the leakage emission for the First Project Activity Instance of 894.06 hectares considering the 50cm radius spherical buffer from the tree stem, hence the PP has not considered the buffer area for cultivation of Intercrop. This practice of cultivation ensures smoother intercultural operations. As such area of agriculture displaced by the Project Activity is limited to the buffer area around each planted tree.

Due to shifting of agriculture to plantation activity leakage has been accounted for the project. The leakage emission has been estimated for displaced agriculture activities in section 5.3.

In addition, PP has devised intercropping plan which elaborates the crops to be undertaken as the agroforestry plantation considering various factors such as soil properties, climatic conditions, methods of cultivation and tree canopy.

Commercially Sensitive Information

The public version of this Project description and Monitoring report includes all relevant information and commercially sensitive information has been excluded from the public version of this document. Commercially sensitive information that has been made available to the validator, but it is being excluded from the public are -Land ownership documents, agreements between the Project developer and PP etc. provided to the audit team during the onsite visit.

Further Information

There is no such further information in this project. Hence, this is not applicable.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Stakeholder Identification	The process of identifying the stakeholder impacted by the project activity following steps were taken: a) Identification of the area for project- The PP, having worked in agriculture and related fields in Andhra Pradesh, Tamil Nadu and Madhya Pradesh for over a decade, possesses a thorough understanding of the region's geographical and climatic intricacies. Leveraging this expertise, in conjunction with detailed ground assessments carried out with the help of local experts and experienced farmers, the PP had identified the optimal area for project implementation. b) Identification of the stakeholder: The process began with the PP conducting an internal assessment of various factors such as soil type, water availability, cropping patterns, farming practices, climate conditions, and hydrogeology to select an appropriate meeting location within the Project Area. Following this, an initial engagement session was held with local people and communities, to introduce the project and its benefits to small landholding farmers. After a successful initial engagement, an invitation letter was sent informing them about the local stakeholder consultation meeting. This invitation, written in the local language, was then communicated to the farmers. The invitation letter included details such as the meeting date, venue, subject briefing on "plantation,". It also outlined the format of the meeting, which includes presentations and feedback from stakeholders that were recorded. A stakeholder response team furthered connects with attendees to assess their understanding of the meeting content. Any input or requests received during the meeting were duly incorporated into the project's processes and standard procedures. After completing understanding about the project, interested farmers register their name in register of Mangrove Foundation of India, Greenmile Agroforestry Private Limited and Outreach Projects Private Limited via phone call, voluntary person or visiting to the office. List of stakeholders/Group of stakeholders identified:

	❖ Farmers/Local farming communities ❖ Women representatives ❖Daily wages labor  Photo: **Meeting for Stakeholder Identification**
Legal or customary tenure/access rights	The project proponent (PP) holds sole ownership of the carbon rights generated under this project. This ownership is secured through a legal framework established via agreements between the PP and other entities (implementation partner), such as MFI, Greenmile Agroforestry Private Limited, and Outreach Projects Pvt. Ltd., as well as between these entities and the participating farmers. In which, farmers have vested rights to carbon credits with project implementer under a carbon credit contractual agreement. The PP is authorized to issue and trade carbon credits. As well as, PP will allocate carbon credit sales earnings to farmers through implementation partners in accordance with the contractual arrangement (carbon credit agreement). Moreover, all of the farmlands, under this project activity, are held by Individual farmers or the family of the farmers which are private lands in nature. Further, during the onboarding of the farmers we also ensure that the project area is free from any legal or customary disputes. Thus, there are no conflicting rights pertaining to land tenure identified in the project area.
Stakeholder diversity and changes over time	Social diversity: The social diversity among stakeholders is significantly influenced by the types of farming practices prevalent in the region. Practices such as subsistence farming, extensive cereal cultivation, mixed farming, etc., are deeply intertwined with the regional social structure. Additionally, factors such as education, political development, political influences, and government policies also play pivotal roles in shaping social

diversity. As a result, different entities are actively involved within project areas to address this diversity. The primary stakeholder group of the project consists of farmers with low to medium-sized landholdings and local daily wage laborers, who exhibit diversity in income levels, which in turn affects their social lives.

Financial variety: Stakeholders display a spectrum of economic statuses. Farmers encompass both those with small landholdings grappling with financial challenges and those with medium-sized farms experiencing relatively consistent incomes. Similarly, local daily wage laborers experience differing levels of economic stability influenced by factors like job availability, wages, and seasonal variations. This economic disparity affects stakeholders' access to resources, employment prospects, and overall financial well-being. Gender Diversity: Stakeholder identification prioritized the inclusion of diverse representations within the project area. Intrinsic stakeholders primarily comprise community members, including both men and women, each with gender-specific roles in the baseline scenario and during project implementation. Traditionally, women have been engaged in regulatory and agriculture-supportive activities, such as managing non-timber products, seedling establishment, sowing, and post-harvest practices, while men have typically undertaken execution and operational responsibilities. The project has recognized and incorporated these roles, while also promoting an evolution in stakeholder participation. Women have been empowered with decision-making responsibilities in addition to their traditional roles, ensuring active participation across plantation and operational activities. Beyond project-specific duties, women continue to play central roles in household management, childcare, and livelihood support, highlighting the dynamic and evolving nature of stakeholder engagement over time. Cultural variety: The project has been implemented in the states of Andhra Pradesh, Tamil Nadu and Madhya Pradesh, with plans to expand only Andhra Pradesh, Tamil Nadu *and* Madhya states in India. PAI-1 initiated in Andhra Pradesh, Tamil Nadu and Madhya Pradesh highlighted the differences between these two cultures. During stakeholder identification, there was no bias based on caste, religion, or language, people from diverse backgrounds came together, forming mutual bonds to collaboratively advance the project’s development. The implementation of the project had served as a catalyst for positive changes in social, economic, and cultural diversity within the stakeholder community. By promoting inclusive participation, equitable opportunities, and respect for diverse perspectives and traditions, the project contributed to the development of a more cohesive, resilient, and vibrant community. Despite these differences, various project activities bring them together from diverse social and cultural

	backgrounds, fostering collaboration and the sharing of cultural experiences. This interaction contributes to a rich tapestry of social, cultural and financial diversity within the project community.
Expected changes in well-being	The project activities are inherently environmentally friendly, fostering positive impacts on the surrounding ecosystem. anticipated environmental benefits include biodiversity conservation, enhanced soil fertility, water security, improved food security and contributions to climate Anticipated environmental benefits include biodiversity conservation, enhanced soil fertility, bolstered water security, improved food security, and contributions to climate change mitigation and adaptation Stakeholders recognize and comprehend the importance of the under the project to their way of life, especially the farming community. Positive human involvement can also foster a sense of commitment and ownership among the stakeholders. As the project involves consultations with individual farmers, there is an opportunity for changes in livelihoods. Project may lead to the adoption of more efficient and sustainable agricultural practices, potentially improving farmers' economic well-being after completion as well as involvement of local people indicates a focus on empowering within the community. Results can lead to positive changes in the economic and social well-being of people in the community. Sustainable land management practices of project could positively impact on ecosystem services such as soil fertility, water quality etc.
Location of stakeholders	The primary focus of stakeholders, including NGOs, local farmer communities, local stakeholder farming communities is in Andhra Pradesh, Tamil Nadu and Madhya Pradesh.
Location of resources	The project's focus on Chittoor and Prakasam districts in Andhra Pradesh, Tiruvallur districts in Tamil Nadu and Dhar and Ratlam districts of Madhya Pradesh strategically targets areas where local communities, particularly small and marginal farming communities have a significant presence. These stakeholders either own or customarily access territories and resources within these regions, making their involvement crucial to the project's success. By engaging local stakeholders through a phased approach, the project not only aims to respect the traditional rights and practices of these communities but also ensures that its impact reaches diverse groups. The widespread participation of people across various territories highlights the project's potential to create far-reaching benefits. This approach could lead

	to the adoption of sustainable land use practices, enhancing both agricultural productivity and environmental health across the region. Moreover, the emphasis on inclusivity allows for a deeper connection between the project and the local communities, increasing the likelihood of long-term commitment to sustainable practices. The involvement of farmer further strengthens this, as they are often key players in promoting social and economic empowerment, particularly for women. This broad participation fosters a collective responsibility among stakeholders, ensuring that the project has a lasting, positive impact on both the environment and the livelihoods of the people within these districts.

2.1.2 Stakeholder Consultation and Ongoing Communication

Date of stakeholder consultation

The first stakeholder consultation meeting was conducted as on 26-January-2018 at Community Hall, GD Nellore, Andhra Pradesh. However, for the continuous development and progress of the project, several other meetings were also conducted and the details are given in the stakeholder engagement process. The details of the meetings conducted are as below:

Mangrove Foundation of India:

Date	Place/Location
26/01/2018	Community hall, Gd Nellore, Andhra Pradesh
07/08/2018	Community hall, Gd Nellore, Andhra Pradesh
15/02/2019	Penumuru, Chittoor, Andhra Pradesh
13/09/2019	Penumuru, Chittoor, Andhra Pradesh
21/01/2020	Community hall, Tiruvallur, Tamil Nadu
22/02/2021	Community hall, Palasamudra, Chittoor, Andhra Pradesh
24/09/2021	Community hall, Palasamudra, Chittoor, Andhra Pradesh
13/02/2022	Community hall, S R Puram, Chittoor, Andhra Pradesh
15/07/2022	Community hall, Gummidipoondi, Chittoor, Andhra Pradesh
10/01/2023	Community hall, Gummidipoondi, Chittoor, Andhra Pradesh
14/06/2023	Community hall, Sri Rangarajpuram, Chittoor, Andhra Pradesh

Greenmile Agroforestry Private Limited:

Date	Place/Location
13/02/2019	Grama Panchayathi Office, Dadireddipalle, Kanigiri, Prakasam, Andhra Pradesh

12/02/2022	Grama Panchayathi Office, Dadireddipalle, Kanigiri, Prakasam, Andhra Pradesh

Outreach Project Pvt Ltd:

Date	Place/Location
15/01/2018	Gram Panchayat, Roopkheda Village, Badnawar Tehsil, Dhar District, MP
09/03/2019	Gram Panchayat, Sandla Village, Badnawar Tehsil, Dhar District, MP
20/02/2020	Maruti School, Birmawal, Tehsil & District-Ratlam, MP-471033.
18/01/2021	Z.P. School, Bhakhatpura, Badnawar, Dhar, MP
19/01/2022	Govt. Middle School Jabda, Badnawar Tehsil, Dhar District, MP

Stakeholder engagement process

The meeting invitations were distributed via various channels in addition to being prominently displayed at the Gram Sabha's office in local, Hindi and English language before 8-10 days of the meeting date (01-March-2018 to 28-February-2024). The engagement process was further facilitated via telephonic and word-of-mouth communications through community leaders, women's groups, and farmer collectives. The LSC meetings and project discussions were scheduled during the official working hours of the Gram Sabha office, ensuring accessibility and convenience for all stakeholders, including farming communities, women participants, and daily wage laborers. The participation of all stakeholders in the project has been inclusive, according to individual and gender-independent capacities basis. In multiple times consultation was done with the farming communities. Initially, meetings were arranged to explain the objectives of the project to social entities, leaders including women community leaders serving as representative members of the community. This allowed for widespread community publicity. The community's members and entities were there in a positive manner and were aware of the project's needs and effectiveness for their improvement. To ensure balanced and equitable representation, the PP took deliberate measures to facilitate the active and meaningful participation of all stakeholders, including women and youth, throughout the stakeholder consultation process.

Figure: Photographs of engagement of stakeholder

Alongside general stakeholder engagement, specific activities were also carried out to ensure women's voices were heard and their participation strengthened. These measures included: Organizing small-group meetings designed to provide a safe and comfortable space where women. Engaging female facilitators and respected women leaders from within the community to build trust and encourage broader female participation.

Figure: Photographs of engagement of women

During these stakeholder consultation meetings, the PP demonstrate and presented a detailed overview of the project's design including plantation strategies, species selection, roles and responsibilities, grievance redress process, monitoring protocols, implementation timelines etc.

Stakeholders were actively encouraged to share feedback, raise concerns, and contribute suggestions. Their participation and consent were obtained

	through a transparent and inclusive consultation process, aligned with the principles of Free, Prior, and Informed Consent (FPIC). The discussions encompassed potential project risks, costs, and anticipated benefits such as improvements in biodiversity, soil fertility, water availability, food security, and overall socio-economic well-being etc. The PP also briefed participants on applicable national labour laws and presented its worker rights policy, emphasizing fairness, occupational safety, dignity at work, and equal opportunity. It was clearly communicated that land tenure and property rights would remain fully protected, and that any changes in land use would occur only with the explicit and informed consent of landholders. Where relevant, benefit-sharing mechanisms were introduced to ensure equitable distribution of the project's economic and social gains. The model of carbon finance was also discussed, highlighting how the project aims to enhance carbon sequestration through sustainable land-use practices and reduce greenhouse gas. Stakeholders were further informed about the Verified Carbon Standard (VCS) validation and verification framework, including the role of the independent Validation/Verification Body (VVB) and their planned field visits for project assessment. Overall, all consultations were meticulously documented through attendance sheets, consultation forms, and meeting minutes to ensure transparency, accountability, and traceability throughout the stakeholder engagement process.
Consultation outcome	The consultation process was marked by the active participation of each stakeholder or stakeholder group. Throughout the discussion, the project design and implementation underwent thorough scrutiny, leading to unanimous agreement and consent from all stakeholder groups to participate in the project. Extensive deliberations were held regarding the potential risks, costs, and benefits associated with the project, ensuring that stakeholders gained a comprehensive understanding of the possible impacts. A comprehensive overview of all relevant laws and regulations pertaining to workers' rights in the host country was provided and thoroughly discussed to ensure full compliance and address any concerns raised by stakeholders. Participants were also oriented on the technical aspects of carbon financing. The Project Proponent (PP) provided a comprehensive overview of the stages involved in carbon credit program development. This included detailed explanations on land eligibility assessment, plantation activities, project implementation, and monitoring arrangements to be undertaken by field partners. The PP assured participants that the project would undergo rigorous validation and verification by an accredited Validation and Verification Body (VVB), fully aligned with the requirements and guidelines of the VCS Validation

	and Verification framework. Project participants were fully briefed on the site visits to be conducted by the designated VVB as part of the standard validation and verification process. Furthermore, it highlights the mitigation potential of planted species as a carbon sink. The session also elucidates the additional benefits derived from the project in the form of carbon credits. Moreover, Local communities will benefit from enhanced livelihoods, with increased income from carbon credit sales and fruit production. The comprehensive benefit-sharing plan was thoroughly discussed during LSC. Benefits from the current project will be distributed directly to the farming community through implementing partners in accordance with the terms of the signed agreement. Moreover, the meetings also highlighted discussions on property and resource rights. It was explicitly clarified that all forms of property, land, and resource rights will remain with the landowners, with no transfer of such rights to the Project Proponent (PP). Only the carbon rights will be transferred to the PP in accordance with the agreement. Additionally, detailed Free, Prior, and Informed Consent (FPIC) was obtained from all landowners participating in the project. The success of the project hinges on effective stakeholder engagement and the fair distribution of benefits, ensuring a sustainable and positive outcome for all parties involved. Overall, the consultation outcome showed positive results, with most stakeholders demonstrating a thorough understanding of the project details, indicating a successful communication and engagement process. This proactive approach to communication ensured transparency, engagement, and collaboration between project proponents and stakeholders, fostering trust and accountability within the plantation project. As a result of this consultation, most stakeholders became well-informed about the project.
Ongoing communication	Mangrove Foundation of India, Greenmile Agroforestry Private Limited and Outreach Projects Pvt. Ltd. has established a structured process to facilitate ongoing communication among stakeholders and address any concerns or issues arising from project activities. The organization is actively engaged with stakeholders in the project area, including a dedicated group of volunteers who play a crucial role in fostering communication. Farmers can easily reach out to Mangrove Foundation of India, Greenmile Agroforestry Private Limited and Outreach Projects Pvt. Ltd. through various channels, including phone calls or direct visits to a designated group member appointed in the project region by the Mangrove Foundation of India (MFI), Greenmile Agroforestry Private Limited and Outreach Projects Pvt. Ltd. and Infinite Environment Solutions Limited head office, which is conveniently located within the project area. This comprehensive approach ensures that farmers remain informed and engaged throughout the project, enhancing collaboration and trust

	between Mangrove Foundation of India (MFI), Greenmile Agroforestry Private Limited and Outreach Projects Pvt. Ltd. with the community.
Stakeholder input	1. The participants were very optimistic about the project and extended their complete support. 2. Farmers suggested that such stakeholder meetings should be conducted regularly. 3. Farmers agreed to assist the Infinite team and the DOE during the field visits and provide appropriate data required for the project. 4. Farmers appreciated the environmental benefits, additional monetary benefits, and productivity enhancement due to the implementation of project activities. 5. Stakeholders and farmers reached a consensus that the program carried no potential negative impacts; instead, they acknowledged its role in enhancing area productivity and providing additional advantages to farmers, ultimately positively affecting their livelihoods. 6. Discussion on various carbon credits mechanisms was carried out. The monitoring mechanism as well as carbon stock assessment was discussed and farmers agreed to be part of the sampling measures that would be implemented during the entire period. Sharing of carbon credit was explained and they were happy to be part of such a positive initiative. By actively incorporating stakeholder input into the decision-making process, the project team demonstrated a strong commitment to inclusive and participatory development. This ensured transparency and helped build sustained trust and collaboration with stakeholders. 

Photo: **Stakeholder consultation meeting**

2.1.3 Free Prior and Informed Consent

Obtaining consent	Efforts were made to identify and engage all relevant rights holders, with additional focus on women, marginalized groups, and underrepresented stakeholders, to foster equitable participation. No unresolved conflicts or disputes were identified in the project areas during stakeholder engagement. Moreover, steps were taken to confirm that the project activities would neither exacerbate nor influence the outcomes of any pre-existing conflicts in surrounding regions. The project team has established an accessible grievance redressal mechanism to address any emerging issues, ensuring sustained collaboration and trust with stakeholders. The property and land use rights of local stakeholders have been upheld, and free, prior, and informed consent has been secured from enrolled farmers through a Farmer's Agreement. The farmer has signed a consent form with the project proponent, granting the proponent exclusive rights to generate credits from the designated land. The proponent will assume full responsibility for verification, auditing, and issuance. The landowner commits not to have sold, nor to sell in the future, any greenhouse gas (GHG) reductions or removals from plantations

	to any party other than the proponent. They have also agreed to provide all legal rights in accordance with applicable carbon standards. A copy of the signed agreement has been submitted to the validation and verification body. As part of the free, prior, and informed consent (FPIC) process, stakeholders were briefed on the potential impact to property rights, ensuring they were fully informed and empowered to make decisions. Discussions on benefit sharing were conducted where relevant, emphasizing the importance of an equitable distribution of project benefits among all stakeholders involved. The process of VCS validation and verification, including the logistics of the validation/verification body's site visit, was meticulously explained and discussed between project proponents and stakeholders to ensure clarity and transparency.
Outcome of FPIC	The free prior and informed consent has very good outcomes in terms of transparent understanding of the concept of the project, process of the implementation of the project, establishment of grievance redress mechanism and process initiated for conservation of Ips and LCs for define the long-term intellectual property rights. Farmers have gained knowledge and understanding regarding greenhouse gases (GHG), their environmental impacts, and the grievance redressal mechanism. This has increased local awareness and involvement in the project and the concept of carbon credits. They also recognize the importance of these issues for both the environment and human well-being. The FPIC process resulted in voluntary consent from farmers, documented through signed Farmer agreements. The project adheres strictly to land ownership boundaries, ensuring no encroachment or displacement. Consent and ownership documents validate the absence of forced relocation or economic displacement, affirming transparent agreement and stakeholder participation.

2.1.4 Grievance Redress Procedure

Development process	Identified the key stakeholder which is affected by the project. Assessment was conducted by all stakeholders to understand the local context and their issues. Thereafter, a grievance mechanism was established by Mangrove Foundation of India (MFI), Greenmile Agroforestry Private Limited and Outreach Projects Pvt. Ltd., where all the comments/queries/complaints would be addressed by local NGO representative to resolve the conflict at initial level. The mechanism has been developed in such a way that the views of all the stakeholders reach the higher management authorities. The group of farmers will be addressing the complaint and any grievance with respect to the project.

	The grievance mechanism includes the following: Stakeholders can submit grievances through various channels such as in-person, phone, text, email, social media, and mail, which is regularly monitored by the PP team for resolution. All grievances submitted through the portal are maintained in a database at the PP head office. The grievance system ensures quick, efficient, transparent, culturally appropriate, and accessible responses at no cost and without fear of retaliation. During stakeholder engagement, the PP informs affected parties about the grievance process and maintains public records of responses. All users of the grievance system are protected from retaliation, abuse, or discrimination, and grievances are handled confidentially, impartially, objectively, and promptly.
Grievance redress procedure	The Grievance Redress Mechanism (GRM) encompasses a structured, transparent, and accessible platform for stakeholders to raise concerns via multiple channels, including telephone, in-person consultations, and written submissions, all in local languages. This includes issues related to benefit sharing, safeguard compliance, and other stakeholder engagement aspects as outlined in Sections 3.18 and 3.19 of VCS standard v4.7. From initial acknowledgment to resolution and closure, the GRM is intentionally designed to be culturally sensitive, gender-responsive, and religion-neutral, ensuring inclusivity and equitable treatment across all stakeholder groups. The process aligns with best-practice principles of participatory engagement, fostering accountability, trust, and timely resolution while maintaining meticulous documentation for monitoring, verification, and audit purposes. Its core objective is to deliver an accessible, prompt, and effective response, particularly for vulnerable populations who may face barriers in accessing formal legal or institutional systems. Cultural inclusivity is embedded throughout the procedure: stakeholders are encouraged to engage in group discussions to identify and address concerns openly, with provisions for gender-sensitive spaces where women and men can voice grievances freely. Recommendations from these separate consultations are then integrated and brought to a neutral mediator, ensuring solutions are collectively agreed upon while respecting social norms and cultural sensitivities. It is essential that potentially impacted stakeholders understand the purpose of the GRM, the various options available for voicing their grievances, and where to obtain assistance and guidance on how to proceed. All grievances are recorded in a central database maintained at the PP's head office, ensuring that every submission is documented and tracked for resolution.

The grievance process follows a three-stage resolution mechanism: **Amicable Resolution**: The PP shall make every effort to resolve grievances amicably through direct engagement with the complainant and issue a written response in a timely and culturally sensitive manner. Efforts are made to resolve grievances within 15–30 days.

Mediation: If a grievance cannot be resolved through amicable negotiations, it is referred to mediation by a neutral third party, as required under the VCS Standard. Neutral mediators may include respected community figures such as the Panchayat head, agricultural experts, or other locally recognized impartial individuals. Dr. R. Narendran is the neutral Third Party. All mediation processes are conducted in a culturally appropriate and fair manner to ensure balanced resolution.

Legal Recourse: If mediation fails, the grievance may be escalated either to formal arbitration (where legally applicable) or to the competent local court. This is without prejudice to the right of any party to approach a supranational adjudicatory body, where relevant. But in the current grievance I resolve at amicable and mediation level.

The Project Proponent regularly monitors grievances and maintains a detailed database at its head office. The grievance system is transparent, culturally appropriate, accessible, and free of retaliation or cost. Stakeholders are informed about the grievance process during engagement activities, with responses publicly recorded.

Grievances are addressed through multiple resolution levels, including negotiation, mediation, and legal escalation if needed. Multiple accessible channels are provided for stakeholders to raise concerns and receive guidance on the grievance process.

Acknowledging Receipt: Staff members who receive grievances, whether at the project office or through NGOs, should notify complainants that their grievance has been received. This will be logged and reviewed for eligibility, with an initial organizational response generated if deemed eligible. Initial acknowledgement should normally arrive within 3-5 days of receipt and will be resolved within the timeframe of 15-30 days at max. Final formalization will be conveyed in the shape of a conventional letter.

Evaluating GRM Eligibility: This procedural step confirms that the issue presented is relevant to the project. Maintaining a low barrier to entry with a rapid turnaround is preferable, ensuring that concerns can be addressed without unnecessary obstacles. Eligibility determination serves to initiate an initial examination and response.

Assigning Responsibility: Complaints are directed to the appropriate institution or individual. Given the involvement of multiple partners in project activities, clarity regarding roles and responsibilities for GRM implementation and response is crucial. The referral process will depend on the type of issue raised and its associated risk level.

Closing Out the Grievance: If the response is successful, GRM staff will document the satisfactory resolution in consultation with the complainant. In cases involving significant risks, impacts, or negative publicity, it may be appropriate to include written documentation from the complainant indicating satisfaction with the response.

If there is a grievance or question that cannot be resolved through discussion or by both the parties (PP and project Implementor), it will be referred to a neutral third party as an agricultural experts, environmental consultants, or academics, for mediation. Dr. R. Narendran works as a neutral third party. If mediation fails, the project has a choice between arbitration, national courts, or possibly a higher international body for dispute resolution.

Key Features of the Grievance Mechanism:

- The grievance procedure, governing structure, and decision-makers must be transparent, culturally inclusive and gender neutral.
- The GRM should address concerns quickly, effectively, and in a culturally appropriate manner, ensuring accessibility for all affected parties without cost or retaliation.
- The project proponent (PP) will inform impacted parties about the grievance process during community engagement initiatives and maintain a public record of grievance responses.
- All grievances will be processed confidentially, independently, and without bias, and in a timely manner. Users of the grievance mechanism will not face retaliation, abuse, or discrimination.

The PP employs trained personnel to conduct stakeholder engagement initiatives and may seek external expertise as needed. Records of grievance responses which are included in grievance register will be made publicly available.

Photo: Understanding the role of Grievance

Grievances received	Resolution and outcome
Minor comments were received on the grievance mechanism, and all have been appropriately addressed. As most of the comments were similar in nature, they have been consolidated and recorded in the logbook. The comments primarily pertained to the following points: **1. What are the possible causes of stunted growth in plants?** **2. What preventive measures can be implemented to reduce the impact of pests and diseases?**	➢ The concern regarding the stunted growth of plants was addressed by clarifying that several biophysical and site-specific factors can influence reduced growth performance. These include inadequate soil fertility, nutrient deficiencies, and moisture stress caused by irregular watering, among others. This explanation helped community members understand that growth variability often reflects underlying environmental and management conditions. They were also informed that consistent field monitoring and careful site selection are critical for improving sapling health and overall survival. Following field observations and diagnostic assessments, organic fertilizers were applied to enhance soil nutrient availability, which led to a noticeable improvement in plant vigor. Continued monitoring allowed for timely corrective actions, ultimately resulting in healthier growth patterns and significantly better sapling survival rates. ➢ The query regarding preventive measures to minimize the impact of pests and diseases was addressed by detailing practical management practices. These included the

3. How will the project benefit the local community?	adoption of integrated pest management, regular field inspections for early detection of symptoms etc. This clarification enhanced community awareness of proactive steps they can implement to protect saplings and support overall plantation health. The introduction of organic and bio-based pesticides, combined with technical guidance provided to the farmers, resulted in a significant reduction in pest incidence. Farmers observed improved plant health and vitality, which contributed to higher plantation survival rates and minimized crop losses. Therefore, PP provides training on integrated pest management related to the farmer. ➢ The response clarified that the project is designed to generate multiple socio-economic and environmental benefits. These include improved soil quality, increased vegetation cover, and long-term carbon sequestration. Additionally, the project supports livelihood opportunities through involvement in plantation activities, capacity-building programs, and potential revenue generation from project outcomes. The outcome was a clearer understanding among stakeholders of how the project contributes to both environmental restoration and community well-being. Therefore, PP conducted multiple number of stakeholders meeting along with FPIC.

2.1.5 Public Comments

Comments received	Actions taken
Project was open for public comment period from 16-August-2022 to 15-September-2022, the project did not receive comments during the public commenting period, or after the public comment period.	No action required as there are no comments received.

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

The project management and development teams consist of experienced professionals with over five years of expertise in AFOLU project design, carbon accounting, and reporting. Many have successfully managed projects through the validation, verification, and issuance of GHG credits

under the VCS Program or other approved GHG programs. The management teams possess expertise and experience in implementing nature-based livelihood and carbon development projects, particularly in collaboration with the Mangrove Foundation of India (MFI), Greenmile Agroforestry Private Limited and Outreach Projects Private Limited. They are skilled in engaging communities effectively. The project proponent has also partnered with other organizations to enhance project support and has developed a recruitment strategy to address identified gaps in expertise or resources. This collaborative, interactive approach ensures effective management, reduces risks, and promotes positive project outcomes.

2.2.2 Risk Assessment

Table below describe the risk assessment and outcome of the potential risks to stakeholders and the environment.

	Risks identified[45]	Mitigation or preventative measure taken
Natural and human-induced risks to stakeholders' wellbeing	No risk identified	Project design includes strategies aimed at preventing potential negative impacts, backed by stringent protocols to ensure stakeholder safety and well-being throughout the project. The careful planning and implementation of our activities, which prioritize both environmental and social responsibility, reinforce this proactive approach. This effectively mitigates possible risks, thereby protecting the interests of all parties involved. The species planted in this project are native. Thus, they do not primarily possess any natural risk disrupting the environmental wellbeing of participants. Participants are always part of decision making and monitoring plans, thus a sense of connectedness and integrity is ensured, pointing towards workplace, financial and societal wellbeing as a whole.
Risks to stakeholder participation	No risk identified	The project proponent has assessed and not any natural and human-induced risks to local stakeholder's well-being, food security, land loss, loss of yields and climate change adaptation were identified. All the local stakeholders have been included in the local stakeholder consultations during the development of the carbon

[45] The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties

		project and further, general training during project activity considers any potential risks. The project activities have been carefully developed in collaboration with the owners and beneficiaries. Their valuable input and perspectives have been taken into consideration during the planning process. All local stakeholders were consulted during the LSC meetings, and their concerns were addressed before they actively participated in the project. The project design includes measures to mitigate any foreseeable risks, ensuring that stakeholder safety and wellbeing are not compromised. As a result, stakeholders can engage with the project confidently, knowing that their health and safety are safeguarded.
Working conditions	No risk identified	No risk involved for current project working conditions. The Project Proponent has adopted a Management Manual for overall project management which is outlines the safety conditions related to key activities such as pruning, land preparation, and harvesting. The PP has also implemented Human Resource policies and a Code of Conduct to ensure safe and fair working conditions.
Safety of women and girls	No risk identified	The project proponent (PP) adheres to relevant rules, regulations, and laws that uphold the freedom, safety, and dignity of female employers, as these are key concerns of the state government. PP has put POSH and Anti-Harassment and Anti-Discrimination policies in place to ensure safety of women and girls. Also, safety and awareness programs are organized.
Safety of minority and marginalized groups, including children	No risk identified	The project proponent (PP) has established a regular framework in accordance with the reports from the Ministry of Minority Affairs and the Ministry of Local stakeholder Affairs, Government of India. PP has put Anti-Discrimination policy in place to ensure safety of minority and marginalized groups. Also, grievance policies are there so that all employees especially minorities, women and children are heard and treated equally.
Pollutants (air, noise, discharges	No risk identified	No development activity under the project causes harm to the environment or stakeholders. The project does not use

to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)		synthetic fertilizers or chemical plant protectants, ensuring a more natural and eco-friendly approach to cultivation. The project promotes organic pest management practices and traditional cultivation methods which include the use of natural compost, organic pest repellents, and manual or mechanical weed control, which support soil health and biodiversity. Additionally, it does not generate hazardous waste or materials such as chemical pesticides or fertilizers. This approach ensures that project activities remain environmentally safe and socially responsible, fully aligned with sustainable land management principles.

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

	Risks identified[46]	Mitigation or preventative measure(s) taken
Discrimination	No risk identified	PP ensures equality and prohibits discrimination on grounds of religion, race, caste or sex. The project proponent confirms that neither they nor any other entity involved in the project design or implementation has engaged in any form of discrimination. The project proponent has established anti-discrimination policies, which can be provided to the auditor at a later stage. Both Infinite Solutions and the implementing partner have robust policies in place to protect against discrimination affecting employees and other stakeholders involved in the project.
Sexual harassment	No risk identified	The project proponent confirms that neither they nor any other entity involved in the project design or implementation has engaged in any form of sexual harassment. Sexual harassment of any kind is strictly prohibited for all stakeholders involved, and the organizations maintain Internal Complaints Committees (ICCs) to address any

[46] The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

		complaints of sexual harassment. There is no history of such incidents within these organizations.
Equal pay for equal work	No risk identified	The project proponent offers employment opportunities and promotes fair and inclusive work environments for both men and women in Andhra Pradesh, Tamil Nadu and Madhya Pradesh. PP ensure equal pay for equal work and value and currently have a team (implementation partners) of many individuals working on the ground across the project boundary. Equal pay for equal work ensures that individuals (male and female) performing the same job with similar responsibilities and qualifications receive the same compensation, eliminating wage disparities. This practice upholds fairness and promotes a transparent, equitable workplace, reinforcing trust and employee satisfaction.
Gender equity in labor and work	No risk identified	The project proponent and implementation partners are proactively fostering an enabling environment that empowers and educates women and girls across various project activities. This approach not only enhances local employment opportunities but also ensures that equal opportunities are extended to all genders involved in the project.
Forced labor	No risk identified	PP does not promote or engage in forced labor within or outside of the project boundary and is committed to not using victims of these practices now or in the future. There are no such events/ activities in project which represent victims of forced labor.
Child labor	No risk identified	PP does not promote or engage in child labor within or outside of the project boundary and is committed to not using victims of these practices now or in the future. There are no such events/ activities in project which represent victims of child labor.
Human trafficking	No risk identified	PP does not promote or engage in human trafficking within or outside of the project boundary and is committed to not using victims of these practices now or in the future. There are no such events/ activities in project which represent victims of human trafficking.

2.3.2 Human Rights

The property and land use rights of local stakeholders have been upheld, and free, prior, and informed consent has been obtained from enrolled farmers through a Farmer's Agreement.

Consequently, the project recognizes, respects, and promotes the protection of the rights of farming communities and customary rights holders, in alignment with applicable international human rights law.

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	The property and land use rights of the local stakeholders have not been violated. The property and land use rights will remain intact, with the project ensuring that free, prior, and informed consent has been obtained from the enrolled farmers through the execution of farmer's agreement.

2.3.3 Indigenous Peoples and Cultural Heritage

This ARR activity is also supporting the conservation of sacred grooves and forest areas situated near the surrounding Chittoor and Prakasam districts of Andhra Pradesh, Tiruvallur district of Tamil Nadu and Dhar and Ratlam district of Madhya Pradesh. The plantations near the religious places are helpful to conserve the cultural places as well as old tree species in the vicinity of the heritages. All the farm owners involved in this project activity includes lands or territories duly owned or controlled by farm owners and are not undertaken by other parties.

Risks identified	Mitigation(s) or preventative measure taken
No risk identified	Project staff, partners, and stakeholders had received cultural sensitivity training to promote respect and knowledge of the customs, beliefs, and practices of the local community and also developed guidelines and protocols to ensure that project operations are conducting in a way that respects and doesn't impede cultural customs and sensitive locations.

2.3.4 Property Rights

The current ARR project has been implemented in the private farmland which has clear title rights of the local farmers from the local stakeholder community. The property rights and resources right go to landowner of plantation areas. The legal documents of land right are available with each farmer which justify the real ownership.

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	The property and land use rights of local stakeholders have been fully respected, and free, prior, and informed consent has been obtained from enrolled farmers through a Farmer's Agreement.

2.3.5 Benefit Sharing

Process used to design the benefit sharing plan	The carbon rights sharing agreement has been executed with each individual farmer participating in the project. During the stakeholder consultation process, the aspects of carbon revenue sharing and associated benefits were discussed in detail with beneficiaries and local implementation partners, ensuring full alignment with the VCS requirements. The benefit-sharing mechanism was thoroughly explained during these consultations, outlining that the revenue generated from the sale of carbon credits will be distributed among the farmers, the Implementing Partners (IPs), and the Project Proponent (PP). This structure ensures transparency, fairness, and clarity regarding each stakeholder's share of project benefits. Under the executed agreements, the rights to the carbon credits are initially assigned by the farmers to the Implementing Partners, who subsequently transfer these rights to the Project Proponent. This arrangement enables the PP to manage credit sales and facilitate revenue distribution in accordance with the agreed benefit-sharing framework. Importantly, no concerns or objections were raised by the participating farmers regarding the benefit-sharing mechanism, demonstrating their full understanding, consent, and satisfaction with the arrangement.
Summary of the benefit sharing plan	A transparent and equitable benefit-sharing framework has been established between the Project Proponent (PP), the Project Implementing Partners (IPs) Mangrove Foundation of India (MFI), Greenmile Agroforestry Private Limited, and Outreach Projects Pvt. Ltd. and the participating farming community. Under this arrangement, the PP, as the rightful owner of the carbon credits, receives the revenue generated from credit sales. The PP then transfers the agreed share of carbon revenue to the respective IPs, who subsequently distribute the corresponding benefits to the farmers in accordance with the executed farmer-level agreements. This structured flow of benefits from PP to IPs and finally to the farmers ensures transparency, fairness, and accountability in revenue distribution. The mechanism was discussed and finalized through stakeholder consultations, ensuring Free,

	Prior, and Informed Consent (FPIC) and a clear understanding of benefit-sharing provisions among all participants. All parties are responsible for maintaining confidentiality and securely managing project-related documents in line with project governance protocols.
Approval and dissemination of benefit sharing plan	The benefit-sharing agreement has been signed which is treated as commercially sensitive information has been reviewed, approved, and implemented by the PP in coordination with the Project Implementing Partners i.e. Mangrove Foundation of India (MFI), Greenmile Agroforestry Private Limited, and Outreach Projects Pvt. Ltd. It outlines the mechanism for distributing carbon credit revenue and other project benefits to participating farmers. The plan has been communicated to all stakeholders through community meetings, ensuring that farmers fully understand and provide informed consent to the arrangements. Copies of the plan and related agreements are readily accessible to farmers upon request through the IPs, promoting transparency and accountability.
Benefit sharing during the monitoring period	During the monitoring period, the actual carbon credit revenue received from the project will be directly transferred to the bank accounts of the participating farmers through the Project Proponent and the respective Project Implementing Partners. This ensures timely, transparent, and accountable distribution of project benefits in accordance with the executed benefit-sharing agreements.

2.4 Ecosystem Health

	Risks identified	Mitigation or preventative measure(s) taken
Impacts on biodiversity and ecosystems	No risk Identified	In the context of South and Central India, specifically Andhra Pradesh, Tamil Nadu and Madhya Pradesh. The project has had a positive impact on biodiversity and ecosystems. No significant risks to biodiversity have been identified, so no

		specific mitigation or preventive measures were deemed necessary. The project has focused on planting native and non-native tree species that has adapted native ecological conditions and is not harmful for native species and ecosystem and are well-suited, to the agro-ecological zones of these regions, thereby enhancing local biodiversity and ecosystem services. Moreover, the project proponent has made efforts to avoid the introduction of invasive alien species, ensuring that all planting activities contribute to the preservation and enhancement of the local environment. By emphasizing the use of indigenous species, the project has supported the natural flora and fauna of Andhra Pradesh, Tamil Nadu, and Madhya Pradesh contributing to the resilience and sustainability of local ecosystems.
Soil degradation and soil erosion	No risk Identified	The trees planted in the project area will bind the soil, effectively preventing topsoil erosion. Farmers actively participate in tree planting, which enhances soil health and contributes to overall environmental improvement. This initiative not only restores ecosystem balance but also boosts soil fertility through the act of planting trees.
Water consumption and stress	No risk Identified	No species have been used in the project that will cause negative or increase in water consumption and stress. It is well-recognized that deep roots play a vital role in increasing soil water availability to crop water use, their ability in regulating the allocation of the crop water use during the growing season would also influence crop yield and water productivity.[47]

[47] https://doi.org/10.1016/j.agwat.2022.107710

2.4.1 Rare, Threatened, and Endangered species

Is the project located in or adjacent to habitats for rare, threatened, or endangered species?

☐ Yes ☒ No

2.4.2 Introduction of species

Species introduced	Classification	Justification for use	Adverse effects and mitigation
Mango (*Mangifera indica*)	Native[48]	Mango (*Mangifera indica* L.) belonging to Family Anacardiaceae is the most important commercially grown fruit crop of the country. It is called the king of fruits. India has the richest collection of Mango cultivars. Mango trees play a crucial role in maintaining soil quality by preventing soil erosion, thereby safeguarding valuable nutrients essential for agricultural productivity. Additionally, the cultivation of Mango trees offers farmers a reliable source of income through the sale of their fruit. This not only supports local economies but also provides a sustainable livelihood for families and communities, contributing to long-term economic stability.[49]	Not Applicable
Red Sanders (*Pterocarpus santalinus*)	Native[50]	*Pterocarpus santalinus* (Family – Fabaceae) popularly known as Red Sanders is an endemic species confined to Southern parts of Eastern Ghats of India specially in Andhra Pradesh. Heartwood of Red Sanders has high demand in domestic as well as international market and the wavy grained wood is valued. Along with its extensive use in furniture, the red dye obtained from the wood is used as coloring agent for textile, medicine and food. The heartwood can accumulate various elements and rare earth elements like strontium cadmium, zinc, copper and uranium. Wood has different uses in traditional and folklore medicines and is	Not Applicable

[48] https://www.phytojournal.com/archives/2017.v6.i6.2226/mango-history-origin-and-distribution

[49] https://deeprooted.co/blogs/environmental-impact-of-mango-cultivation

[50] https://doi.org/10.31357/jtfe.v4i2.2063

		used for the treatment of diabetes, prickly heat, skin diseases and for various other ailments.	
Guava (*Psidium gujava*)	Non-native[51]	Guava (Psidium guajava L.) tree (Myrtaceae family) bears fruit rich in vitamins, fiber, and other nutrients. While native to Latin America, Guava is grown in many tropical and subtropical regions across the globe. Since, the plant is introduced in India in the seventeenth century[52] and presently, India has growing area of 3.14 lakh ha.[53] Despite the fact that the plant is non-native to India, it has covered larger area in the country and often be counted as one of the important fruit crops in India. It has long been used in traditional medicine to treat a myriad of ailments. Guava has been shown to exhibit a number of biological and pharmacological activities, such as antioxidant, anti-inflammatory, immunomodulatory, antimicrobial, antidiabetic, and anticancer properties. Several parts of the plant, including the leaves, fruits, seeds, peels, pulp, bark, and oil, produce phytochemicals with medicinal properties.	Not Applicable, it has adapted native ecological conditions and is not harmful for native species and ecosystem.

Existing invasive species	Mitigation measures to prevent the spread or continued existence of invasive species
There is no invasive species found in this project.	There has no invasive species been planted under this project activity. Hence, this is not applicable.

2.4.3 Ecosystem conversion

The project start date for the project is 01-March-2018. The current ARR project has not cleared up any native ecosystem in last ten years from its start date. Additionally, the PRA responses conclude that land parcels involved in the project activity were in the land use identified in the baseline which is low productive degrading agriculture land for more than last 10 years. Secondary literature shows that long and sustained use of mineral fertilizers, chemical pesticides, mechanical tillage, and groundwater exploitation has negatively impacted land

[51] Jamieson, S., Wallace, C. E., Das, N., Bhattacharyya, P., & Bishayee, A. (2022). Guava (Psidium guajava L.): a glorious plant with cancer preventive and therapeutic potential. Critical reviews in food science and nutrition, 63(2), 192-223.
[52] https://nhb.gov.in/report_files/guava/GUAVA.htm#:~:text=Guava%20(Psidium%20guajava)%20is%20one,after%20mango%2C%20banana%20and%20citrus
[53] https://icar.org.in/sites/default/files/2024-02/IH%20Jan-Feb%202024%20Normal%20_0.pdf

quality.[54] The historical land use of the lands selected under the project activity is provided. A Land Use Land Cover (LULC) map for the project location has been prepared to prove the project location.

	Risks identified	Mitigation or preventative measure(s) taken
Ecosystem conversion	No risk identified	Separate KML file has been uploaded with the project documents and can be used to cross check any conversion of native ecosystem.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

The CDM consolidated methodology AR-ACM0003[55]: Afforestation and reforestation of lands except wetlands Version 02.0 is applied.

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	AR-ACM0003	Afforestation and reforestation of lands except wetlands	2.0
Tool	AR-TOOL02	Combined tool to identify the baseline scenario and demonstrate additionally in A/R CDM project activities[56]	1.0
Tool	AR-TOOL03	Calculation of the number of sample plots for measurements within A/R CDM project activities[57]	2.1.0

[54] Land Degradation–Desertification in Relation to Farming Practices in India: An Overview of Current Practices and Agro-Policy Perspectives

[55] https://cdm.unfccc.int/UserManagement/FileStorage/THNRJC15IW4K89UBE6DFZYX23OVP0Q
[56] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-02-v1.pdf
[57] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-03-v2.1.0.pdf

Tool	AR-TOOL08	Estimation of non-CO2 greenhouse gas (GHG) emissions resulting from burning of biomass attributable to an A/R CDM project activity[58]	4.0.0
Tool	AR-TOOL12	Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities[59]	1.1.0
Tool	AR-TOOL14	Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities[60]	4.1
Tool	AR-TOOL15	Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity[61]	01
Tool	AR-TOOL16	Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities[62]	1.1.0
Tool	AR-TOOL19	Demonstration of eligibility of lands for A/R CDM project activities[63]	2.0
Tool		VCS AFOLU Non-Permanence Risk Tool (Version 4.0)[64]	4.2

3.2 Applicability of Methodology

Methodology ID	Applicability condition	Justification of compliance
AR - ACM0003 A/R	The land subject to the project activity does not fall in wetland category. 1. Soil disturbance attributable to the project activity does not cover more than 10 per cent of area in each of the following types of land, when these lands are included within the project boundary: i) Land containing organic soils	*1)* Wetlands are defined as lands that are covered or saturated by water for all or part of the year (e.g., peatland) and that does not fall into the forest land, crop land, grass land or settlements categories.[65] Land parcels where rice cultivation was being practiced are not

[58] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-08-v4.0.0.pdf
[59] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-12-v3.1.pdf
[60] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-14-v4.2.pdf
[61] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-15-v2.0.pdf
[62] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-16-v1.1.0.pdf
[63] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-19-v1.pdf
[64] https://verra.org/wp-content/uploads/2019/09/AFOLU_Non-Permanence_Risk-Tool_v4.0.pdf
[65] Chapter 7 Wetlands, Volume 4, 2006 IPCC Guidelines (iges.or.jp)

	ii) Land which, in the baseline, is subjected to land-use and management practices and receives inputs listed in appendices 1 and 2 to AR-ACM0003 methodology.	included in the project. LULC map have been provided for the Project area which concludes that project area does not fall under wetland category. 1. As per implementation plan, dimensions of pits have been fixed at 0.3 x 0.3m. Plantation density remained less than 1666 plants per hectare throughout the project area. Activity results total 0.3 x 0.3 m x 1666 = 149.94 m2soil disturbance per hectare. It concludes that total soil disturbance occurred due to project activity is than 1.5% which is less than 10%. So, AR-ACM0003 is applicable. 2. As per the Implementation and Management Plan, rice field is excluded from the project area for current as well as future PAIs.
AR-CDM Tool 02	1. Forestation of the land within the proposed project boundary performed with or without being registered as the A/R CDM project activity shall not lead to violation of any applicable law even if the law is not enforced. 2. This tool is not applicable to small-scale afforestation and reforestation project activities.	1. Project activity does not violate applicable law within the project boundary as described in section 1.14. 2. This project is not a small-scale afforestation and reforestation project. As project is a grouped project and will be implemented over 4000 ha area which will lead to annual GHGs removal of more than 16,000 tons of CO2. As per CDM methodology booklet, it is a large-scale Afforestation and Reforestation project activity.

AR-CDM Tool 03	This tool has no internal applicability conditions.	
AR-CDM Tool 08	1. The tool is applicable to all occurrence of fire within the project boundary. 2. Non-CO_2 GHG emissions resulting from any occurrence of fire within the project boundary shall be accounted for each incidence of fire which affects an area greater than the minimum threshold area reported by the host Party for the purpose of defining forest, provided that the accumulated area affected by such fires each year is ≥5% of the project area.	No loss due to fire is reported in the project area
AR-CDM Tool 12	This tool has no internal applicability conditions	
AR-CDM Tool 14	This tool has no internal applicability conditions.	
AR-CDM Tool 15	This tool is not applicable if the displacement of agricultural activities is expected to cause, directly or indirectly, any drainage of wetlands or peat lands.	
AR-CDM Tool 16	1. The areas of land to which this tool is applied: I. Do not fall into the wetland category II. Do not contain organic soil as defined in "Annexure A: glossary" of the IPCC GPG LULUCF 2003 III. Are not subject to any of the land management practices and application of inputs as listed in Tables 1 and 2 2. The A/R CDM project activity meets the following conditions: I. Litter remains on site and is not removed in the A/R CDM project activity II. Soil disturbance is attributable to the A/R CDM project activity, if any	1. Project lands are not wetlands or peatlands. 2. The project area is characterized as degraded land. The type of soil in the project area are red soil, black soil, deltaic alluvial soils, coastal alluvial soils, laterite soil and skeletal soils. Such lands under tropical conditions have less carbon compared to plantations and forest cover. 2) The lands of Table 1 in AR-CDM tool 16[66] refer to cropland in which soil disturbance is restricted. Project area does not

[66] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-16-v1.1.0.pdf

	3. In accordance with appropriate soil conservation practices, e.g., follows the land contours Limited to soil disturbance for site preparation before planting and such disturbance is not repeated in less than twenty years.	classify as land listed in Table 1. The lands of Table in AR-CDM tool 16[67] refer to grassland in which soil disturbance is restricted. There are no grasslands in the project area with the use of any inputs. Therefore, the project area does not classify as land listed in Table 2 in AR-CDM tool 16.[68] 3. Litter is not removed. 4. Soil disturbances are limited to site preparation (digging of holes to plant seedlings). There is no soil disturbance after the project activity implementation.
AR-CDM Tool19	This tool has no internal applicability conditions	
VCS Non-Permanence Risk Tool	Applicable on all AFOLU projects	Project is an AFOLU project.

3.3 Project Boundary

The proposed Project Activity involves multiple scattered small parcels of land spread across three states of India mentioned in section 1.12. Total proposed coverage of the Project Activity is 4,000 hectares of land, expected to involve 2052 family. The first Project Activity Instance covers 894.06 hectares of land parcels involving (2052) farmers across Chittoor and Prakasam districts of Andhra Pradesh, Tiruvallur district of Tamil Nadu and Dhar and Ratlam districts in Madhya Pradesh of India.

[67] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-16-v1.1.0.pdf

[68] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-16-v1.1.0.pdf

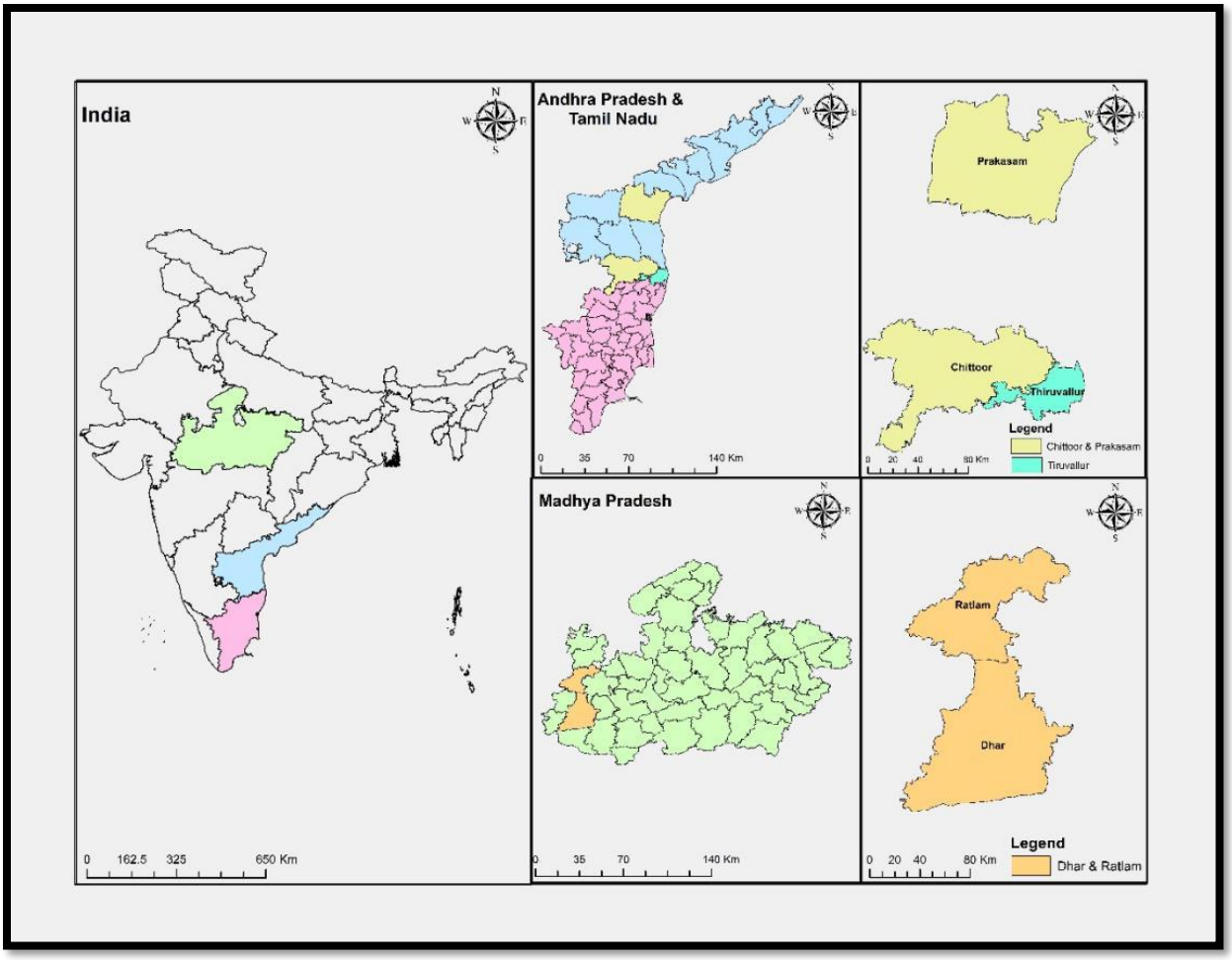


Figure: Map of the project boundary

Source		Gas	Included?	Justification/Explanation
Baseline	Above Ground Biomass	CO_2	Yes	Carbon stock in this pool is expected to increase in the baseline if trees are present there in the baseline. Change in CO_2 is considered zero as per the explanation given in section 5.1 of this document.
		CH_4	No	GHG emissions in the baseline can be conservatively ignored
		N_2O	No	GHG emissions in the baseline can be conservatively ignored
		Other	N/A	-
		CO_2	Yes	Carbon stock in this pool is expected to increase in the baseline if trees are present

Source		Gas	Included?	Justification/Explanation
				there in the baseline. Change in CO_2 **is considered zero as per** the explanation given in section 5.1 of this document.
	Below Ground Biomass	CH_4	No	GHG emissions in the baseline can be conservatively ignored
		N_2O	No	GHG emissions in the baseline can be conservatively ignored
		Other	N/A	-
	Soil Organic Carbon	CO_2	Yes	Soil disturbance is less than 10% on non-organic soil so baseline emissions can be conservatively ignored.
		CH_4	No	GHG emissions in the baseline can be conservatively ignored
		N_2O	No	GHG emissions in the baseline can be conservatively ignored
		Other	N/A	-
	Litter	CO_2	Yes	Carbon stock in this pool is expected to increase in the baseline if trees are present there in the baseline. Change in CO_2 is considered zero as per the explanation given in section 5.1 of this document.
		CH_4	No	GHG emissions in the baseline can be conservatively ignored
		N_2O	No	GHG emissions in the baseline can be conservatively ignored
		Other	N/A	-
	Dead wood	CO_2	Yes	Carbon stock in this pool is expected to increase in the baseline if trees are present there in the baseline. Change in CO2 is

Source		Gas	Included?	Justification/Explanation
				considered zero as per the explanation given in section 5.1 of this document.
		CH_4	No	GHG emissions in the baseline can be conservatively ignored
		N_2O	No	GHG emissions in the baseline can be conservatively ignored
		Other	N/A	-
Project	Above Ground Biomass	CO_2	Yes	This corresponds to the largest carbon reservoir subject to the project activity. Carbon stock in this pool is expected to increase due to the implementation of the project activity. Carbon sequestration in the form of Above ground biomass has been calculated using AR-CDM TOOL14 "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"69
		CH_4	No	GHG emissions in the baseline can be conservatively ignored
		N_2O	No	GHG emissions in the baseline can be conservatively ignored
		Other	N/A	-
	Below Ground Biomass	CO_2	Yes	Carbon stock in this pool is expected to increase due to the implementation of the project activity. Carbon stock is calculated using AR-CDM TOOL14 Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"70

[69] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-14-v4.2.pdf

[70] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-14-v4.2.pdf

Source		Gas	Included?	Justification/Explanation
				"which suggest using the root shoot ratio for the calculation of below ground biomass.
		CH_4	No	GHG emissions in the baseline can be conservatively ignored
		N_2O	No	GHG emissions in the baseline can be conservatively ignored
		Other	N/A	-
	Soil Organic Carbon	CO_2	Yes	Carbon stock in this pool is expected to increase due to the implementation of the project activity. Soil organic carbon increase in the project has been calculated using the default method given in AR-CDM TOOL16 "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities"71
		CH_4	No	GHG emissions in the baseline can be conservatively ignored
		N_2O	No	GHG emissions in the baseline can be conservatively ignored
		Other	N/A	-
	Litter	CO_2	Yes	Carbon stock in this pool is expected to increase due to the implementation of the project activity. Increase in the litter biomass in the project has been calculated using the default method given in AR-CDM TOOL12 "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"72

[71] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-12-v3.1.pdf
[72] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-12-v3.1.pdf

Source		Gas	Included?	Justification/Explanation
		CH_4	No	GHG emissions in the baseline can be conservatively ignored
		N_2O	No	GHG emissions in the baseline can be conservatively ignored
		Other	N/A	-
	Dead wood	CO_2	Yes	Carbon stock in this pool is expected to increase due to the implementation of the project activity. Increase in the dead wood biomass in the project has been calculated using the default method given in AR-CDM TOOL12 "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"[73]
		CH_4	No	GHG emissions in the baseline can be conservatively ignored
		N_2O	No	GHG emissions in the baseline can be conservatively ignored
		Other	N/A	-

As per the table 2, paragraph 10 of AR-ACM0003, CO_2 emissions due to burning of woody biomass are accounted as a change in carbon stock, however in this project activity there is no burning of woody biomass has taken place for the for the purpose of site preparation, or as part of forest management.

Source	Gas	Included?	Justification/Explanation
Burning of woody biomass	CO_2	No	There is no burning of woody biomass has taken place as a project activity for the management of the plantation in this project instance.
	CH_4	No	Biomass in the project boundary is not slashed

[73] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-12-v3.1.pdf

	N_2O	No	or burnt.

3.4 Baseline Scenario

The eligibility requirement for land parcels to be part of the Grouped Activity is as under:

- No native forest for the past 10 years prior to the plantation date
- No wetland
- Land must be used either for cropping, or should be barren or fallow

The First Project Activity Instance covers a total of 894.06 hectares of small land parcels in 3 States viz., Andhra Pradesh, Tamil Nadu and Madhya Pradesh and the more detail on year and state-wise plantation is given in section 1.13 of this document. Project Activity will targeted at 4000 hectares area, whereas in the current PAI-1 894.06 ha area, which includes multiple scattered small land parcels across three states (Andhra Pradesh, Tamil Nadu and Madhya Pradesh) in India.

The demonstration and assessment of the baseline scenario of the project is made in accordance with the applied AR-ACM0003 methodology following the steps of the AR-AM Tool 02 "Combined tool to identify the baseline scenario and demonstrate additionally in A/R CDM project activities" (Version 1).

State	Geographical area[74]	Forest area [75] (ha)	Major crops	Net sown area[76] (ha)	Coverage of plantation area as a percentage of geographical area*
Andhra Pradesh	16,297	3,688	The important crops are rice, cotton, groundnut, pigeonpea, sunflower, blackgram and sorghum[77].	5,884	0.048 %
Tamil Nadu	13,006	2,157	The major crops are rice, cotton, groundnut, mungbean, urdbean and sugarcane[78].	4,738	0.001 %
Madhya Pradesh	30,825	8,704	The major crops are soybean, wheat, chickpea and cotton[79].	15,512	0.004 %

* Plantation area means all the plantation activity under the project in a particular state.

[74] Agricultural_Statistics_at_a_Glance_2022_0.pdf
[75] Agricultural_Statistics_at_a_Glance_2022_0.pdf
[76] Agricultural_Statistics_at_a_Glance_2022_0.pdf
[77] https://icar.org.in/node/17257
[78] https://icar.org.in/node/17291
[79] https://icar.org.in/node/17271

The starting date of this project was 1st March 2018, which was after 31 December 1999. The proof of evidence for the start date of the project is provided in the supporting documents. The AR-TOOL02, "Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM Project Activities, Version 01," was used to identify alternative scenarios and assess the project's additionality. The methodology detailing the steps involved in this process is described in Section 3.5. The methodology necessitates providing a rationale for considering the pre-project land use (degrading agriculture land) as the most probable baseline scenario for the large-scale A/R CDM project activity as per the baseline survey conducted (PRA).

Based on the observations conducted in the baseline field assessment, as outlined in the Prior to project initiation, baseline scenario of the project area is degrading agriculture land with low productivity as land facing the problem of low productivity, high cost of cultivation in Andhra Pradesh, while, Tamil Nadu farmer facing the problem of water supply etc. Whereas, Madhya Pradesh, a landlocked state of India, receives most of its rainfall during the monsoon season, averaging only 95.2 cm, annually. Farmers in this state encounter challenges such as soil and water conservation, low per capita income, and dependence on rainfed farming. Therefore, project aim of the project is to establish a consistent and sustainable source of livelihood income for farmers. The project areas are private lands owned by subsistence farmers conducting the project activity. They have a history of farming and use of the land, other than natural forest or long-term forestry practice.

Prior to project implementation, the land earmarked for the PAI-1 a longstanding agricultural farming. In the Andhra Pradesh, the primary crops cultivated are cotton, groundnut, pigeon pea, sunflower, black gram, and sorghum[80] and in Tamil Nadu the common crops grown are cotton, groundnut, mungbean, urdbean and sugarcane[81]. While in the Madhya Pradesh common growing crops are soybean, wheat, chickpea and cotton.

The demonstration and identification of land degradation were carried out by following the steps outlined in the AR-AM Tool “Tool for the Identification of Degraded or Degrading Lands for Consideration in Implementing CDM A/R Project Activities” which provides a systematic approach for identifying land degradation. With reference to the tool, i.e. A reduction in plant cover or productivity due to overgrazing or other land management” outlined in sub section C in the section C for procedure III consist with the result of PRA survey. Based on the PRA survey it also indicate that chemical degradation, primarily driven by the excessive use of inorganic fertilizers, and biological degradation, manifested through a reduction in crop productivity, are significant factors contributing to the ongoing land degradation issues faced by the project area.

[80] https://naturalfarming.niti.gov.in/andhra-pradesh/
[81] https://icar.org.in/node/17291

The primary constraints faced by the PAI-1 farmers are include low productivity, soil erosion, water scarcity, and salination etc which also contributing to reducing the land productivity. The PRA conducted by the PP clearly indicated that land low productivity was primarily caused by the excessive use of inorganic fertilizers and pesticides, water scarcity, and poor land management, among other factors. This challenges often compel farmers to alter cropping patterns or even abandon agricultural activities altogether. These factors lead to the conclusion that there is no reason to believe that the project areas will revert to forest area without intervention.

It is reported that 23 percent of Tamil Nadu's land and 33 percent of Andhra Pradesh's land of the total land area of both the states are already degraded for which the main reason is soil erosion by water[82]. Soil degradation implies a long-term decline in soil productivity and its capacity to moderate the environment, or we can say it deteriorates the quality of soil, ultimately reducing crop production.[83]

The other contributors to land degradation in Andhra Pradesh are salinity due to excessive water evaporation and the concentration of salts and also seepage of sea water, soil and waterlogged saline soil due to low land near sea, sodicity due to inland movement of salts from seacoast and wastelands due to mining. Similarly, for Tamil Nadu, the other causative factors for land degradation are acidic soils due to high levels of ammonium-based fertilizers, sodic soils due to inland movement of salts from seacoast and saline soils due to inappropriate application of fertilizers. In both states, destruction of vegetation cover leads water erosion and wind erosion. Many of the regions in both states have scanty or irregular rainfall pattern.[84] Moisture is the major limiting factor for agriculture in the dry land regions of Tamil Nadu and Andhra Pradesh. As climate-triggered risks for agricultural crop production are increasing, farmers are facing challenges with current cropping practices and are shifting towards climate-resilient crops.

This challenges often compel farmers to alter cropping pattern or even abandon agriculture activities. These factors lead to the conclusion that there is no reason believe that the project areas will revert to forest area without internation.

Acknowledging the scenarios, the primary objective of the proposed activity scenario is to establish plantations in the region to enhance socioeconomic conditions. This involves promoting enhanced crop diversification through agroforestry to ensure year-round food security and improve the livelihoods of smallholder farmers. The incentive from the planned sale of carbon credit was seriously considered in the decision to proceed with the project activity.

According to PRA survey report, lacking other efficient and profitable alternatives, they continue to rely on low-productivity farming lands. This has led to their interest in carbon credit programs. Additionally, they have recognized that the land use practices (Agriculture/long-term cultivated cropland) in baseline have been in place for the past 10 years.

[82]https://www.researchgate.net/publication/322222168_Degraded_and_Wastelands_of_India_Status_and_Spatial_Distribution

[83] http://www.tinread.usarb.md:8888/jspui/bitstream/123456789/1139/1/soil_degradationRA.pdf

[84] https://mausamjournal.imd.gov.in/index.php/MAUSAM/article/download/731/627

3.5 Additionality

Additionality of the project has been analysed using AR-CDM tool "Combined tool to identify the baseline scenario and demonstrate additionally in A/R CDM project activities" (Version 01)

Project participants shall apply the following five steps:

STEP 0. Preliminary screening based on the starting date of the A/R project activity

STEP 1. Identification of alternative scenarios: alternative land use scenario has been analysed and justified with the help of PRA responses collected from the project area.

STEP 2. Barrier analysis: Barrier analysis has been justified with the help of PRA responses collected from the project area.

STEP 3. Investment analysis (if needed): Not performed as baseline is the only alternative scenario that is not prevented by any barrier.

STEP 4. Common practice analysis: Similar type of project in the project area in respect of similar scale and nature has been identified for common practice analysis.

3.5.1 Regulatory Surplus

Is the project registered or seeking registration in an UNFCCC Annex 1 or Non-Annex 1 country?

☐ Annex 1 country ☒ Non-Annex 1 country

Are the project activities mandated by any law, statute, or other regulatory framework?

☐ Yes ☒ No

If the project is located inside a Non-Annex 1 country and the project activities are mandated by a law, statute, or other regulatory framework, are such laws, statutes, or regulatory frameworks systematically enforced?

☐ Yes ☒ No

As described in Section 1.15 of the PDMR, the project activities are not required under any existing laws, statutes, or regulatory frameworks, including any systematically enforced

regulations applicable in UNFCCC non-Annex I countries. This is applicable across the geographical boundary (i.e., Andhra Pradesh, Tamil Nadu and Madhya Pradesh) of this project. While the project is consistent with the broader legal and policy framework supporting forest conservation and biodiversity protection as outlined in Section 1.15—its specific activities go beyond what is legally required. The project delivers additional environmental benefits that are not mandated by government programs or policies, thereby fulfilling the regulatory surplus requirement.

3.5.2 Additionality Methods

The demonstration and assessment of the additionality of the project is made in accordance with the applied AR-CDM tool 02 "Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities" version 01[85]. Following the steps of the "Combined tool to identify the baseline scenario and demonstrate additionally in A/R CDM project activities" (Version 01).

STEP 0. Preliminary screening based on the starting date of the A/R project activity

The planting activity was conducted from 1st March 2018, which is before the registration date and after 31-December-1999. The first plantation date is 1st-March-2018 and is considered as Project Start Date which was after 31-December-1999.

The incentive from the planned sale of carbon credits was seriously considered in the decision to proceed with the project activity. Accordingly, a board member meeting was conducted on 10-January-2018 to assess the feasibility and strategic rationale of initiating the proposed Agroforestry Plantation Project, including the financial viability supported by the anticipated revenue from carbon credits.

Each land parcel is included in the Grouped Project Activity after collecting following evidence to confirm meeting all the applicability and eligibility criteria:

- Last 10 years satellite images form the part of each farmer eligibility for inclusion in Project Activity and First Project Activity phase-1.
- Land Title/Rights Document for each land parcels which categorize the land use type belongs to degrading land and having low productivity. According to additionally tool, the alternative land use scenario of the proposed project includes:

STEP 1. Identification of alternative scenarios to the proposed A/R CDM project activity

Sub-step 1a. Identify credible alternative land use scenarios to the proposed project activity
The following alternatives to the project activity will be evaluated:

1. ***Land Use Type 1:*** **Degrading Agriculture Land with Low Productivity in Andhra Pradesh**

[85] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-02-v1.pdf

According to the AR-CDM tool 02, the alternative land use scenario in Andhra Pradesh for the proposed project includes:

Land Use Scenario A	Continuation of Pre-Project Land Use: The Project Activity that involves multiple scattered small land parcels privately owned by farmers are most likely to continue with existing /historical land use is degrading land in the state of Andhra Pradesh. Farmers are generally involved in growing agricultural crop. The primary crops cultivated are cotton, groundnut, pigeon pea, sunflower, black gram, sorghum etc in Andhra Pradesh.
Land Use Scenario B	Plantation activity without being registered as A/R VCS project

The Project Activity that involves multiple scattered small land parcels privately owned by farmers is most likely to continue with existing /historical land use of degrading land with low productivity. The above scenario being carried out historically complies with all mandatory applicable legal and regulatory requirements.

2. **Land Use Type 2: Degrading Agriculture Land with Low Productivity in Tamil Nadu**
   According to the AR-CDM tool 02, the alternative land use scenario in Tamil Nadu for the proposed project includes:

Land Use Scenario A	Continuation of Pre-Project Land Use: The Project Activity that involves multiple scattered small land parcels privately owned by farmers are most likely to continue with existing /historical land use is degrading land in the state of Tamil Nadu. Farmers are generally involved in growing agricultural crop. The primary crops cultivated are cotton, groundnut, mungbean, urdbean, sugarcane in Tamil Nadu.
Land Use Scenario B	Plantation activity without being registered as A/R VCS project

The Project Activity that involves multiple scattered small land parcels privately owned by farmers in Tamil Nadu, is most likely to continue with existing /historical land use of degrading land with low productivity. The above scenario being carried out historically complies with all mandatory applicable legal and regulatory requirements.

3. **Land Use Type 3: Degrading Agriculture Land with Low Productivity in Madhya Pradesh**
   According to the AR-CDM tool 02, the alternative land use scenario in Madhya Pradesh for the proposed project includes:

Land Use Scenario A	Continuation of Pre-Project Land Use: The Project Activity that involves multiple scattered small land parcels privately owned by farmers are most likely to continue with existing /historical land use is degrading land in the state of Madhya Pradesh. Farmers are generally involved in growing agricultural crop. The primary crops cultivated are soyabean, cotton, wheat and chickpea.
Land Use Scenario B	Plantation activity without being registered as A/R VCS project

The Project Activity that involves multiple scattered small land parcels privately owned by farmers in Madhya Pradesh, is most likely to continue with existing /historical land use of degrading land with low productivity. The above scenario being carried out historically complies with all mandatory applicable legal and regulatory requirements.

The above use scenario being carried out historically complies with all mandatory applicable legal and regulatory requirements.

The Forest Survey Report of 2021[86] has been released, revealing a notable increase of 2,261 square kilometers in the total forest and tree cover of the country over the past two years. This highlights the emergence of a credible alternative land use option.

❖ If applicable, forestation of at least a part of the land within the project boundary of the proposed A/R CDM project at a rate resulting from:

- Legal requirements;
- Extrapolation of observed forestation activities in the geographical area with similar socio-economic and ecological conditions to the proposed A/R CDM project activity occurring in a period since 31 December 1989 as selected by the PPs

The Project Area does not comprise any land designated for forestation due to legal obligations, and the rate of forestation activities in geographical areas with similar socioeconomic and ecological conditions to the proposed project activity is very low, almost negligible. Therefore, this scenario is not applicable.

Outcome of Sub-step 1a: Below is the list of credible alternative land use scenarios that would have occurred on the land within the project boundary of the A/R CDM project activity.

Land Use Type 1: Degrading Agriculture Land with Low Productivity in Andhra Pradesh

- Land Use Scenario A: Continuation of the pre-project land use (degrading agriculture land with low productivity);
- Land Use Scenario B: Plantation activity without being registered as A/R VCS project

Land Use Type 2: Degrading Agriculture Land with Low Productivity in Tamil Nadu

[86] https://moef.gov.in/wp-content/uploads/2022/03/Forest-Survey-report-2021-released.pdf

- Land Use Scenario A: Continuation of the pre-project land use (degrading agriculture land with low productivity);
- Land Use Scenario B: Plantation activity without being registered as A/R VCS project

Land Use Type 3: Degrading Agriculture Land with Low Productivity in Madhya Pradesh

- Land Use Scenario A: Continuation of the pre-project land use (degrading agriculture land with low productivity);
- Land Use Scenario B: Plantation activity without being registered as A/R VCS project

Sub-step 1b. Consistency of credible alternative land use scenarios with enforced mandatory applicable laws and regulations

The above alternative land use scenarios were selected as those that were the most plausible activities for the given project area, under the context of the type and structure of land tenure.

The above scenario follows mandatory applicable legislation and regulations for land categorized as degraded.

Current laws and/or regulations allow all the alternative land use scenario. Therefore, the identified alternatives are entirely in compliance with applicable legal and regulatory requirements, currently and in the foreseeable future.

1. Indian Forest Act, 1927[87]
2. National Forest Policy, 1988[88]
3. Forest Conservation Act, 1980[89]
4. Forest Right Act, 2006
5. Andhra Pradesh Forest Act, 1967
6. Andhra Pradesh Forest (Amendment) Act, 2016
7. The Tamil Nadu Preservation of Private Forest Act, 1949
8. The Tamil Nadu Forest Act, 1882
9. The Tamil Nadu Hill Areas (Preservation of Trees) Act, 1955
10. Wildlife (Transit) (Tamil Nadu) Rules, 1991
11. Tamil Nadu Forest Policy, 2018
12. Madhya Pradesh State Forest Policy, 2005

All the above laws and regulations are taken into consideration while evaluating the alternatives to the Project Activity and First Project Activity Phase and the above-mentioned alternatives in 1a listed are following the applicable laws and regulations.

Land Use Type 1: Degrading Agriculture Land with Low Productivity in Andhra Pradesh

[87] Rahate and Banait, "The Indian Forest Act, 1927."

[88] https://moef.gov.in/uploads/2019/06/nfp.pdf

[89] https://www.indiacode.nic.in/bitstream/123456789/10815/1/forest_%28conservation%29_act%2C_1980.pdf

Identified Alternative Scenarios	Permitted/Not permitted
Land Use Scenario A: Continuation of the pre-project land use (degrading agriculture land with low productivity)	Permitted
Land Use Scenario B: Plantation activity without being registered as A/R VCS project	Permitted

Land Use Type 2: Degrading Agriculture Land with Low Productivity in Tamil Nadu

Identified Alternative Scenarios	Identified Alternative Scenarios
Land Use Scenario A: Continuation of the pre-project land use (degrading agriculture land with low productivity)	Permitted
Land Use Scenario B: Plantation activity without being registered as A/R VCS project	Permitted

Land Use Type 3: Degrading Agriculture Land with Low Productivity in Madhya Pradesh

Identified Alternative Scenarios	Permitted/Not permitted
Land Use Scenario A: Continuation of the pre-project land use (degrading agriculture land with low productivity)	Permitted
Land Use Scenario B: Plantation activity without being registered as A/R VCS project	Permitted

Output Sub Step-1b: List of Alternatives that are compliant with Law and Regulation

Here is the compilation of plausible alternative land use scenarios to the A/R CDM project activity, ensuring compliance with mandatory legislation and regulations (also mentioned in section 1.15). This assessment considers their enforcement within the region or country, as well as decisions by the Executive Board (EB) regarding national and/or sectoral policies and regulations.

No legal or policy constraints prevent continuation of these land uses; thus, the baseline scenario is realistic.

Land Use Type 1: Degrading Agriculture Land with Low Productivity in Andhra Pradesh

- Land Use Scenario A: Continuation of the pre-project land use (degrading agriculture land with low productivity);
- Land Use Scenario B: Plantation activity without being registered as A/R VCS project

Land Use Type 2: Degrading Agriculture Land with Low Productivity in Tamil Nadu

- Land Use Scenario A: Continuation of the pre-project land use (degrading agriculture land with low productivity);
- Land Use Scenario B: Plantation activity without being registered as A/R VCS project

Land Use Type 3: Degrading Agriculture Land with Low Productivity in Madhya Pradesh

- Land Use Scenario A: Continuation of the pre-project land use (degrading agriculture land with low productivity);
- Land Use Scenario B: Plantation activity without being registered as A/R VCS project

Step 2: Barrier analysis

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

The proposed project activity and First Project Activity Instance faces a number of investment, technological, and social barriers to its implementation described below:

Land Use Type 1: Degrading Agriculture Land with Low Productivity in Andhra Pradesh

The proposed project activity and First Project Activity Instance face investments, technological, and social barriers in Andhra Pradesh to its implementation described below:

For 1st PAI-Barrier analysis matrix is as follow:

Land use scenarios	Investment	Institutional	Technological	Local tradition	Prevailing practice	Ecological conditions	Social conditions
Continuation of the pre-project land use							
Afforestation of the land with in Agroforestry system without being registered as the A/R CDM project activity	X		X				X

1. **Investment Barrier-**

(i) **Absence of Private capital/absence of credit or loan:** The main constraints for farmers are lack of credit facilities, which have a negative impact on agroforestry farming.[90] Plantation projects

[90] Analyses of factors affecting the adoption of major Agro-forestry systems in the high altitude zone of Andhra Pradesh

often face risks like changing weather patterns, and unstable market prices. The absence of financial assistance by the Government-of India is likely to inhibit--execution of any ambitious programme of Fast growing or Quick growing species.[91]

The absence of private capital/absence of credit or loan forces many farmers to rely on informal money lenders, often at high interest rates, which adds to their financial stress. The following data illustrates the average amount (INR) of outstanding loans per agricultural household and the percentage of indebted agricultural households during year 2019 in Andhra Pradesh is as follow:

States	Survey for year 2019[92]	
	Average Amount of Outstanding Loan Per Agricultural Household (INR)	Percentage of Indebted Agriculture Households
Andhra Pradesh	245554	93.2

(ii) **High upfront investment**:

Financial difficulties such as a lack of funding and long investment periods are barriers to the implementation of plantations.[93] Average Monthly Income per Agricultural Household (during 2018-2019 & 2019-2020)[94] for Andhra Pradesh is found as Rs 10480/- making it impossible for the farmers to cover the plantation/ implementation cost. Financial difficulties such as lack of funding and long investment periods are barriers to the implementation of plantations.[95]

2. **Technological barriers**

Lack of necessary material: Selecting appropriate species and ensuring the availability of high-quality saplings requires specialized technical expertise to identify the most suitable options for the project area Access to improved, high-yielding, or climate-resilient varieties can be limited, which poses a challenge for ensuring the long-term sustainability and productivity of the plantations. The probability of tree planting is also associated with random effects that vary from village to village and with the number of plots that the household manages [96]. Quality of planting stock used/procured by farmers is of dubious quality and from largely unknown sources[97]. In reality, Indian farmers encounter a number of challenges, including issues with land tenure and lack of improved planting materials[98]. Inadequate availability of quality

[91] PPTA-IX3-149-152-Need-for-a-Firm-Plantation.pdf
[92] State/UT-wise Details of Average Amount of Outstanding Loan per Agricultural Household and Percentage of Indebted Agricultural Households during 2019 | Open Government Data (OGD) Platform India
[93] Barriers to plantation activities in different agro-ecological zones of Southern India
[94] State/UT-wise Average Monthly Income per Agricultural Household during 2018-19 and 2019-20 | Open Government Data (OGD) Platform India
[95] Barriers to plantation activities in different agro-ecological zones of Southern India | Regional Environmental Change
[96] Incentives for Rural Households to Establish Tree Cover on Agricultura
[97] (PDF) Sandalwood farming in India: problems and prospects
[98] India's approach to agroforestry as an effective strategy in the context of climate change: An evaluation of 28 state climate change action plans - sciencedirect

planting material (QPM) is a major limitation to the expansion of mango area is found as a major production problem[99].

3. Social Barrier

(i) **Demographic Pressure on Land:** Land use change may be examined by considering conversion of forest to crop and rangeland; losses of productive land through various factors; conversion of wetlands to agriculture and urban use: and conversion of other types of land to various human uses[100]. The gross cropped area under all crops is to 67.44 lakh hectares during 2022-23 as against 73.28 lakh hectares in 2021-22, showing a decrease of 7.97 percent. The area under food crops in the State during 2022-23 is 48.46 lakh hectares as against 53.47 lakh hectares in 2021-22 showing a decrease of 9.37 percent[101]. This change in cultivated area indicates a gradual shift in land use patterns, potentially linked with urbanization, declining soil fertility and changing agricultural practices. The table below illustrates the number of Small and Marginal Operational land holdings as of March 31, 2024[102] providing insight into the changes in land ownership and utilization.

States	Total Number of Small and Marginal Operational Holdings Farmers in project states as of 31st March 2024	
	Marginal	Small
Andhra Pradesh	5904039	1646246

(ii) **Lack of skilled labour/or properly trained labour force:** Among the socio-economic constraints in the districts of Andhra Pradesh, scarcity of labor at the time of field operations has been found to be a major challenge experienced by farmers[103]. Lack of knowledge, skills and severe labour scarcity is a challenge faced by farmers in agroforestry adoption[104].

Land Use Type 2: Degrading Agriculture Land with Low Productivity in Tamil Nadu

The proposed project activity and First Project Activity Instance face investments, technological, and social barriers in Tamil Nadu to its implementation described below:

For 1st PAI-Barrier analysis matrix

Land use scenarios	Investment	Institutional	Technological	Local tradition	Prevailing practice	Ecological conditions	Social conditions
Continuation of the pre-project land use							

[99] *AARJ_III_1_2019_2_Chaudhari_pp9-29.pdf
[100] IJRAR22B3772.pdf
[101] SEASONANDCROPREPORT_2022_23.pdf
[102] State/UT-wise Total Number of Small and Marginal Operational Holdings Farmers in the Country as on 31st March 2024 | Open Government Data (OGD) Platform India
[103] 2015_article_623-45.pdf
[104] (PDF) Agroforestry in India: Overcoming Challenges to Build a Greener Tomorrow

Afforestation of the land with in Agroforestry system without being registered as the A/R CDM project activity	X		X				X

1. Investment Barrier-

i) Absence of Private capital/absence of credit or loan: Smallholder farmers in Tamil Nadu face numerous challenges that hinder their agricultural productivity and overall livelihood, despite agriculture being a primary source of income for the majority of the rural population. One of the most critical issues is the lack of access to adequate financial resources for purchasing inputs such as seeds, fertilizers, machinery, and irrigation systems. This lack of financial capital often limits the adoption of modern agricultural practices, resulting in lower crop yields and income levels for farmers[105]. The study revealed that majority of the agriculture credit has no impact on the tertiary needs of the farmers. Long term credit facilities are availed by 3.7 percent of the farmers in the entire group and only 29.3 percent are availing medium term loans. 67 percent of the farmers are still reliant on short term loans use to purchase basic agriculture inputs[106]. The following data illustrates the average amount (INR) of outstanding loans per agricultural household and the percentage of indebted agricultural households during year 2019 in Tamil Nadu is as follows:

States	**Survey for year 2019[107]**	
	Average Amount of Outstanding Loan Per Agricultural Household (INR)	**Percenatge of Indebted Agriculture Households**
Tamil Nadu	106553	65.1

ii) **High upfront investment:** There are different economic factors influencing farmer's adoption of Agro forestry species. The last economic factor influencing farmers' adoption is the agricultural income with 4.56 mean rank. Cost of establishing and managing trees was found to be non-significant in agro-ecological zones of Tamil Nadu[108]. Major constraints faced by the tree-growing farmers are non-availability of tree insurance and investments[109]. Average Monthly Income per Agricultural Household (during 2018-2019 & 2019-2020) for Tamil Nadu is found as followed, making it a challenge for the farmers to meet the plantation cost.

States	**Average Monthly Income per Agricultural Household (during 2018-2019 & 2019-2020)[110]**

[105] IJSDR2501057.pdf
[106] 3.pdf
[107] State/UT-wise Details of Average Amount of Outstanding Loan per Agricultural Household and Percentage of Indebted Agricultural Households during 2019 | Open Government Data (OGD) Platform India
[108] Cover_IJAS_2nd Issue 2022_2
[109] 14IJEAB-107202218-Trees.pdf
[110] State/UT-wise Details of Average Amount of Outstanding Loan per Agricultural Household and Percentage of Indebted Agricultural Households during 2019 | Open Government Data (OGD) Platform India

Tamil Nadu	11924 INR

2. Technological Barrier

Lack of access to planting material: Various factors those have impeded the growth of agroforestry is non availability of quality planting material[111]. Non-availability of quality planting materials or difficulty in accessing them also plays a major role and farmers depend mostly on local nurseries for planting stock, normally poor in quality, which will not give good returns in the future[112]. The adoption rates of agroforestry are still low because there are several challenges that reap the benefits of agroforestry like shortage of superior planting material. Only about 10% of planting material is of high quality, the rest without any guarantee for quality standard[113].

3. Social Barrier

(i) **Demographic Pressure on Land**: In many parts of Tamil Nadu decreasing profitability in agriculture and increasing price of lands for non-agricultural purposes have encouraged farmers to sell lands for non-agricultural, urban uses[114]. Over the past few decades, Tamil Nadu's agricultural sector has grappled with challenges such as erratic rainfall, depleting groundwater levels, soil degradation, and limited access to modern technologies, leading to significant declines in productivity and growth[115]. It was reported by Narmadha N and Karunakaran KR (2022) that land classified as land put to non-agricultural uses and fallow land recorded positive expansion in areas of Tamil Nadu. The area under paddy, bajra, sugarcane, groundnut, and gingelly are growing at a negative rate. It can be stated that net sown area in Tamil Nadu is declining, with shift in food crops being hurt worse than non-food crops[116]. The table below illustrates the number of Small and Marginal Operational land holdings as of March 31, 2024 in the state[117].

States	Total Number of Small and Marginal Operational Holdings Farmers in project states as of 31st March 2024	
	Marginal	Small
Tamil Nadu	6224319	1119229

(i) **Lack of skilled labour/or properly trained labour force:** The major constraints faced by the tree-growing farmers in Tamil Nadu are the non-availability of skilled labour with high wages[118]. Furthermore, adoption of improved agroforestry technologies remains limited due

[111] Agroforestory_Guidelines_new_English.pdf
[112] 14IJEAB-107202218-Trees.pdf
[113] SP-6-6-241.pdf
[114] Balasubramanian, R., & Choi, S. C. (2010). Urbanization, population pressure and agricultural intensification: Evidences from Tamil Nadu in India. Journal of Rural Development/Nongchon-Gyeongje, 33(2), 87-108
[115] Agricultural stagnation and migration in Tamil Nadu: Challenges and policy implications
[116] EAv67n3e.pdf
[117] State/UT-wise Total Number of Small and Marginal Operational Holdings Farmers in the Country as on 31st March 2024 | Open Government Data (OGD) Platform India
[118] 14IJEAB-107202218-Trees.pdf

to inadequate knowledge and skills[119], restricting the expansion and productivity of tree based farming.

Land Use Type 3: Degrading Agriculture Land with Low Productivity in Madhya Pradesh

The proposed project activity and First Project Activity Instance face investments, technological, and social barriers in Madhya Pradesh to its implementation described below:

For 1st PAI-Barrier analysis matrix

Land use scenarios	Investment	Institutional	Technological	Local tradition	Prevailing practice	Ecological conditions	Social conditions
Continuation of the pre-project land use							
Afforestation of the land with in Agroforestry system without being registered as the A/R CDM project activity	X		X				X

1. Investment Barrier-

i) Absence of Private capital/absence of credit or loan: The study by Rathi Meenakshi (2020) reported that the agricultural credit is inadequate especially to small and marginal farmers. Overdue and mis-utilization of credit is a major problem for bankers in rural areas. Majority of the respondents believed that inadequate credit is the main reason for low productivity in some areas[120]. Unlike in agriculture, tree growers are not considered for bank loan, incentives, crop insurance and other benefits[121]. The following data illustrates the average amount (INR) of outstanding loans per agricultural household and the percentage of indebted agricultural households during year 2019 in Madhya Pradesh is as follow:

States	Survey for year 2019[122]	
	Average Amount of Outstanding Loan Per Agricultural Household (INR)	Percenatge of Indebted Agriculture Households
Madhya Pradesh	74420	48.4

ii). High upfront investment: Livelihood of the communities depending more on climate-sensitive sectors like agriculture and forests, have low adaptive capacities because of lack of financial

[119] sangeetha, r., suganthi, n., & karthick, v. Enhancing adoption of agro forestry in the north western agro ecological zone of tamil nadu.
[120] Rathi, M., & Sharma, D. (2020). Fueling Agricultural Growth In Madhya Pradesh Through Formal Credit-A Way Towards Financial Inclusion. Journal of Cryptology.
[121] 40IJEAB-11220215-Role.pdf
[122] State/UT-wise Details of Average Amount of Outstanding Loan per Agricultural Household and Percentage of Indebted Agricultural Households during 2019 | Open Government Data (OGD) Platform India

resources to withstand the adverse impacts of climate change making poor communities more vulnerable to the vagaries of climate change. Many farmers in the region are poor, and since very few are associated with support institutions (government and private), majority of the farmers could not adopt adaptive strategies to climate change such as agroforestry due to paucity of funds and lack of linkages[123]. Average Monthly Income per Agricultural Household (during 2018-2019 & 2019-2020) for Madhya Pradesh is found as followed, making it difficult for the farmers to adopt plantation practices.

States	Average Monthly Income per Agricultural Household (during 2018-2019 & 2019-2020)[124]
Madhya Pradesh	8339

2. Technological Barrier

Lack of access to planting material: Access to improved, high-yielding, or climate-resilient varieties can be limited, which poses a challenge for ensuring the long-term sustainability and productivity of the plantations. The constraints which were most perceived by guava growers were unavailability of quality planting material[125]. Lack of quality planting material has been identified as a strategy affecting the quality guava production affecting the overall crop production[126].

3. Social Barrier

(i) **Demographic Pressure on Land:** The scenario of farming is changing not only at the macro level, but also at the micro level in the villages. The empirical evidence indicates that agriculture in the tribal areas has shifted to a settled agriculture, excepting a few cases. Under settled agriculture, we could see that a majority have adopted both a combination of modern and traditional methods of farming techniques[127]. It was found that in Madhya Pradesh, the area under non agricultural uses and net area sown was found to be increased by 13.90 and 4.27 percent in the current year (2015-16) over the base year (2001-02) with the annual growth rate of 0.21 and 0.45 thousand ha per year and compound growth of 1.01 and 1.00 percent per year respectively[128]. As the population continues to grow, agricultural landholdings are becoming increasingly fragmented, leading to smaller and less viable farms. Today, landless and marginal farmers make up over 80% of rural households in India, and agriculture alone is no longer sufficient to sustain their livelihoods.

The table below illustrates the number of Small and Marginal Operational land holdings as of March 31, 2024.

123 *SLACC_manual-libre.pdf
124 State/UT-wise Average Monthly Income per Agricultural Household during 2018-19 and 2019-20 | Open Government Data (OGD) Platform India
125 Singh, V. K., & Tyagi, P. K. (2017). Constraints faced by farmers in adoption of guava production technology in Tikamgarh District of Madhya Pradesh. Indian Journal of Extension Education, 53(1), 128-130.
126 Singh, G. (2007). RECENT DEVELOPMENT IN PRODUCTION OF GUAVA. Acta Hortic. 735, 161-176
127 Working Paper 142 Suresh Reddy May. 2018.p65
128 3481-Article Text-6512-1-10-20220914.pdf

States	Total Number of Small and Marginal Operational Holdings Farmers in project states as of 31st March 2024[129]	
	Marginal	Small
Madhya Pradesh	4834531	2724684

(ii) **Lack of skilled labour/or properly trained labour force:** Agroforestry systems vary in their structural complexity and species diversity, productive, protective attributes and socio-economic dimensions. Integrated farming practices are more substantial, efficient and feasible for small and marginal farmers in Madhya Pradesh. Usually, lack of scientific knowledge, trained labour, institutional approach and negative attributes of tree components compels farmers to avoid adopting tree components in their fields[130].

Outcome of Step 2a: List of barriers that may prevent one or more land use scenarios identified in Step 1b

Land Use Type 1: Degrading Agriculture Land with Low Productivity in Andhra Pradesh

- Investment Barriers
- Technological Barriers
- Barriers due to social conditions

Land Use Type 2: Degrading Agriculture Land with Low Productivity in Tamil Nadu

- Investment Barriers
- Technological Barriers
- Barriers due to social conditions

Land Use Type 3: Degrading Agriculture Land with Low Productivity in Madhya Pradesh

- Investment Barriers
- Technological Barriers
- Barriers due to social conditions

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

The following table shows the summary of barriers hindering land-use option scenarios

Alternative Land Use Scenario	Barriers Limiting the Scenario
Land Use Scenario A - Continuation of the pre-project land use (degrading agriculture land with low productivity)	Not prevented by any barrier

[129] State/UT-wise Total Number of Small and Marginal Operational Holdings Farmers in the Country as on 31st March 2024 | Open Government Data (OGD) Platform India

[130] (PDF) Trends and Insights of Agroforestry Practices in Madhya Pradesh, India

Land Use Scenario B- Afforestation of the land with in Agroforestry system without being registered as the A/R CDM project activity for Andhra Pradesh, Tamil Nadu and Madhya Pradesh	❖ **Investment Barrier** ✓ Access to credit is difficult and level of indebtedness ✓ High upfront investment ❖ **Technological Barrier** ✓ Lack of access to necessary materials, for example planting materials ❖ **Social condition** ✓ Demographic pressure on the land ✓ Lack of skilled labour/or properly trained labour force

Outcome of Sub-step 2b: Land use scenario A – Continuation of Pre-Project Land Use, the only alternative scenario is not prevented by any barrier. The continuation of the Pre-Project Land Use does not require any investment or expenses to maintain the current situation. In accordance with the applied tool this alternative scenario is identified as the baseline scenario.

Sub-step 2c. Determination of baseline scenario

This sub step consists of applying the decision tree from the tool. As demonstrated above, plantation without being registered as an A/R VCS project activity is not included in the list of land use scenarios that are not prevented by any barrier and the list contains only one alternative land use scenario. As such step 3 of Investment Analysis is not needed. Therefore, according to the decision tree of sub step 2c of the combined tool, it is concluded that Land Use Scenario A, Continuation of pre project land use, is the baseline scenario and Step 4: "Common practice test" is the next step in the analysis.

STEP 3. Investment analysis

Not needed.

STEP 4. Common practice analysis

The proposed project PAI 1 which is located in the states of Andhra Pradesh, Tamil Nadu and Madhya Pradesh in India. The selected lands for the project are degrading agriculture land with low productivity and undergoing further deterioration.
This section evaluates the prevalence of similar plantation activities in the geographical area of the project and identifies barriers to their replication. This section incorporates statistical data

from the Forest Survey of India (FSI), and relevant agroforestry schemes in relation to respective states.

A). Andhra Pradesh

The following table summarizes the forest and tree cover statistics in Andhra Pradesh as reported by the Forest Survey of India (FSI) – 2021[131],[132]:

State	Geographical Area (sq. km)	Forest Cover (sq. km)	Tree Cover (sq. km)	Forest Cover (%)	Tree Cover (%)	Change in Forest Cover (2019-2021) (sq. km)
Andhra Pradesh	162,968	29,784	4,679	18.28	2.87	+ 647

The project area includes several tree planting initiatives[133] which are listed below.

- Mahatma Gandhi National Rural Employment Guarantee Scheme[134]
- National Afforestation Programme (NAP)
- Sub-Mission on Agroforestry (SMAF) Under National Mission for Sustainable Agriculture (NMSA)

Major planation scheme highlighted that most of the farmers were unaware that they are actually practicing Agroforestry system, this scenario happens because most of the communities in the rural areas were having unfavorable attitudes, less knowledge, and financial issues towards the agroforestry practice. The main constraints for farmers are lack of financial facilities, extension services, and the failure to adapt to new technology, all of which have a negative impact on agroforestry farming[135]. Among the listed schemes, MGNREGS while providing rural employment has been observed to accentuates the agrarian crisis by creating skilled labour shortage on one hand and hiking agricultural wages on the other, thereby discouraging the adoption of labour intensive agroforestry practices. Several studies confirmed that agricultural wages have gone up after the implementation of MGNREGS[136]. In contrast, the Sub Mission on Agroforestry (SMAF) under NMSA aims to promote agroforestry through financial assistance, however, the funding pattern supports farmers with financial assistance to the extent of 50% of the actual cost of the interventions, which makes farmers reluctant to utilize/adopt this scheme for agroforestry initiatives[137].

Thus, despite multiple schemes targeting afforestation and agroforestry, the combined challenges of labour scarcity, insufficient financial incentives and limited knowledge continue to hinder the widespread adoption of agroforestry systems in the project area.

[131] https://fsi.nic.in/isfr-2021/chapter-2.pdf
[132] https://fsi.nic.in/isfr-2021/chapter-6.pdf
[133] https://rsdebate.nic.in/bitstream/123456789/718909/1/PQ_254_22072021_U432_p327_p336.pdf
[134] https://nrega.dord.gov.in/MGNREGA_new/Nrega_home.aspx
[135] Analyses of factors affecting the adoption of major Agro-forestry systems in the high altitude zone of Andhra Pradesh
[136] MGNREGS-Impact-on-Agriculture-A-Study-of-Undivided-Andhra-Pradesh.pdf
[137] Sub-Mission on Agroforestry (SMAF) | Agriculture

B. Tamil Nadu

The following table summarizes the forest and tree cover statistics in Tamil Nadu as reported by the Forest Survey of India (FSI) – 2021[138],[139]:

State	Geographical Area (sq. km)	Forest Cover (sq. km)	Tree Cover (sq. km)	Forest Cover (%)	Tree Cover (%)	Change in Forest Cover (2019-2021) (sq. km)
Tamil Nadu	130,060	26,419	4,424	20.31	3.40	+ 55

The project area includes several tree planting initiatives[140],[141],[142]which are listed below.

- Massive Tree Planting Programme
- National Afforestation Programme (NAP)
- Green India Mission (GIM)
- Tank Foreshore Plantations
- Tamil Nadu Afforestation Project (Phase I)
- Tree Cultivation in Private Lands (TCPL)

Massive tree planting programme involves indigenous species plantation with monitoring and evaluation. However, it has been found that the programme lack management practices resulted in high mortality rate. Stunted growth are observed in areas having saline soils affecting the growth of the plant[143]. Tamil Nadu Afforestation Project contributing to environmental and livelihood improvements for local communities with participatory afforestation. However, it was found that a major in its success was the temporary financial support provided during the early years, when the yields of plantation were low and funds for livelihood improvement activities were in short supply[144].

Under Green India Mission, plantation drives have aimed restoration of degraded land and promote forest cover. However, challenges remain in balancing development needs with conservation objectives. Despite conservation efforts, habitat fragmentation pose ongoing threats to biodiversity[145].

C. Madhya Pradesh

The following table summarizes the forest and tree cover statistics in Madhya Pradesh as reported by the Forest Survey of India (FSI) – 2021[146],[147]:

[138] https://fsi.nic.in/isfr-2021/chapter-2.pdf
[139] https://fsi.nic.in/isfr-2021/chapter-6.pdf
[140] State Schemes | Tamil Nadu Forest Department
[141] Shared Schemes | Tamil Nadu Forest Department
[142] Part Ii Schemes | Tamil Nadu Forest Department
[143] Evaluation of Massive Tree Planting Programme in Cuddalore District using Forest Survey of India method assessing trees outside Forest – TNSLURB
[144] Annual Evaluation Report 2008
[145] Varghese, C., Ramaswamy, S., Kaveri, V., Mohan, S., Arun, S., & Amutha, S. (2025). Evaluating SDG's Progress in India and Tamil Nadu (2015-2024): A Decade of Achievements and Challenges. IJNRD2502288.pdf
[146] https://fsi.nic.in/isfr-2021/chapter-2.pdf
[147] https://fsi.nic.in/isfr-2021/chapter-6.pdf

State	Geographical Area (sq. km)	Forest Cover (sq. km)	Tree Cover (sq. km)	Forest Cover (%)	Tree Cover (%)	Change in Forest Cover (2019-2021) (sq. km)
Madhya Pradesh	308,252	77,493	8,054	25.14	2.61	+ 11

The project area includes several tree planting initiatives[148][149][150] which are listed below:

- Bundelkhand Plantation Scheme
- Lok Vaniki
- Social Forestry
- Green India Mission
- CAMPA project
- MGNREGS

Most existing government schemes fall under social forestry, designed to meet the basic needs of rural communities such as fuelwood, fodder, and minor forest products. These include plantations on private lands, community-owned lands, and government-designated non-forest areas. While valuable, such schemes tend to prioritize short-term community needs over integrated, long-term sustainable land management. Also, farmers with major land holdings will get more benefit by the agroforestry related schemes than the small and marginal farmers[151]. The Compensatory Afforestation Fund Management and Planning Authority (CAMPA) funds, designed to offset deforestation and enhance green cover in different states of India. It is highlighted that issues in fund allocation and usage has been found raising the concern over the effectiveness of CAMPA in Madhya Pradesh. The activities were found outside the CAMPA's scope, moreover funds were also used against CAMPA's regulation[152]. For Compensatory Afforestation, difficulties were observed during the intervening period in the implementation of CA scheme primarily include delayed fund flow[153].

Large-scale agroforestry projects with mango, guava, and red sander face several barriers. Financially, above mentioned government schemes offer limited support, covering only part of the costs for planting and initial care, while the high upfront costs discourage small farmers. Technically, there is limited expertise in integrating fruit-bearing and high-value species, and farmers lack proper training on soil preparation, irrigation, and pest control. Policy barriers include fragmented regulations across departments and inadequate support for linking tree plantations with carbon credit mechanisms. Additionally, there is a lack of large-scale collaboration between government and private sectors to promote agroforestry for carbon sequestration. These factors hinder the growth of such projects. Government-led programs and

[148] GIM_Progress_Report_19-20.pdf
[149] forestfieldconsultant290523051820.pdf
[150] MADHYA PRADESH STATE FOREST POLICY — 2004
[151] (PDF) Agroforestry systems: Opportunities and challenges in India
[152] https://climatefactchecks.org/campa-funds-misuse-in-india-a-repeated-pattern-of-diversion-and-ineffectiveness/
[153] 354734717$Guidelines on Accredited Compensatory Afforestation.pdf

schemes are hindered by funding shortages, delays in implementation, lack of systematic monitoring and limited budgetary support for long-term maintenance often results in high tree mortality rates[154].

Despite the various schemes, programs, and policies listed above that reflect government efforts towards afforestation and forest conservation, there is no substantial evidence of these initiatives of their effective or widespread implementation within the project areas. Farmers across the state of Andhra Pradesh, Tamil Nadu and Madhya Pradesh face several significant barriers in accessing the benefits of afforestation and social forestry schemes. One of the most critical issues is the lack of awareness and technical education, which severely limits farmer participation. Even in areas where such schemes are publicized, the availability of quality planting materials[155],[156] timely technical training, and institutional support[157],[158] is often insufficient This creates a major implementation gap. Moreover, the financial incentives[159] provided under afforestation schemes are minimal and often do not adequately compensate for the opportunity cost or labour required. These limitations contribute to the limited spread and low adoption rates of social forestry initiatives in these states.

Considering these gaps in government schemes and afforestation plans, there is a critical need for diverse and locally afforestation and restoration initiatives across Andhra Pradesh, Tamil Nadu and Madhya Pradesh to increase productivity of degrading agriculture lands. The existing constraints of agroforestry adoption in India are not sufficiently addressed, and the strategies proposed lack the necessary precision to enable effective implementation on the ground[160]. In addition to this, the referenced programs largely fall under social forestry initiatives, which aims to meet basic human needs such as fuelwood, fodder by promoting tree cultivation on private large land holdings and government designated non-forest lands.

However, the current VCS AFOLU project activity addresses critical gaps in existing afforestation efforts by promoting economically viable and environmentally sustainable agroforestry. Unlike traditional social forestry schemes, this model emphasizes long-term sustainable land use, climate change mitigation, and economic diversification for smallholder farmers. The project offers comprehensive support including farmer engagement, access to planting materials, technical training, field-level implementation, and ongoing monitoring, which effectively addresses constraints such as limited awareness, inadequate resources, and poor technical support often found in government-led initiatives. However, the financial feasibility and long-term sustainability of such an approach are heavily dependent on carbon investment mechanisms. Without carbon credit revenue, the high upfront costs, and lack of immediate income would make

[154]Evaluating the Effectiveness of Tree Planting Schemes in India
[155] qpm - icar-cafri
[156] agroforestry policy with way forward.cdr
[157] w:\ramakrishna\mjas 2nd issue 1
[158] pdf) agroforestry and carbon sequestration
[159] (pdf) policy and financial support for agroforestry development: incentives, programs, and market opportunities
[160] india's approach to agroforestry as an effective strategy in the context of climate change: an evaluation of 28 state climate change action plans

these agroforestry interventions unviable. This model deviates significantly from the dominant agricultural practices to an agroforestry model in these states and requires critical external financial support. This supports global climate change mitigation efforts while providing farmers with diversified income opportunities. Its reliance on the critical finance to ensure its success and longevity makes it additional under the VCS methodology.

Nonetheless, without the financial backing from carbon credits, such projects plantation on degrading agricultural lands with low productivity without intervention by Mangrove Foundation of India, Greenmile Agroforestry Private Limited and Outreach Projects Pvt. Ltd. would be rare and unsustainable. Therefore, project activity cannot be considered a common practice, as it relies heavily on these critical financial supports to ensure its success and longevity.

Outcome of Step 4

The proposed VCS project activity is not a common practice hence project is additional

3.6 Methodology Deviations

There is no deviation to Applied AR-ACM0003 Methodology.

4 IMPLEMENTATION STATUS

4.1 Implementation Status of the Project Activity

The total coverage of the Mango, Guava and Red Sander Plantation India Project Activity is 4,000 hectares, comprising multiple small, scattered land parcels across Chittoor and Prakasam district of Andhra Pradesh, Tiruvallur district of Tamil Nadu and Dhar and Ratlam district of Madhya Pradesh respectively.

This is a new plantation project, and there are no previously implemented activities that will continue during the current monitoring period (1-March-2018 to 30-September-2024). The first instance of the Project Activity involves plantations on 894.06 hectares of multiple small, scattered land parcels in Chittoor and Prakasam district of Andhra Pradesh and Tiruvallur district of Tamil Nadu and Dhar and Ratlam district of Madhya Pradesh, involving 2052 farmers. These plantations were carried out between 2018 and 2023. Currently PP has collected data till 2023 and monitoring period is considered till 30-September-2024. Project is being implemented after 2023 also. Further implemented project activity will be considered in the next instances.

During the current monitoring period, no events have occurred that have impacted the intended GHG removals.

Photo: Photos of Project Implementation

5 QUANTIFICATION OF ESTIMATED GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The baseline net GHG removals by sinks shall be calculated according to the A/R Large-scale Consolidated Methodology - Afforestation and reforestation of lands except wetlands version 2.0, (sectorial scope 14) as follows -

The baseline net GHG removals by sinks shall be calculated as follows (equation 1 of AR-ACM0003 methodology):

$C_{BSL,t} = C_{TREE\_BSL,t} + C_{SHRUB\_BSL,t} + C_{DW\_BSL,t} + C_{LI\_BSL,t}$

Where:

$C_{BSL,t}$ = Baseline net GHG removals by sinks in year t; t CO_{2-e}

$C_{TREE\_BSL,t}$ = Change in carbon stock in baseline tree biomass within the project boundary in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO_{2-e}

$C_{SHRUB\_BSL,t}$ = Change in carbon stock in baseline shrub biomass within the project boundary, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO_{2-e}

$C_{DW\_BSL,t}$= Change in carbon stock in baseline dead wood biomass within the project boundary, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO_{2-e}

$C_{LI\_BSL,t}$ = Change in carbon stock in baseline litter biomass within the project boundary, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO_{2-e}

The baseline emissions estimation is carried out using the A/R Methodological AR-TOOL 14 "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities Version 04.2"

According to the AR-TOOL 14, carbon stock in trees in the baseline can be accounted as zero if all of the following conditions are met:

1) The Baseline trees are neither harvested, nor cleared, nor removed throughout the crediting period of the Project activity.

   During the commencement of the Project Activity on the various small land parcels, and the land is solely used for the agricultural practices. Based on the PRA and satellite imaginary there is no evidence of shrub or trees in the bunds/boundary. These areas were traditionally used for cultivating annual crops. This practice has been a longstanding part of traditional farming. Consequently, there were no trees and shrub in the Project Area prior to the project's start date.

2) The Baseline trees do not suffer mortality because of competition from trees planted in the project, or damage because of implementation of the Project activity, at any time during the crediting period of the project activity.

As previously stated, there were no trees in the Project Area prior to the start of the project

3) The Baseline trees are not inventoried along with the project trees in monitoring of carbon stocks but their continued existence, consistent with the baseline scenario, is monitored throughout the crediting period of the Project activity.

As indicated above there are no pre-project trees in the Project Area.

4) $\Delta C_{SHRUB\_BSL,t}$ conservatively is assumed to be zero in the baseline scenario, due to the fact that changes in carbon stock of above and below ground biomass of non-tree vegetation of the degraded land in baseline scenario is not possible.

5) $\Delta C_{DW\_BSL,t}$ and $\Delta C_{LI\_BSL,t}$ are assumed to be zero because the baseline scenario was degraded land, in which farmers were totally focused on agriculture crop cultivation and the trees are not part of their traditional farming practice. Additionally, farmers were performing land management practices for their long-term cultivation in the baseline scenario which includes continues removal/clearing of the crop residues and other biomass which did not allow accumulation of dead wood and litter. Hence, the change in dead wood biomass $\Delta C_{DW\_BSL,t}$ and change in litter biomass $\Delta C_{LI\_BSL,t}$ are considered as zero. The default factor-based method has been applied for both the pool (deadwood and litter) for the baseline scenario that is conservatively estimated to be 1% of the tree biomass as per table 5 and 6 of the AR-CDM tool 12 v3.1 respectively. As stated above $\Delta C_{TREE\_BSL,t}$ conservatively assumed to be zero in the baseline scenario, hence the change in dead wood biomass $\Delta C_{DW\_BSL,t}$ and change in litter biomass $\Delta C_{LI\_BSL,t}$ in baseline are also assumed to be zero.

That is why the estimated baseline emissions or removals are considered insignificant and hence accounted as zero

$$\Delta C_{TREE\_BSL,t} = 0$$

5.2 Project Emissions

The actual net GHG removals by sinks are estimated using the equation 2 of the methodology AR ACM0003 (Version 02.0).

$$\Delta C_{ACTUAL,t} = \Delta C_{P,t} - GHG_{E,t} \quad \text{Equation (2)}$$

Where:

$\Delta C_{ACTUAL,t}$ = Annual actual net GHG removals by sinks at time t; t CO_{2-e} yr-1

$\Delta C_{P,t}$ = Change in carbon stocks in project, occurring in the selected carbon pools, at time t; t CO_{2-e} yr-1

$GHG_{E,t}$ = Increase of non-CO2 GHG emissions within the project boundary as a result of the implementation of the A/R project activity, in year t; t CO_{2-e}

As Change in the carbon stocks in project, occurring in the selected carbon pools in year t shall be calculated as follows:

$$\Delta C_{P,t} = \Delta C_{TREE\_PROJ,t} + \Delta C_{SHRUB\_PROJ,t} + \Delta C_{DW\_PROJ,t} + \Delta C_{LI\_PROJ,t} + \Delta C_{SOC\_AL,t}$$

Where:

$\Delta C_{P,t}$ = Change in the carbon stocks in project, occurring in the selected carbon pools, in year t; t CO_{2-e}

$\Delta C_{TREE\_PROJ,t}$ = Change in carbon stock in tree biomass in project in year t, as estimated in the tool " Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO_{2-e}

$\Delta C_{SHRUB\_PROJ,t}$ = Change in carbon stock in shrub biomass in project in year t, as estimated in the tool " Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO_{2-e}

$\Delta C_{DW\_PROJ,t}$ = Change in carbon stock in dead wood in project in year t, as estimated in the tool " Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO_{2-e}

$\Delta C_{LI\_PROJ,t}$ = Change in carbon stock in litter in project in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO_{2-e}

$\Delta C_{SOC\_AL,t}$ = Change in carbon stock in SOC in project, in year t, in areas of land meeting the applicability conditions of the tool "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities", as estimated in the same tool; t CO_{2e}

Estimation in the changes of carbon stock in tree biomass:

The change in carbons stock in tree biomass was estimated as per the requirements in the methodological tool AR-TOOL 14, "Estimation of carbon stocks and change in carbon stocks of

trees and shrubs in A/R CDM project activities", Version 4.2. According to section 8.2 of this tool, this method is used for ex-ante estimation of the carbon stock in tree biomass. Under this method existing data is used in combination with tree growth models to predict the growth and development of trees over time.

Under the method applied (Difference of two independent stock estimations), the change in carbon stock in trees is estimated as the difference between two successive and independent carbon stock estimations.

The change in carbon stock in trees is estimated as follows:

$$\Delta C_{TREE} = C_{TREE,t2} - C_{TREE,t1}$$

Where,

ΔC_{TREE} = Change in carbon stock in trees during the period between two points of time t1 and t2; t CO_{2e}

$C_{TREE,t1}$ = Carbon stock in trees as estimated at time t1; t CO_{2e}

$C_{TREE,t2}$ = Carbon stock in trees as estimated at time t2; t CO_{2e}

The carbon stock estimation uses the following equation:

$C_{TREE} = 44/12 * CF_{TREE} \times B_{TREE}$

Where;

C_{TREE}= Carbon stock in trees in the tree biomass estimation strata; t CO2e

CF_{TREE} = Carbon fraction of tree biomass; t C (t d.m.)$_{-1}$. A default value of 0.47 t C (t.d.m.)$_{-1}$ is used.

B_{TREE} = Tree biomass in the tree biomass estimation strata; t d.m

For estimation of Tree biomass, the following equation is used:

B_{TREE}= AGB (Above Ground Biomass) + BGB (Below Ground Biomass). For BGB Root Shoot Ratio (0.25) default value is used.

For Calculating AGB of the tree following equation where is used-

Mango above ground biomass (Y)[161] = 0.20*(Collar diameter)$^{1.85}$

Guava above ground biomass (Y)[162] = (3.264X$^{1.012}$)+3.446

[161] Biomass, carbon stocks estimation and predictive modeling in mango based land uses on degraded lands in Indian Sub-Himalayas

[162] Microsoft Word - May25O

Red sander volume equation (V)[163] = √v=-0.144504+2.943115*D

Where: X & CD = Collar Diameter

D= Diameter at Breast Height (1.37 m) (meter)

Estimation in the changes in carbon stock in dead wood:

Deadwood is expected to remain in the project area and will not be removed. Conservatively, it is anticipated that the carbon stock in this pool will increase over the project duration. As per equation 9, para 34 of the AR-CDM Tool 12 v03.1, For all strata to which the default-factor based method is applied, the carbon stock in dead wood is estimated as:

$$C_{DW,i,t}=C_{TREE,i,i}\times DF_{DW}$$

Where:

$C_{DW,i,t}$ = Carbon stock in dead wood in stratum i at a given point of time in year t; t CO2e

$C_{TREE,i,t}$ = Carbon stock in trees biomass in stratum i at a point of time in year t, as calculated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO2e

DF_{DW} = Conservative default factor expressing carbon stock in dead wood as a percentage of carbon stock in tree biomass; per cent

The increase in carbon stock in deadwood is linked to the tree biomass, as outlined in Table 5 of the AR-CDM Tool 12. According to the data provided in Table 5 of the tool, the deadwood pool is conservatively estimated to be 1% of the tree biomass[164].

Estimation in the changes in carbon stock in litter:

Litter is expected to remain in the project area and will not be removed. Conservatively, the carbon stock contained in this pool is expected to increase in the project duration. For all strata to which the default-factor based method is applied, the carbon stock in dead wood is estimated as:

$$C_{LI,i,t}=C_{TREE,i,i}\times DF_{LI}$$

Where:

$C_{LI,i,t}$ = Carbon stock in litter in stratum i at a given point of time in year t; t CO_{2e}

$C_{TREE,i,t}$ = Carbon stock in trees biomass in stratum i at a point of time in year t, as calculated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO2e

[163] forests.ap.gov.in/PDF/publications/forest_inventory_report.pdf
[164] cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-12-v3.1.pdf

DF_{LI} = Conservative default factor expressing carbon stock in litter as a percentage of carbon stock in tree biomass; per cent

Carbon stock increase in litter is associated with the tree biomass as per the Table 6 of AR-CDM tool 12. According to the data/parameter table no. 6 given in tool, litter pool is conservatively considered 1 % of the tree biomass. To calculate the carbon in the litter pool, the carbon fraction of 0.37, as specified in CDM Tool 12, is used[165].

Estimation in the changes in carbon stock in soil organic carbon:

Soil organic carbon (SOC) stock estimations are conducted in accordance with the "Tool for the Change in Soil Organic Carbon Stocks Due to the Implementation of A/R CDM Project Activity." According to the tool's recommendations, it is assumed that the project activity will raise the SOC content of the lands from pre-project levels to those equivalents to the steady-state SOC content under native vegetation. This increase in SOC content is projected to occur at a constant rate over a 20-year period from the year of planting, The project meets the applicability conditions of this tool since:

- The areas of land to where the tool is applied do not fall into wetland category and are not subject to any of the land management practices and application of tool;
- Additionally, in this section details the type of land or category that the project plantations fall, with this it's also demonstrated that the project plantations don't fall in wetland category.
- Litter remains on site and is not removed and soil disturbance is in accordance to appropriate conservation practices, limited to site preparation and not repeated within 20 years.

SOC at the beginning of the project ($SOC_{INITIAL,i}$) is estimated by multiplying the factors in Table by the reference SOC. As per the tool, a loss in SOC ($SOC_{LOSS,i}$) is applied in the case that soil disturbance occurs on more than 10 per cent of the land area, for the case of the project activity this is not the case, therefore $SOC_{LOSS,i}$ is zero. The following methodological formula is used for calculating the annual change in SOC stock.

$$dSOC_{(i,t)} = SOC_{REF,I} - (SOC_{INITIAL,I} - SOC_{LOSS.i}/(20\ years)$$

Where:

$dSOC_{i,t}$ = The rate of change in SOC stock in stratum i of the area of land, in year t; tC/ha/year

$SOC_{REF,I}$= Reference SOC stock corresponding to the reference condition in native lands by climate region and soil types applicable to stratum i of the area of land; tC/ha

[165] cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-12-v3.1.pdf

$SOC_{INITIAL,i}$= SOC stock at the beginning of the A/R project activity in stratum i of the areas of land

$SOC_{LOSS,i}$ = Loss of SOC caused by soil disturbance attributable the A/R project activity, in stratum i of the areas of land; tC/ha

The values of $SOC_{REF,i}$,$f_{LU,i}$, $f_{MG,I}$ and $f_{In,I}$ are taken form the table 3 to 6 of Tool 16 (Tool for the Change in Soil Organic Carbon Stocks Due to the Implementation of A/R CDM Project Activity).

Parameter	Symbol	Andhra Pradesh and Tamil Nadu		Madhya Pradesh	
		Value	Source (SOC estimation tool, V01.1.0)	Value	Source (SOC estimation tool, V01.1.0)
Reference SOC (tC/ha)	$SOC_{REF,i}$	65	Table 3: HAC soils, Tropical Moist	47	Table 3: LAC soils, Tropical dry.
Land use factor	$f_{LU,i}$	0.48	1. Long term Cultivated, Table 4	0.48	1. Long term Cultivated, Table 4
Management factor	$f_{MG,i}$	1.00	1. Full tillage, Table 4	1.00	1. Full tillage, Table 4
Input factor	$f_{IN,i}$	1.00	2. Medium, Table 5	1.00	2. Medium, Table 5

Initial SOC stock at the start of the project is estimated as follows:

$$SOC_{INITIAL,i} = SOC_{REF,i} * f_{LU,i} * f_{MG,i} * f_{IN,i}$$

Where:

$SOC_{INITIAL,i}$ = SOC stock at the beginning of the A/R project activity in stratum i of the areas of land

$SOC_{REF,i}$ = Reference SOC stock corresponding to the reference condition in native lands (i.e. non-degraded, unimproved lands under native vegetation – normally forest) by climate region and soil type applicable to stratum i of the areas of land;t C ha-1

$f_{LU,i}$ = Relative stock change factor for baseline land-use in stratum i of the areas of land; dimensionless

$f_{MG,i}$ = Relative stock change factor for baseline management regime in stratum i of the areas of land; dimensionless

$f_{IN,I}$ = Relative stock change factor for baseline input regime (e.g. crop residue returns, manure) in stratum i of the areas of land; dimensionless

i= 1, 2, 3, … strata of areas of land; dimensionless

As per the tool 16, $dSOC_{i,t}$ is not considered more than 0.8 t C/ha/year. The result of $dSOC_{i,t}$ is 0.8 t C/ha/year, therefore this is the value of the increase of the soil organic carbon.

Estimation of GHG emissions within the project boundary

Following the methodology and the "tool for non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity (v04.0.0)" under GHGE,t only the non-CO2 gases N2O and NH4 need to be quantified.

$$GHG_{E,t} = GHG_{SPF,t} + GHG_{FMF,t} + GHG_{FF,t}$$

$GHG_{E,t}$= Emission of non-CO2 GHGs resulting from burning of biomass and forest fires within the project boundary in year t; t CO_{2-e}

$GHG_{SPF,t}$= Emission of non-CO2 GHGs resulting from use of fire in site preparation in year t; t CO_{2-e}

$GHG_{FMF,t}$= Emission of non-CO2 GHGs resulting from use of fire to clear the land of harvest residue prior to replanting of the land or other forest management, in year t; t CO_{2-e}

$GHG_{FF,t}$= Emission of non-CO2 GHGs resulting from fire in year t; t CO_{2-e}

t= 1,2,3.... years counted from the start of the A/R CDM project activity

In the Project Activity and First Project Activity Instance:

I. There is no using fire for site preparation

II. There is no use of fire to clear the land of harvest residue prior to replanting of the land

III. There is no fire event during the current monitoring period.

Therefore, GHGE,t is zero.

5.3 Leakage Emissions

According to the baseline Study, prior to the project implementation, the project area is degraded land with subsistence agriculture, there are no grazing activities, so leakage emission attributable to the displacement of grazing activities is accounted as zero. As per Tool 15, leakage is estimated as follows:

$$\boldsymbol{LK_t = LK_{AGRIC,t}}$$

Where:

LK_t = GHG emissions due to leakage, in year t; tCO2-e

$LK_{AGRIC,}$ = Leakage due to the displacement of agricultural activities in year t, as estimated in the tool "Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity"; tCO_{2-e}

The calculations for leakage are determined through Tool AR0015: Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity, leakage emission resulting from displacement of the activities is composed of decrease in carbon stock in the carbon pools of the land and change in soil organic carbon stock due to land-use change in the land.

$LK_{AGRIC,t} = (44/12) \times (\Delta C_{BIOMASS,t} + \Delta SOC_{LUC,t})$

$\Delta C_{BIOMASS,t} = [1.1 \times b_{TREE} \times (1+R_{TREE}) + b_{SHRUB} \times (1+ RS)] \times CF \times A_{DISP,t}$

$\Delta SOC_{LUC,t} = SOC_{REF} \times (f_{LUP} \times f_{MGP} \times f_{INP} - f_{LUD} \times f_{MGD} \times f_{IND}) \times A_{DISP,t}$

Where:

$LK_{AGRIC,t}$ = Leakage emission resulting from displacement of agricultural activities in year t; t CO2e
$\Delta C_{BIOMASS,t}$ = Decrease in carbon stock in the carbon pools of the land receiving the activity displaced in year t; t d.m.

CF = Carbon fraction of woody biomass; dimensionless.

$A_{DISP,t}$ = Area of land from which agricultural activity is being displaced in year t; ha^{-1}.

b_{TREE} = Mean above-ground tree biomass in land receiving the displaced activity; t d.m. ha^{-1}.

R_{TREE} = Root-shoot ratio for trees in the land receiving the displaced activity; dimensionless.

b_{SHRUB}= Mean above-ground shrub biomass in land receiving the displaced activity; t d.m. ha^{-1}.
RS = Root-shoot ratio for shrubs in the land receiving the displaced activity; dimensionless.
$\Delta SOC_{LUC,t}$= Change in soil organic carbon (SOC) stock due to land-use change in the land receiving the displaced activity in year t; tC ha^{-1}.

SOC_{REF}= SOC stock corresponding to the reference condition in native lands by climate region and soil type applicable to the land receiving the displaced activity; t C ha^{-1}.

f_{LUP},f_{MGP}, f_{INP}= Relative SOC stock change factors for land-use, management practices, and inputs respectively, applicable to the receiving land before the displaced activity is received; dimensionless.

f_{LUD}, f_{MGD}, f_{IND} = Relative SOC stock change factors for land-use, management practices, and inputs respectively, applicable to the receiving land after the displaced activity has been received; dimensionless. t = 1, 2, 3 …years elapsed since the start of the A/R CDM project activity.

Land receiving the displaced activity is unidentified, such receiving land being forest land is ruled out because of national regulations. Hence, PP has considered the area receiving the displaced agriculture activities as the shrub land. Since there were no trees in the pre-project scenario, the only insignificant displacement of agriculture activities has been considered as traditional seasonal agriculture practices of crops which are considered in the category of Shrubs.

As per A/R CDM tool 14, Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities,

$b_{SHRUB,i} = BDR_{SF} \times b_{FOREST} \times CC_{SHRUB,i}$

BDR_{SF} = Ratio of shrub biomass per hectare in land having a shrub crown cover of 1.0 (i.e. 100 per cent) and the default above-ground biomass content per hectare in forest in the region/country where the A/R CDM project activity is located, default value of 0.10 is considered

b_{FOREST}= Default above-ground biomass content in forest in the region/country where the A/R CDM project activity is located; t d.m. ha^{-1}, default value of 73 is considered for Forest in India as per table 3A.1.4 of IPCC GPG-LULUCF 2003

$CC_{SHRUB,i}$= Crown cover of shrubs in shrub biomass estimation stratum i at the time of estimation, expressed as a fraction, default value of 0.5 is considered as per the CDM AR- Tool 14 Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities, version 04.2, para 64, table 2

Rs=Root-shoot ratio for shrubs, default value of 0.40 is considered

Cf=0.47, Carbon Fraction

$A_{DISP,\,t}$ = Area of land from which agricultural activity is being displaced in year t; ha

5.4 Estimated GHG Emission Reductions and Carbon Dioxide Removals

The net anthropogenic GHG removals by sinks are calculated as follows, according to the "A/R Large-scale Consolidated Methodology - Afforestation and reforestation of lands except wetlands version 2.0, sectorial scope 14" (equation 5 of AR-ACM0003 methodology):

$$\Delta C_{AR\text{-}CDM\,,t} = \Delta C_{ACTUAL,t} - \Delta C_{BSL,t} - L_{Kt}$$

Where:

$C_{AR\ CDM\,,t}$ =Net anthropogenic GHG removals by sinks, in year t; $tCO_{2\text{-}e}$

$\Delta C_{ACTUAL,t}$ =Actual net GHG removals by sinks, in year t; $tCO_{2\text{-}e}$

$C_{BSL,t}$ =Baseline net GHG removals by sinks, in year t; $tCO_{2\text{-}e}$

L_{Kt} = GHG emissions due to leakage, in year t; $tCO_{2\text{-}e}$

Since baseline removals and emissions due to leakage were considered zero,

$L_{Kt} = 0$

Net anthropogenic removals are expressed according to the formula:

$$\Delta C_{AR\text{-}CDM,t} = \Delta C_{ACTUAL,t} - \Delta C_{BSL,t}$$

Project proponent applied a discount reserve of 20% to cover the aspects related to the risk of non-permanence. The complete non-permanence risk analysis can be referred from the non-permanence risk report.

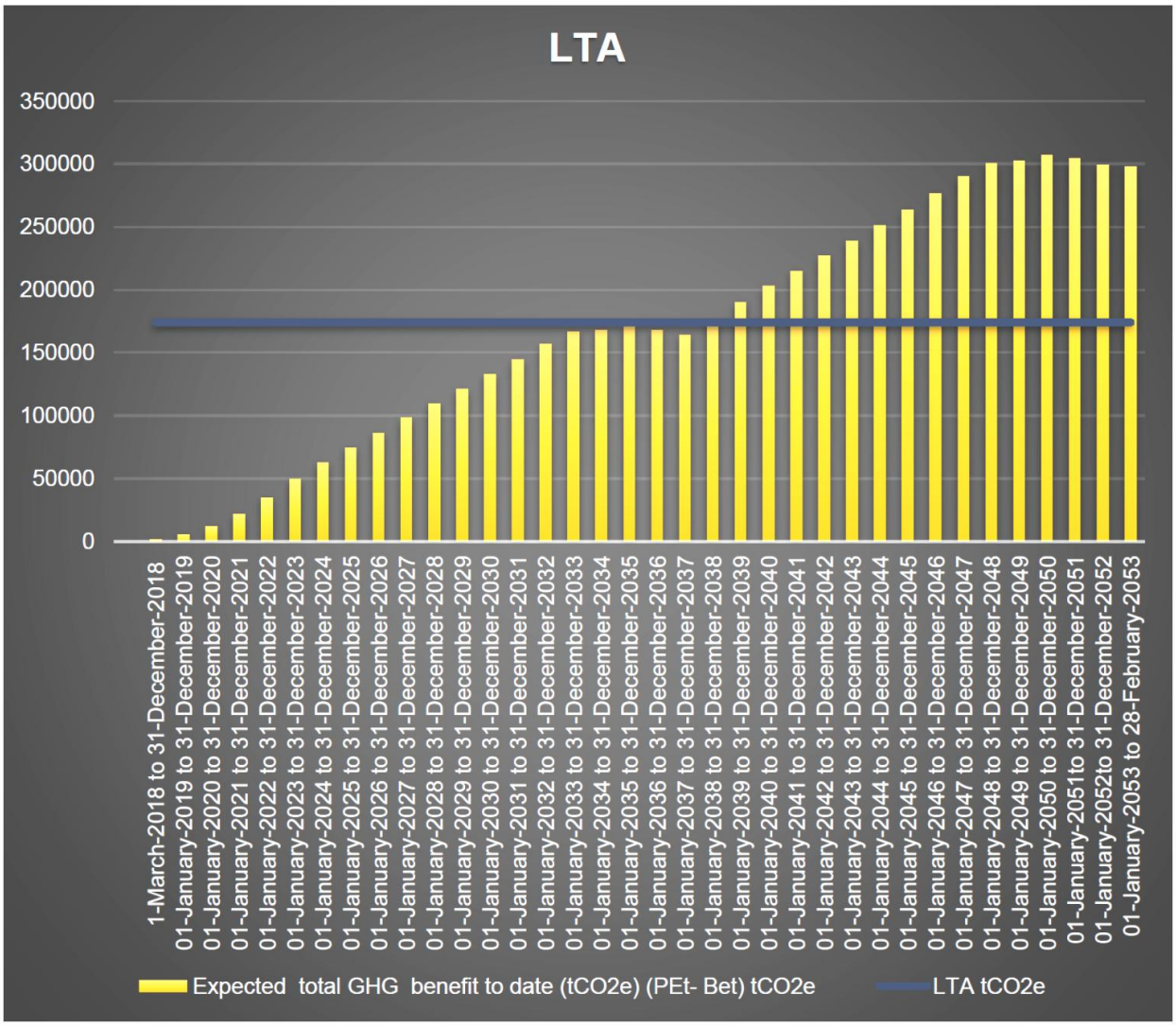
Based on data and parameters monitored detailed under section 6.2 below are the estimated net GHG emission removals for 894.06ha of land parcels in First Project Activity Instance.

Calculation of Long-Term Average:

Long Term Average Calculations: for 1st Instance

The Long-Term Average (LA) has been calculated by following the VCS Guidelines of Section 3.2.25 of VCS Program Standard v4.4[166] and AFOLU Guidance: Example for Calculating the Long-Term Average Carbon Stock for ARR Projects with Harvesting[167].

Long term average GHG benefit Chart:



[166] VCS-Standard-v4.4-FINAL.pdf (verra.org)

[167] https://verra.org/wp-content/uploads/2018/03/VCS-Guidance-Harvesting-Examples_0.pdf

Calculation of LA: According to the standard requirements, for those projects where harvesting practices is contemplated on project activities, the loss of carbon due to harvesting shall be include in the quantification of the project emissions. Due to the project activities contemplating an increment on the project area with different rotation periods per species the long-term average (LA) GHG benefit was calculated as follows according to VCS Standard: Where: LA The long-term average GHG benefit, PE_t = The total to-date GHG emission reductions and removals generated in the project scenario (tCO_{2e}). Project scenario emission reductions and removals shall also consider project emissions of CO_2, N_2O, CH_4 and leakage. BE_t = The total to-date GHG emission reductions and removals projected for the baseline scenario (tCO_{2e}).

Vintage period	Estimated baseline emissions (tCO_2e)	Estimated project emissions (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated buffer pool allocation (tCO_2e)	Estimated reduction VCUs (tCO_2e)	Estimated removal VCUs (tCO2e)	Estimated total VCUs issuance (tCO_2e)
01-March-2018 to 31-Dec-2018	0	1,284	44	257	0	1,240	984
01-Jan-2019 to 31-Dec-2019	0	3,752	138	750	0	3,614	2,864
01-Jan-2020 to 31-Dec-2020	0	6,393	274	1,279	0	6,120	4,841
01-Jan-2021 to 31-Dec-2021	0	10,117	471	2,023	0	9,646	7,622
01-Jan-2022 to 31-Dec-2022	0	13,115	732	2,623	0	12,384	9,761
01-Jan-2023 to 31-Dec-2023	0	14,627	1,010	2,925	0	13,617	10,692
01-Jan-2024 to 31-Dec-2024	0	13,192	1,290	2,638	0	11,901	9,263
01-Jan-2025 to 31-Dec-2025	0	11,837	1,571	2,367	0	10,266	7,899
01-Jan-2026 to 31-Dec-2026	0	11,888	1,851	2,378	0	10,038	7,660
01-Jan-2027 to 31-Dec-2027	0	11,759	2,131	2,352	0	9,628	7,277
01-Jan-2028 to 31-Dec-2028	0	11,552	2,411	2,310	0	9,141	6,831

01-Jan-2029 to 31-Dec-2029	0	11,414	2,691	2,283	0	8,722	6,440
01-Jan-2030 to 31-Dec-2030	0	11,644	2,971	2,329	0	8,673	6,344
01-Jan-2031 to 31-Dec-2031	0	11,950	3,251	2,390	0	8,699	6,309
01-Jan-2032 to 31-Dec-2032	0	12,396	3,532	2,479	0	8,864	6,385
01-Jan-2033 to 31-Dec-2033	0	9,848	3,812	1,970	0	6,036	4,067
01-Jan-2034 to 31-Dec-2034	0	1,022	4,092	204	0	-3,070	-3,274
01-Jan-2035 to 31-Dec-2035	0	3,930	4,372	786	0	-442	-1,228
01-Jan-2036 to 31-Dec-2036	0	-3,647	4,652	-729	0	-8,299	-7,570
01-Jan-2037 to 31-Dec-2037	0	-3,910	4,932	-782	0	-8,842	-8,060
01-Jan-2038 to 31-Dec-2038	0	12,076	5,212	2,415	0	6,863	4,448
01-Jan-2039 to 31-Dec-2039	0	13,877	5,493	2,775	0	8,384	5,609
01-Jan-2040 to 31-Dec-2040	0	12,507	5,773	2,501	0	6,735	4,233
01-Jan-2041 to 31-Dec-2041	0	12,260	6,053	2,452	0	6,207	3,755
01-Jan-2042 to 31-Dec-2042	0	12,044	6,333	2,409	0	5,711	3,303
01-Jan-2043 to 31-Dec-2043	0	11,991	6,613	2,398	0	5,378	2,979
01-Jan-2044 to 31-Dec-2044	0	12,249	6,893	2,450	0	5,356	2,906
01-Jan-2045 to 31-Dec-2045	0	12,532	7,173	2,506	0	5,359	2,853

01-Jan-2046 to 31-Dec-2046	0	12,818	7,454	2,564	0	5,364	2,801
01-Jan-2047 to 31-Dec-2047	0	13,243	7,734	2,649	0	5,510	2,861
01-Jan-2048 to 29-Feb-2048	0	2,183	1,275	437	0	908	471
Total	**0**	**291,944**	**112,233**	**58,389**	**0**	**179,711**	**121,323**

6 MONITORING

6.1 Data and Parameters Available at Validation

Data / Parameter	Location of project area- Latitude and Longitude
Data unit	Degree decimal
Description	GPS co-ordinates of the project boundary and sample plot
Source of data	GPS
Value applied:	As per the work sheet, Field data
Justification of choice of data or description of measurement methods and procedures applied	Direct measurement of latitude and longitude of a point within a project area using a GPS. Used to provide a simple location of a discrete project area
Purpose of data	Calculation of Project Emissions
Comments	N/A

Data / Parameter	Total area of PAI - 1
Data unit	Hectare

Description	The area where the project activity has been implemented.
Source of data	Data is provided by Project proponent.
Value applied:	894.06
Justification of choice of data or description of measurement methods and procedures applied	The eligible area for the project activity was determined by collecting multiple GPS location points of the land parcel. Using these points, individual land parcel KML files were then extracted with Google Earth
Purpose of data	Calculation of Project Emissions
Comments	N/A

Data / Parameter	Collar diameter/Collar Girth/ Diameter/Girth at breast height (DBH/GBH)
Data unit	cm (Centimeter)
Description	Growth of tree
Source of data	Mango: T03364.pdf Guava: https://www.currentscience.ac.in/Volumes/120/10/1627.pdf Red Sander: 172774.pdf
Value applied:	Collar diameter (Mango)=28.76 cm (6th year) Collar diameter (Guava)= 1.37cm (2nd year), 3.36cm (4th year), 5.70cm (6th year), 7.28cm (8th year), 9.83cm (10th year). DBH (Red sander, m) = Girth (cm)/3.14/100 Girth (cm) values for initial 15 years (5.0, 16.2, 23.8, 25.9, 28.0, 30.1, 32.4, 34.5, 36.1, 37.7, 39.3, 40.9, 42.5, 44.6, 44.9)
Justification of choice of data or description of measurement methods and procedures applied	These values are taken from secondary data sources and are used in calculating the estimated Project emission reductions. This approach ensures that the data is based on established research and, provides a reliable foundation for accurate estimation.
Purpose of data	Calculation of Project Emissions

Comments	N/A

Data / Parameter	Allometric equation
Data unit	Kg/tree
Description	Used for the calculation of AGB of tree
Source of data	**Mango:** Biomass, carbon stocks estimation and predictive modeling in mango based land uses on degraded lands in Indian Sub-Himalayas **Guava:** https://www.currentscience.ac.in/Volumes/120/10/1627.pdf
Value applied:	Allometric equation (ex-ante) Mango | *M. indica* | Y=0.20*Collar Diameter^1.85 Guava | *P. guajava* | Y=(3.264X^1.012) +3.446
Justification of choice of data or description of measurement methods and procedures applied	For calculating the above ground biomass.
Purpose of data	*Calculation of Project Emissions*
Comments	N/A

Data / Parameter	Volumetric Equation
Data unit	m^3
Description	Used for calculating stem volume
Source of data	Andhra Pradesh forest Inventory Report,2010
Value applied:	Red Sander | P. santalinus | v^1/2=0.144504+2.943115*D

Justification of choice of data or description of measurement methods and procedures applied	For calculating the above ground biomass
Purpose of data	Calculation of Project Emissions
Comments	N/A

Data / Parameter	Wood density
Data unit	kg/m^3
Description	Wood density is used to convert wood volume into biomass for Red sanders.
Source of data	As per the IPPC default value, Tale 3.1.9-2 https://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf_files/GPG_LULUCF_FULL.pdf
Value applied:	0.44
Justification of choice of description of measurement methods and procedures applied	Published data has been used and reference for the same is provided in the ex-ante and ex-post ER sheets.
Purpose of data	Calculation of Project Emissions
Comments	N/A

Data / Parameter	Root-to-Shoot Ratio (R)
Data unit	Dimensionless (Ratio)
Description	Root-shoot ratio appropriate for biomass stock
Source of data	AR Tool 14- Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities

Value applied:	0.25
Justification of choice of data or description of measurement methods and procedures applied	The ratios of belowground to aboveground biomass (root-to-shoot ratio) is used to account for belowground biomass in living biomass estimations as it is not possible to estimate BGB through measurement for a living tree species. So, as per the Tool 14 default value 0.25 are taken.
Purpose of data	Calculation of Project Emissions
Comments	N/A

Data / Parameter	Carbon Fraction (CF tree)
Data unit	tC/t.d.m
Description	Carbon fraction of tree biomass
Source of data	Refer excel sheet
Value applied:	0.47
Justification of choice of data or description of measurement methods and procedures applied	According to the applied tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities" IPCC default value is used. The carbon fraction was taken from IPCC (2006), Guidelines for National Greenhouse Gas Inventories-Volume 4 Agriculture, Forestry and Other Land Use, Forestry, Table 4.3, tropical/subtropical wood.
Purpose of data	Calculation of Project Emissions
Comments	N/A

Data / Parameter	Carbon Fraction (CF litter and dead wood)
Data unit	tC/t.d.m
Description	Carbon fraction of litter and dead wood in tree biomass

Source of data	Refer excel sheet
Value applied:	This carbon fraction was taken from IPCC (2006), Guidelines for National Greenhouse Gas Inventories-Volume 4 Agriculture, Forestry and Other Land Use, Forestry, Table 4.3, tropical/subtropical wood
Justification of choice of data or description of measurement methods and procedures applied	According to the applied tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities" default value of 0.47 is used.
Purpose of data	Calculation of Project Emissions
Comments	N/A

Data / Parameter	BEF
Data unit	NA
Description	Biomass expansion factor
Source of data	https://sci-hub.st/https://doi.org/10.1016/S0961-9534(00)00040-4
Value applied:	1.59
Justification of choice of data or description of measurement methods and procedures applied	Reference study provides biomass expansion factor value as 1.59 for broad-leaved category.
Purpose of data	Calculation of Project Emissions
Comments	N/A

Data / Parameter	Leakage parameters			
Data unit	R_{TREE}	Dimensionless	BDR_{SF}	Dimensionless

	R_S | Dimensionless | b_{FOREST} | t.d.m/ha CF | Dimensionless | $CC_{SHRUB,i}$ | Dimensionless
Description	Leakage parameters are used to estimate the leakage emissions due to implementation of project activity. In line with CDM AR-Tool 15, default/published values are used. In PAI-1, Leakage due to project activity implementation is calculated as 321 tCO2e.
Source of data	R_{TREE} | CDM AR-Tool 15 | BDR_{SF} | CDM AR-Tool 14 R_S | CDM AR-Tool 15 | b_{FOREST} | Default value for Forest in India as per table 3A.1.4 of IPCC GPG-LULUCF 2003 CF | CDM AR-Tool 15 | $CC_{SHRUB,i}$ | CDM AR-Tool 14
Value applied:	R_{TREE} | 0.25 | BDR_{SF} | 0.1 R_S | 0.4 | b_{FOREST} | 73 CF | 0.47 | $CC_{SHRUB,i}$ | 0.5
Justification of choice of data or description of measurement methods and procedures applied	Values are used in accordance with CDM AR tool 15 and IPCC GPG LULUCF report.
Purpose of data	Project leakage emissions calculation
Comments	N/A

Data / Parameter	Conversion C to CO2
Data unit	t CO2/t C
Description	Factor applied to convert the tree carbon sequestered to tree CO2e sequestered
Source of data	IPCC default value.

Value applied:	44/12=3.67
Justification of choice of data or description of measurement methods and procedures applied	IPCC default value.
Purpose of data	Calculation of Project Emissions
Comments	N/A

Data / Parameter	DF_{LI}
Data unit	%
Description	Conservative default factor expressing carbon stock in litter as a percentage of carbon stock in tree biomass
Source of data	CDM AR-Tool 12
Value applied:	1%
Justification of choice of data or description of measurement methods and procedures applied	Conservative value
Purpose of data	Estimation of carbon stock in litter
Comments	

Data / Parameter	DF_{DW}
Data unit	%
Description	Conservative default factor expressing carbon stock in dead wood as a percentage of carbon stock in tree biomass
Source of data	CDM AR-Tool 12
Value applied:	1%

Justification of choice of data or description of measurement methods and procedures applied	Conservative value
Purpose of data	Estimation of carbon stock in deadwood
Comments	

Data / Parameter	Soil Organic Carbon (SOC)
Data unit	t C/ha
Description	Soil organic carbon (SOC) refers only to the carbon component of organic compounds.
Source of data	AR-Tool 16 applied for the SOC calculations and total area is multiplied with the dSOC value obtain from the tool spreadsheet.
Value applied:	dSOC value applied as 0.8 t/ha/yr
Justification of choice of data or description of measurement methods and procedures applied	This value is taken as per the AR-Tool 16. For calculating the value of the dSOC following factor are considered-
Purpose of data	Calculation of Project Emissions
Comments	N/A

Parameter	$SOC_{REF,i}$	$f_{LU,i}$	$f_{MG,i}$	$f_{IN,i}$	$SOC_{INITIAL,i}$	$SOC_{LOSS,i}$
Andhra Pradesh and Tamil Nadu	65	0.48	1	1	31.2	0
Madhya Pradesh	47	0.48	1	1	22.56	0

Data / Parameter	Project trees
Data unit	Counting of tree in numbers

Description	The number of trees
Source of data	As per implementation master sheet provided by PP
Value applied:	<table><tr><th>Year</th><th>No. of trees</th></tr><tr><td>2018</td><td>75,049</td></tr><tr><td>2019</td><td>73,587</td></tr><tr><td>2020</td><td>56,353</td></tr><tr><td>2021</td><td>96,183</td></tr><tr><td>2022</td><td>90,374</td></tr><tr><td>2023</td><td>13,569</td></tr></table>
Justification of choice of data or description of measurement methods and procedures applied	Data records for the number of saplings planted were procured at the time of plantation activity.
Purpose of data	Calculation of Project Emissions
Comments	N/A

Data / Parameter	Stratum weight (w_i)
Data unit	Dimensionless
Description	Relative weight of the area of stratum i, the area of the stratum i divided by the total project area
Source of data	Calculated
Value applied:	<table><tr><th>Stratum Name</th><th>W_i</th></tr><tr><td>2018 Mango</td><td>0.29</td></tr><tr><td>2019 Mango</td><td>0.13</td></tr><tr><td>2020 Mango</td><td>0.09</td></tr><tr><td>2021 Mango</td><td>0.10</td></tr><tr><td>2022 Mango</td><td>0.08</td></tr><tr><td>2023 Mango</td><td>0.08</td></tr><tr><td>2019 Red Sander</td><td>0.02</td></tr><tr><td>2020 Red Sander</td><td>0.02</td></tr><tr><td>2021 Red Sander</td><td>0.01</td></tr><tr><td>2022 Red Sander</td><td>0.03</td></tr><tr><td>2018 Guava</td><td>0.02</td></tr></table>

	2019 Guava: 0.02 2020 Guava: 0.02 2021 Guava: 0.05 2022 Guava: 0.04
Justification of choice of data or description of measurement methods and procedures applied	Calculation of sample plots and project GHGs removal after allocating sample plots to each stratum.
Purpose of data	Calculation of Project Emissions
Comments	N/A

Data / Parameter	Permanent Sample Plot (PSP)
Data unit	Number
Description	Sample plots are chosen randomly from each stratum representing the plantation of respective stratum. Project Activity monitoring is based on the PSPs.
Source of data	Refer excel sheet
Value applied:	46
Justification of choice of data or description of measurement methods and procedures applied	Established PSPs based on A/R Methodological Tool 'Calculation of the number of sample plots for measurements within A/R CDM project activities' (Version 02.1.0)[168]
Purpose of data	Calculation of Project Emissions
Comments	N/A

6.2 Data and Parameters Monitored

Data / Parameter	Collar Dimeter (CD)/Diameter at breast Height (DBH)
Data unit	Centimeters (cm)

[168] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-03-v2.1.0.pdf

Description	Near to the ground level (5-10cm form ground level)/1.37m for DBH
Source of data	Field measurements in Permanent Sample Plots (PSPs)
Description of measurement methods and procedures applied	DBH is measured at 1.37 m above ground and Collar Girth is measured near to the ground level (5-10cm form ground level) over the bark by the diameter Tape.
Frequency of monitoring/recording	At the end of each monitoring period
Value applied:	Refer to Ex-post Emission Reduction sheet
Monitoring equipment	Measuring Tape
QA/QC procedures applied	Standard operating procedures are made to ensure the correct and validating data collection for each of the monitoring parameters.
Purpose of data	Calculation of actual project emissions
Calculation method	Diameter is calculated using the formula Diameter= Girth/(π)
Comments	None

Data / Parameter	Tree Height (H)
Data unit	Meters (m)
Description	Height of the trees
Source of data	Field measurements of PSPs
Description of measurement methods and procedures applied	Height is measured with Clinometers. The measurement involves the following: i. Angle/degree percentage observation through clinometers ii. Distance in meter of the observer from point of observation to the tree (measure by using Measuring Tape)

Frequency of monitoring/recording	At the end of each monitoring period.
Value applied:	Refer to Ex-post Emission Reduction sheet
Monitoring equipment	Clinometer
QA/QC procedures applied	Standard operating procedures are made to ensure the correct and validating data collection for each of the monitoring parameters
Purpose of data	Calculation of actual project emissions
Calculation method	Tree height is measured with the help of Suunto Clinometer. The angle is measured and then, Tree height= Observer Eye Height + (Angle * Distance between observer and tree)
Comments	None

Data / Parameter	Ai
Data unit	Hectare (ha)
Description	Area of stratum i
Source of data	Refer Excel sheet containing Latitude and Longitude of the Project Area using Geographical Information System (GIS)
Description of measurement methods and procedures applied	Strata area is selected and mapped in the software as .kml file
Frequency of monitoring/recording	Measured at start of the project and at each verification event

Value applied:	Project Stratification for the first Project Activity phase is based on the year of plantation and species planted. Strata wise total area for the first Project Activity phase using GIS is given in below table:

Stratum Name	Area
2018 Mango	258.02
2019 Mango	115.32
2020 Mango	76.96
2021 Mango	93.61
2022 Mango	74.86
2023 Mango	68.5
2019 Red Sander	22.09
2020 Red Sander	19
2021 Red Sander	12.1
2022 Red Sander	27.77
2018 Guava	15.79
2019 Guava	20
2020 Guava	14.63
2021 Guava	43.96
2022 Guava	31.45

Monitoring equipment	GPS instrument
QA/QC procedures applied	Measurement, Verification and Reporting (MRV) personnel have been trained to measure the GIS Coordinates.
Purpose of data	Calculation of project emissions
Calculation method	Yes
Comments	None

Data / Parameter	Standard Deviation
Data unit	t/ha
Description	Assumed standard deviation of biomass stock in stratum i
Source of data	Assumed

<table>
<tr><td>Description of measurement methods and procedures applied</td><td>For the calculation of PSPs, the std.dev is assumed within the startum.</td></tr>
<tr><td>Frequency of monitoring/recording</td><td>During presurvey before monitoring the project</td></tr>
<tr><td>Value applied:</td><td>Total area of PSPs is shown in the table below:
<table><tr><th>Stratum Name</th><th>Std.dev (t.dm/ha)</th></tr><tr><td>2018 Mango</td><td>10.97</td></tr><tr><td>2019 Mango</td><td>11.27</td></tr><tr><td>2020 Mango</td><td>9.02</td></tr><tr><td>2021 Mango</td><td>6.87</td></tr><tr><td>2022 Mango</td><td>4.84</td></tr><tr><td>2023 Mango</td><td>2.95</td></tr><tr><td>2019 Red Sander</td><td>21.36</td></tr><tr><td>2020 Red Sander</td><td>17.62</td></tr><tr><td>2021 Red Sander</td><td>14.24</td></tr><tr><td>2022 Red Sander</td><td>11.23</td></tr><tr><td>2018 Guava</td><td>5.47</td></tr><tr><td>2019 Guava</td><td>4.87</td></tr><tr><td>2020 Guava</td><td>4.27</td></tr><tr><td>2021 Guava</td><td>3.39</td></tr><tr><td>2022 Guava</td><td>2.50</td></tr></table></td></tr>
<tr><td>Monitoring equipment</td><td>Calculated</td></tr>
<tr><td>QA/QC procedures applied</td><td>N/A</td></tr>
<tr><td>Purpose of data</td><td>Calculation of project emissions</td></tr>
<tr><td>Calculation method</td><td>Yes</td></tr>
<tr><td>Comments</td><td>None</td></tr>
</table>

Data / Parameter	Land Title Records
Data unit	N/A

Description	Land ownership document of each individual farmers involved in the Project Activity and First Project Activity phase.
Source of data	Land ownership document of each individual farmer in the form of land patta or community authority land
Description of measurement methods and procedures applied	The land title records are certified by government.
Frequency of monitoring/recording	During each verification
Value applied:	Yes
Monitoring equipment	Land title of document
QA/QC procedures applied	The PP employee checks the data
Purpose of data	For verification of land title ownership of Farmers involved in the Project Activity and First Project Activity phase
Calculation method	Yes
Comments	None

Data / Parameter	Contractual Agreement
Data unit	Yes
Description	Contractual Agreement between each individual farmers and implementation body for the plantation and cultivation of Mango, Red Sander and Guava
Source of data	Physical copy of Contractual Agreement
Description of measurement methods and procedures applied	Yes
Frequency of monitoring/recording	During each verification

Value applied:	Yes
Monitoring equipment	Physical copy of Contractual Agreement
QA/QC procedures applied	The PP employee checks the data contractual copy
Purpose of data	For representation of the following: 1. Carbon Credit Ownership and Authorization 2. Plot Plantation Details 3. Farmers Representation 4. Duration of the Contract
Calculation method	Yes
Comments	None

Data / Parameter	Survival Rate
Data unit	% (percentage)
Description	The number of trees counted in each sample parcel initially after 3 months of planting and replantation is carried out immediately. Plantation management requires a final survival check three years after planting. The number of trees contained in each PSP is manually counted and recorded during monitoring.
Source of data	Field Measurement
Description of measurement methods and procedures applied	Initial survival checking after 3 months of planting. Final survival checking after 3 years of planting and subsequently at each monitoring event.
Frequency of monitoring/recording	During each verification
Value applied:	90%
Monitoring equipment	N/A

QA/QC procedures applied	N/A
Purpose of data	Calculation of l project emissions
Calculation method	(Number of trees available / Number of trees planted) x 100%
Comments	None

Data / Parameter	AGB
Data unit	Kg.d.m
Description	Above Ground Biomass in kilogram dry matter (kg.d.m)
Source of data	Calculated Value in Ex-post Calculation Sheet
Description of measurement methods and procedures applied	For calculating the above ground biomass, PP measures Diameter at Breast height (D) at 1.3-meter height from ground and Tree Height (H).
Frequency of monitoring/recording	During each verification
Value applied:	Please refer the Ex-post Emission Reduction Sheet
Monitoring equipment	N/A
QA/QC procedures applied	Measurement, Verification and Reporting (MRV) personnel are professionals equipped with adequate knowledge of using spreadsheet and efficient calculation of above ground biomass
Purpose of data	Calculation of project emissions
Calculation method	Allometric Equations are referred for calculation of AGB
Comments	None

Data / Parameter	BGB (Root-to-Shoot Ratio)

Data unit	Kg.d.m
Description	Below Ground Biomass in kilogram dry matter (kg.d.m)
Source of data	Calculated Value in Ex-post Calculation Sheet
Description of measurement methods and procedures applied	Refer Ex-post Emission Reduction Sheet
Frequency of monitoring/recording	During each verification
Value applied:	Please refer the Ex-post Emission Reduction Sheet
Monitoring equipment	N/A
QA/QC procedures applied	Measurement, Verification and Reporting (MRV) personnel are professionals equipped with adequate knowledge of using spreadsheet and efficient calculation of below ground biomass
Purpose of data	Calculation of project emissions
Calculation method	Multiplying AGB with Root to Shoot ratio
Comments	None

Data / Parameter	Total Biomass (TB)
Data unit	t.d.m/ha
Description	TB of tree species in sample plot of stratum at time t calculated using allometric equations for AGB and Root shoot ratio for BGB.
Source of data	Calculated Value in Ex-post Calculation Sheet
Description of measurement methods and procedures applied	Refer Ex-post Emission Reduction Sheet

Frequency of monitoring/recording	During each verification
Value applied:	It will be calculated-

Stratum Name	(t.dm/ha)
2018 Mango	34.79
2019 Mango	32.85
2020 Mango	30.52
2021 Mango	22.98
2022 Mango	10.44
2023 Mango	10.24
2019 Red Sander	143.44
2020 Red Sander	180.61
2021 Red Sander	80.41
2022 Red Sander	106.45
2018 Guava	7.91
2019 Guava	6.68
2020 Guava	15.77
2021 Guava	8.53
2022 Guava	12.27

Monitoring equipment	N/A
QA/QC procedures applied	Measurement, Verification and Reporting (MRV) personnel are professionals equipped with adequate knowledge of using spreadsheet and efficient calculation of below ground biomass
Purpose of data	Calculation of project emissions
Calculation method	By adding the above ground biomass and below ground biomass
Comments	None

Data / Parameter	Allometric equation
Data unit	Kg/tree
Description	Used for the calculation of AGB of tree

<table>
<tr><td>Source of data</td><td>Mango: Biomass, carbon stocks estimation and predictive modeling in mango based land uses on degraded lands in Indian Sub-Himalayas

Guava:
https://www.currentscience.ac.in/Volumes/120/10/1627.pdf</td></tr>
<tr><td>Description of measurement methods and procedures applied</td><td>N/A</td></tr>
<tr><td>Frequency of monitoring/recording</td><td>At the end of each monitoring period.</td></tr>
<tr><td>Value applied:</td><td>Allometric equation (ex-ante)
<table><tr><td>Mango</td><td>M. indica</td><td>Y = 30.40 × EXP (–5.07 × EXP(–0.26 × collar diameter)) + 1.277</td></tr><tr><td>Guava</td><td>P. guajava</td><td>Y=(3.264X^1.012) +3.446</td></tr></table></td></tr>
<tr><td>Monitoring equipment</td><td>N/A</td></tr>
<tr><td>QA/QC procedures applied</td><td>N/A</td></tr>
<tr><td>Purpose of data</td><td>Calculation of Project Emissions</td></tr>
<tr><td>Calculation method</td><td>Allometric equation</td></tr>
<tr><td>Comments</td><td>N/A</td></tr>
</table>

Data / Parameter	Volumetric Equation
Data unit	m^3
Description	Used for calculating stem volume
Source of data	Andhra Pradesh forest Inventory Report,2010
Description of measurement methods and procedures applied	N/A

Frequency of monitoring/recording	At the end of each monitoring period.
Value applied:	Red Sander | *P. santalinus* | v^1/2=-0.144504+2.943115*D
Monitoring equipment	Volumetric equation
QA/QC procedures applied	N/A
Purpose of data	Calculation of actual project emissions
Calculation method	Allometric equation
Comments	N/A

Data / Parameter	Wood density
Data unit	kg/m^3
Description	Wood density is used to convert wood volume into biomass for Red sanders.
Source of data	As per the IPPC default value, Tale 3.1.9-2 https://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf_files/GPG_LULUCF_FULL.pdf
Description of measurement methods and procedures applied	Refer Ex-post Emission Reduction Sheet
Frequency of monitoring/recording	During each verification
Value applied:	0.44
Monitoring equipment	N/A
QA/QC procedures applied	N/A
Purpose of data	Calculation of Project Emissions
Calculation method	Based on secondary research paper

Comments	N/A

Data / Parameter	BEF
Data unit	NA
Description	Biomass expansion factor
Source of data	https://sci-hub.st/https://doi.org/10.1016/S0961-9534(00)00040-4
Description of measurement methods an procedures applied	Refer Ex-post Emission Reduction Sheet
Frequency of monitoring/recording	During each verification
Value applied:	1.59
Monitoring equipment	N/A
QA/QC procedures applied	N/A
Purpose of data	Calculation of Project Emissions
Calculation method	Based on secondary research paper
Comments	N/A

Data / Parameter	DF_{LI}
Data unit	%
Description	Conservative default factor expressing carbon stock in litter as a percentage of carbon stock in tree biomass
Source of data	Table:6 CDM AR-Tool 12
Description of measurement methods and procedures applied	Refer Ex-post Emission Reduction Sheet

Value applied:	1%
Monitoring equipment	N/A
QA/QC procedures applied	N/A
Purpose of data	Calculation of Project Emissions
Comments	N/A

Data / Parameter	DF_{DW}
Data unit	%
Description	Conservative default factor expressing carbon stock in deadwood as a percentage of carbon stock in tree biomass
Source of data	Table:6 CDM AR-Tool 12
Description of measurement methods and procedures applied	Refer Ex-post Emission Reduction Sheet
Value applied:	1%
Monitoring equipment	N/A
QA/QC procedures applied	N/A
Purpose of data	Calculation of Project Emissions
Comments	N/A

Data / Parameter	Soil Organic Carbon (SOC)
Data unit	tC/ha/yr

Description	Soil organic carbon (SOC) refers only to the carbon component of organic compounds.
Source of data	CDM AR-Tool 16
Description of measurement methods and procedures applied	Refer Ex-post Emission Reduction Sheet
Value applied:	0.8 tC/ha/yr for Madhya Pradesh and 0.8 for Andhra Pradesh and Tamil Nadu respectively
Monitoring equipment	N/A
QA/QC procedures applied	N/A
Purpose of data	Calculation of Project Emissions
Comments	N/A

Data / Parameter	Size of Each PSPs in the Stratum i (APlot i)
Data unit	Hectares (ha)
Description	An area of 25-meter x 25-meter size (Mango & Red sander) and 15 meter x 15 meter (Guava) (measuring 0.0625 ha & 0.0225 ha) is measured and marked within each sample land parcel. The selection of 0.0625 ha PSP is based on the CDM manual for "Measurements for Estimation of Carbon Stocks"
Source of data	Winrock PSP calculator
Description of measurement methods and procedures applied	Refer Ex-post Emission Reduction Sheet

Value applied:	

Stratum Name	Number of PSPs based on tool
2018 Mango	14
2019 Mango	7
2020 Mango	4
2021 Mango	4
2022 Mango	2
2023 Mango	2
2019 Red Sander	2
2020 Red Sander	1
2021 Red Sander	1
2022 Red Sander	1
2018 Guava	1
2019 Guava	2
2020 Guava	4
2021 Guava	1
2022 Guava	1

Monitoring equipment	N/A
QA/QC procedures applied	N/A
Purpose of data	Calculate the actual number of sample size
Comments	N/A

Data / Parameter	$A_{Burn,i,t}$
Data unit	Hectares (ha)
Description	Area burnt in stratum i in year t; ha
Source of data	CDM AR-Tool 16
Description of measurement methods and procedures applied	Refer Ex-post Emission Reduction Sheet
Value applied:	

Stratum Name	$A_{Burn,i,t}$
2018 Mango	0
2019 Mango	0
2020 Mango	0
2021 Mango	0
2022 Mango	0
2023 Mango	0
2019 Red Sander	0
2020 Red Sander	0

	2021 Red Sander	0
	2022 Red Sander	0
	2018 Guava	0
	2019 Guava	0
	2020 Guava	0
	2021 Guava	0
	2022 Guava	0
Monitoring equipment	N/A	
QA/QC procedures applied	N/A	
Purpose of data	Calculation of Project Emissions	
Comments	N/A	

Data / Parameter	Wi	
Data unit	Dimensionless	
Description	Relative weight of the area of stratum i, the area of the stratum i divided by the project area	
Source of data	Winrock PSP calculator	
Description of measurement methods and procedures applied	Refer Ex-post Emission Reduction Sheet	
Value applied:	**Stratum Name**	**Wi**
	2018 Mango	0.29
	2019 Mango	0.13
	2020 Mango	0.09
	2021 Mango	0.10
	2022 Mango	0.08
	2023 Mango	0.08
	2019 Red Sander	0.02
	2020 Red Sander	0.02
	2021 Red Sander	0.01
	2022 Red Sander	0.03

	2018 Guava	0.02
	2019 Guava	0.02
	2020 Guava	0.02
	2021 Guava	0.05
	2022 Guava	0.04
Monitoring equipment	N/A	
QA/QC procedures applied	N/A	
Purpose of data	Calculation of Project Emissions	
Comments	N/A	

6.3 Monitoring Plan

This monitoring plan provides information on monitoring procedures for the project activity and First Project Activity phase. The monitoring plan ensures credible and precise procedures for project performance evaluation and verification of net anthropogenic GHG emission removals in accordance with AR ACM0003 methodology and its tools. As per the requirements of VCS, the Project will describe the process and schedule for obtaining, recording, compiling, and analysing the monitored data and parameters. Permanent Sample Plots (PSPs) are used for monitoring carbon stock in Mango, Guava and Red Sander plantation. Each parcel of land is assigned a unique number, geo-referenced, and located inside the Project Area. SOPs are prepared for acquiring credible data for baseline, project leakage, and GHG removal estimations. Purpose of preparation of monitoring plan is to collect the relevant data necessary as follows:

a) Verification that the applicability conditions listed under paragraphs 3 and 4 has been met;

b) Verification of changes in carbon stocks in the pools selected

c) Verification of project emissions and leakage emissions.

Roles and Responsibilities:

The management structure of the plantation project between Infinite Solutions and MFI.

Organization	Roles	Reporting	Designation
Infinite Solution	Managing the financial components of a project, including budgeting and accounting; establishing in place checks and controls for project monitoring and reporting; and making sure that carbon	Infinite Solution	Project Proponent

	credit initiatives are monitored in accordance with all legal requirements		
Mangrove foundation of India, Greenmile Agroforestry Private Limited and Outreach Projects Pvt. Ltd.	Managing project implementation, overseeing general administration duties, coordinating with field staff, and establishing systems for the development and maintenance of data		Project implementor
Plantation supervisors	Providing comprehensive field assistance to administrators, including tasks such as nursery raising, land development, labor management and allocation, site monitoring, on-site management, and compiling inventory and reports		Project implementor
MRV team	Demarcation of Permanent Sample Plots, Recording Geo coordinates of the Permanent Sample Plots, field measurements such as DBH, Height, Number of Mango trees	Infinite Solution	Project Proponent

Establishment of the Project Boundary

All land parcels designated for plantations under this project activity are accurately delineated using GPS tracking devices. To ensure precision, extensive training is provided, and up-to-date GPS portable devices such as Garmin eTrex are supplied. A step-by-step guidance on the tracking procedure is detailed in the Standard Operating Procedures (SOPs). Each planting plot is assigned a unique ID and tracked, with the tracks downloaded and recorded as Google Earth Pro. kml files, shape files, and Excel files. This facilitates further processing of the tracks via GIS applications. The following activities enable effective management and monitoring of the project areas as follows:

- Review of all project boundaries to assess potentially on-going afforestation activities, site by site
- Utilizing GPS technology to geo-reference (latitude and longitude coordinates) each land parcel included in the project
- Periodic verifying a minimum of 10% of recorded boundary tracks to ensure alignment with the designated project boundaries.

- There will be periodic verifications of the project area boundaries, during the crediting period as well as documentation has been maintained for areas where planting efforts fail or where there are changes in land use
- The field information will be analysed using a ArcGIS to calculate the areas covered by Mango, Guava and Red Sander and the year of planting.

Stratification

Stratification of the areas has been corresponding to the guidelines established by methodology AR - ACM0003 "Afforestation and reforestation of lands except wetlands". The monitoring of this project activity involves planting Mango, Guava and red sander, necessitates the periodic updating of a comprehensive database. This database captures crucial information including the results of biomass accumulation, planting dates, and any unexpected disturbances that occur during the crediting period, such as fire, pest, or disease outbreaks. Additionally, it accounts for variations in forest management practices, such as cleaning, planting, re-replanting, and harvesting, which may occur at different years and areas. Furthermore, the database allows for the identification of different strata, which may be similar enough to be merged into one stratum. The stratification identification procedure considers variables such as species planted, plantation model, and climatic zone, as outlined in the project inventory database, to establish the pre-stratification scenario.

Parameter	Variation in project design		Impact on Biomass Estimation
Location	Andhra Pradesh and Tamil Nadu	Madhya Pradesh	Change in the agroecological region effect the biomass
Species	Mango and Red Sander	Guava	Effect of species on biomass occurred with respect to location
Plantation density	Around 300 Mango/ha And 600 Red sander/ha	1100 Guava/ha	Effect of density on biomass occurred with respect to location
Soil	Homogenous	Homogenous	Effect of soil on biomass occurred with respect to location
Plantation year	Mango 2018: 263.42 Mango 2019: 120.48	2018 Guava: 13.50 2019 Guava: 38.33	Biomass of Mango, Guava and red sander species is affected by

	Mango 2020: 80.65 Mango 2021: 93.14 Mango 2022: 76.36 Mango 2023: 65.96 Red Sander 2019: 22.09 Red Sander 2020: 19.00 Red Sander 2021: 12.12 Red Sander 2022: 27.77	2020 Guava: 53.68 2021 Guava: 8.15 2022 Guava: 2.56	the plantation date and density.
Tree DBH or Collar diameter	**Mango and Guava:** Collar diameter of tree is measured at height of 0 to 10 cm as forking is start from the ground level of the tree. **Red sander:** Diameter is measured at height of 1.37 m of tree from ground level.		DBH and collar diameter are used for estimating the above ground biomass of the tree.

Sampling Design, Sampling size and Random sample point selection

The Project Activity area of 894.06 hectares is stratified according to the plantation year and area, according to the A/R Methodological Tool "Calculation of the number of sample plots for measurements within A/R CDM project activities" (Version 02.1.0). Number of PSPs required for estimation of biomass stock is calculated iteratively. In the first iteration, the number of sample plots for the project area is calculated as:

$$n = \frac{N t_{VAL}^2 * (\llbracket \sum_i w_i * s_i) \rrbracket^2}{N * E^2 + t_{VAL}^2 * \sum_i w_i * s_i}$$

Where:

n= Number of sample plots required for estimation of biomass stocks within the project boundary; dimensionless

N= Total number of possible sample plots within the project boundary (i.e. the sampling space or the population); dimensionless

t_{val}= Two sided Student's t value, at infinite degrees of freedom, for the required confidence level; dimensionless; value of 1.645 is taken from tool

w_i= Relative weight of the area of stratum i (i.e. the area of the stratum i divided by the project area); dimensionless

s_i= Estimated standard deviation of biomass stock in stratum i; t d.m. (or t d.m. ha^{-1})

E = Acceptable margin of error (i.e. one half the confidence interval) in estimation of biomass stock within the project boundary; t d.m. (or t d.m. ha^{-1}), i.e. in the units used for s i; default value equal to 10% of mean biomass stock is taken from the tool = 1, 2, 3,...

biomass stock estimation strata within the project boundary

With above equation the number of PSPs are established. The PSPs are then allocated among the strata using the below equation:

$$n_i = n * \frac{w_i * s_i}{\sum_i w_i * s_i}$$

Where:

n_i = Number of sample plots allocated to stratum i; dimensionless

N = Number of sample plots required for estimation of biomass stocks within the project boundary; dimensionless

w_i = Relative weight of the area of stratum i (i.e. the area of the stratum i divided by the project area); dimensionless

s_i = Estimated standard deviation of biomass stock in stratum i; t d.m. (or t d.m. ha^{-1})

i = 1, 2, 3..... biomass stock estimation strata within the project boundary

Number of Permanent Sample Plot (n) established, and allocation of the PSP (n_i) is shown in the below table:

Stratum	Strata Year	Area (ha)	Number of PSPs based on tool
2018 Mango	2018	258.02	14
2019 Mango	2019	115.32	7
2020 Mango	2020	76.96	4
2021 Mango	2021	93.61	4
2022 Mango	2022	74.86	2
2023 Mango	2023	68.5	2
2019 Red Sander	2019	22.09	2
2020 Red Sander	2020	19	1
2021 Red Sander	2021	12.1	1
2022 Red Sander	2022	27.77	1
2018 Guava	2018	15.79	1
2019 Guava	2019	20	2
2020 Guava	2020	14.63	4
2021 Guava	2021	43.96	1
2022 Guava	2022	31.45	1
Total		**894.06**	**47**

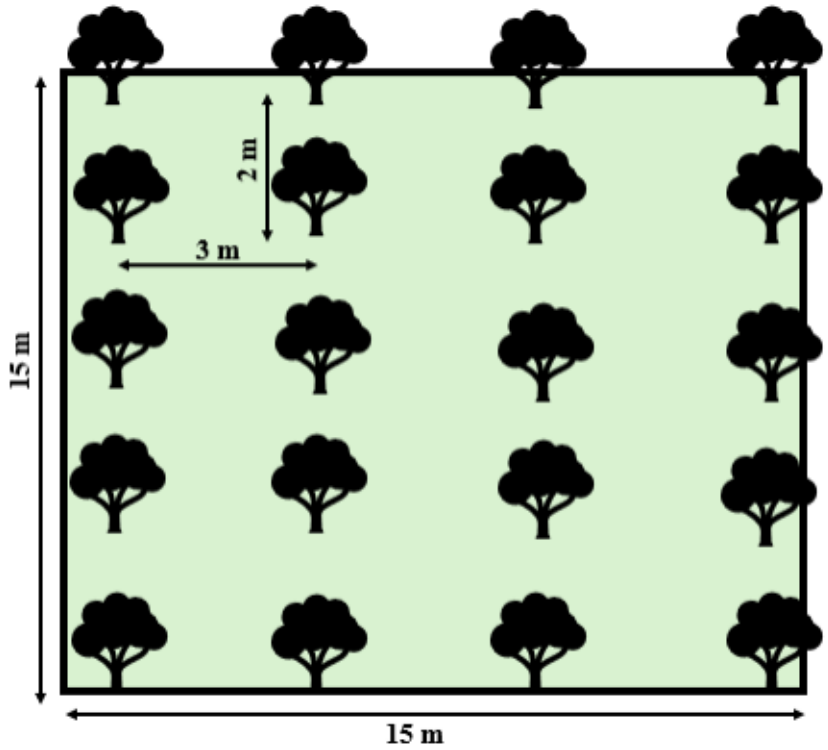


Figure: Layout of quadrat for measurement of Guava and Red Sanders DBH

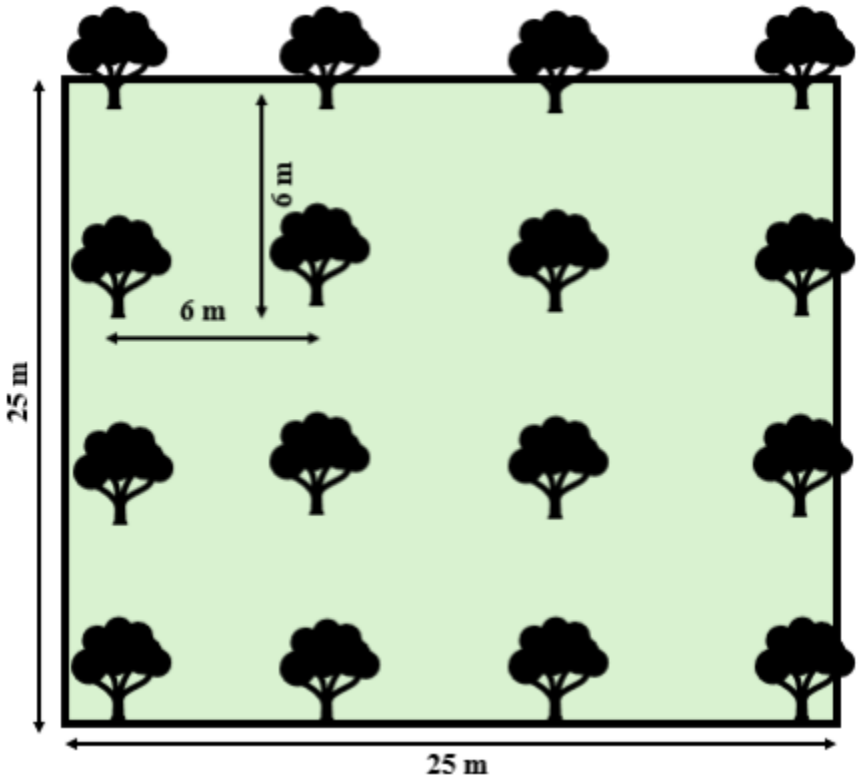


Figure: Layout of quadrat for measurement of Mango and Red Sanders DBH

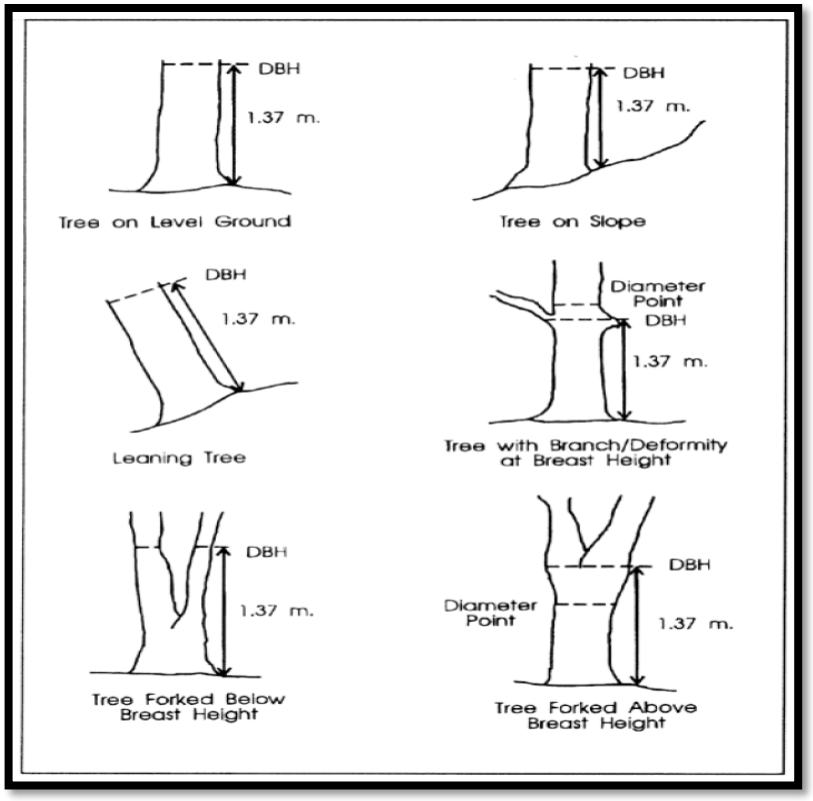


Figure: Measurement method of tree DBH

To establish statistical independence, at least one plot will be set for each strata. Tree biomass stock is measure by recording the height and DBH of Mango, Guava and Red Sander. DBH and height measurements are made in accordance with the SOP created by PP for the MRV per personnel. Using a Vernier calliper, the diameter at Breast Height (DBH) is measured 1.37 meters above ground to determine the DBH. A reference stick is used to estimate the measuring point, which is located 1.37 meters above the ground. The Clinometer instrument was used to measure the height of the trees. A clinometer is a device that measures angles to the top and base of trees as well as the distance from trees. The surveyor stands for measuring the angle, and the distance between the base of the tree and the surveyor is measured in meters using a measuring tape. To calculate tree height, use the formula below:

*Height (H) = Distance between tree and surveyor (m) * Angle (x)*
+ Eye level height of the Surveyor

All the trees (mango, red sander and guava) are counted in the sample land parcel by the MRV personnel for calculating the exact survival rate. MRV personnel are trained to measure Mango, Guava and Red sander diameter. Training includes a classroom session where MRV workers learn about the importance of DBH and Height measurements in estimating biomass stock

changes. After classroom training, MRV workers receive hands-on training in sample plots to measure DBH and height. These trainings for MRV workers are held everyone in a year.

Field Measurements such as DBH, height shall be measured before each verification event. PP has appointed a team of expert Managers and Carbon Experts to manage the project activity. Accredited laboratories will be consulted to guarantee compliance with the monitoring approach. We shall conduct internal audits and seek external assistance to ensure quality control and assurance processes are followed.

The PP has established SOPs for implementing and monitoring project activity. These procedures define the responsibilities, activities, controls, and steps required to monitor key features, such as:

1. Employee Training
2. Data collection
3. Data quality control and quality assurance
4. Instrument calibration and maintenance

The methodology entails monitoring the following data, which have been identified as being necessary for calculating the estimated emission reduction:

1. Plantation Area
2. Geo-coordinates (Latitude and Longitude)
3. Area of Sample Land Parcel and PSPs
4. Diameter at Breast Height (DBH)
5. Top Tree Height (H)
6. Land Title Records

Parameters collected and measured in the field

Measurements for each sample plots have been taken as per the specific requirement of the tree species. The tree diameter has been measured at DBH (for Red Sander) and Collar Diameter (for horticulture species; Guava and Mango).

DBH: Diameter at breast height for each sampled tree has been calculated from the girth values measured in the field at 1.37m height. Tailor tape has been used for the girth measurement and a stick has been carried to fix 1.37m height for girth measurements.

$$DBH=Girth/3.14$$

If there is multi stem in one tree at the 1.37m or less than 1.37m height, use the following formula to compute DBH:

$$DBH = SQRT\ [SUM\ (stem\ diameter^2)]$$

Collar Diameter: Tree measurements for sampled tree has been taken at the height of between 0-10 cm from ground level and diameter has been calculated. Tailor tape was wrapped around the trunk at this level for the measurements, ensuring the tape was level and not twisted.

$$D=C/3.14$$

If we are measuring collar diameter and the tree is multi stem or there is forked trees present within the sample plot, the measurement will be taken as follows[169]:

- If the distance between forking/branching area to the ground is sufficient (more than 10 cm and there are no swelling/irregularities in stem taper due to forking/branching), the measurements will be taken as collar diameter at the height of between 5-10 cm from ground level for the tree.
- If the distance between forking/branching area to the ground is not sufficient to take one single measurement (less than 10 cm and/or swelling/irregularities in stem taper due to forking/branching), the measurements will be taken for all the branches or stem for the tree.

If there is multi stem in one tree at the root collar, use the following formula to compute DRC[170]

$$DRC = SQRT [SUM (stem\ diameter^2)]$$

Internal audits will be performed on a regular basis to ensure the consistency of monitored data.

Prior to any verification, the PP will conduct a final check of the data and analyse project performance. All MRV personnel involved in the Project Activity will receive the desired training for field measurements. The Project Developer will keep records of trained MRV personnel. The Carbon Credit Manager will ensure that only trained personnel shall carry out the monitoring activity

Height: Suunto clinometer has been used for tree height estimations in permanent sample plots. While measuring the height of the tree, observer eyes the tree top and points 45°C angle in clinometer which adjusting himself near to/far away with respect to tree.

[169] How should we measure the DBH of multi-stemmed urban trees?
[170] Urban Tree Database and Allometric Equations

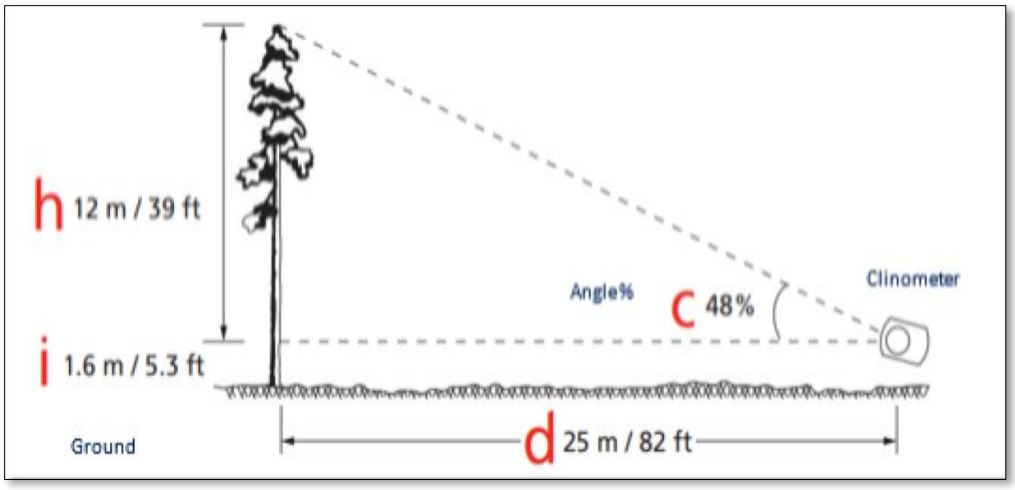


Figure: Trigonometric method for heigh measurement

Strategy of measurement of trees in sample plot

Sampling was carried out in accordance with the stratification as defined above. Some studies have been carried out to in order to define an optimal plot design for tree inventory as a result, the size of sample plots will be of 625 m2 (for Mango and Red Sander) and 225 m2 (for Guava)

for all the strata. Limitations associated with the establishment of circular plots within tree planted representing a high effort, being unjustifiably time consuming and consequently carrying high costs result in the delineation of square sample plots of 25m*25m and 15m*15m. Within the sample plots all the trees present will be monitored and measured at each verification event.

Internal audits will be performed on a regular basis to ensure the consistency of monitored data. Prior to any verification, the PP will conduct a final check of the data and analyse project performance. All MRV personnel involved in the Project Activity will receive the desired training for field measurements. The Project Dev eloper will keep records of trained MRV personnel. The Carbon Credit Manager will ensure that only trained personnel shall carry out the monitoring activity.

Monitoring of sample plots for all the tree species planted:

Step 1:

- Record the GPS location of four corner of each PSPs
- Conting the number of trees in each PSPs
- DBH was measured for Red Sander and collar diameter was measured of Mango and Guava

Step 2:

- Each tree growth measurements (collar diameter, diameter and height) were recorded for biomass estimation

Monitoring the baseline trees (if any):

In this project activity, no felling of existing trees and clearing of vegetation have been proposed due to the project implementation. The baseline trees are neither harvested, nor cleared, nor removed throughout the crediting period of the Project activity. However, if any baseline tree is present under the project area, as per the PRA survey conducted, trees will remain in the field until its life cycle.

The plantation activity is just digging the pit for plantation of the sapling, and no disturbance and/or damage will occur because of implementation of the project activity to the baseline trees. No machinery has been used or will be used for the preparation and tree plantation activity. Also, as previously stated, as per PRA survey, baseline trees (if present) will remain undisturbed in the field until its lifecycle. Project implementation and management team has ensured that baseline trees will not suffer mortality because of competition from trees planted in the project.

The project implementation and management activities did not impact the growth of baseline trees. The project involves block plantations of selected tree species, which are easily distinguishable from baseline trees based on their growth patterns, species characteristics, and their distinct placement within the project area. Baseline trees, including those existing along boundaries, have been preserved and carefully monitored to ensure no adverse effects from project activities.

Stakeholders are advised for the regular monitoring of the baseline trees to ensure that any issues impacting are promptly identified and addressed. Farmers, involvement will aid in the protection and preservation of the trees

Any non-conformities identified during the internal audit; a non-conformity report is prepared which consists of the root cause of the non-conformity. Once the non-conformity is reported, Carbon Credit Manager in consultation with Carbon Credit Head, Plantation Head, MRV Personnel, Forestry Expert prepares the corrective action measure s and implements the same. After the implementation of the corrective actions the Internal Audit team conducts assessment on the non-conformity and if found ok, the Internal Audit closes the non-conformity.

QA/QC for field measurements

Obtaining accurate field measurements is a critical step in the quality assurance process. All participants are receiving extensive training in field data collecting and interpretation. This training will thoroughly educate each team member with all procedures, emphasizing the need of accurate data gathering. Standard Operating Procedures (SOPs) specify the required measurements and methods.

QA/QC for Data Entry

Accurate carbon estimates require accurate data entering spreadsheets for analysis. Errors will be reduced by adopting the appropriate steps. The results were reviewed by double-checked for

typo errors. If there are unsolved difficulties with monitoring plot data, it should not be used for analysis.

QA/QC for Data Archiving

All electronic data and reports will be duplicated onto long-lasting media, such as External Hard Drives (EHDs), and copies of the EHDs will be stored in multiple places.

7 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

7.1 Data and Parameters Monitored

Data / Parameter	Total area of the project in PAI-1
Data unit	Hectare
Description	Size of the area where the project has been implemented
Value applied:	894.06
Comments	None

Data / Parameter	Ai
Data unit	Hectare
Description	Area of stratum i
Value applied:	Project Stratification for the first Project Activity phase is based on the year of plantation and species planted. Strata wise total area for the first Project Activity phase using GIS is given in below table:

Stratum Name	Area
2018 Mango	258.02
2019 Mango	115.32
2020 Mango	76.96

	2021 Mango: 93.61 2022 Mango: 74.86 2023 Mango: 68.5 2019 Red Sander: 22.09 2020 Red Sander: 19 2021 Red Sander: 12.1 2022 Red Sander: 27.77 2018 Guava: 15.79 2019 Guava: 20 2020 Guava: 14.63 2021 Guava: 43.96 2022 Guava: 31.45
Comments	None

Data / Parameter	DBH/Collar diameter
Data unit	cm
Description	Diameter of the tree at breast height (1.37m) and collar diameter at height of between (0 - 10) cm
Value applied:	Applied at ER sheet separately for each tree monitoring in the sample plots
Comments	None

Data / Parameter	Allometric equation or volumetric equation
Data unit	NA
Description	Calculation of above ground dry biomass of tree
Value applied:	*M. indica*: Y= 30.40*EXP(-5.07*EXP(-0.26*collar diameter)+ 1.277 *Psidium gujava*: $Y=0.069*CD^{2.456}$ *P. santilinus*: v^1/2=-0.144504+2.943115*D

Comments	None

Data / Parameter	BGB (Root-to-Shoot Ratio)
Data unit	Dimensionless
Description	Root-shoot ratio appropriate for biomass stock
Value applied:	0.25
Comments	None

Data / Parameter	Total Biomass (TB)
Data unit	t.d.m/ha
Description	TB of tree species in sample plot of stratum at time t calculated using allometric equations for AGB and Root shoot ratio for BGB
Value applied:	It will be calculated-

Stratum Name	(t.dm/ha)
2018 Mango	34.79
2019 Mango	32.85
2020 Mango	30.52
2021 Mango	22.98
2022 Mango	10.44
2023 Mango	10.24
2019 Red Sander	143.44
2020 Red Sander	180.61
2021 Red Sander	80.41
2022 Red Sander	106.45
2018 Guava	7.91
2019 Guava	6.68
2020 Guava	15.77
2021 Guava	8.53

	2022 Guava	12.27
Comments	None	

Data / Parameter	Soil Organic Carbon (SOC)
Data unit	tC/ha/yr
Description	Soil organic carbon (SOC) refers only to the carbon component of organic compounds.
Value applied:	0.8 tC/ha/yr for Madhya Pradesh and 0.8 for Andhra Pradesh and Tamil Nadu respectively
Comments	None

Data / Parameter	Size of Each PSPs in the Stratum i (APlot i)
Data unit	Hectares (ha)
Description	An area of 25-meter x 25-meter size (Mango & Red sander) and 15 meter x 15 meter (Guava) (measuring 0.0625 ha & 0.0225 ha) is measured and marked within each sample land parcel. The selection of 0.0625 ha PSP is based on the CDM manual for "Measurements for Estimation of Carbon Stocks"

Value applied:

Stratum Name	Number of PSPs based on tool
2018 Mango	14
2019 Mango	7
2020 Mango	4
2021 Mango	4
2022 Mango	2
2023 Mango	2
2019 Red Sander	2
2020 Red Sander	1
2021 Red Sander	1
2022 Red Sander	1
2018 Guava	1
2019 Guava	2

	2020 Guava: 4 2021 Guava: 1 2022 Guava: 1
Comments	None

Data / Parameter	$A_{Burn,i,t}$
Data unit	Hectare
Description	Area burnt in stratum i in year t; ha
Value applied:	

Stratum	$A_{Burn,i,t}$
2018 Mango	0
2019 Mango	0
2020 Mango	0
2021 Mango	0
2022 Mango	0
2023 Mango	0
2019 Red Sander	0
2020 Red Sander	0
2021 Red Sander	0
2022 Red Sander	0
2018 Guava	0
2019 Guava	0
2020 Guava	0
2021 Guava	0
2022 Guava	0

Comments	None

Data / Parameter	Wi
Data unit	Dimensionless
Description	Relative weight of the area of stratum i, the area of the stratum i divided by the project area
Value applied:	

Stratum Name	Wi

	2018 Mango	0.29
	2019 Mango	0.13
	2020 Mango	0.09
	2021 Mango	0.10
	2022 Mango	0.08
	2023 Mango	0.08
	2019 Red Sander	0.02
	2020 Red Sander	0.02
	2021 Red Sander	0.01
	2022 Red Sander	0.03
	2018 Guava	0.02
	2019 Guava	0.02
	2020 Guava	0.02
	2021 Guava	0.05
	2022 Guava	0.04
Comments	None	

Data / Parameter	Tree Height (H)
Data unit	Meters (m)
Description	Height of the trees
Value applied:	Height is not used as equation is developed only basis of diameter or collar diameter
Comments	None

Data / Parameter	Land Title Records
Data unit	N/A
Description	Land ownership document of each individual farmers involved in the Project Activity and First Project Activity phase.

Value applied:	Yes
Comments	None

Data / Parameter	Contractual Agreement
Data unit	Yes
Description	Contractual Agreement between each individual farmers and implementation body for the plantation and cultivation of Mango, Red Sander and Guava
Value applied:	Yes
Comments	None

Data / Parameter	AGB
Data unit	Kg.d.m
Description	Above Ground Biomass in kilogram dry matter (kg.d.m)
Value applied:	Please refer the Ex-post Emission Reduction Sheet
Comments	None

Data / Parameter	Wood density
Data unit	kg/m^3
Description	Wood density is used to convert wood volume into biomass for Red sanders.
Value applied:	0.44
Comments	None

Data / Parameter	BEF
Data unit	NA
Description	Biomass expansion factor
Value applied:	1.59
Comments	None

Data / Parameter	DF_{LI}
Data unit	%
Description	Conservative default factor expressing carbon stock in litter as a percentage of carbon stock in tree biomass
Value applied:	1%
Comments	None

Data / Parameter	DF_{DW}
Data unit	%
Description	Conservative default factor expressing carbon stock in deadwood as a percentage of carbon stock in tree biomass
Value applied:	1%
Comments	None

7.2 Baseline Emissions

According to IPCC Good Practice Guidelines for Land Use, Land Use Change, and Forestry (2003), it is assumed that the net greenhouse gas removals by sinks in the baseline are zero because the baseline scenario is the continuation of an activity that has been implemented unchanged for more than 20 years. The baseline scenario was degraded land, which did not allow accumulation of dead wood and litter. Hence, the change in dead wood biomass $\Delta C_{DW\_BSL,t}$ and change in litter biomass $\Delta C_{LI\_BSL,t}$ are considered as zero. However, change in carbon stock in soil organic carbon is not taken into consideration as a part of the baseline activities. Therefore, SOC has been considered as zero in baseline emission calculations. Moreover, baseline emissions estimation was carried out using the A/R Methodological AR-TOOL 14 "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities Version 04.2. Therefore, Baseline net GHG removals by sinks, $\Delta C_{BSL,t}$ is zero. The baseline net GHG removals by sinks shall be calculated according to the equation 1 of AR-ACM0003 methodology v02.0):

$\Delta C_{BSL,t}$ = Baseline net GHG removals by sinks in year t; t CO_2-e

$\Delta C_{TREE\_BSL,t}$ = Change in carbon stock in baseline tree biomass within the project boundary in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO_2-e

$\Delta C_{SHRUB\_BSL,t}$ = Change in carbon stock in baseline shrub biomass within the project boundary, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO_2-e

$\Delta C_{CDW\_BSL,t}$ = Change in carbon stock in baseline dead wood biomass within the project boundary, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO_2-e

$\Delta C_{LI\_BSL,t}$ = Change in carbon stock in baseline litter biomass within the project boundary, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO_2-e

$$\Delta C_{BSL,t} = \Delta C_{TREE\_BSL,t} + \Delta C_{SHRUB\_BSL,t} + \Delta C_{DW\_BSL,t} + \Delta C_{LI\_BSL,t}$$

According to the AR-TOOL 14, carbon stock in trees in the baseline can be accounted as zero if all of the following conditions are met:

(a) The pre-project trees are neither harvested, cleared, nor removed throughout the crediting period of the project activity.

(b) The pre-project trees do not suffer mortality because of competition from trees planted in the project, or damage because of implementation of the project activity, at any time during the crediting period of the project activity; and

(c) The pre-project trees are not inventoried along with the project trees in monitoring of carbon stocks but their continued existence, consistent with the baseline scenario, is monitored throughout the crediting period of the project activity.

The pre-project trees (if present) under the project area, as per the PRA survey conducted, trees will remain in the field until its life cycle. The activity is just digging the pit for plantation of the sapling and no disturbance and/or damage will occur because of implementation of the project activity to the baseline trees. No machinery has been used or will be used for the preparation and tree plantation activity. Project implementation and management team has ensured that baseline trees will not suffer mortality because of competition from trees planted in the project.

The trees planted only under this project activity will be inventoried during the monitoring of the carbon stocks. The Project Activity and First Project Activity Instance is plantation activity in the low productive land parcels, which involves the cultivation of Mango, Guava and Red Sander in the degraded land. The project land parcels were low productive and degraded in the baseline and continue to be degraded in the absence of the project activity.

As the pre-project land was degraded and no pre-project (existing) trees are being harvested for the project implementation and plantation management activity. Hence, $\Delta C_{TREE\_BSL,t}$ is accounted as zero. There is no clearing or slash-and-burning of the vegetation is involved in the project activity for the project implementation and management of the planation activity. Hence, $\Delta C_{SHRUB\_BSL,t}$ in the baseline is accounted as zero. As the pre-project trees will remain undisturbed for its lifecycle. Hence, the change in carbon due to dead wood biomass $\Delta C_{DW\_BSL,t}$ and change in litter biomass $\Delta C_{LI\_BSL,t}$ are considered as zero. Change in carbon stock in soil organic carbon is not taken into consideration as a part of the baseline activities. Therefore, SOC has been considered as zero in baseline emission calculations.

Therefore, Baseline net GHG removals by sinks, $\Delta C_{BSL,t}$ is zero.

$$\boldsymbol{\Delta C_{BSL,t} = 0}$$

7.3 Project Emissions

According to the methodology AR-ACM0003 is stated that if biomass distribution over the project area is not homogeneous, stratification should be carried out to improve the precision of biomass estimation. In the case of the project activity their different conditions of the plantations such as the year of plantation etc. These variables directly affect the biomass distribution of the project activity, the type species and weather conditions are involved in the variable of growth curve. The actual net GHG removals by sinks shall be calculated as follows:

$$\Delta C_{ACTUAL,t} = \Delta C_{P,t} - GHG_{E,t}$$

Where:

$\Delta C_{ACTUAL,t}$ = Actual net GHG removal

s by sinks, in year t; t CO_2-e

$\Delta C_{P,t}$= Change in the carbon stocks in project, occurring in the selected carbon pools, in year t; t CO_2-e

$GHG_{E,t}$ = Increase in non-CO2 GHG emissions within the project boundary as a result of the implementation of the A/R CDM project activity, in year t, as estimated in the tool "Estimation of non-CO_2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity"; t CO_2-e

Estimation of GHG emissions within the project boundary

The increase in GHG emissions as a result of the implementation of the proposed A/R CDM project activity within the project boundary can be estimated as:

$$GHG_E = \sum_{t=1}^{t*} GHG_{E,t}$$

Where;

GHG_E= Increase in GHG emissions as a result of the implementation of the proposed A/R CDM project activity within the project boundary; t CO_2-e

$GHG_{E,t}$= Increase in non- CO_2 emissions due to burning of biomass of existing woody vegetation as part of site preparation in year t, as estimated in the tool "Estimation of non-CO_2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity"; tCO_2e

t= 1,2,3,....t* years elapsed since the start of the A/R CDM project activity

Change in the carbon stocks in project, occurring in the selected carbon pools in year t shall be calculated as follows:

$$\Delta C_{P,t} = \Delta C_{TREE-PROJ,t} + \Delta C_{SHRUB-PROJ,t} + \Delta C_{DW-PROJ,t} + \Delta C_{LI-PROJ,t} + \Delta SOC_{AL,t}$$

$\Delta C_{P,t}$ = Change in the carbon stocks in project, occurring in the selected carbon pools, in year t; tCO_2-e

$\Delta C_{TREE-PROJ,t}$ = Change in carbon stock in tree biomass in project in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; tCO_2-e

$\Delta C_{SHRUB-PROJ,t}$ = Change in carbon stock in shrub biomass in project in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; tCO_2-e

$\Delta C_{DW-PROJ,t}$ = Change in carbon stock in dead wood in project in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; tCO_2-e

$\Delta C_{LI-PROJ,t}$= Change in carbon stock in litter in project in year t, as estimated in the tool "Estimation of carbon stocks due to the implementation of A/R CDM project activities", as estimated in the same tool; tCO_2-e

$\Delta SOC_{AL,t}$= Change in carbon stock in SOC in project, in year t, in areas of land meeting the applicability conditions of the tool "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities", as estimated in the same tool; tCO_2-e

$$\Delta C_{BSL,t} = \Delta C_{TREE-BSL,t} + \Delta C_{SHRUB-BSL,t} + \Delta C_{DW-BSL,t} + \Delta C_{LI-BSL,t}$$

Where:

$\Delta C_{BSL,t}$= Baseline net GHG removals by sinks in year t; t CO_2-e

$\Delta C_{TREE-BSL,t}$= Change in carbon stock in baseline tree biomass within the project boundary in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO_2-e

$\Delta C_{SHRUB-BSL,t}$ = Change in carbon stock in baseline shrub biomass within the project boundary, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO_2-e

$\Delta C_{DW-BSL,t}$ = Change in carbon stock in baseline dead wood biomass within the project boundary, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO_2-e

$\Delta C_{LI-BSL,t}$= Change in carbon stock in baseline litter biomass within the project boundary, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO_2-e

Estimation of tree above ground biomass

Species specific volume equations are used to convert tree dimensions to volume of tree. Tree volume is converted to above-ground tree biomass using biomass expansion factors, and the above-ground tree biomass is expanded to total tree biomass using root-shoot rations.

Y= 30.40*EXP(-5.07*EXP(-0.26*collar diameter) + 1.277 for Mango

$Y = 0.069 \times CD^{2.456}$ for Guava

$v^{1/2}$=-0.144504+2.943115*D for Red Sander

Estimation in the changes in carbon stock in dead wood:

The change in carbon stock in deadwood biomass in project in year t is estimated based on the equation 9, para 34 of the AR-CDM Tool 12 v03.1;

$$C_{DWi,t} = C_{Tree,i,i} \text{ X } DF_{DW}$$

According to the data provided in table 5 of the tool, the deadwood pool is conservatively estimated to be 1% of the tree biomass[171].

Estimation in the changes in carbon stock in litter:

The change in carbon stock in litter biomass in project in year t is estimated based on the equation 15, para 45 of the AR-CDM Tool 12 v03.1;

$$C_{LI,i,t} = C_{TREE,i,i} \times DF_{LI}$$

According to the data provided in table 6 given in tool, the litter pool is conservatively considered 1 % of the tree biomass[172]

Above and below ground biomass have been estimated according to the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activity".

Soil organic carbon

Estimations of soil organic carbon (SOC) stocks were done accordance to the "Tool for the change in soil organic carbon stocks due to the implementation of A/R CDM project activity". As suggested by the tool, it is assumed that the implementation of the project activity increases the SOC content of the lands from the pre-project level to the level that is equal to the steady-state of SOC content under native vegetation. The increase in SOC content in the project scenario takes place at a constant rate over a period of 20 years from the year of planting.

The project meets the applicability conditions of this tool since:

- The areas of land to where the tool is applied do not fall into wetland category and are not subject to any of the land management practices and application of tool;
- Additionally, in this section details the type of land or category that the project plantations fall, with this it's also demonstrated that the project plantations don't fall in wetland category. The main soils related to the project boundary of Assam is silicate clay mineral[173] i.e. kaolinite and illite etc. However, in project boundary of Madhya Pradesh, soils with low activity clay (LAC) minerals are highly weathered soils, dominated by 1:1 clay minerals and amorphous[174].
- Litter and dead wood remains on site and are not removed and soil disturbance is in accordance to appropriate conservation practices, limited to site preparation and not repeated within 20 years.

[171] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-12-v3.1.pdf
[172] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-12-v3.1.pdf
[173] https://www.sciencedirect.com/science/article/abs/pii/0168583X93951917
[174]https://www.academia.edu/29824526/Geological_Scenario_of_Bangar_Area_Dewas_District_Malwa_Region_Madhya_Pradesh_India

Parameter	Symbol	Value		Source (SOC Estimation tool V01.1.0)[175]
		Andhra Pradesh and Tamil Nadu	Madhya Pradesh	
Reference SOC (tC/ha)	$SOC_{REF,i}$	65	47	HAC soil is predominately present in the Andhra Pradesh and Tamil Nadu whereas LAC soil is in Madhya Pradesh[176]
Land use factor	$f_{LU,i}$	0.48	0.48	Short-term or set aside cropland
Management	f_{MG}	1.00	1.00	Full tillage (Substantial soil disturbance with full inversion and/or frequent (within-year) tillage operations. At planting time, little (e.g. <30%) of the surface is covered by residues)
Input	f_{IN}	1.00	1.00	Medium (All crop residues are returned to the field)

SOC at the beginning of the project ($SOC_{INITIAL,i}$) is estimated by multiplying the factors in Table by the reference SOC. As per the tool, a loss in SOC ($SOC_{LOSS,i}$) is applied in the case that soil disturbance occurs on more than 10 per cent of the land area, for the case of the project activity this is not the case, therefore $SOC_{LOSS,i}$ is zero. The following methodological formula is used for calculating the annual change in SOC stock.

$$dSOC_{i,t} = \frac{SOC_{REF,i} - \left(SOC_{INITIAL,i} - SOC_{LOSS,i}\right)}{20 \text{ years}}$$

Where:

$dSOC_{i,t}$ = The rate of change in SOC stock in stratum i of the area of land, in year t; tC/ha/year

$SOC_{REF,i}$= Reference SOC stock corresponding to the reference condition in native lands by climate region and soil types applicable to stratum i of the area of land; tC/ha

$SOC_{INITIAL,i}$= SOC stock at the beginning of the A/R project activity in stratum i of the areas of land

$SOC_{LOSS,i}$ = Loss of SOC caused by soil disturbance attributable the A/R project activity, in stratum i of the areas of land; tC/ha

The result of $dSOC_{i,t}$ is 0.8 t C/ha/year, therefore this is the value of the increase of the soil organic carbon.

[175] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-16-v1.1.0.pdf
[176] https://oar.icrisat.org/6817/1/CurrentSc_104_10_1308-1323_2013.pdf

7.4 Leakage Emissions

As per the monitoring survey, during and after the project activity and first project activity instance implementation, there are no grazing activities involved in the project activity in the current monitoring period, so leakage emission attributable to the displacement of grazing activities is accounted as.

According to AR-Tool 15, The leakage is estimated as follows:

$$\boldsymbol{LKt = LKAGRIC,t}$$

$$\boldsymbol{LK_{AGRIC,t} = 44/12 \times [\Delta C_{BIOMASS,t} + \Delta SOC_{LUC,t}]}$$

Since there is no harvesting or displacement of trees in the pre-project scenario involved under this project activity, the only displacement of agriculture activities has been considered as traditional seasonal agriculture practices of crops which are considered in the category of Shrubs. Hence, b_{TREE} and $\Delta SOC_{LUC,t}$ is considered as 0.

Thus, according to equation 2 given in CDM AR-Tool 15:

$$\boldsymbol{\Delta C_{BIOMASS,t} = [b_{SHRUB} \times (1 + R_S)] \times CF \times A_{DISP,t}}$$

$A_{DISP,t}$ is calculated by considering a 50 cm radius spherical buffer around each planting unit. So, $A_{DISP,t}$= (π*r2)*No of plants, where r=0.5m or 50cm.

As per Para 3 (a) (iii) of "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities", Version 1.1.0, estimation of change in soil organic carbon is not applicable. Hence,

$$\boldsymbol{\Delta SOC_{LUC,t} = 0}$$

Hence,

$$LK_{AGRIC,t} = \frac{44}{12} \times \left(\Delta C_{BIOMASS,t}\right)$$

As per tool 14, Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities,

$$b_{SHRUB,i} = BDR_{SF} \times b_{FOREST} \times CC_{SHRUB,i}$$

BDR_{SF} = 0.10, default value

b_{FOREST} = 73, default value for Forest in India as per table 3A.1.4 of IPCC GPG-LULUCF 2003

CC_{SHRUB}, = 0.5, default value as per the CDM AR- Tool 14 Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities, version 04.2, para 64, table 2.

As PP has considered the displacement of agricultural activity as a result of the project activities, leakage emissions have been considered for the life of the project for displaced agriculture activity.

Hence, Leakage emissions due to project activity:

$$LK_t = LK_{AGRIC,t} = 1{,}336 \text{ t } CO_2e$$

7.5 GHG Emission Reductions and Carbon Dioxide Removals

State the non-permanence risk rating (%)	20	
Has the non-permanence risk report been attached as either an appendix or a separate document?	☒ Yes	☐ No
For ARR and IFM projects with harvesting, state, in $tCO_2e$the Long-term Average (LTA).	169,623	
Has the LTA been updated based on monitored data, if applicable?	☒ Yes	☐ No
State, in tCO_2e, the expected total GHG benefit to date	65,813	
If a loss occurred (including a loss event or reversal), state the amount of tCO_2e lost:	☐ Yes	☒ No

Vintage period	Baseline emissions (tCO_2e)	Project emissions (tCO_2e)	Leakage emissions (tCO_2e)	Buffer pool allocation (tCO_2e)	Reductions VCUs (tCO_2e)	Removals VCUs (tCO_2e)	Total VCU issuance (tCO_2e)
01-Mar-2018 to 31-Dec - 2018	0	8,741	174	1,748	0	8,567	6,819
1-Jan-2019 to 31-Dec-2019	0	10,461	208	2,092	0	10,253	8,160
1-Jan-2020 to 31-Dec-2020	0	10,461	208	2,092	0	10,253	8,160
1-Jan-2021 to 31-Dec-2021	0	10,461	208	2,092	0	10,253	8,160
1-Jan-2022 to 31-Dec-2022	0	10,461	208	2,092	0	10,253	8,160
1-Jan-2023 to 31-Dec-2023	0	10,461	208	2,092	0	10,253	8,160

1-Jan-2024 to 30-Sep-2024	0	6,104	121	1,221	0	5,983	4,762
Total	**0**	**67,149**	**1,336**	**13,430**	**0**	**65,813**	**52,381**

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/ removals	Percent difference	Explanation for the difference
01-Mar-2018 to 31-Dec -2018	1,240	8,567	(+)18.61	The percentage difference between the total achieved reduction/removal and the ex post estimated reduction/removal is due to the following reasons: First, the actual emission reduction achieved may be similar to the estimated reduction, with minimal variance, due to the relatively small difference in plantation density. Second, difference arises from variation in growth parameters (DBH and height) based on secondary data versus the actual recorded data in the field.
1-Jan-2019 to 31-Dec-2019	3,614	10,253		
1-Jan-2020 to 31-Dec-2020	6,120	10,253		
1-Jan-2021 to 31-Dec-2021	9,646	10,253		
1-Jan-2022 to 31-Dec-2022	12,384	10,253		
1-Jan-2023 to 31-Dec-2023	13,617	10,253		
1-Jan-2024 to 30-Sep-2024	6,945	5,983		
Total	53,566	65,813		

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

Section	Information	Justification
1.8	Land ownership documents	As this information pertains to stakeholders' private data and may violate their privacy rights, it has been excluded from the public version of the documents.
1.8	Agreements between the project implementer and farmer community	
1.12	Agreement between the project implementer and PP	
2.3.5	Benefit sharing mechanism	

APPENDIX 2: PLANTATION DETAILS

Number of for Andhra Pradesh in PAI-1

Farmer name	District	Village name	Plantation year	Species Name	Area ha.	Latitude	Longitude
D Kailasaiah	Chittoor	Um Puram Hw	2018	Mango	0.41	13.3109	79.3478
M Armugam	Chittoor	Um Puram Hw	2020	Mango	0.24	13.3106	79.3501
M Munaswamy	Chittoor	Um Puram	2020	Mango	0.24	13.3096	79.3482
D Muragaiah	Chittoor	Um Puram	2018	Mango	0.21	13.3084	79.3420
D Lakshmamma	Chittoor	Um Puram	2018	Mango	0.29	13.3095	79.3430
A Sambasivan	Chittoor	Um Puram	2020	Mango	0.28	13.3084	79.3431
B Rajamma	Chittoor	Repalli	2023	Mango	0.78	13.2931	79.3542
S Reddy	Chittoor	Chinnathayyur	2022	Mango	0.1	13.3030	79.3124
Y Hemadri	Chittoor	Chinnathayyur	2018	Mango	0.93	13.3025	79.3118
N Sankaraiah	Chittoor	Pedda Thayyur	2022	Mango	0.14	13.3029	79.3088
N Ravibabu	Chittoor	Pedda Thayyur	2022	Mango	0.19	13.3029	79.3086
N Lakshmaiah	Chittoor	Pedda Thayyur	2023	Mango	0.19	13.3029	79.3083
N Gangaiah	Chittoor	Pedda Thayyur	2022	Mango	0.41	13.3028	79.3080
B Savithramma	Chittoor	Um Puram	2018	Mango	0.4	13.3108	79.3441
M Subramanyam Naidu	Chittoor	Repalli	2020	Mango	0.45	13.2892	79.3524
A Ramesh	Chittoor	Um Puram	2020	Mango	0.53	13.3121	79.3482
B Jayaramaiah	Chittoor	Um Puram	2020	Mango	0.2	13.3123	79.3476
A Sivaji	Chittoor	Um Puram	2021	Mango	0.21	13.3123	79.3495
C Jayamma	Chittoor	Um Puram	2020	Mango	0.25	13.3123	79.3487
B Ananda Naidu	Chittoor	Repalli	2023	Mango	1.54	13.2953	79.3545
A.Venkatesulu	Chittoor	Varadappa Naidu Kandriga	2020	Mango	0.49	13.1967	79.3001
Krishnamandadi	Chittoor	Gollakandriga	2023	Mango	0.11	13.1989	79.3020
P.Krishnamandadi	Chittoor	Gollakandriga	2023	Mango	0.21	13.1984	79.3020
P.Kuppamma	Chittoor	Gollakandriga	2018	Mango	0.29	13.2000	79.3023

T.Subramanyam Naidu	Chittoor	Kothakandriga	2018	Mango	0.55	13.2055	79.3069
T.Saraswathi	Chittoor	Kothakandriga	2018	Mango	1.15	13.2055	79.3075
T.Saraswathi	Chittoor	Kothakandriga	2020	Mango	0.1	13.2063	79.3075
P.Vasntha	Chittoor	Golla Kandriga	2020	Mango	0.18	13.1930	79.3201
G.Doraswamy Mandadi	Chittoor	Jayalakshmi Puram	2020	Mango	0.49	13.1934	79.3190
G.Nagaraju Yadav	Chittoor	Jayalakshmi Puram	2018	Mango	0.27	13.1929	79.3193
G.Doraswamy Mandadi	Chittoor	Jayalakshmi Puram	2020	Mango	0.18	13.1925	79.3188
K.Jairam Mandadi	Chittoor	Jayalakshmi Puram	2020	Mango	0.13	13.1934	79.3195
K.Nagaraju	Chittoor	Jayalakshmi Puram	2021	Mango	0.31	13.1911	79.3221
V.Govindaiah	Chittoor	Mangunta	2022	Mango	0.32	13.3143	79.2954
V.Govindaiah	Chittoor	Mangunta	2023	Mango	0.35	13.3153	79.2954
K.Haimavathi	Chittoor	Mangunta	2019	Mango	0.61	13.3229	79.2906
T.Srinivas	Chittoor	Kotha Kandriga	2018	Mango	0.61	13.2059	79.3116
T.Srinivas	Chittoor	Kottha Kandriga	2018	Mango	0.92	13.2055	79.3121
T.Saraswathi	Chittoor	Kottha Kandriga	2018	Mango	0.16	13.2047	79.3120
K.Lokanadha Naidu	Chittoor	Kottha Kandriga	2023	Mango	0.65	13.2110	79.3112
K.Naveen Kumar	Chittoor	Kottha Kandriga	2022	Mango	0.1	13.1928	79.3076
K.Savithri	Chittoor	Jaya Lakshmi Puram	2022	Mango	0.42	13.1895	79.3216
K.Munemma	Chittoor	Jayalakshmi Puram	2020	Mango	0.41	13.1904	79.3216
K.Subbaiah Mandadi	Chittoor	Jayalakshmi Puram	2021	Mango	0.5	13.1902	79.3192
K.Subbaiah Mandadi	Chittoor	Jayalakshmi Puram	2022	Mango	0.22	13.1905	79.3207
M.Sudhakar Naidu	Chittoor	Kottha Kandriga	2023	Mango	0.75	13.2111	79.3107
M.Sudhakar Naidu	Chittoor	Kottha Kandriga	2023	Mango	0.68	13.2108	79.3101
E.Narayanaswamy Naidu	Chittoor	Amudala	2018	Mango	0.29	13.1934	79.3061
E.Pappamma	Chittoor	Amudala	2022	Mango	0.1	13.1918	79.3071
E.Pappamma	Chittoor	Amudala	2018	Mango	0.28	13.1936	79.3062
E.Pappamma	Chittoor	Amudala	2019	Mango	0.24	13.1941	79.3069
E.Narayana Swamy Naidu	Chittoor	Amudala	2019	Mango	0.1	13.1941	79.3066
E.Subramanyam Naidu	Chittoor	Amudala	2022	Mango	0.19	13.1921	79.3082

E.Subramanyam Naidu	Chittoor	Amudala	2020	Mango	0.12	13.1926	79.3070
E.Ayyappa	Chittoor	Amudala	2020	Mango	0.18	13.1932	79.3095
E.Ayyappa	Chittoor	Amudala	2023	Mango	0.41	13.1936	79.3072
Munemma	Chittoor	Vejjupalli	2020	Mango	0.57	13.3039	79.2100
Rajendrayya	Chittoor	Vejjupalli	2018	Mango	0.41	13.3038	79.2090
Bujjamma	Chittoor	Vejjupalli	2019	Mango	0.43	13.3038	79.2094
Doraswami	Chittoor	Vejjupalli	2019	Mango	0.1	13.3028	79.2096
V.Santhosh	Chittoor	Amudala	2023	Mango	0.12	13.1916	79.3078
V.Santhosh	Chittoor	Amudala	2022	Mango	0.12	13.1918	79.3081
V.Kumar	Chittoor	Amudala	2022	Mango	0.12	13.1918	79.3083
B.Charles Babu	Chittoor	L.N.Puram	2023	Mango	0.47	13.1965	79.3289
Z.Asadulla Hussain	Chittoor	L.N.Puram	2023	Mango	0.55	13.1963	79.3297
S.Saqalain Hyder	Chittoor	L.N.Puram	2023	Mango	0.34	13.1957	79.3299
Z.Sharif Ali	Chittoor	L.N.Puram	2018	Mango	0.18	13.1978	79.3287
Z.Sharif Ali	Chittoor	L.N.Puram	2018	Mango	0.29	13.1980	79.3286
Z.Asadulla Hussain	Chittoor	L.N.Puram	2023	Mango	0.33	13.1957	79.3303
Z.Sharif Ali	Chittoor	L.N.Puram	2018	Mango	0.23	13.1983	79.3295
E.Venkatesulu	Chittoor	Amudala	2023	Mango	0.2	13.1918	79.3076
E.Manojraja	Chittoor	Amudala	2021	Mango	0.43	13.1869	79.3080
E.Meenakshmi	Chittoor	Jayalakshmi Puram	2021	Mango	0.5	13.1919	79.3250
G.Sarojamma	Chittoor	Amudala	2020	Mango	0.44	13.1924	79.3244
G.Sarojamma	Chittoor	Jayalakshmi Puram	2020	Mango	0.41	13.1925	79.3250
G.Sarojamma	Chittoor	Amudala	2020	Mango	0.57	13.1929	79.3243
G.Sarojamma	Chittoor	Amudala	2020	Mango	0.3	13.1931	79.3250
E.Sarojamma	Chittoor	Amudala	2020	Mango	0.66	13.1929	79.3255
Giri Babu	Chittoor	Vejjupalli	2018	Mango	0.52	13.3024	79.2086
Raj Reddy	Chittoor	Vejjupalli	2018	Mango	0.4	13.2987	79.2078
Rajendrayya	Chittoor	Vejjupalli	2018	Mango	0.4	13.2972	79.2036
Rajendra	Chittoor	Vejjupalli	2018	Mango	0.41	13.2972	79.2040

Munirathnam Reddy	Chittoor	Vejjupalli	2018	Mango	0.26	13.2974	79.1976
Munirathnam Reddy	Chittoor	Vejjupalli	2018	Mango	0.32	13.2970	79.1977
Eswaramma	Chittoor	Vejjupalli	2018	Mango	0.28	13.2978	79.1976
Kanukonda Reddy	Chittoor	Vejjupalli	2018	Mango	1.19	13.2888	79.2062
E.Veeraswamy Naidu	Chittoor	Amudala	2018	Mango	0.19	13.1897	79.3051
E.Veeraswamy Naidu	Chittoor	Amudala	2018	Mango	1.1	13.1891	79.3074
Markondayya	Chittoor	Bandarlla Palli Hw	2018	Mango	0.19	13.2751	79.2023
Vallemma	Chittoor	Bandallapallihw	2020	Mango	0.18	13.2877	79.2030
Vallemma	Chittoor	Bandarllapalli	2018	Mango	0.27	13.2881	79.2057
P.Anusuyamma	Chittoor	Varadappa Naidu Kandriga	2018	Mango	0.66	13.2001	79.2991
P.Anusuyamma	Chittoor	Varadappa Naidu	2018	Mango	0.3	13.2002	79.2996
P.Subbamma	Chittoor	Varadappa Naidu Kandriga	2020	Mango	0.49	13.1985	79.2982
P.Subbamma	Chittoor	Varadappa Naidu	2018	Mango	0.54	13.1988	79.2990
Lokanadam Reddy	Chittoor	Pidathala Byllu	2018	Mango	0.12	13.2975	79.1885
Lokanadam Reddy	Chittoor	Pidathala Bayllu	2021	Mango	0.42	13.2996	79.1932
Baskar Reddy	Chittoor	Padathalabayllu	2019	Mango	0.19	13.2979	79.1875
Baskar Reddy	Chittoor	Pidathalabayllu	2022	Mango	0.3	13.2988	79.1886
Raamemma	Chittoor	Pidathalabayllu	2021	Mango	0.48	13.2990	79.1925
Chamgamma	Chittoor	Pidathala Bayllu	2021	Mango	0.24	13.2994	79.1922
Vennella	Chittoor	Pidathalabyllu	2019	Mango	0.31	13.2971	79.1873
Parvathi	Chittoor	Pidathala Byllu	2019	Mango	0.44	13.2961	79.1869
Yammama Reddy	Chittoor	Pidathala Bayllu	2019	Mango	0.45	13.2967	79.1873
Narasimha Reddy	Chittoor	Pidathala Bayllu	2021	Mango	0.28	13.3150	79.1757
B.Ramachandra Naidu	Chittoor	Amudalaputhur	2018	Mango	0.64	13.1834	79.2861
B.Ramachandra Naidu	Chittoor	Amudala Puttur	2023	Mango	0.28	13.1843	79.2859
P.Chandra Sekhar Naidu	Chittoor	Varadappa Naidu	2022	Mango	0.45	13.1981	79.2979
G.Renuka	Chittoor	Kaveri Rajapuram	2018	Mango	0.38	13.1929	79.2948

P.Lakshmana	Chittoor	Amudalaputhur	2018	Mango	0.42	13.1810	79.2860
P.Lakshmana	Chittoor	Amudalaputhur	2018	Mango	0.36	13.1810	79.2856
P.Lakshmana	Chittoor	Amudalaputhur	2018	Mango	0.3	13.1811	79.2851
Krisnayya	Chittoor	Bandarlla Pallihw	2018	Mango	0.35	13.1811	79.2847
Krisnayya	Chittoor	Bandarlla Pallihw	2018	Mango	0.51	13.2909	79.2016
Nvanetha	Chittoor	Bandarlla Pallihw	2019	Mango	0.42	13.2873	79.2007
Navanethamma	Chittoor	Bandarlla Pallihw	2019	Mango	0.4	13.2876	79.2007
Krisnayya	Chittoor	Bandarlla Pallihw	2019	Mango	0.4	13.2862	79.2008
Narisimha reddy	Chittoor	Vejjupalli	2018	Mango	0.47	13.2850	79.2092
Subramanyam reddy	Chittoor	Vejjupalli	2018	Mango	0.41	13.2859	79.2095
Subramanyam reddy	Chittoor	Vejjupalli	2018	Mango	0.58	13.2852	79.2087
Bubbamma	Chittoor	Krisnapuram	2018	Mango	0.4	13.2860	79.2091
Chinnamma	Chittoor	Krisnapuram	2021	Mango	0.41	13.2836	79.1941
Chinnamma	Chittoor	Krisnapuram	2019	Mango	0.52	13.2827	79.1947
Srinivasulu reddy	Chittoor	Krisna Puram	2019	Mango	0.59	13.2878	79.1861
Srinivasulu reddy	Chittoor	Krisnapuram	2019	Mango	0.42	13.2885	79.1863
Mohan reddy	Chittoor	Krisnapuram	2019	Mango	0.56	13.2873	79.1867
G.Bharath	Chittoor	Kaveri Rajapuram	2019	Mango	0.27	13.2868	79.1866
A.anandamma	Chittoor	Kaveri Rajapuram	2023	Mango	0.1	13.1941	79.2975
Mallampati Rajaram	Chittoor	Kaveri Rajapuram	2022	Mango	0.46	13.1951	79.2999
T.Govindamma	Chittoor	Kothavenkatapuram	2023	Mango	0.81	13.1494	79.2505
G.Balaiah naidu	Chittoor	Kaveri Rajapuram	2023	Mango	0.39	13.1489	79.2509
G.Balaiah naidu	Chittoor	Kaveri Rajapuram	2018	Mango	0.32	13.1915	79.2985
J Krishna naidu	Chittoor	Amudala	2020	Mango	0.69	13.1894	79.2992
Mallempati rajaram	Chittoor	Kaveri Rajapuram	2022	Mango	0.19	13.1952	79.2994
Ravindraredfy	Chittoor	Vejjupalli	2018	Mango	0.39	13.2857	79.2072
Narasimha reddy	Chittoor	Krisnapuram	2018	Mango	0.31	13.2857	79.2066
Narasimha reddy	Chittoor	Krisnapuram	2018	Mango	1.38	13.2856	79.1976
Janakiram reddy	Chittoor	Krisnapuram	2021	Mango	0.27	13.2824	79.1979

Narasimha reddy	Chittoor	Krisnapuram	2019	Mango	0.72	13.2772	79.2054
Chinnabba reddy	Chittoor	Krisnapuram	2021	Mango	0.59	13.2797	79.2031
Chinnabba reddy	Chittoor	Kisnapuram	2018	Mango	0.65	13.2818	79.1988
Chinnabba reddy	Chittoor	Krisnapuram	2018	Mango	0.42	13.2821	79.1985
Changalry reddy	Chittoor	Krisnapuram	2019	Mango	0.72	13.2860	79.1867
Changalrya reddy	Chittoor	Krisnpuram	2019	Mango	0.68	13.2848	79.1871
Dhanlkhmi	Chittoor	Bandrllpilli	2019	Mango	0.38	13.2853	79.1865
Ramireddy	Chittoor	Krisnapuram	2019	Mango	0.36	13.2861	79.1898
Rami reddy	Chittoor	Karisna Puram	2022	Mango	0.41	13.2798	79.2023
Chinnamma	Chittoor	Krisnapuram	2021	Mango	0.12	13.2741	79.2051
M.Kesavulu naidu	Chittoor	Amudala	2021	Mango	0.97	13.2802	79.1995
Karajala kiran	Chittoor	Amudala	2018	Mango	0.43	13.1922	79.3019
Karjala Kiran	Chittoor	Amudala	2018	Mango	0.3	13.1927	79.3276
A.Ramachandra Naidu	Chittoor	L N Puram	2020	Mango	0.5	13.1944	79.3281
K.V.venkatesulu naidu	Chittoor	L.N.Puram	2018	Mango	0.63	13.1925	79.3330
M.Bakthavachalam naidu	Chittoor	Kaveri Rajapuram	2018	Mango	0.5	13.1923	79.3326
T Saraswathi	Chittoor	Amudala	2021	Mango	0.19	13.1916	79.3272
Suguna	Chittoor	Pathapalem	2021	Mango	0.26	13.2880	79.3673
E.Venktapathi	Chittoor	Pathapalem	2018	Mango	0.29	13.2830	79.3699
A.koteswraoo	Chittoor	Pathapaleam	2018	Mango	0.33	13.2895	79.3656
Koteswraroo	Chittoor	Pathapaleam	2018	Mango	1.22	13.2791	79.3648
A.ravi	Chittoor	Pathapaleam	2020	Mango	0.43	13.2793	79.3652
B.lalitha	Chittoor	Dasarigunta Village	2020	Mango	0.35	13.2866	79.3693
J.Lokanadhanaidu	Chittoor	Kondrajupuram	2020	Mango	0.18	13.2863	79.3693
Jyothi	Chittoor	Thokalachenu	2018	Mango	0.49	13.2756	79.3520
Dillep reddy	Chittoor	Krisnspuram	2021	Mango	0.32	13.2817	79.1971
Prasanna	Chittoor	Krisnapuram	2021	Mango	0.75	13.2884	79.1856
Kanakamma	Chittoor	Krisnapuram	2021	Mango	0.61	13.2885	79.1848
Redeemma	Chittoor	Thokalachenu	2020	Mango	0.61	13.2896	79.1839

Jyothi	Chittoor	Thokalachenu	2019	Mango	0.4	13.2904	79.1845
Subramanyam reddy	Chittoor	Vejjupalli	2021	Mango	0.37	13.2903	79.1849
Kondareddy	Chittoor	Bndarllapalli	2021	Mango	0.95	13.2893	79.1846
Konda reddy	Chittoor	Nandarrla Palli	2019	Mango	0.4	13.2874	79.1919
Ravendra reddy	Chittoor	Bandarllapalli	2019	Mango	0.5	13.2882	79.1898
K.mohan	Chittoor	Amudala	2018	Mango	0.5	13.1932	79.3174
K.mohan	Chittoor	Amudala	2018	Mango	0.46	13.1932	79.3160
K.Babu	Chittoor	Amudala	2018	Mango	0.51	13.1932	79.3167
K.Sridhar	Chittoor	Amudala	2020	Mango	1.29	13.1925	79.3169
M Radhamma	Chittoor	Kaveri Rajapuram	2021	Mango	0.17	13.1910	79.2974
M radhamma	Chittoor	Kaveri Rajapuram	2020	Mango	0.1	13.1912	79.2962
K Subramanyam mandadi	Chittoor	Kaveri Rajapuram	2018	Mango	0.59	13.1916	79.2911
C.Babu naidu	Chittoor	L.N.Puram	2020	Mango	0.52	13.1916	79.3170
K.mohan	Chittoor	Amudala	2018	Mango	0.44	13.1931	79.3305
K.Jayarama naidu	Chittoor	L.N.Puram	2018	Mango	0.48	13.1951	79.3313
K.Prabhakar naidu	Chittoor	Lakshmi Narasimha Puram	2022	Mango	0.38	13.1933	79.3326
V.Amarendra	Chittoor	D.K.Kandriga	2018	Mango	0.38	13.1918	79.3142
V.Amarendra	Chittoor	D.K.Kandriga	2020	Mango	0.39	13.2344	79.3350
P.Venu	Chittoor	D.K.Kandriga	2020	Mango	0.37	13.2344	79.3357
P.Subramanyam	Chittoor	Ranipuram	2020	Mango	0.34	13.2313	79.3352
K SREERAMULU NAIDU	Chittoor	Eguva Medavada	2020	Mango	0.81	13.2305	79.3303
Gopal	Chittoor	Kannambakkam	2023	Mango	0.52	13.4900	80.0457
Sarala	Chittoor	Padmapuram	2023	Mango	0.32	13.4890	80.0435
Saraswathi	Chittoor	Marripalli	2023	Mango	0.92	13.2724	79.3523
Mohanammal	Chittoor	Kannambakkam	2018	Mango	0.41	13.3045	79.3213
Mohanammal	Chittoor	Kannambakkam	2018	Mango	0.12	13.4957	80.0319
G.Hari	Chittoor	Marripalli	2018	Mango	0.1	13.4954	80.0320
Jayammal	Chittoor	Kannambakkam	2023	Mango	0.5	13.3020	79.3076

Viswanadaiah	Chittoor	Padhmapuram	2022	Mango	0.18	13.4949	80.0330
Y.sreekanth	Chittoor	Medhavaada	2023	Mango	0.67	13.2726	79.3512
A.guravamma	Chittoor	Medhavaada	2021	Mango	0.25	13.3020	79.3353
G balabadra Naidu	Chittoor	Kanikapuram	2023	Mango	0.42	13.3019	79.3081
T.Munirathnam	Chittoor	Marripalli	2020	Mango	0.26	13.1944	79.3511
Lakshmipathi	Chittoor	Marripalli	2018	Mango	0.42	13.3059	79.3365
Gurappanaidu	Chittoor	Marripalli	2018	Mango	0.9	13.3049	79.3238
Prameelamma	Chittoor	Marripalli	2023	Mango	0.74	13.3114	79.3244
Prameelamma	Chittoor	Marripalli	2018	Mango	0.45	13.3070	79.3248
Sudakarnaidu	Chittoor	Marripalli	2018	Mango	0.25	13.3064	79.3253
k.lakshmi	Chittoor	Kanikapuram	2018	Mango	0.47	13.3057	79.3253
Chandrashekhar Reddy	Chittoor	Thokala Chenu	2019	Mango	0.69	13.2948	79.1784
Mallamma	Chittoor	Thokala Chenu	2019	Mango	0.27	13.2945	79.1792
Mallamma	Chittoor	Thokala Chenu	2019	Mango	0.74	13.2938	79.1777
Neelavathi	Chittoor	Thokala Chenu	2019	Mango	0.2	13.2914	79.1816
Narayanamma	Chittoor	Thokalachenu	2021	Mango	0.39	13.2898	79.1806
Narayanamma	Chittoor	Thokala Chenu	2019	Mango	0.43	13.2904	79.1840
Munemma	Chittoor	Thokala Chenu	2022	Mango	0.64	13.2905	79.1792
Rajamma	Chittoor	Thokala Chenu	2019	Mango	0.42	13.2889	79.1838
Amaravathi	Chittoor	Vejjupalli	2023	Mango	0.38	13.3044	79.2099
Amaravathi	Chittoor	Vejjupalli	2023	Mango	0.48	13.3049	79.2099
Krisnaveni	Chittoor	Vejjupalli	2023	Mango	0.76	13.3030	79.2106
Subramanyam	Chittoor	Vejjupalli Hw	2023	Mango	1.14	13.2994	79.2127
Devarajula reddy	Chittoor	Vejjupalli	2021	Mango	0.32	13.2970	79.2098
Rejeswari	Chittoor	Vejjupalli	2023	Mango	0.1	13.2966	79.2098
Jayasankar	Chittoor	Marripalli	2018	Mango	0.54	13.3022	79.3228
Madhavanaidu	Chittoor	Pillyarkuppam	2021	Mango	0.1	13.3083	79.3251
Lakshmi pathi	Chittoor	Marripalli	2018	Mango	0.3	13.3053	79.3243
B.kodandha pani	Chittoor	Vengalaraja Kuppam	2023	Mango	0.17	13.1966	79.3345

Kandra suma	Chittoor	Kanikapuram	2022	Mango	0.24	13.2014	79.3547
B.Kodandha pani	Chittoor	Vengalaraja Kuppam	2020	Mango	0.6	13.2021	79.3551
B.Narasimha mandhadi	Chittoor	Balakrishnapuram	2023	Mango	0.23	13.2385	79.3335
B.Dhanum jayulu	Chittoor	Balakrishnapuram	2018	Mango	0.48	13.1789	79.2867
K.venkatapathi naidu	Chittoor	Balakrishnapuram	2022	Mango	0.26	13.1780	79.2885
K.venkatapathi naidu	Chittoor	Balakrishnapuram	2018	Mango	0.98	13.1806	79.2866
V.Gouthami	Chittoor	Dk.Kandriga	2019	Mango	0.42	13.1776	79.2878
V.Purushotham	Chittoor	D.K.Kandiga	2022	Mango	0.33	13.2365	79.3321
C.Munaswamy	Chittoor	Kapukandiga	2023	Mango	0.28	13.2370	79.3319
M.munemma	Chittoor	Amudala Puttur	2018	Mango	0.9	13.2519	79.3459
M.k.subramanyam naidu	Chittoor	Amudala Puttur	2018	Mango	0.44	13.2761	79.3519
Dhurvasulunaidu	Chittoor	Sindurajapuram	2018	Mango	0.77	13.2880	79.3502
Sakunthala	Chittoor	Sindurajapuram	2020	Mango	0.42	13.2759	79.3525
Nageswararao	Chittoor	Sindurajapuram	2020	Mango	0.54	13.2759	79.3529
Dhanalakshmi	Chittoor	Sindurajapuram	2018	Mango	1.1	13.2755	79.3537
Rajeswari	Chittoor	Vejjupalli	2018	Mango	1	13.2773	79.3529
Yuvarajulu reddy	Chittoor	Thokala Chenu	2019	Mango	0.2	13.3158	79.1774
Yuvarajulu reddy	Chittoor	Thokala Chenu	2019	Mango	0.34	13.2914	79.1820
Subramanyam reddy	Chittoor	Thokalachenu	2019	Mango	0.4	13.2876	79.1811
Subramanyam reddy	Chittoor	Thokalachenu	2019	Mango	0.2	13.2871	79.1806
Narasamma	Chittoor	Thokala Chenu	2021	Mango	0.11	13.2900	79.1798
Subbalakshmi	Chittoor	Thokala Chenu	2019	Mango	0.37	13.2941	79.1786
Sankarachari	Chittoor	Bandarlla Palli	2019	Mango	0.21	13.2937	79.1785
Hemavathi	Chittoor	Bandarlla Palli	2022	Mango	0.57	13.2909	79.1854
Janardhan reddy	Chittoor	Bandarlla Palli	2022	Mango	0.41	13.2912	79.1859
Ravendra reddy	Chittoor	Thokalachenu	2022	Mango	0.34	13.2917	79.1854
Mohan babu	Chittoor	Bandarlla Palli	2019	Mango	0.36	13.2897	79.1823
G.Anjaneyulu naidu	Chittoor	Balakrishnapuram	2018	Mango	0.74	13.1635	79.2754
K.Subramanyam pillai	Chittoor	Amudala Puttur	2018	Mango	0.19	13.1635	79.2749

A.narasimhulu mandadi	Chittoor	Balakrishnapuram	2019	Mango	0.2	13.1791	79.2851
M.dhanamjaya naidu	Chittoor	Kaveri Rajapuram	2018	Mango	0.53	13.1863	79.2947
Vallemma	Chittoor	C.M.Kandriga	2020	Mango	0.32	13.2351	79.3119
Venkatrathnam	Chittoor	Marripalli	2018	Mango	0.35	13.2354	79.3120
P varada reddy	Chittoor	Gkv Puram	2023	Mango	0.41	13.2983	79.3199
Markondareddy	Chittoor	Banga Reddy Palle	2023	Mango	0.34	13.2222	79.2169
Sisindri	Chittoor	Jangalapalli	2023	Mango	0.33	13.2958	79.3172
Irragamma	Chittoor	52Kanikapuram	2020	Mango	0.3	13.2963	79.3172
Kasiviswanadh	Chittoor	52Kanikapuram	2018	Mango	0.51	13.2969	79.3171
N.rajendra reddy	Chittoor	Sarvi Reddy Palle	2018	Mango	0.11	13.2347	79.2218
N.rajendra reddy	Chittoor	Sarvi Reddy Palle	2022	Mango	0.27	13.2348	79.2215
Markondareddy	Chittoor	52Kanikapuram	2018	Mango	0.32	13.2341	79.2219
Vennela	Chittoor	52Kanikapuram	2018	Mango	0.57	13.2959	79.3130
Munnarbhee	Chittoor	Jangalapalli	2018	Mango	0.51	13.2960	79.3139
Silodirai	Chittoor	Marripalli	2023	Mango	0.23	13.2976	79.3262
Ruubee	Chittoor	Nellepalli Hw	2023	Mango	0.41	13.2982	79.3264
Naga reju	Chittoor	Nellepalli Hw	2018	Mango	0.64	13.2818	79.2136
Suguna	Chittoor	Nellepalli Hw	2018	Mango	0.52	13.2818	79.2140
Girija	Chittoor	Nellepalli Hw	2018	Mango	1.1	13.2800	79.2136
Suguna	Chittoor	Nellepalli Hw	2022	Mango	0.24	13.2801	79.2149
Pubalan	Chittoor	Nellepalli Hw	2018	Mango	1.21	13.2798	79.2129
Rami reddy	Chittoor	Nellepalli	2018	Mango	0.49	13.2889	79.2178
Devasamudram	Chittoor	Nellepalli Hw	2018	Mango	0.55	13.2781	79.2166
Esak	Chittoor	Nellepalli Hw	2018	Mango	0.65	13.2782	79.2162
Esak	Chittoor	Nellepalli Hw	2018	Mango	0.51	13.2780	79.2170
Esak	Chittoor	Nellepalli Hw	2018	Mango	0.4	13.2774	79.2171
Munaswami	Chittoor	Nellepalli Hw	2018	Mango	0.6	13.2781	79.2177
Jokap	Chittoor	Nellepalli	2018	Mango	0.22	13.2787	79.2178
Manjula	Chittoor	Nellepalli Hw	2019	Mango	0.42	13.2833	79.2129

Manjula	Chittoor	Nellepalli Hw	2019	Mango	0.21	13.2834	79.2124
T.rajeswari	Chittoor	Sarivi Reddy Palle	2018	Mango	0.62	13.2254	79.2204
B.chinnabba reddy	Chittoor	Sarvi Reddy Palle	2020	Mango	0.23	13.2313	79.2250
B.chinnabba reddy	Chittoor	Sarvi Reddy Palle	2023	Mango	0.42	13.2304	79.2248
N.markonda reddy	Chittoor	Sarvi Reddy Palle	2020	Mango	0.41	13.2308	79.2249
A mohan reddy	Chittoor	Sarvi Reddy Palle	2018	Mango	0.62	13.2289	79.2205
P.Balaiah	Chittoor	C.M.Kandriga	2023	Mango	0.1	13.2342	79.3252
Vijaya	Chittoor	C.M.Kandiga	2018	Mango	0.48	13.2387	79.3064
M.Dhanamjaya naidu	Chittoor	Kaveri Rajapuram	2020	Mango	0.58	13.2380	79.3256
G Dhamodhar naidu	Chittoor	Balakrishnapuram	2022	Mango	1.11	13.1645	79.2740
Kodanda naidu	Chittoor	Balakrishnapuram	2022	Mango	0.7	13.1651	79.2751
Kondamda naidu	Chittoor	Balakrishnapuram	2022	Mango	0.76	13.1644	79.2750
Kumari	Chittoor	Vejjupalli	2020	Mango	0.32	13.2984	79.2014
Naveena	Chittoor	Vejjupalli	2021	Mango	0.37	13.2990	79.2015
Naveena	Chittoor	Vejjupalli	2021	Mango	0.32	13.2991	79.2022
Vasantha	Chittoor	Vejjupalli	2023	Mango	0.18	13.2977	79.2080
Sambasiva naidu	Chittoor	Kaveri Rajapuram	2023	Mango	0.32	13.2976	79.2084
P Muniraja	Chittoor	Ramakrishnapuram	2018	Mango	0.33	13.1695	79.2811
P yashodhamma	Chittoor	Ramakrishna Puram	2018	Mango	0.33	13.1701	79.2813
P yashodhamma	Chittoor	Ramakrishnapuram	2022	Mango	0.42	13.1746	79.2796
G krishnama naidu	Chittoor	Ramakrishna Puram	2022	Mango	0.13	13.1735	79.2789
J Devarajulu naidu	Chittoor	Ramakrishnapuram	2022	Mango	0.23	13.1718	79.2780
B.Ammulu	Chittoor	Ramakrishnapuram	2022	Mango	0.3	13.1712	79.2780
Venkatapathi naidu	Chittoor	Ramakrishna Puram	2019	Mango	0.39	13.1718	79.2809
Triveni	Chittoor	Ramakrishna Puram	2018	Mango	0.41	13.1688	79.2778
G.Venkatapathi naidu	Chittoor	Ramakrishna Puram	2018	Mango	0.32	13.1684	79.2781
G Lakshamma	Chittoor	Ramakrishna Puram	2022	Mango	0.31	13.1708	79.2772
G Subba Naidu	Chittoor	Ramakrishna Puram	2018	Mango	0.38	13.1708	79.2799
G govindarajulu naidu	Chittoor	Ramakrishna Puram	2018	Mango	0.29	13.1704	79.2802

Govindaraulu naidu	Chittoor	Ramakrishna	2018	Mango	0.24	13.1701	79.2797
Hariprasadreddy	Chittoor	Kapukandiga	2018	Mango	0.38	13.1695	79.2796
Indraveni	Chittoor	Kapukandiga	2023	Mango	0.44	13.2457	79.3427
Tiruvallamma	Chittoor	Kapukandiga	2023	Mango	0.4	13.2451	79.3429
Darmaveni	Chittoor	Kapukandiga	2023	Mango	0.29	13.2452	79.3425
Jayachandra	Chittoor	Kapukandriga	2023	Mango	0.16	13.2461	79.3422
Chanrakala	Chittoor	Kapukandiga	2023	Mango	0.28	13.2466	79.3390
Krishnareddy	Chittoor	Kapukandiga	2023	Mango	0.16	13.2448	79.3390
Jayachandrareddy	Chittoor	Kapukandiga	2023	Mango	0.61	13.2456	79.3393
Dhanarajamm	Chittoor	Kapukandiga	2023	Mango	0.2	13.2460	79.3395
Varadaiah	Chittoor	Kapukandiga	2023	Mango	0.64	13.2454	79.3415
Narayanaswamy	Chittoor	Kapukandiga	2020	Mango	0.83	13.2507	79.3455
K.Hari	Chittoor	Kapukandiga	2023	Mango	0.66	13.2515	79.3448
Salamma	Chittoor	Kapukandiga	2022	Mango	0.48	13.2468	79.3410
Jayalakshmi	Chittoor	Kapukandiga	2022	Mango	0.47	13.2468	79.3403
Krishnamoothy	Chittoor	Kapukandiga	2022	Mango	0.5	13.2469	79.3397
Nandini	Chittoor	Pullur.H.W	2018	Mango	0.87	13.2474	79.3406
E changama naidu	Chittoor	Amudala	2018	Mango	0.3	13.1590	79.2685
R Govinda Naidu	Chittoor	Amudala	2021	Mango	0.11	13.1912	79.3055
G ramachandra naidu	Chittoor	Kottha Venkatapuram	2019	Mango	0.2	13.1619	79.2706
G ramachandra naidu	Chittoor	Kottha Venkatapuram	2019	Mango	0.34	13.1624	79.2707
m jayapal naidu	Chittoor	Kottha Venkatapuram	2018	Mango	0.52	13.1562	79.2703
m jayapal naidu	Chittoor	Kottha Venkatapuram	2018	Mango	0.24	13.1557	79.2700
M lokanadha naidu	Chittoor	Kottha Venkatapuram	2018	Mango	0.1	13.1564	79.2709
m jayapal naidu	Chittoor	Kotthvenkatapuram	2022	Mango	0.44	13.1553	79.2705
M sambasiva naidu	Chittoor	Kotthvenkatapuram	2022	Mango	0.12	13.1577	79.2696
E raj gopal naidu	Chittoor	Kotthvenkatapuram	2022	Mango	0.1	13.1576	79.2700
E varadarajulu naidu	Chittoor	Kotthvenkatapuram	2018	Mango	0.31	13.1591	79.2678
M chiranjeevi	Chittoor	Kotthvenkatapuram	2022	Mango	0.38	13.1572	79.2686

M narasimhulu naidu	Chittoor	Kotthvenkatapuram	2022	Mango	0.14	13.1566	79.2690
M narasimhulu naidu	Chittoor	Kotthvenkatapuram	2022	Mango	0.1	13.1564	79.2686
M Prabhakar naidu	Chittoor	Kotthvenkatapuram	2022	Mango	0.24	13.1557	79.2685
M kesavulu naidu	Chittoor	Kotthvenkatapuram	2018	Mango	0.34	13.1598	79.2723
M venkataswamy Naidu	Chittoor	Kotthvenkatapuram	2018	Mango	0.31	13.1595	79.2721
M venkataswamy Naidu	Chittoor	Kotthvenkatapuram	2022	Mango	0.32	13.1595	79.2714
P gowramma	Chittoor	Balakrishnapuram Aw	2022	Mango	0.21	13.1595	79.2709
G.devi	Chittoor	Ek Kandriga	2023	Mango	0.32	13.2351	79.3354
Narasimhulu	Chittoor	Ek Kandriga	2018	Mango	0.33	13.2355	79.3243
G prabhakar	Chittoor	Ek Kandriga	2018	Mango	0.48	13.2359	79.3237
K uma	Chittoor	Ek Kandriga	2018	Mango	0.33	13.2355	79.3224
Govindaiah	Chittoor	Kapukandiga	2023	Mango	0.1	13.2449	79.3384
Eswari	Chittoor	Kapukandiga	2020	Mango	0.74	13.2540	79.3372
Nikita	Chittoor	Kapukandiga	2020	Mango	0.27	13.2533	79.3371
Hemalatha	Chittoor	Pullur	2022	Mango	0.49	13.2500	79.3432
Gunasekar redfy	Chittoor	Nellepalli	2018	Mango	0.75	13.2477	79.3394
Gunasekar reddy	Chittoor	Nellepalli	2018	Mango	0.58	13.2838	79.2236
Venkatachati	Chittoor	Nellepalli	2021	Mango	0.35	13.2802	79.2235
Venkatachri	Chittoor	Nellepalli	2018	Mango	0.53	13.2813	79.2168
Govinfhachari	Chittoor	Nellepalli	2018	Mango	0.86	13.2815	79.2157
Doraswami reddy	Chittoor	Nellepalli	2018	Mango	0.49	13.2829	79.2208
Pattabi reddy	Chittoor	Nellepalli	2018	Mango	0.54	13.2849	79.2218
Venkatesulu	Chittoor	Nellepalli	2021	Mango	0.1	13.2805	79.2268
Bhargav	Chittoor	Kannikapuram	2023	Mango	0.31	13.2803	79.2291
M manohar	Chittoor	Thugundram	2018	Mango	0.54	13.1955	79.2858
M manohar	Chittoor	Thugundram	2019	Mango	0.32	13.2011	79.2870
M manohar	Chittoor	Thugundram	2023	Mango	0.39	13.2016	79.2871
P Anuradha	Chittoor	Thugundram	2023	Mango	0.44	13.2019	79.2873
R Venkatesulu Naidu	Chittoor	Kaveri Rajapuram	2018	Mango	0.4	13.1974	79.2908

V Dhananjaya naidu	Chittoor	Thugundram	2020	Mango	0.12	13.1967	79.2903
V Viswanatha naidu	Chittoor	Thugundram	2020	Mango	0.42	13.1933	79.2876
V Viswanatha naidu	Chittoor	Thugundram	2018	Mango	0.15	13.1928	79.2873
R hemadri	Chittoor	Thugundram	2018	Mango	0.24	13.1924	79.2871
T padmavati	Chittoor	Thugundram	2019	Mango	0.47	13.1912	79.2859
T padmavati	Chittoor	Thugundram	2019	Mango	0.1	13.1912	79.2851
T padmavati	Chittoor	Thugundram	2018	Mango	0.24	13.1908	79.2866
T padmavati	Chittoor	Thugundram	2020	Mango	0.23	13.1908	79.2863
R Hemadri	Chittoor	Thugundram	2018	Mango	0.21	13.1955	79.2868
T padmavati	Chittoor	Thugundram	2018	Mango	0.1	13.1951	79.2869
R balabhaskar	Chittoor	Thugundram	2018	Mango	0.11	13.1910	79.2832
Prabavathi	Chittoor	Padmapuram	2020	Mango	0.1	13.2633	79.3487
Jamuna	Chittoor	Padmapuram	2018	Mango	0.29	13.2633	79.3461
Subramanyam	Chittoor	Padmapuram	2018	Mango	0.32	13.2631	79.3455
Jamuna	Chittoor	Padmapuram	2018	Mango	0.79	13.1968	79.2565
Seshadri	Chittoor	Padmapuram	2018	Mango	0.11	13.2639	79.3466
Seshadri	Chittoor	Padmapuram	2018	Mango	0.37	13.2627	79.3488
G devan	Chittoor	Thugundram	2018	Mango	0.17	13.2629	79.3482
Bhaktavachalam	Chittoor	Padmapuram	2018	Mango	0.63	13.1971	79.2570
Maniamma	Chittoor	Padmapuram	2020	Mango	0.28	13.2607	79.3492
Bhaktavachalam	Chittoor	Padmapuram	2020	Mango	0.29	13.2604	79.3489
Sandeef kumar. V	Chittoor	Ambodharapalli Hw	2018	Mango	0.11	13.2609	79.3495
Rohith	Chittoor	Padmapuram	2018	Mango	0.49	13.1841	79.2413
Rohith	Chittoor	Padmapuram	2018	Mango	0.73	13.2756	79.3506
Chittemma	Chittoor	Padmapuram	2018	Mango	0.5	13.2753	79.3512
V Neela	Chittoor	Ambodharapalli Hw	2018	Mango	0.56	13.2756	79.3502
Babu redfy	Chittoor	Peddha Mittapalli	2018	Mango	0.59	13.2948	79.2152
Ranga reddy	Chittoor	Meddhamitta Palli	2018	Mango	0.3	13.2944	79.2152
Venkat reddy	Chittoor	Peddhamitta Palli	2021	Mango	0.21	13.2941	79.2161

Babu reddy	Chittoor	Peddhamitta Palli	2021	Mango	0.18	13.2945	79.2161
Jayarami reddy	Chittoor	Peddhamitta Palli	2021	Mango	0.2	13.2941	79.2153
Jayaram reddy	Chittoor	Peddhamitta Palli	2019	Mango	0.34	13.2932	79.2121
Jayarami reddy	Chittoor	Varadha Reddy	2019	Mango	0.5	13.2934	79.2116
Jayaram reddy	Chittoor	Peddhamitta Palli	2019	Mango	0.24	13.2947	79.2142
Narasimha reddy	Chittoor	Peddhamitta	2018	Mango	0.41	13.2947	79.2125
Narasimha reddy	Chittoor	Peddhamitta Palli	2018	Mango	0.4	13.2940	79.2125
Raaja reddy	Chittoor	Peddhamitta Palli	2019	Mango	0.25	13.2940	79.2117
Rajareddy	Chittoor	Peddhamitta Palli	2018	Mango	0.18	13.2926	79.2123
Narayana reddy	Chittoor	Peddhamitta Palli	2018	Mango	0.32	13.2920	79.2116
Chandra reddy	Chittoor	Peddhamitta Palli	2018	Mango	0.33	13.2916	79.2120
Chandra reddy	Chittoor	Peddhamitta Palli	2018	Mango	0.49	13.2911	79.2123
Chandra reddy	Chittoor	Peddhamitta Palli	2018	Mango	0.4	13.2913	79.2117
Chithambaram	Chittoor	Peddhamitta Palli	2018	Mango	0.31	13.2869	79.2169
Chithbarm	Chittoor	Peddhamitta Palli	2018	Mango	0.3	13.2865	79.2168
Roosamma	Chittoor	Peddhamitta Palli	2019	Mango	0.27	13.2874	79.2167
Papi reddy	Chittoor	Peddhamitta Palli	2019	Mango	0.1	13.2842	79.2177
Chittibabu	Chittoor	Peddhamitta Palli	2018	Mango	0.29	13.2851	79.2174
Paramdhama reddy	Chittoor	Peddhamitta Palli	2018	Mango	0.16	13.2855	79.2175
M eswaran	Chittoor	Thugundram	2020	Mango	0.45	13.1961	79.2570
M ramaiah	Chittoor	Thugundram	2018	Mango	0.14	13.1911	79.2531
K Subramanyam Naidu	Chittoor	Md Mangalam	2018	Mango	0.6	13.1886	79.2571
K Subramanyam Naidu	Chittoor	Md Mangalam	2018	Mango	0.62	13.2031	79.2471
K Dora swamy naidu	Chittoor	Mahadev Mangalam	2022	Mango	0.39	13.2041	79.2472
K Dora swamy naidu	Chittoor	Mahadev Mangalam	2018	Mango	0.35	13.2028	79.2475
K Dora swamy	Chittoor	Mahadev Mangalam	2020	Mango	0.16	13.2025	79.2480
P adikesavulu reddy	Chittoor	Md Mangalam	2020	Mango	0.4	13.1913	79.2480
k sreeramulu naidu	Chittoor	Mahadeva Mangalam	2023	Mango	0.1	13.2014	79.2483
J Jayalakshmi	Chittoor	Mahadev Mangalam	2018	Mango	0.88	13.1990	79.2480

K Purushottam naidu	Chittoor	Mahadev Mangalam	2023	Mango	0.14	13.1980	79.2480
K jamuna	Chittoor	Mahadev Mangalam	2018	Mango	0.34	13.2028	79.2450
K jamuna	Chittoor	Mahadev Mangalam	2021	Mango	0.29	13.2022	79.2455
K jamuna	Chittoor	Mahadev Mangalam	2023	Mango	0.92	13.1991	79.2484
K nagesh naidu	Chittoor	Mahadev Mangalam	2020	Mango	0.88	13.1997	79.2475
K nagesh naidu	Chittoor	Mahadev Mangalam	2018	Mango	0.78	13.2030	79.2456
K damodara naidu	Chittoor	Gollapalle	2022	Mango	0.39	13.1998	79.2471
Chandra Shekar kandra	Chittoor	Mahadev Mangalam	2018	Mango	0.41	13.1987	79.2492
K umapathi	Chittoor	Mahadev Mangalam	2018	Mango	0.45	13.1987	79.2488
Eswarnaidu	Chittoor	R.R.Puram	2022	Mango	0.41	13.1996	79.2489
Babu	Chittoor	Ampuram	2018	Mango	0.25	13.2884	79.3429
Lakshmidevi	Chittoor	Am.Puram	2018	Mango	0.81	13.2886	79.3435
Vijaya	Chittoor	Peddhamitta Palli	2019	Mango	0.39	13.2926	79.2117
Vijaya	Chittoor	Peddhamitta Palii	2019	Mango	0.1	13.2924	79.2112
Thaygarajullu reddy	Chittoor	Peddhamitta Palli	2018	Mango	0.43	13.2911	79.2169
Tharangani	Chittoor	Chinnamitta Palli	2018	Mango	0.65	13.3036	79.2186
Kuppireddy	Chittoor	Chinnamitta Palli	2018	Mango	0.35	13.2915	79.2187
Narasimha reddy	Chittoor	Chinnamitta Palli	2018	Mango	0.87	13.2894	79.2134
Jyothi	Chittoor	Chinnamitta Palli	2019	Mango	0.16	13.2893	79.2150
Paanduranga reddy	Chittoor	Chinnamitta Palli	2018	Mango	0.58	13.3002	79.2161
Panduranga reddy	Chittoor	Chinnamitta Palli	2018	Mango	0.47	13.3003	79.2153
Lokeswari	Chittoor	Ampuram	2018	Mango	0.46	13.2876	79.3433
Bujji	Chittoor	A.M.Puram	2018	Mango	0.39	13.2887	79.3441
Dhananjayulu	Chittoor	A.M.Puram	2018	Mango	0.75	13.2893	79.3431
Gunnemma	Chittoor	Ampuram	2018	Mango	0.18	13.2893	79.3441
Santhi	Chittoor	Am.Puram	2018	Mango	0.4	13.2886	79.3448
K.Thrinadh	Chittoor	R.R Puram	2021	Mango	0.84	13.2949	79.3450
Narasihmulunaidu	Chittoor	R R Puram	2021	Mango	0.43	13.2954	79.3449
Chamundeaswari	Chittoor	R R Puram	2023	Mango	0.16	13.2948	79.3458

Munemma	Chittoor	R R Puram	2021	Mango	0.2	13.2948	79.3489
M . Lakshmi	Chittoor	Repalli	2020	Mango	0.18	13.2945	79.3487
M.lakshmi	Chittoor	Repalli	2018	Mango	0.41	13.2945	79.3476
G Govindhamma	Chittoor	R R Puram	2020	Mango	0.29	13.2934	79.3477
Vasanthamma	Chittoor	R R Puram	2022	Mango	0.26	13.2940	79.3448
Vasanthamma	Chittoor	R R Puram	2022	Mango	0.38	13.2944	79.3446
Chengalrayanaidu	Chittoor	R R Puram	2022	Mango	0.15	13.2943	79.3451
P.vanaja	Chittoor	R R Puram	2022	Mango	0.11	13.2897	79.3434
Bindhu madhavi.k	Chittoor	R R Puram	2022	Mango	0.24	13.2902	79.3437
Premala.k	Chittoor	R R Puram	2023	Mango	0.21	13.2903	79.3440
Subbalakshmi	Chittoor	Kapukandiga	2023	Mango	0.32	13.2506	79.3349
Suhasini	Chittoor	Kapukandiga	2022	Mango	0.52	13.2504	79.3340
Amala	Chittoor	Kapukandiga	2022	Mango	0.14	13.2505	79.3334
Suhasini	Chittoor	Kapukandriga	2023	Mango	0.12	13.2507	79.3327
E Subramanyam Naidu	Chittoor	Mahadev Mangalam	2018	Mango	1.41	13.2054	79.2515
V nagamma	Chittoor	Thugundram	2018	Mango	0.81	13.2067	79.2520
V damodra naidu	Chittoor	Thugundram	2018	Mango	0.4	13.2072	79.2526
V umapathi naidu	Chittoor	Thugundram	2018	Mango	0.18	13.2074	79.2516
Pumapathi naidu	Chittoor	Thugundram	2019	Mango	0.47	13.2093	79.2513
E srinivasusulu naidu	Chittoor	Thugundram	2020	Mango	0.37	13.2099	79.2513
E srinivasusulu naidu	Chittoor	Thugundram	2020	Mango	0.55	13.2100	79.2507
K Babu naidu	Chittoor	Mahadev Mangalam	2020	Mango	0.26	13.1996	79.2507
K Babu naidu	Chittoor	Mahadev Mangalam	2018	Mango	0.7	13.1987	79.2505
K Babu naidu	Chittoor	Mahadev Mangalam	2018	Mango	0.5	13.1988	79.2501
Kupakar naidu	Chittoor	Thugundram	2019	Mango	0.33	13.2081	79.2563
E navanithamma	Chittoor	Bukkapatnam	2019	Mango	0.26	13.2085	79.2568
Kurapakar naidu E	Chittoor	Thugundram	2019	Mango	0.38	13.2084	79.2562
E doraswamy naidu	Chittoor	Thugundram	2022	Mango	0.44	13.2078	79.2566
K madhava naidu	Chittoor	Mahadev Mangalam	2021	Mango	0.51	13.1985	79.2511

K madhava naidu	Chittoor	Mahadev Mangalam	2021	Mango	0.36	13.1991	79.2512
K vasu	Chittoor	Mahadev Mangalam	2020	Mango	0.27	13.2010	79.2507
E padmavathamma	Chittoor	Arimakulapalle	2018	Mango	0.38	13.2084	79.2517
E krishnama naidu	Chittoor	Arimakulapalle	2020	Mango	0.14	13.2069	79.2529
S Anjaneyulu	Chittoor	Arimakulapalle	2019	Mango	0.37	13.2096	79.2518
S Anjaneyulu naidu	Chittoor	Arimakulapalle	2019	Mango	0.38	13.2088	79.2509
S vijaya kumar	Chittoor	Arimakulapalle	2018	Mango	0.87	13.2085	79.2527
S vijaya kumar	Chittoor	Arimakulapalle	2018	Mango	0.27	13.2092	79.2537
E Babu naidu	Chittoor	Thugundram	2023	Mango	0.41	13.2075	79.2558
Chittemma	Chittoor	Kammavariooru	2018	Mango	0.37	13.2734	79.3306
Nagarjuna	Chittoor	Kammavariooru	2018	Mango	0.61	13.2738	79.3308
Nagarjuna	Chittoor	Kammavariooru	2018	Mango	0.36	13.2741	79.3310
P.Chittemma	Chittoor	Kammavariooru	2018	Mango	0.22	13.2726	79.3259
Haritha	Chittoor	D R Puram	2018	Mango	0.83	13.2851	79.3336
Bhagyalakshmi	Chittoor	D R Puram	2023	Mango	0.3	13.2836	79.3348
A Bhasker	Chittoor	D R Puram	2023	Mango	0.53	13.2842	79.3350
Gurumurthy Naidu	Chittoor	D R Puram	2023	Mango	0.35	13.2835	79.3356
Gurumurthy naidu	Chittoor	D R Puram	2023	Mango	0.31	13.2832	79.3352
B Sujatha	Chittoor	D R Puram	2023	Mango	0.15	13.2832	79.3359
B.sujatha	Chittoor	D R Puram	2023	Mango	0.11	13.2832	79.3362
Suseelamma	Chittoor	D R Puram	2018	Mango	0.16	13.2843	79.3335
Anandanaidu	Chittoor	D R Puram	2018	Mango	0.23	13.2841	79.3327
Anandanaidu	Chittoor	D R Puram	2018	Mango	0.15	13.2837	79.3326
Ananda naidu	Chittoor	D R Puram	2018	Mango	0.14	13.2837	79.3330
Ananda naidu	Chittoor	D R Puram	2018	Mango	0.15	13.2834	79.3328
Anandanaidu	Chittoor	D R Puram	2018	Mango	0.16	13.2835	79.3324
Uma	Chittoor	Thota Kandriga	2018	Mango	0.79	13.2683	79.3229
Krishnam naidu	Chittoor	Thugundram	2023	Mango	0.42	13.1988	79.2567
Krishnamandadi	Chittoor	Thugundram	2023	Mango	0.29	13.1986	79.2563

Krishnamandadiu	Chittoor	Thugundram	2022	Mango	0.35	13.1984	79.2557
C Venkatesulu reddy	Chittoor	Bukkapatnam	2018	Mango	0.54	13.2157	79.2610
V mohan reddy	Chittoor	Thugundram	2018	Mango	0.52	13.2152	79.2593
Mohan reddy	Chittoor	Bukkapatnam	2018	Mango	0.1	13.2147	79.2597
Babu	Chittoor	Thugundram	2023	Mango	0.1	13.2137	79.2717
Babu A	Chittoor	Thugundram	2023	Mango	0.18	13.2142	79.2714
M vasudhdeva chetty	Chittoor	Thugundram	2023	Mango	0.21	13.2145	79.2727
Vasudeva chetty	Chittoor	Thugundram	2023	Mango	0.13	13.2145	79.2725
B syamala	Chittoor	Thugundram	2018	Mango	0.28	13.2136	79.2704
G Eswraredd	Chittoor	Bukkapatnam	2018	Mango	0.37	13.2182	79.2737
M Chandra sekhar	Chittoor	Pillari Kuppam	2018	Mango	0.65	13.1973	79.2817
K lokanatha reddy	Chittoor	Bukkapatnam	2018	Mango	0.44	13.2151	79.2738
G Raja reddy	Chittoor	Bukkapatnam	2018	Mango	0.57	13.2147	79.2619
A subramanyam reddy	Chittoor	Bukkapatnam	2018	Mango	0.48	13.2203	79.2668
K narasimha reddy	Chittoor	Bukkapatnam	2021	Mango	0.2	13.2187	79.2676
K narasimha reddy	Chittoor	Bukkapatnam	2021	Mango	0.18	13.2187	79.2678
K narasimha reddy	Chittoor	Bukkapatnam	2022	Mango	0.26	13.2195	79.2675
K Narasimha Reddy	Chittoor	Bukkapatnam	2021	Mango	0.23	13.2188	79.2681
A purushotham reddy	Chittoor	Bukkapatnam	2018	Mango	0.35	13.2194	79.2661
A baskhar reddy	Chittoor	Bukkapatnam	2018	Mango	0.44	13.2206	79.2704
K lokanatha reddy	Chittoor	Bukkapatnam	2018	Mango	0.29	13.2177	79.2719
Subramanyam	Chittoor	Lakshmireddy Palli	2019	Mango	0.37	13.2897	79.2338
Subramanyam	Chittoor	Lakshmireddy Palli	2019	Mango	0.65	13.2891	79.2341
Subramanyam	Chittoor	Lakshmireddy Palli	2019	Mango	0.1	13.2896	79.2342
Vidyasagar reddy	Chittoor	Lakshmireddy Palli	2023	Mango	0.77	13.2914	79.2351
Girija	Chittoor	Assala Puram	2023	Mango	0.1	13.2892	79.2268
Papi reddy	Chittoor	Bodireddy Kandiga	2022	Mango	0.32	13.2894	79.2238
Papi reddy	Chittoor	Bodireddy Kandriga	2018	Mango	0.55	13.2933	79.2244
Geetha	Chittoor	Bodireddy Kandriga	2018	Mango	0.56	13.3006	79.2243

E.Uma	Chittoor	Totaka Ndiga	2020	Mango	0.21	13.2673	79.3229
Uma	Chittoor	Thotakandiga	2020	Mango	0.1	13.2678	79.3232
Chinnaswamy	Chittoor	N.R.Puram	2018	Mango	0.31	13.2799	79.3309
Swarna	Chittoor	Padmapuram	2022	Mango	0.19	13.2650	79.3497
Munaswamy	Chittoor	Padmapuram	2020	Mango	0.3	13.2654	79.3498
Geetha	Chittoor	Padmapuram	2020	Mango	0.15	13.2653	79.3505
Nagamma	Chittoor	Padmapuram	2022	Mango	0.63	13.2657	79.3508
Sumathi	Chittoor	Padmapuram	2022	Mango	0.46	13.2670	79.3508
Sumathi	Chittoor	Padmapuram	2023	Mango	0.28	13.2669	79.3503
N amaravathi	Chittoor	Thota Kandriga	2018	Mango	0.46	13.2670	79.3210
Narasimha Reddy	Chittoor	Thota Kandriga	2020	Mango	0.2	13.2675	79.3202
Narasimha Reddy	Chittoor	Thota Kandriga	2020	Mango	0.32	13.2683	79.3198
Ms arvind	Chittoor	Thugundram	2018	Mango	0.22	13.1977	79.2805
Ma arvind	Chittoor	Thugundram	2018	Mango	0.41	13.1984	79.2808
Vasanthamma	Chittoor	Thugundram	2020	Mango	0.3	13.1976	79.2789
C manjunath	Chittoor	Thugundram	2018	Mango	0.61	13.1964	79.2744
Muneyyaa	Chittoor	Thugundram	2019	Mango	0.45	13.2027	79.2764
Prabakarkar reddy	Chittoor	Assala Puram	2019	Mango	0.29	13.2977	79.2226
Nareadra babu	Chittoor	Assala Puram	2018	Mango	0.77	13.2899	79.2192
Narayana reddy	Chittoor	Damaragunta	2018	Mango	1.11	13.3157	79.2409
Srinivasulu	Chittoor	Chinna Damaragunta	2020	Mango	0.33	13.3138	79.2292
Seiramulu	Chittoor	Chinna Damaragunta	2023	Mango	0.94	13.3158	79.2236
Durga	Chittoor	Chinna Damaragunta	2018	Mango	0.37	13.3131	79.2259
Gurga	Chittoor	Chinna Damaragunta	2018	Mango	0.29	13.3131	79.2266
Ramakrisna reddy	Chittoor	Chinna Damaragunta	2018	Mango	0.79	13.3121	79.2247
Ramakrisna reddy	Chittoor	Chinna Damaragunta	2018	Mango	0.81	13.3127	79.2251
Eragamamma	Chittoor	Chinna Damaragunta	2018	Mango	0.9	13.3123	79.2237
Dilli babu	Chittoor	Doraswami Reddy	2019	Mango	0.54	13.3162	79.2262
Jaya prakash	Chittoor	Chinna Damaragunta	2021	Mango	1.14	13.3133	79.2246

Jaya prakash	Chittoor	Chinna Damaragunta	2021	Mango	0.1	13.3134	79.2241
Girija	Chittoor	Pedha Damaragunta	2018	Mango	0.32	13.3137	79.2209
Surendra reddy	Chittoor	Chinna Damaragunta	2018	Mango	0.94	13.3144	79.2201
Ademma	Chittoor	Pedha Damaragunta	2018	Mango	0.74	13.3121	79.2170
Lokes	Chittoor	Pedha Damaragunta	2018	Mango	1.11	13.3125	79.2228
Narasamma	Chittoor	Pedha Damaragunta	2018	Mango	0.28	13.3114	79.2220
Rajendra reddy	Chittoor	Thugundram	2018	Mango	0.16	13.1905	79.2773
Muraga reddy	Chittoor	Thugundram	2018	Mango	0.2	13.1908	79.2769
Muraga reddy	Chittoor	Thugundram	2018	Mango	0.12	13.1912	79.2770
Vasanthamma	Chittoor	Thugundram	2018	Mango	0.31	13.1976	79.2784
Gangadaram	Chittoor	Damaragunta	2020	Mango	0.31	13.3132	79.2226
Subramanyam reddy	Chittoor	Bandarlla Plli	2021	Mango	0.28	13.2930	79.1879
Girij	Chittoor	Bandarlla Palli	2021	Mango	0.54	13.2934	79.1879
Girija	Chittoor	Bandarlla Palli	2021	Mango	0.43	13.2938	79.1880
Kannamma	Chittoor	Bandarlla Palli	2019	Mango	0.12	13.2904	79.1925
Knnamma	Chittoor	Bandarlla Palli	2019	Mango	0.31	13.2906	79.1924
Umamaswrir reddy	Chittoor	Bandarlla Palli	2019	Mango	0.17	13.2901	79.1921
Ummaheswar reddy	Chittoor	Bandarlla Palli	2019	Mango	0.18	13.2899	79.1920
G jyothi	Chittoor	L.N.Puram	2023	Mango	0.1	13.1958	79.3332
C bujjamma	Chittoor	Vengalarajakuppam	2021	Mango	0.22	13.1969	79.3622
K Chiranjeevi	Chittoor	Vengalarajakuppam	2022	Mango	0.19	13.1969	79.3627
A chiranjeevi	Chittoor	Amudala Puttur	2018	Mango	0.31	13.1849	79.2936
A chiranjeevi	Chittoor	Amudala Puttur	2022	Mango	0.31	13.1847	79.2944
A sreenivasulu	Chittoor	Amudalaputhur	2018	Mango	0.1	13.1846	79.2935
A Girivasulu	Chittoor	Amudala Puttur	2018	Mango	0.2	13.1853	79.2932
A Girivasulu	Chittoor	Amudalaputhur	2018	Mango	0.17	13.1851	79.2938
A bhaskar chetty	Chittoor	Kaveri Rajapuram	2022	Mango	0.4	13.1828	79.2946
Pramila	Chittoor	Amudala	2023	Mango	0.38	13.1954	79.3224
R Meenakshi	Chittoor	Veerlagudi	2018	Mango	0.94	13.1953	79.3570

Subramanyam Naidu	Chittoor	Amudala	2018	Mango	0.29	13.1945	79.3364
R raviraj	Chittoor	Veerlagudi	2020	Mango	0.46	13.1966	79.3597
Deekshitha	Chittoor	N.Rpuram	2020	Mango	0.46	13.2775	79.3271
Deekshitha	Chittoor	N.Rpuram	2020	Mango	0.68	13.2777	79.3276
Vijaya	Chittoor	N.R.Puram	2020	Mango	0.19	13.2770	79.3272
Jagannath am	Chittoor	N.Rpuram	2020	Mango	0.11	13.2781	79.3277
Bharathi	Chittoor	N.Rpuram	2020	Mango	0.43	13.2768	79.3267
Bharathi	Chittoor	N.Rpuram	2020	Mango	0.1	13.2763	79.3269
Bharathi	Chittoor	N.R.Puram	2020	Mango	0.92	13.2767	79.3260
Narasimhulu	Chittoor	N.R.Puram	2020	Mango	0.11	13.2778	79.3266
Mamatha	Chittoor	N.R.Puram	2020	Mango	0.19	13.2799	79.3272
Mamatha	Chittoor	N.Rpuram	2020	Mango	0.2	13.2800	79.3277
Devarajulunaidu	Chittoor	N.R.Puram	2020	Mango	0.35	13.2803	79.3274
Saraswathi	Chittoor	Kammavariooru	2018	Mango	0.27	13.2753	79.3267
Subramanyam	Chittoor	Kammavariooru	2018	Mango	0.25	13.2757	79.3268
Subramanyam	Chittoor	Kammavariooru	2018	Mango	0.15	13.2757	79.3271
Elumalai	Chittoor	Padmapuram	2018	Mango	0.24	13.2706	79.3413
V vasnathaiah	Chittoor	Pachi Gunta	2018	Mango	0.49	13.2120	79.3145
V vasnathaiah	Chittoor	Pachi Gunta	2018	Mango	0.35	13.2125	79.3141
V vasnathaiah	Chittoor	Pachi Gunta	2018	Mango	0.1	13.2126	79.3138
N Chandra Shekhar	Chittoor	Pachi Gunta	2023	Mango	0.24	13.2195	79.3031
N Chandra Shekhar	Chittoor	Pachi Gunta	2023	Mango	0.13	13.2196	79.3037
P Ramanaidu	Chittoor	Pachi Gunta	2018	Mango	0.44	13.2172	79.2846
S Guna sekhar	Chittoor	Kamma Kandriga	2020	Mango	0.51	13.2171	79.3191
S Guna sekhar	Chittoor	Kamma Kandriga	2020	Mango	0.96	13.2161	79.3209
S Guna sekhar	Chittoor	Kamma Kandriga	2020	Mango	0.54	13.2166	79.3186
P Saraswati	Chittoor	Pachigunta	2018	Mango	0.42	13.2173	79.2859
P Saraswati	Chittoor	Pachigunta	2018	Mango	0.21	13.2171	79.2853
K papi reddy	Chittoor	Bukkapatnam	2020	Mango	0.11	13.2255	79.2802

Hemachandra reddy	Chittoor	Bukkapatnam	2023	Mango	0.4	13.2206	79.2821
G Hemachandra reddy	Chittoor	Bukkapatnam	2023	Mango	0.13	13.2210	79.2819
K Papi reddy	Chittoor	Bukkapatnam	2020	Mango	0.14	13.2258	79.2802
Papi reddy	Chittoor	Bukkapatnam	2020	Mango	0.14	13.2254	79.2806
Rajamma	Chittoor	P.C.Mitta	2018	Mango	0.23	13.2469	79.3081
Narasimhulu	Chittoor	C.M.Kandiga	2018	Mango	0.51	13.2395	79.3122
Sekhar	Chittoor	Jangamalakandriga	2023	Mango	0.18	13.3454	79.5591
K.murali	Chittoor	Jangamalakandriga	2018	Mango	0.34	13.3462	79.5594
Murali	Chittoor	Jangamalakandriga	2018	Mango	0.34	13.3465	79.5594
Marali	Chittoor	Jangamalakandriga	2018	Mango	0.24	13.3469	79.5593
Murali	Chittoor	Jangamalakandriga	2018	Mango	0.19	13.3468	79.5597
Rajamma	Chittoor	Jangamalakandriga	2023	Mango	0.26	13.3484	79.5575
Neelamma .b	Chittoor	Jangamalakandriga	2018	Mango	0.35	13.3459	79.5593
L asaiah	Chittoor	Veerlagudi	2020	Mango	0.72	13.2043	79.3653
L asaiah	Chittoor	Veerlagudi	2020	Mango	0.63	13.2041	79.3646
S jayakodi	Chittoor	Veerlagudi	2018	Mango	0.51	13.2042	79.3632
Gangayya	Chittoor	Kanikapur	2019	Mango	0.45	13.2823	79.2282
Nelakantam reddy	Chittoor	Venkata Puram	2018	Mango	0.37	13.2913	79.2264
Chandra	Chittoor	Appireddy Kandriga	2018	Mango	0.48	13.2748	79.2242
Jeevamma	Chittoor	Appireddy Kandriga	2018	Mango	0.37	13.2752	79.2228
Ravendrareddy	Chittoor	Bodireddy Kandriga	2018	Mango	0.11	13.2739	79.2225
Subramanyam reddy	Chittoor	Bodireddy Kandriga	2018	Mango	0.57	13.2739	79.2216
Mani	Chittoor	Pullur	2022	Mango	0.31	13.2213	79.3185
Mani	Chittoor	Pullur	2022	Mango	0.16	13.2217	79.3189
Venkatesh	Chittoor	Pullur	2022	Mango	0.2	13.2210	79.3189
Venkatesh	Chittoor	Pullur	2022	Mango	0.27	13.2206	79.3194
Ganesh	Chittoor	Pullur	2023	Mango	0.44	13.2212	79.3162
Reddemma	Chittoor	E.K.Kandiga	2023	Mango	0.3	13.2349	79.3280
Naresh	Chittoor	E.K.Kandiga	2023	Mango	0.24	13.2354	79.3282

Munemma	Chittoor	E.K.Kandiga	2023	Mango	0.37	13.2348	79.3271
Subbalakshmi	Chittoor	E.K.Kandiga	2018	Mango	0.12	13.2367	79.3253
Kesavulunaidu	Chittoor	E.K.Kaandiga	2018	Mango	0.34	13.2369	79.3247
Rameshnaidu	Chittoor	E.K.Kandiga	2023	Mango	0.27	13.2363	79.3272
Janabai	Chittoor	E.K.Kandiga	2020	Mango	0.33	13.2353	79.3253
Rajagopal	Chittoor	E.K.Kandiga	2018	Mango	0.12	13.2367	79.3260
Neelavathi	Chittoor	E.K.Kandiga	2018	Mango	0.18	13.2358	79.3264
Devendra	Chittoor	Ek.Kandiga	2020	Mango	0.14	13.2371	79.3251
Devendra	Chittoor	Ek.Kandiga	2020	Mango	0.16	13.2375	79.3254
Janardananaidu	Chittoor	E.K.Kandiga	2020	Mango	0.22	13.2375	79.3250
Chandra	Chittoor	E.K.Kandiga	2023	Mango	0.36	13.2341	79.3292
Munirathnam ma	Chittoor	E.K.Kandiga	2018	Mango	0.2	13.2367	79.3242
Munirathnam ma	Chittoor	E.K.Kandiga	2018	Mango	0.1	13.2365	79.3245
Munirathnam	Chittoor	E.K.Kandiga	2021	Mango	0.18	13.2337	79.3218
Narasimha reddy	Chittoor	Damaragunta	2018	Mango	0.11	13.3131	79.2210
Narasimha reddy	Chittoor	Damaragunta	2018	Mango	0.26	13.3140	79.2229
Bhupathi	Chittoor	Damaragunta	2018	Mango	0.56	13.3133	79.2237
Gnanasekar	Chittoor	Damaragunta	2018	Mango	0.88	13.3117	79.2262
V Bharathi	Chittoor	Kj Puram	2018	Mango	0.91	13.2111	79.4306
SR Raju	Chittoor	Kj Puram	2020	Mango	0.56	13.2236	79.4310
Givindamm	Chittoor	K V Puram	2022	Mango	0.63	13.1623	79.2684
R Venkatesulu Naidu	Chittoor	K V Puram	2022	Mango	0.33	13.1622	79.2688
R Venkatesulu naidu	Chittoor	K V Puram	2022	Mango	0.15	13.1623	79.2692
R Venkatesulu naidu	Chittoor	Kv Puram	2022	Mango	0.59	13.1630	79.2687
Chandra Shekhar Naidu	Chittoor	K V Puram	2018	Mango	0.3	13.1630	79.2641
Sambasiva naidu	Chittoor	K V Puram	2019	Mango	0.18	13.1597	79.2608
Sambasiva naidu	Chittoor	K V Puram	2019	Mango	0.17	13.1596	79.2612
Sambasiva naidu	Chittoor	Kv Puram	2019	Mango	0.23	13.1599	79.2613
Krishnamma	Chittoor	K V Puram	2018	Mango	0.26	13.1554	79.2627

Bhupathi Naidu	Chittoor	K V Puram	2022	Mango	1	13.1714	79.2628
Bhupathi Naidu	Chittoor	Kv Puram	2022	Mango	0.52	13.1711	79.2623
Bhupathi Naidu	Chittoor	K V Puram	2022	Mango	0.26	13.1720	79.2624
Bhupathi Naidu	Chittoor	Kv Puram	2022	Mango	0.22	13.1720	79.2622
Bhupathi naidu	Chittoor	Kv Puram	2022	Mango	0.29	13.1719	79.2618
Bhupathi naidu	Chittoor	Kv Puram	2022	Mango	0.3	13.1716	79.2613
Bhupathi Naidu	Chittoor	Kv Puram	2022	Mango	0.24	13.1716	79.2610
M syamala	Chittoor	Kv Puram	2022	Mango	0.42	13.1713	79.2618
Mk chittibabu	Chittoor	Kv Puram	2023	Mango	0.34	13.1702	79.2622
Mk chittibabu	Chittoor	Kv Puram	2023	Mango	0.36	13.1701	79.2614
P bashkar nsudu	Chittoor	Kv Puram	2022	Mango	0.27	13.1712	79.2604
M Baskar Naidu	Chittoor	Kv Puram	2022	Mango	0.17	13.1707	79.2599
M Baskar Naidu	Chittoor	Kv Puram	2022	Mango	0.55	13.1713	79.2599
S sriramulu	Chittoor	Kv Puram	2022	Mango	0.22	13.1687	79.2636
S Baskar	Chittoor	Kv Puram	2022	Mango	0.16	13.1687	79.2639
S Baskar	Chittoor	Kv Puram	2022	Mango	0.2	13.1682	79.2639
G Venkateshulu Naidu	Chittoor	Kv Puram	2022	Mango	0.3	13.1653	79.2631
G Venkatesulu Naidu	Chittoor	Kv Puram	2022	Mango	0.18	13.1654	79.2628
Venkatesulu naidu	Chittoor	Kv Puram	2022	Mango	0.26	13.1654	79.2625
Devarajulunaidu	Chittoor	E.K.Kandiga	2019	Mango	0.24	13.2379	79.3114
Devarajulunaidu	Chittoor	C.M.Kandiga	2019	Mango	0.18	13.2383	79.3119
Devarajulunaidu	Chittoor	C.M.Kandiga	2019	Mango	0.1	13.2381	79.3114
Devendra	Chittoor	C.M.Kandiga	2019	Mango	0.6	13.2385	79.3112
Bhanu	Chittoor	C.M.Kandiga	2022	Mango	0.44	13.2368	79.3118
Venktadri	Chittoor	E.K.Kandigga	2018	Mango	0.1	13.2364	79.3176
Subramanyam reddy	Chittoor	Damaragunta	2018	Mango	0.23	13.3048	79.2218
Ramesh	Chittoor	Damaragunta	2018	Mango	0.19	13.3065	79.2232
Ramesh	Chittoor	Damaragunta	2018	Mango	0.37	13.3065	79.2239
Ramesh	Chittoor	Damaragunta	2018	Mango	0.14	13.3060	79.2240

Ramesh	Chittoor	Damaragunta	2018	Mango	0.15	13.3061	79.2236
Pedhabba reddy	Chittoor	Damaragunta	2023	Mango	0.23	13.3108	79.2291
Pedhabba reddy	Chittoor	Damaragunta	2023	Mango	0.11	13.3100	79.2289
Pedhabba reddy	Chittoor	Damaragunta	2023	Mango	0.1	13.3098	79.2293
Chandrasekar	Chittoor	Damaragunta	2021	Mango	0.36	13.3146	79.2234
Padmanaba reddy	Chittoor	Damaragunta	2018	Mango	0.11	13.3117	79.2220
M Bhaskar	Chittoor	Kj Puram	2018	Mango	0.37	13.2240	79.4270
M Bhaskar	Chittoor	Kj Puram	2018	Mango	0.42	13.2243	79.4276
G jaganath naidu	Chittoor	Kv Puram	2022	Mango	0.47	13.1663	79.2617
G jaganath naidu	Chittoor	Kv Puram	2022	Mango	0.59	13.1660	79.2621
G jaganath naidu	Chittoor	Kv Puram	2022	Mango	0.39	13.1664	79.2628
D ramaswamy reddy	Chittoor	Ambodhara Palli	2019	Mango	0.41	13.1793	79.2498
j Venkateshulu Naidu	Chittoor	Patha Palyam	2018	Mango	0.31	13.1804	79.2636
M Venkatesulu naidu	Chittoor	Patha Palyam	2018	Mango	0.16	13.1805	79.2641
M Venkatesulu Naidu	Chittoor	Patha Palyam	2018	Mango	0.93	13.1795	79.2650
M chilakamma	Chittoor	Patha Palyam	2018	Mango	0.71	13.1789	79.2611
A ganasekar naidu	Chittoor	Patha Palyam	2018	Mango	0.58	13.1798	79.2620
A ganasekar naidu	Chittoor	Patha Palyam	2019	Mango	0.27	13.1831	79.2656
J balaiah	Chittoor	Patha Palyam	2018	Mango	0.33	13.1842	79.2659
M chilakamma	Chittoor	Patha Palyam	2018	Mango	0.34	13.1844	79.2652
M chilakamma	Chittoor	Patha Palyam	2018	Mango	0.34	13.1849	79.2649
M chandramma	Chittoor	Vengalarajakuppam	2023	Mango	0.51	13.1960	79.3737
D chandramma	Chittoor	Kotthvenkatapuram	2022	Mango	0.64	13.1612	79.2672
D lokanadham naidu	Chittoor	Thugundram	2018	Mango	0.17	13.1762	79.2587
D lokanadham naidu	Chittoor	Thugundram	2018	Mango	0.16	13.1757	79.2590
D lokanadham naidu	Chittoor	Thugundram	2018	Mango	0.31	13.1748	79.2592
M venkatesh	Chittoor	Mitta Kothur	2018	Mango	0.74	13.1781	79.2665
M venkatesh	Chittoor	Mitta Kothur	2018	Mango	0.25	13.1779	79.2659
A lokanadha naidu	Chittoor	Mitta Kothur	2019	Mango	0.55	13.1772	79.2670

A lokanadha naidu	Chittoor	Mitta Kothur	2018	Mango	0.4	13.1771	79.2665
N vanasri	Chittoor	Mitta Kothur	2018	Mango	0.67	13.1769	79.2644
Bhaskar reddy	Chittoor	Damaragunta	2018	Mango	1.19	13.3110	79.2109
Konda reddy	Chittoor	Damaragunta	2018	Mango	0.19	13.3105	79.2257
Parvathi	Chittoor	Damaragunta	2018	Mango	0.1	13.3105	79.2253
Narasimha reddy	Chittoor	Damaragunta	2018	Mango	0.18	13.3073	79.2271
Narasimha reddy	Chittoor	Bandarlla Palli	2019	Mango	0.22	13.2916	79.1933
Vinod kumar	Chittoor	Bandarlla Palli	2021	Mango	0.16	13.2923	79.1908
Sambasiva reddy	Chittoor	Bandarlla Palli	2021	Mango	0.5	13.2929	79.1946
Subramanyam reddy	Chittoor	Bandarlla Palli	2022	Mango	0.68	13.2916	79.1891
Sambasiva reddy	Chittoor	Bandarlla Palli	2019	Mango	0.14	13.2896	79.1930
Sambasiva reddy	Chittoor	Bandarlla Palli	2021	Mango	0.22	13.2886	79.1930
Rajarao	Chittoor	E.K.Kandiga	2023	Mango	0.19	13.2345	79.3279
Lokesh	Chittoor	C.M.Kandiga	2018	Mango	0.57	13.2353	79.3103
Lokesh	Chittoor	C.Mkandiga	2018	Mango	0.4	13.2354	79.3098
Lokesh	Chittoor	C.M.Kandiga	2018	Mango	0.25	13.2354	79.3095
Lokesh	Chittoor	C.Mkandiga	2018	Mango	0.2	13.2352	79.3092
Chilakamma	Chittoor	Krishnaiah	2018	Mango	0.28	13.2344	79.3093
Raniamma	Chittoor	C.M.Kandiga	2018	Mango	0.41	13.2344	79.3096
Subramanyam	Chittoor	C.M.Kandiga	2018	Mango	0.43	13.2344	79.3089
D Subramanyam	Chittoor	Pv Puram	2022	Mango	0.28	13.1716	79.2539
G yesu padha	Chittoor	Pv Puram	2018	Mango	0.59	13.1503	79.2508
Samivel	Chittoor	Pv Puram	2021	Mango	0.34	13.1493	79.2493
T sulochan	Chittoor	Kv Puram	2018	Mango	0.31	13.1611	79.2660
Balakrishnaiah chetty	Chittoor	Patha Palyam	2018	Mango	0.5	13.1806	79.2602
R thulasamm	Chittoor	Patha Palyam	2018	Mango	0.13	13.1816	79.2686
B Devarajulu reddy	Chittoor	Chinavepanjeri	2019	Mango	0.38	13.2069	79.2376
B Devarajulu reddy	Chittoor	Chinavepanjeri	2019	Mango	0.4	13.2074	79.2379
B allemma	Chittoor	Chinavepanjeri	2019	Mango	0.26	13.2079	79.2383

N Munaswamy naidu	Chittoor	Chinavepanjeri	2019	Mango	0.32	13.2076	79.2372
N Munaswamy naidu	Chittoor	Chinavepanjeri	2019	Mango	0.73	13.2082	79.2373
Guru swamy naidu	Chittoor	Chittoor	2018	Mango	0.5	13.2042	79.2371
Guru swamy naidu	Chittoor	Chinavepanjeri	2018	Mango	0.5	13.2041	79.2376
Venkata krishnamm naidu	Chittoor	Chinavepanjeri	2018	Mango	0.34	13.2034	79.2375
E varadarajulu naidu	Chittoor	Chinavepanjeri	2018	Mango	0.35	13.2052	79.2369
E varadarajulu naidu	Chittoor	Chinavepanjeri	2018	Mango	0.38	13.2041	79.2367
E varadarajulu naidu	Chittoor	Chinavepanjeri	2018	Mango	0.24	13.2043	79.2365
C Geetha	Chittoor	Chinavepanjeri	2021	Mango	0.45	13.2072	79.2371
Prameela	Chittoor	Pullur.Hw	2018	Mango	0.22	13.2538	79.3312
Saranya	Chittoor	Pullur.Hw	2020	Mango	0.39	13.2541	79.3315
Venubabu	Chittoor	Pullur.Hw	2023	Mango	0.36	13.2530	79.3264
Sobhanbabu	Chittoor	Pullur.Hw	2023	Mango	0.23	13.2530	79.3259
Rajeswari	Chittoor	Kapukandiga	2018	Mango	0.35	13.2529	79.3362
Mohankumar	Chittoor	Kapukandiga	2018	Mango	0.48	13.2527	79.3365
Mohankumar	Chittoor	Kapukandiga	2018	Mango	0.3	13.2524	79.3368
Mohankumar	Chittoor	Kapukandiga	2018	Mango	0.42	13.2525	79.3371
Dora swamy	Chittoor	Kapukandiga	2018	Mango	0.24	13.2525	79.3375
Subbareddy	Chittoor	Kapukandiga	2018	Mango	0.63	13.2518	79.3377
Subbareddy	Chittoor	Kapukandiga	2018	Mango	0.56	13.2517	79.3383
E chinnama	Chittoor	Chinavepanjeri	2020	Mango	0.17	13.2048	79.2368
N govind rajulu Naidu	Chittoor	Mahadev Mangalam	2018	Mango	0.34	13.2059	79.2343
N govind rajulu Naidu	Chittoor	Mahadev Mangalam	2018	Mango	0.39	13.2055	79.2332
Gunachari	Chittoor	Bandarlla Palli	2018	Mango	0.19	13.2944	79.1917
gunasekar achari	Chittoor	Bandarlla Palli	2018	Mango	0.48	13.2949	79.1921
Gunasekar achari	Chittoor	Bandarlla Palli	2018	Mango	0.43	13.2939	79.1919
Nandakumar	Chittoor	N.Rpuram	2020	Mango	0.53	13.2711	79.3314
Narasimhulu naidu	Chittoor	D.R.Puram	2018	Mango	0.3	13.2800	79.3369
Kavitha	Chittoor	D.R.Puram	2020	Mango	0.26	13.2805	79.3357

Bhaskar	Chittoor	D.R.Puram	2018	Mango	0.32	13.2790	79.3375
Bhaskar	Chittoor	D.R.Puram	2018	Mango	0.17	13.2787	79.3377
Siva	Chittoor	D.R.Puram	2018	Mango	0.14	13.2791	79.3378
N doraswamy naidu	Chittoor	Mahadev Mangalam	2020	Mango	0.24	13.2023	79.2346
N doraswamy naidu	Chittoor	Mahadev Mangalam	2020	Mango	0.12	13.2019	79.2346
N brahmaiah	Chittoor	Mahadev Mangalam	2020	Mango	0.4	13.2023	79.2352
N Subramanyam Naidu	Chittoor	Mahadev Mangalam	2020	Mango	0.52	13.2019	79.2356
N sugun	Chittoor	Mahadev Mangalam	2020	Mango	0.65	13.2025	79.2340
N doraswamy naidu	Chittoor	Mahadev Mangalam	2020	Mango	0.18	13.2014	79.2349
N brahmaiah	Chittoor	Mahadev Mangalam	2020	Mango	0.2	13.2018	79.2350
N rajendra Naidu	Chittoor	Mahadev Mangalam	2020	Mango	0.43	13.2033	79.2341
N rajendra Naidu	Chittoor	Mahadev Mangalam	2020	Mango	0.27	13.2035	79.2346
M sarala	Chittoor	Mahadev Mangalam	2018	Mango	0.38	13.2071	79.2365
Redemma	Chittoor	Vejjupalli	2021	Mango	0.38	13.2997	79.2024
Bhaskar reddy	Chittoor	Vejjupalli	2020	Mango	0.33	13.2952	79.2089
Anand reddy	Chittoor	Damaragunta	2023	Mango	1.1	13.3106	79.2123
Yekambaram	Chittoor	Damaragunta	2018	Mango	0.17	13.3114	79.2156
Sudhakar reddy	Chittoor	Damaragunta	2018	Mango	0.39	13.3103	79.2156
Venkat redfy	Chittoor	Damaragunta	2020	Mango	0.2	13.3106	79.2136
Venkat reddy	Chittoor	Damaragunta	2020	Mango	0.36	13.3101	79.2128
E.jayaramnaidu	Chittoor	Varattur	2018	Mango	0.11	13.2126	79.2469
E. Jayarama naidu	Chittoor	Varathuru	2019	Mango	0.13	13.2133	79.2481
M.santhama	Chittoor	Varathuru	2018	Mango	0.12	13.2122	79.2481
N.y.yogamoortynaidu	Chittoor	Chinnavepanjeri	2018	Mango	0.5	13.2055	79.2315
N.y.yogamoortynaidu	Chittoor	Mahadevamangalam	2018	Mango	0.61	13.2054	79.2319
N.y.yogamoortynaidu	Chittoor	Mahadevamangalam	2018	Mango	0.66	13.2052	79.2323
N.yangamanaidu	Chittoor	Mahadevamangalam	2020	Mango	0.25	13.2062	79.2347
N.y.yogamoortynaidu	Chittoor	Chinnavepanjeri	2018	Mango	0.53	13.2055	79.2310
M.sankar chetty	Chittoor	Mahadevamangalam	2020	Mango	0.29	13.2094	79.2403

Nandareddy	Chittoor	Chinnavepamjeri	2018	Mango	0.92	13.2140	79.2396
Kodandapani	Chittoor	Chinnavepanjeri	2018	Mango	0.28	13.2104	79.2449
L.ramoortyreddy	Chittoor	Bukkapatnam	2018	Mango	0.18	13.2142	79.2512
L.ramoortyreddy	Chittoor	Varattur	2018	Mango	0.18	13.2147	79.2513
G.sambasivasetty	Chittoor	Bukkapatnam	2018	Mango	0.3	13.2143	79.2509
M.subramanyamnaidu	Chittoor	Varattur	2018	Mango	0.26	13.2122	79.2476
E.jeevaratnamnaidu	Chittoor	Varattur	2018	Mango	0.23	13.2123	79.2469
K.umapathi	Chittoor	Chinnavepanjeri	2018	Mango	0.23	13.2144	79.2339
V.damodar reddy	Chittoor	Chinnavepanjeri	2019	Mango	0.2	13.2131	79.2316
Prabhavathi	Chittoor	Chinnavepanjeri	2019	Mango	0.64	13.2103	79.2339
Prabhavathi	Chittoor	Chinnavepanjeri	2022	Mango	0.42	13.2109	79.2353
K.nagaiah	Chittoor	Chinnavepanjeri	2018	Mango	0.44	13.2096	79.2350
J.ramareddy	Chittoor	Chinnavepammjeri	2018	Mango	0.11	13.2067	79.2296
Chinnama reddy	Chittoor	Maredupalli	2018	Mango	0.9	13.2801	79.1986
Rami reddy	Chittoor	Maredupalli	2018	Mango	0.52	13.2793	79.1986
Naagamma	Chittoor	Maredupall	2022	Mango	0.78	13.2750	79.1973
B neerajakshulu naidu	Chittoor	Yella Palli	2021	Mango	0.4	13.1756	79.2253
B neerajakshulu naidu	Chittoor	Yella Palli	2018	Mango	0.38	13.1704	79.2285
B neerajakshulu naidu	Chittoor	Yella Palli	2018	Mango	0.1	13.1719	79.2287
T chirajeevi	Chittoor	Yella Palli	2019	Mango	0.2	13.1769	79.2268
T kokila	Chittoor	Yella Palli	2018	Mango	0.25	13.1686	79.2234
T chirajeevi	Chittoor	Yella Palli	2018	Mango	0.14	13.1686	79.2237
T chirajeevi	Chittoor	Yella Palli	2018	Mango	0.22	13.1687	79.2231
C nagarajulu	Chittoor	Yella Palli	2018	Mango	0.43	13.1684	79.2241
C nagarajulu	Chittoor	Yella Palli	2018	Mango	0.17	13.1697	79.2236
C nagarajulu	Chittoor	Yella Palli	2018	Mango	0.4	13.1701	79.2252
Ak Raghu chandra	Chittoor	Yella Palli	2020	Mango	0.2	13.1667	79.2248
G Lakshmi pathi naidu	Chittoor	Ambodhara Palli	2018	Mango	0.41	13.1753	79.2365
M rajgopal naidu	Chittoor	Ambodhara Palli	2018	Mango	0.37	13.1772	79.2366

M rajgopal naidu	Chittoor	Ambodhara	2018	Mango	0.15	13.1787	79.2407
G Hemanth kumar	Chittoor	Ambodhara Palli	2018	Mango	0.82	13.1769	79.2372
G govinda reddy	Chittoor	Varathuru	2021	Mango	0.33	13.2176	79.2418
B kuppaiah naidu	Chittoor	Yallapalli	2018	Mango	0.4	13.1712	79.2304
G govinda reddy	Chittoor	Varathuru	2018	Mango	0.21	13.2176	79.2415
B kuppaiah naidu	Chittoor	Yallapalli	2018	Mango	0.43	13.1711	79.2297
B kuppaiah naidu	Chittoor	Yallapalli	2018	Mango	0.88	13.1704	79.2301
B kuppaiah naidu	Chittoor	Yallapalli	2018	Mango	0.67	13.1718	79.2295
A subramanyam naidu	Chittoor	Yallapalli	2018	Mango	0.86	13.1744	79.2269
A subramanyam naidu	Chittoor	Yallapalli	2018	Mango	0.24	13.1696	79.2239
A Sairam	Chittoor	Yallapalli	2018	Mango	0.81	13.1658	79.2248
J sivaji	Chittoor	Ellapalle	2023	Mango	0.16	13.1657	79.2263
J sivaji	Chittoor	Ellapalle	2023	Mango	0.14	13.1661	79.2265
G Sathish	Chittoor	Edhara Pallam	2018	Mango	0.6	13.1798	79.2390
G sandeep	Chittoor	Edhara Pallam	2018	Mango	0.68	13.1791	79.2391
K Ramya sree	Chittoor	Edhara Pallam	2022	Mango	0.51	13.1787	79.2376
Pc ravi	Chittoor	Ambodhara	2019	Mango	0.71	13.1877	79.2480
V Munaswamy	Chittoor	Ambodhara Palli	2018	Mango	0.28	13.1760	79.2435
M Baskar Naidu	Chittoor	Ambodhara Palli	2018	Mango	0.29	13.1788	79.2426
M sujatha	Chittoor	Ambodhara Palli	2018	Mango	0.1	13.1786	79.2423
K seshamma	Chittoor	Ambodhara Palli	2023	Mango	0.75	13.1818	79.2365
M chandrasekhar naidu	Chittoor	Ambodhara Palli	2023	Mango	0.15	13.1786	79.2328
K mohan raju	Chittoor	Ambodhara Palli	2023	Mango	0.78	13.1741	79.2386
K praveena	Chittoor	Ambodhara Palli	2023	Mango	0.22	13.1806	79.2369
Prathibha Rani katta	Chittoor	Ambodhara Palli	2023	Mango	0.32	13.1763	79.2365
Vimala	Chittoor	Maredupall	2018	Mango	0.48	13.2785	79.2022
Vimala	Chittoor	Maredupall	2020	Mango	0.18	13.2780	79.2016
Lokanadam reddy	Chittoor	Maredupall	2018	Mango	1.14	13.2784	79.2028
Lakshmamma	Chittoor	Maredupall	2021	Mango	0.63	13.2786	79.1959

Kanukondareddy	Chittoor	Maredupall	2018	Mango	0.74	13.2731	79.1989
Kanukonda reddy	Chittoor	Maredupall	2018	Mango	0.37	13.2728	79.1985
Kondareddy	Chittoor	Krisna Puram	2022	Mango	0.58	13.2816	79.1900
Rekha	Chittoor	Krisnapuram	2018	Mango	0.63	13.2809	79.1997
Roja	Chittoor	Krisnapuram	2018	Mango	0.26	13.2817	79.1993
Himadama reddy	Chittoor	Krisnapuram	2018	Mango	0.51	13.2816	79.1998
Mohnreddy	Chittoor	Krisnapuram	2018	Mango	0.44	13.2813	79.2027
Kisorreddy	Chittoor	Mittapalli	2022	Mango	0.61	13.2784	79.1986
Narasimha reddy	Chittoor	Mittapalli	2022	Mango	1.65	13.2791	79.1995
Bhalaji	Chittoor	Mittapalli	2021	Mango	0.86	13.2800	79.2012
Bhalaji	Chittoor	Mittapalli	2021	Mango	0.6	13.2793	79.2011
Duravasulu reddy	Chittoor	Vejjupalli	2018	Mango	0.25	13.2882	79.2033
Sambasiva reddy	Chittoor	Vejjupalli	2018	Mango	0.15	13.2880	79.2039
Narasimha reddy	Chittoor	Mittapalli	2021	Mango	0.89	13.2799	79.2003
Vasantha	Chittoor	Vejjupalli	2018	Mango	0.68	13.2874	79.2068
Duravasula reddy	Chittoor	Vejjupalli	2018	Mango	0.18	13.2879	79.2033
R vasanthamma	Chittoor	Chinna Vepanjeri	2020	Mango	0.18	13.2099	79.2295
R gnana sekhar reddy	Chittoor	Chinna Vepanjeri	2022	Mango	0.31	13.2047	79.2291
D narasamma	Chittoor	Vepanjeri	2021	Mango	0.42	13.2308	79.2289
D narasamma	Chittoor	Vepanjeri	2021	Mango	0.37	13.2310	79.2295
Damodar reddy	Chittoor	Vadhipalli	2018	Mango	0.35	13.2704	79.2059
Rambabu	Chittoor	Vaddipalli	2018	Mango	0.45	13.2727	79.2044
Lakshmamma	Chittoor	Vaddipalli	2019	Mango	0.63	13.2751	79.2029
Lakshmamma	Chittoor	Vaddipalli	2019	Mango	0.15	13.2746	79.2026
Venkata reddy	Chittoor	Vaddipalli	2023	Mango	0.74	13.2752	79.2103
V vasanthamma	Chittoor	Chinavepanjeri	2020	Mango	0.17	13.2021	79.2279
V chinnapapamma	Chittoor	Chinavepanjeri	2020	Mango	0.28	13.2022	79.2276
Munirathnam	Chittoor	E.K.Kandiga	2022	Mango	0.14	13.2340	79.3216
Munirathnam	Chittoor	E.K.Kandiga	2022	Mango	0.13	13.2335	79.3213

Jyothi	Chittoor	E.K.Kandiga	2022	Mango	0.26	13.2338	79.3211
Vasudevanaidu	Chittoor	Padmapuram	2018	Mango	0.26	13.2800	79.3406
Anasuya	Chittoor	D.R.Puram	2018	Mango	0.21	13.2795	79.3391
Brahmaiah	Chittoor	D.R.Puram	2018	Mango	0.92	13.2782	79.3370
Chethana	Chittoor	D.Rpuram	2018	Mango	0.57	13.2776	79.3369
Balakrishnamanaidu	Chittoor	Padmapuram	2023	Mango	0.13	13.2667	79.3500
Dhanush	Chittoor	Padmapuram	2023	Mango	0.14	13.2665	79.3505
Muthulingam	Chittoor	Padmapuram	2023	Mango	0.15	13.2663	79.3505
J.poornaganeshkumar	Chittoor	Chinnavepanjeri	2018	Mango	0.5	13.2073	79.2280
M.anandareddy	Chittoor	Chinnavepanjeri	2022	Mango	0.13	13.2054	79.2256
Rudrareddy	Chittoor	Vaddipalli	2019	Mango	0.34	13.2739	79.2055
Rajeswari	Chittoor	Vaddipalli	2022	Mango	1.34	13.2722	79.2023
Anjaneyulu reddy	Chittoor	Vaddipalli	2020	Mango	0.39	13.2700	79.2093
Anjaneyulu reddy	Chittoor	Vaddipalli	2020	Mango	0.39	13.2699	79.2089
B.kesavareddy	Chittoor	Vepanjeri	2018	Mango	0.6	13.2320	79.2337
K.vallemma	Chittoor	Vepanjeri	2018	Mango	0.48	13.2339	79.2324
K rajendrachetty	Chittoor	Vepanjeri	2018	Mango	0.44	13.2339	79.2318
V.vijayan	Chittoor	Patapalyam	2019	Mango	0.28	13.1815	79.2744
V.vijayan	Chittoor	Patapalyam	2019	Mango	0.11	13.1809	79.2744
P.munaswamy	Chittoor	Pathapalyam	2022	Mango	0.28	13.1717	79.2757
T.aruldas	Chittoor	Patapalyam	2019	Mango	0.28	13.1741	79.2745
N.sesidar reddy	Chittoor	Vepanjeri	2022	Mango	0.23	13.2333	79.2335
N Subramanyam Reddy	Chittoor	Vepanjeri	2018	Mango	0.56	13.2367	79.2368
P.bhoopathi	Chittoor	Dasarigunta Village	2022	Mango	0.38	13.2862	79.3714
P.bhoopathi	Chittoor	Dasarigunta Village	2022	Mango	0.1	13.2861	79.3716
P.bhoopathi mandhidi	Chittoor	Dasarigunta Village	2022	Mango	0.1	13.2859	79.3717
P nhoopathi	Chittoor	Dasarigunta	2020	Mango	0.55	13.2854	79.3731
Krishna mandhidi	Chittoor	Dasarigunta Village	2020	Mango	0.26	13.2864	79.3747
Vanajakshi	Chittoor	Dasarigunta	2020	Mango	0.1	13.2876	79.3749

Vanajakshi	Chittoor	Dasarigunta	2020	Mango	0.12	13.2868	79.3750
Suresh	Chittoor	Dasarigunta	2023	Mango	0.32	13.2629	79.3546
Rajendramandadi	Chittoor	Padmapuram	2023	Mango	0.31	13.2623	79.3544
Manjula	Chittoor	Padmapuram	2023	Mango	0.16	13.2625	79.3548
Manjula	Chittoor	Padmapuram	2023	Mango	0.39	13.2633	79.3544
Guravamma	Chittoor	Padmapuram	2018	Mango	0.38	13.2682	79.3535
Guravamma	Chittoor	Padmapuram	2020	Mango	0.22	13.2651	79.3513
Narasimha reddy	Chittoor	Pedhagunta Palli	2019	Mango	0.15	13.2742	79.1884
Narasimha reddy	Chittoor	Pedhagunta Palli	2019	Mango	0.46	13.2748	79.1883
Lokanadam reddy	Chittoor	Pedhagunta Palli	2019	Mango	0.34	13.2748	79.1880
Adilakshmi	Chittoor	Pedhagunta Palli	2019	Mango	0.36	13.2749	79.1877
Adilakshmi	Chittoor	Pedhagunta Palli	2019	Mango	0.37	13.2750	79.1874
Muthulingam	Chittoor	Padmapuram Hw	2022	Mango	0.34	13.2618	79.3454
Kavitha	Chittoor	Padmapuram	2018	Mango	0.38	13.2607	79.3459
Reshma	Chittoor	Padmapuram	2018	Mango	0.33	13.2611	79.3459
Bhaskarnaidu	Chittoor	Padmapuram	2018	Mango	0.1	13.2603	79.3471
Suseelamma	Chittoor	Padmapuram	2018	Mango	0.88	13.1770	79.2499
S sulochana	Chittoor	Ambodhara Palli	2023	Mango	0.16	13.2337	79.2391
A suman	Chittoor	Vepanjeri	2023	Mango	0.17	13.2337	79.2397
A suman	Chittoor	Vepanjeri	2023	Mango	0.18	13.2342	79.2399
A prakash	Chittoor	Vepanjeri	2023	Mango	0.39	13.2348	79.2391
N munirathnam reddy	Chittoor	Vepanjeri	2022	Mango	0.11	13.2380	79.2369
E chinnaswamy reddy	Chittoor	Vepanjeri	2019	Mango	0.76	13.2375	79.2373
A jaswanth	Chittoor	Vepanjeri	2023	Mango	0.23	13.2305	79.2335
N sudhakar reddy	Chittoor	Vepanjeri	2023	Mango	0.28	13.2301	79.2335
N sudhakar reddy	Chittoor	Vepanjeri	2019	Mango	0.42	13.2289	79.2415
G munemma	Chittoor	Vepanjeri	2019	Mango	0.67	13.2294	79.2406
G munemma	Chittoor	Vepanjeri	2023	Mango	0.14	13.2305	79.2431
K.muniratnam reddy	Chittoor	Vepanjeri	2018	Mango	0.28	13.2368	79.2483

K.syamala	Chittoor	Varattor	2018	Mango	0.58	13.2366	79.2487
K.syamala	Chittoor	Varattor	2018	Mango	0.36	13.2365	79.2491
K.surendra reddy	Chittoor	Varattor	2018	Mango	0.32	13.2363	79.2494
K.surendrareddy	Chittoor	Varattor	2018	Mango	0.35	13.2362	79.2497
K.balakrishnareddy	Chittoor	Varattor	2020	Mango	0.26	13.2412	79.3083
Himachalapathi	Chittoor	Cmkandiga	2020	Mango	0.44	13.2407	79.3079
Srimathi	Chittoor	Cmkandiga	2020	Mango	0.21	13.2408	79.3084
Srimathi	Chittoor	Cmkandiga	2020	Mango	0.11	13.2404	79.3085
Lokanadam	Chittoor	Cmkandiga	2020	Mango	0.27	13.2456	79.3091
Anitha	Chittoor	Pcmitta	2018	Mango	0.5	13.2657	79.3489
Rajeswari	Chittoor	Padmapuram	2020	Mango	0.25	13.2665	79.3491
Rajeswari	Chittoor	Padmapuram	2018	Mango	0.32	13.2656	79.3479
Sujatha	Chittoor	Padmapuram	2018	Mango	0.34	13.2657	79.3522
Padmanabam	Chittoor	Padmapuram	2018	Mango	0.15	13.2660	79.3521
Suseelamma	Chittoor	Padmapuram	2018	Mango	0.12	13.2663	79.3521
G venkata Reddy	Chittoor	Varathuru	2023	Mango	0.16	13.2154	79.2444
B. Chinappamm	Chittoor	Varathuru	2023	Mango	0.1	13.2148	79.2440
B chinnapapamma	Chittoor	Varathuru	2019	Mango	0.32	13.2168	79.2436
V ganapathy reddy	Chittoor	Varathuru	2023	Mango	0.13	13.2227	79.2441
K chandra shekhar reddy	Chittoor	Veerakanellore	2018	Mango	1.36	13.2457	79.2437
N subrahmanyam reddy	Chittoor	Veerakanellore	2018	Mango	1.42	13.2476	79.2461
N subrahmanyam reddy	Chittoor	Veerakanellore	2023	Mango	0.32	13.2466	79.2454
N chinnabba reddy	Chittoor	Veerakanellore	2023	Mango	0.29	13.2467	79.2452
N chenna reddy	Chittoor	Veekanellore	2023	Mango	0.34	13.2467	79.2449
N chenna reddy	Chittoor	Veerakanellore	2023	Mango	0.6	13.2470	79.2436
K venkatesh	Chittoor	Agara Mangalam	2018	Mango	0.75	13.2420	79.2408
N poobhalan	Chittoor	Agara Mangalam	2018	Mango	0.32	13.2458	79.2402
Mk madhava mandadi	Chittoor	Agra Mangalm	2023	Mango	0.38	13.2452	79.2456
N.jagadamma	Chittoor	Veerakanellor	2023	Mango	0.78	13.2458	79.2450

N.jagadamma	Chittoor	Veerakanellor	2023	Mango	0.59	13.2479	79.2477
N.jagadamma	Chittoor	Veerakanellor	2023	Mango	0.74	13.2461	79.2494
N.lokanadareddy	Chittoor	Vepanjeri	2023	Mango	0.2	13.2466	79.2495
N.lokanadareddy	Chittoor	Vepanjeri	2018	Mango	0.16	13.2409	79.2527
A.saradi	Chittoor	Vepanjeri	2018	Mango	0.17	13.2407	79.2526
A.sudakar reddy	Chittoor	Vepanjeri	2018	Mango	0.6	13.2479	79.2361
K.govindareddy	Chittoor	Agaramangalam	2019	Mango	0.6	13.2497	79.2370
K.govindareddy	Chittoor	Agaramangalam	2019	Mango	0.36	13.2499	79.2364
Mk madhava mandadi	Chittoor	Agara Mangalam	2023	Mango	0.33	13.2550	79.2430
K giri	Chittoor	Veerakanellore	2023	Mango	0.1	13.2551	79.2427
Sambasiva reddy	Chittoor	Ugranampalli	2021	Mango	0.18	13.2977	79.1964
Sambasiva reddy	Chittoor	Ugranam Palli	2021	Mango	0.16	13.2977	79.1960
JAYABALAN.J	Chittoor	Lingappa Readymade	2018	Mango	0.36	13.2570	79.2454
C lokanatham reddy	Chittoor	Veerakanellore	2018	Mango	0.48	13.2569	79.2460
C balakrishna reddy	Chittoor	Veerakanellore	2021	Mango	0.21	13.2542	79.2361
M madhava mandadi	Chittoor	Veerakanellore	2023	Mango	0.2	13.2575	79.2360
N Kiran Kumar	Chittoor	Veekanellore	2018	Mango	0.77	13.2509	79.2438
B muni reddy	Chittoor	Veerakanellore	2023	Mango	0.32	13.2509	79.2431
M thulasiram	Chittoor	Veerakanellore	2020	Mango	0.55	13.2491	79.2353
K.anjaneyulureddy	Chittoor	Agaramangalam	2018	Mango	0.41	13.2456	79.2326
K.anjaneyulureddy	Chittoor	Agaramangalam	2018	Mango	0.22	13.2438	79.2315
A.venkatesulureddy	Chittoor	Agaramangalam	2018	Mango	0.4	13.2437	79.2323
A.venkatesulureddy	Chittoor	Agaramangalam	2022	Mango	0.21	13.2443	79.2324
A.chandil kumar	Chittoor	Agaramangalam	2022	Mango	0.42	13.2446	79.2320
A.chandilkumar	Chittoor	Agaramangalam	2022	Mango	0.5	13.2445	79.2316
A.chandilkumar	Chittoor	Agaramangalam	2022	Mango	0.47	13.2491	79.2424
N.ramalingareddy	Chittoor	Varattor	2019	Mango	0.9	13.3055	79.1986
Purnachandra reddy	Chittoor	Pulikalku	2021	Mango	0.1	13.3095	79.1837
Pattabireddy	Chittoor	Pullikallu	2019	Mango	0.3	13.3091	79.1840

Saylaja	Chittoor	Pulikallu	2019	Mango	0.72	13.3081	79.1921
Lokanadam reddy	Chittoor	Pullikallu	2019	Mango	0.53	13.3081	79.1931
C thulasiram reddy	Chittoor	Veerakanellore	2018	Mango	0.73	13.2517	79.2442
N sesha reddy	Chittoor	Varathuru	2018	Mango	0.2	13.2531	79.2424
B Muni reddy	Chittoor	Veerakanellore	2019	Mango	0.1	13.2366	79.2617
A chinbba reddy	Chittoor	Varathuru	2023	Mango	0.58	13.2372	79.2610
Pushpamma	Chittoor	Padmapuram	2018	Mango	0.27	13.2579	79.3466
Pushpamma	Chittoor	Padmapuram	2018	Mango	0.1	13.2584	79.3466
Sarojamma	Chittoor	Padmapuram	2020	Mango	0.43	13.2583	79.3451
Markodanaidu	Chittoor	Padmapuram	2018	Mango	0.37	13.2587	79.3454
Balasubramanyam	Chittoor	Padmapuram	2018	Mango	0.22	13.2574	79.3457
Hemanth	Chittoor	Padmapuram	2018	Mango	0.45	13.2575	79.3449
Nagireddy	Chittoor	Dwarakanagar	2020	Mango	0.46	13.2554	79.3463
Chengamma	Chittoor	Dwarakanagar	2022	Mango	0.18	13.2657	79.3498
Hemalatha	Chittoor	Padmapuram	2020	Mango	0.65	13.2661	79.3498
Varadarajunaidu	Chittoor	Padmapuram	2018	Mango	0.3	13.2512	79.3375
Chandrasekhar	Chittoor	Kapukandiga	2018	Mango	0.43	13.2509	79.3374
Ajith Kumar	Chittoor	U.M Puram	2020	Mango	0.27	13.2991	79.3476
Lalithamma	Chittoor	U M Puram	2020	Mango	1.44	13.3031	79.3497
Balaji naidu	Chittoor	U.M Puram	2020	Mango	0.88	13.3033	79.3488
Balaji naidu	Chittoor	U .M Puram	2021	Mango	0.39	13.3041	79.3491
Narasimhulu	Chittoor	Umpuram	2021	Mango	1	13.3052	79.3486
Ramesh	Chittoor	Umpuram	2022	Mango	0.2	13.3054	79.3477
Chandrasekar reddy	Chittoor	Simgamvariuru	2021	Mango	0.19	13.3118	79.1958
Bhucchireddy	Chittoor	Simgamvariuru	2019	Mango	0.1	13.3120	79.1960
Bhuchireddy	Chittoor	Simgamvariuru	2021	Mango	0.15	13.3118	79.1964
Rajendra reddy	Chittoor	Simgamvariuru	2019	Mango	0.1	13.3115	79.1965
Rajendra reddy	Chittoor	Simgamvariuru	2019	Mango	0.27	13.3113	79.1955
Jaganadam reddy	Chittoor	Simgamvariuru	2019	Mango	0.12	13.3113	79.1949

Anjali	Chittoor	Simgamvariuru	2019	Mango	0.61	13.2417	79.2062
M januu bee	Chittoor	Gd Nellore	2019	Mango	0.28	13.2418	79.2058
E venkateshsulu reddy	Chittoor	Gd Nellore	2021	Mango	0.75	13.2420	79.2052
Darmayya	Chittoor	Simgamvariuru	2021	Mango	0.13	13.3104	79.1961
Subramanyam reddy	Chittoor	Simgamvariuru	2021	Mango	0.1	13.3104	79.1958
Subramanyam reddy	Chittoor	Simgamvariuru	2021	Mango	0.15	13.3104	79.1955
Subramanyam reddy	Chittoor	Simgamvariuru	2021	Mango	0.1	13.3107	79.1956
Subramanyam reddy	Chittoor	Simgamvariuru	2019	Mango	0.22	13.3117	79.1948
Bhaskar reddy	Chittoor	Simgamvariuru	2022	Mango	0.11	13.3121	79.1948
Bhaskar reddy	Chittoor	Simgamvariuru	2019	Mango	0.24	13.3125	79.1950
Hariprasad	Chittoor	Simgamvariuru	2022	Mango	0.29	13.3127	79.1943
Chiranjivi	Chittoor	Simgamvariuru	2021	Mango	0.21	13.2412	79.2055
V Ramchandra reddy	Chittoor	Gd Nellore	2021	Mango	1	13.2410	79.2063
V Ramchandra reddy	Chittoor	Gd Nellore	2021	Mango	0.15	13.2408	79.2072
D suganthi	Chittoor	Gd Nellore	2021	Mango	0.72	13.2366	79.2007
P Rajasekhar reddy	Chittoor	Gd Nellore	2018	Mango	0.47	13.2374	79.2050
V lokanadh	Chittoor	Gd Nellore	2018	Mango	0.95	13.2333	79.2113
V Dharmamanndadi	Chittoor	Gd Nellore	2021	Mango	0.67	13.2354	79.2107
V vasanthamma	Chittoor	Gd Nellore	2021	Mango	1	13.2430	79.2138
B venkata Reddy	Chittoor	Gd Nellore	2018	Mango	0.49	13.2425	79.2133
B Venkata reddy	Chittoor	Gd Nellore	2020	Mango	0.27	13.2428	79.2148
G vasudeva reddy	Chittoor	Gd Nellore	2019	Mango	0.33	13.2443	79.2169
K manohar reddy	Chittoor	100 Golappali	2018	Mango	0.32	13.2468	79.2174
O Jyothi	Chittoor	Late Raghunandan Reddy	2020	Mango	0.44	13.2578	79.2090
T kumar	Chittoor	Kota Garam	2021	Mango	0.28	13.2420	79.2202
G subrahmanyam chetty	Chittoor	Agara Mangalam	2020	Mango	0.31	13.2419	79.2205
G subrahmanyam chetty	Chittoor	Agara Mangalam	2020	Mango	0.11	13.2414	79.2205
G Rajendra chetty	Chittoor	Agara Mangalam	2022	Mango	0.1	13.2414	79.2203

C Venkatesulu	Chittoor	Agara Mangalam	2019	Mango	0.34	13.2416	79.2193
K rambabu	Chittoor	Agra Mangalm	2021	Mango	0.45	13.2412	79.2191
Sheshadri naidu	Chittoor	Papi Reddy Palli	2018	Mango	0.25	13.2898	79.3490
K Hari Reddy	Chittoor	Vinjam	2023	Mango	0.64	13.2497	79.2536
A savitramma	Chittoor	Varathuru	2023	Mango	0.22	13.2394	79.2625
Trupali reddy	Chittoor	Varathuru	2023	Mango	0.21	13.2397	79.2625
Thrupal reddy	Chittoor	Varathuru	2023	Mango	0.23	13.2400	79.2626
V chhiteetamm	Chittoor	Gd Nellore	2019	Mango	0.5	13.3151	79.1945
Lelavathi	Chittoor	Simgamvandlauru	2019	Mango	0.17	13.3151	79.1939
Mohan setti	Chittoor	Simgamvandlauru	2019	Mango	0.13	13.3152	79.1936
Mohan	Chittoor	Simgamvariuru	2019	Mango	0.18	13.3144	79.1934
Mohan reddy	Chittoor	Simgamvariuru	2019	Mango	0.29	13.3147	79.1934
Jayaram setti	Chittoor	Simgamvariuru	2019	Mango	0.11	13.3144	79.1940
Neraja	Chittoor	Simgamvariuru	2019	Mango	0.17	13.3154	79.1942
Venkates reddy	Chittoor	Simgamvariuru	2019	Mango	0.14	13.3145	79.1964
Venkataramana reddy	Chittoor	Simgamvariuru	2022	Mango	0.35	13.3177	79.1959
Sarala	Chittoor	Sindurajapuram	2018	Mango	0.79	13.2848	79.3443
Elumalai	Chittoor	Periya Vazhuthalambedu	2019	Mango	0.32	13.3076	79.1905
Devanandhareddy	Chittoor	Pullikallu	2019	Mango	0.1	13.3073	79.1902
Rajendrareddy	Chittoor	Pullikallu	2019	Mango	1.16	13.2871	79.1701
Sudharani	Chittoor	Bhalajapalli	2019	Mango	1.22	13.2871	79.1708
Sudha rani	Chittoor	Balajapalli	2019	Mango	0.66	13.2780	79.1650
Harikrisnareddy	Chittoor	Balijapalli	2021	Mango	0.51	13.2750	79.1649
Doraswami reddy	Chittoor	Balijapalli	2019	Mango	0.46	13.2764	79.1693
Saymala	Chittoor	Balijapalli	2019	Mango	0.33	13.2760	79.1705
Doraswami reddy	Chittoor	Balijapalli	2021	Mango	0.27	13.2810	79.1647
Subramanyam reddy	Chittoor	Balijapalli	2021	Mango	0.2	13.2806	79.1647
Subramanyam reddy	Chittoor	Balijapalli	2022	Mango	0.24	13.2784	79.1661

Redeppareddy	Chittoor	Balijapalli	2019	Mango	0.43	13.2784	79.1650
Redeppa reddy	Chittoor	Balijapalli	2018	Mango	0.97	13.1987	79.2821
V Dharam iah mandadi	Chittoor	Gd Nellore	2018	Mango	0.59	13.2327	79.2082
V dharma mandadi	Chittoor	Gd Nellore	2018	Mango	0.5	13.2333	79.2078
K Dayakar reddy	Chittoor	Gd Nellore	2019	Mango	0.26	13.2299	79.2103
G kumari	Chittoor	Gd Nellore	2019	Mango	0.8	13.2421	79.2071
K Reddieaih reddy	Chittoor	Gd Nellore	2018	Mango	0.16	13.2551	79.2267
A manohar naidu	Chittoor	Veerakanellore	2019	Mango	0.22	13.2546	79.2265
A Venkatesulu naidu	Chittoor	Veerakanellore	2019	Mango	0.28	13.2550	79.2271
M munirathnam naidu	Chittoor	Agara Mangalam	2019	Mango	0.82	13.2491	79.2347
Gk Mahendra Kumar	Chittoor	Agara Mangalam	2018	Mango	0.25	13.2489	79.2341
Gm Mahendra Kumar	Chittoor	Agara Mangalam	2018	Mango	0.36	13.2497	79.2345
G C Mahendra Kumar	Chittoor	Agara Mangalam	2018	Mango	0.87	13.2549	79.2227
K narasimhulu naidu	Chittoor	Veerakanellore	2018	Mango	0.62	13.2537	79.2354
Late venkata swamy naidu g subrahmanyam naidu	Chittoor	Veerakanellore	2018	Mango	0.39	13.2537	79.2349
Sabapathi.M	Chittoor	Mahankalikapuram	2020	Mango	0.27	13.2793	79.1685
Raambabu	Chittoor	Balijapalli	2022	Mango	0.21	13.2796	79.1683
Rambabu	Chittoor	Balijapalli	2022	Mango	0.48	13.2789	79.1684
Rambabu	Chittoor	Balijapalli	2019	Mango	0.55	13.2782	79.1689
Venkates reddy	Chittoor	Balijapalli	2019	Mango	0.41	13.2784	79.1699
Narasimha reddy	Chittoor	Balijapalli	2019	Mango	0.48	13.2781	79.1697
Sriramulu reddy	Chittoor	Balijapalli	2019	Mango	0.29	13.2787	79.1650
Kavitha	Chittoor	Balijapalli	2019	Mango	0.22	13.2776	79.1684
Munirathnam reddy	Chittoor	Balijapalli	2018	Mango	0.25	13.3507	79.3046
Rajababu	Chittoor	Gundla Kandriga	2018	Mango	0.24	13.3503	79.3044
Raja babu	Chittoor	Gundlakandiga	2018	Mango	0.28	13.3503	79.3048
Srinivasulu reddy	Chittoor	Gundlakandiga	2023	Mango	0.3	13.3517	79.2793
Damodar reddy	Chittoor	Nagarjunkalany	2023	Mango	0.3	13.3517	79.2796
Damodar reddy	Chittoor	Nagarjunkalany	2023	Mango	0.26	13.3518	79.2800

Damodar reddy	Chittoor	Nagarjunkalany	2023	Mango	0.14	13.3515	79.2800
Damodar reddy	Chittoor	Nagarjunkalany	2023	Mango	0.15	13.3523	79.2798
Damodar redfy	Chittoor	Nagarjunkalany	2018	Mango	0.59	13.2667	79.2352
B n Hari nath reddy	Chittoor	Veerakanellore	2023	Mango	0.1	13.2672	79.2347
B n Hari nath reddy	Chittoor	Veerakanellore	2018	Mango	0.1	13.2673	79.2344
B n Hari nath reddy	Chittoor	Veerakanellore	2023	Mango	0.18	13.2666	79.2345
B n Hari nath reddy	Chittoor	Veerakanellore	2018	Mango	0.44	13.2590	79.2269
Devendra nath reddy	Chittoor	Veerakanellore	2019	Mango	0.16	13.2590	79.2259
Bn surender nath reddy	Chittoor	Veerakanellore	2019	Mango	0.5	13.2595	79.2325
B prathap reddy	Chittoor	Veerakanellore	2018	Mango	0.23	13.2602	79.2326
M Ravi	Chittoor	Veerakanellore	2018	Mango	0.18	13.2603	79.2334
M Ravi	Chittoor	Veerakanellore	2018	Mango	0.12	13.2601	79.2337
M ravi	Chittoor	Veerakanellore	2018	Mango	0.33	13.2595	79.2310
M som sekhar reddy	Chittoor	Veerakanellore	2018	Mango	0.19	13.2601	79.2315
M soma sekhar reddy	Chittoor	Veerakanellore	2018	Mango	0.2	13.2595	79.2314
M som sekhar reddy	Chittoor	Veerakanellore	2018	Mango	0.2	13.2596	79.2308
M soma sekhar reddy	Chittoor	Veerakanellore	2018	Mango	0.26	13.2596	79.2306
D padmanabha reddy	Chittoor	Veerakanellore	2020	Mango	0.1	13.2599	79.2304
D padmanabha reddy	Chittoor	Veerakanellore	2020	Mango	0.1	13.2594	79.2302
M gajendra reddy	Chittoor	Veerakanellore	2018	Mango	1.1	13.2589	79.2324
P sehsahdiri reddy	Chittoor	Veerakanellore	2020	Mango	0.23	13.2615	79.2345
V sadhasiva reddy	Chittoor	Veerakanellore	2018	Mango	0.41	13.2610	79.2336
V sadhasiva reddy	Chittoor	Veerakanellore	2022	Mango	0.4	13.2679	79.2489
N N aRajamanikam	Chittoor	Veerakanellore	2020	Mango	0.34	13.2678	79.2480
V sirish	Chittoor	Veerakanellore	2018	Mango	1.54	13.2796	79.2448
V Ravi naidu	Chittoor	Kodepaali	2022	Mango	0.31	13.1991	79.2552
V jyothamma	Chittoor	Thugundram	2022	Mango	0.47	13.1994	79.2560
M chinnabba naidu	Chittoor	Varathuru	2022	Mango	0.36	13.2322	79.2788
J Raja reddy	Chittoor	Veerakanellore	2019	Mango	0.29	13.2575	79.2272

J Raja reddy	Chittoor	Veerakanellore	2019	Mango	0.62	13.2576	79.2268
J Raja reddy	Chittoor	Veerakanellore	2018	Mango	0.55	13.2734	79.2416
T subrahmanyam naidu	Chittoor	Kodepaali	2018	Mango	0.5	13.2733	79.2423
Anjaneyulu reddy	Chittoor	Balijapalli	2021	Mango	0.23	13.2824	79.1588
Joshna	Chittoor	Balijapalli	2022	Mango	0.78	13.2861	79.1591
Gopi	Chittoor	Balijapalli	2019	Mango	0.5	13.2886	79.1680
Madhavareddy	Chittoor	Balijapalli	2019	Mango	0.5	13.2875	79.1677
Nelakanta reddy	Chittoor	Balijapalli	2019	Mango	0.36	13.2785	79.1629
G Rajini	Chittoor	Kodepaali	2018	Mango	0.1	13.2714	79.2377
G varadhrajulu Naidu	Chittoor	Kodepaali	2018	Mango	0.25	13.2710	79.2381
G varadhrajulu Naidu	Chittoor	Kodepaali	2018	Mango	0.27	13.2711	79.2375
G varadhrajulu Naidu	Chittoor	Kodepaali	2020	Mango	0.77	13.2742	79.2455
C narasimhulu	Chittoor	Kodepaali	2021	Mango	0.27	13.2749	79.2455
C Muralidhar	Chittoor	Kodepaali	2018	Mango	0.57	13.2729	79.2419
Muralidhar	Chittoor	Kodepaali	2018	Mango	0.79	13.2777	79.2465
T sumalatha	Chittoor	Kodepaali	2018	Mango	0.65	13.2782	79.2474
M latha	Chittoor	Kodepaali	2018	Mango	1.11	13.2733	79.2502
M latha	Chittoor	Kodepaali	2018	Mango	0.22	13.2924	79.3766
Jyothi prakash	Chittoor	Gmrpuram	2018	Mango	0.22	13.2925	79.3765
Thulabba	Chittoor	Gmrpuram	2022	Mango	0.17	13.2931	79.3766
Kumari	Chittoor	Gmrpuram	2022	Mango	0.2	13.2928	79.3761
Kumari	Chittoor	Gmrpuram	2022	Mango	0.12	13.2928	79.3767
Kumari	Chittoor	Gmrpuram	2022	Mango	0.1	13.2929	79.3766
Balaji	Chittoor	Gmrpuram	2020	Mango	0.13	13.2973	79.3752
Subramanyam	Chittoor	Gmrpuram	2018	Mango	0.21	13.3007	79.3782
Chengaiah	Chittoor	Gmrpuram	2018	Mango	0.15	13.3012	79.3783
Sekar	Chittoor	Thamburedypalaiyam	2019	Mango	0.65	13.2861	79.1616
Jayanthi	Chittoor	Balijapalli	2019	Mango	0.4	13.2851	79.1619
Chandrasekar reddy	Chittoor	Balijapalli	2021	Mango	0.23	13.2848	79.1614

Chinnamma	Chittoor	Balijapalli	2021	Mango	0.29	13.2826	79.1766
Subramanyam reddy	Chittoor	Ramapuram	2019	Mango	0.49	13.2801	79.1782
Subramanyam reddy	Chittoor	Ramapuram	2019	Mango	0.42	13.2804	79.1784
Changalraya reddy	Chittoor	Ramapuram	2021	Mango	0.41	13.2844	79.1863
Prathiba	Chittoor	Ramapuram	2021	Mango	0.61	13.2849	79.1861
Paradesh	Chittoor	Ramapuram	2019	Mango	0.73	13.2793	79.1758
Kodanda naidu	Chittoor	Kodepaali	2021	Mango	0.75	13.2812	79.2468
K munikrishna	Chittoor	Thugundram	2021	Mango	0.52	13.2811	79.2459
Neelaveni	Chittoor	Kodepaali	2021	Mango	0.31	13.2807	79.2463
V valemma	Chittoor	Kodepaali	2020	Mango	0.23	13.2798	79.2388
V venkatesh	Chittoor	Kodepaali	2023	Mango	0.1	13.2799	79.2424
P errama reddy	Chittoor	Kodepaali	2020	Mango	0.66	13.2810	79.2591
Nagarajulu	Chittoor	Kodepaali	2021	Mango	0.4	13.2794	79.2623
B Sanjeev Reddy	Chittoor	Vinjam	2018	Mango	0.85	13.2504	79.2611
S viswanathan achari	Chittoor	Vinjam	2018	Mango	0.16	13.2507	79.2610
S sekhar	Chittoor	Vinjam	2020	Mango	0.1	13.2976	79.3752
Krishnaiah	Chittoor	Gmrpuram	2020	Mango	0.15	13.2978	79.3755
Krishnaiah	Chittoor	Gmrpuram	2018	Mango	0.13	13.2967	79.3780
Srinivasulu	Chittoor	Gmrpuram	2022	Mango	0.18	13.3006	79.3705
Bhagyamma	Chittoor	Dasarigunta	2023	Mango	0.16	13.2854	79.3695
Chengaiah	Chittoor	Dasarigunta	2023	Mango	0.15	13.2855	79.3699
Chengaiah	Chittoor	Dasarigunta	2023	Mango	0.11	13.2856	79.3701
Sandhya	Chittoor	Dasarigunta	2022	Mango	0.14	13.2857	79.3703
Sandhya	Chittoor	Dasarigunta	2021	Mango	0.18	13.2856	79.3707
Narayanaswamy	Chittoor	Dasarigunta	2022	Mango	0.1	13.2858	79.3705
Narayanaswamy	Chittoor	Dasarigunta	2022	Mango	0.11	13.2859	79.3707
Venkatesan	Chittoor	Periya Vazhuthalambedu	2019	Mango	0.81	13.2991	79.1816
Jayaram reddy	Chittoor	Bhukkireddypalli	2022	Mango	0.3	13.2989	79.1810

Jayaram reddy	Chittoor	Bhukkireddypalli	2022	Mango	0.24	13.2993	79.1812
Subamma	Chittoor	Maniyanam Palli	2022	Mango	0.13	13.3021	79.1801
Subamma	Chittoor	Maniyanam Palli	2021	Mango	0.22	13.3010	79.1797
Govindha naydu	Chittoor	Maniyanam Palli	2021	Mango	0.13	13.3010	79.1800
Govinthanaydu	Chittoor	Maniyanam Palli	2021	Mango	0.18	13.3022	79.1805
Govindha naydu	Chittoor	Maniyanam Palli	2021	Mango	0.19	13.3027	79.1808
Sujatha	Chittoor	Bhukkireddypalli	2019	Mango	0.39	13.3019	79.1824
Narasimha reddy	Chittoor	Bhukkireddypalli	2019	Mango	0.1	13.3024	79.1827
Narasimha reddy	Chittoor	Bhukkireddypalli	2019	Mango	0.26	13.3055	79.1822
Paramdama reddy	Chittoor	Bhukkireddypalli	2019	Mango	0.27	13.3059	79.1825
Paramdama reddy	Chittoor	Bhukkireddypalli	2019	Mango	0.3	13.3051	79.1820
Subramanyam reddy	Chittoor	Bhukkireddypalli	2019	Mango	0.52	13.3046	79.1817
Subramanyam reddy	Chittoor	Bhukkireddypalli	2019	Mango	0.28	13.3049	79.1824
Subramanyam reddy	Chittoor	Bhukkireddypalli	2019	Mango	0.38	13.3048	79.1828
Venkates reddy	Chittoor	Bhukkireddypalli	2019	Mango	0.18	13.3026	79.1821
Paramdama reddy	Chittoor	Bhukkireddypalli	2022	Mango	0.11	13.2994	79.1810
Ragunadha reddy	Chittoor	Bhuddareddypalli	2019	Mango	0.3	13.2986	79.1804
Ragunadha reddy	Chittoor	Bhuddareddypalli	2021	Mango	0.31	13.2988	79.1794
Ragunadha reddy	Chittoor	Bhuddareddypalli	2021	Mango	0.16	13.3011	79.1802
Narasimha reddy	Chittoor	Bhuddareddypalli	2021	Mango	0.12	13.3003	79.1800
Narasimha reddy	Chittoor	Bhuddareddypalli	2022	Mango	0.1	13.3000	79.1803
Narasimha reddy	Chittoor	Bhukkireddypalli	2019	Mango	0.16	13.3055	79.1865
G krina kumar reddy	Chittoor	Nanda Noor	2020	Mango	0.27	13.2563	79.1661
S Narayana swamy	Chittoor	Nanda Noor	2019	Mango	0.41	13.2648	79.1601
Jayaramaiah	Chittoor	Sindurajapuram	2018	Mango	0.69	13.2854	79.3524
Jayaramaiah	Chittoor	Sindurajapuram	2018	Mango	0.52	13.2856	79.3531
Rukmanipathinaidu	Chittoor	Sindurajapuram	2018	Mango	0.1	13.2857	79.3536
Manohari	Chittoor	Sindurajapuram	2023	Mango	0.35	13.2834	79.3571
Venkatesh	Chittoor	Sindurajapuram	2023	Mango	0.24	13.2836	79.3577

Venkatesh	Chittoor	Sindurajapuram	2023	Mango	0.14	13.2834	79.3577
Seethamma	Chittoor	Sindurajapuram	2023	Mango	0.21	13.2524	79.3267
Joseph	Chittoor	Pullurhw	2023	Mango	0.14	13.2523	79.3263
Joseph	Chittoor	Pullurhw	2023	Mango	0.25	13.2520	79.3257
Joseph	Chittoor	Pullurhw	2023	Mango	0.11	13.2519	79.3261
R nagarajulu naidu	Chittoor	Nanda Noor	2023	Mango	0.14	13.2522	79.3261
R nagarajulu naidu	Chittoor	Nanda Noor	2019	Mango	0.1	13.2632	79.1599
K thurumalaih naidu	Chittoor	Nanda Noor	2023	Mango	0.13	13.2526	79.3259
K thurumalaih naidu	Chittoor	Nanda Noor	2020	Mango	0.52	13.2533	79.3248
G thyagarajulu ready	Chittoor	Nanda Noor	2019	Mango	0.64	13.2586	79.1692
G thyagarajulu ready	Chittoor	Nanda Noor	2022	Mango	0.94	13.2607	79.1706
P srinivasusulu	Chittoor	Nanda Noor	2021	Mango	0.29	13.2594	79.1688
G dhanasekar ready	Chittoor	Nanda Noor	2021	Mango	1.48	13.2677	79.1973
Arunakumari	Chittoor	Papireddypalli	2019	Mango	0.71	13.2665	79.1925
Rajendra	Chittoor	Guvvalakandiga	2019	Mango	0.31	13.2677	79.1799
Anusuyamma	Chittoor	Guvvalakandiga	2022	Mango	0.49	13.2661	79.1764
Dilli babu	Chittoor	Papireddypalli	2019	Mango	0.51	13.2676	79.1847
Neelavathi	Chittoor	Bala Reddy Kandriga	2021	Mango	0.27	13.3510	79.3604
Navaneethamma	Chittoor	Bali Reddy Kandriga	2021	Mango	0.48	13.3503	79.3602
J Varadha reddy	Chittoor	Bali Reddy Kandriga	2021	Mango	0.38	13.3503	79.3606
Navanretha	Chittoor	Bali Reddy Kandriga	2021	Mango	0.44	13.3507	79.3609
Varadha reddy	Chittoor	Bali Reddy Kandriga	2021	Mango	0.11	13.3515	79.3608
Narayana Reddy	Chittoor	Bali Reddy Kandriga	2021	Mango	0.29	13.3507	79.3589
Navanretha	Chittoor	Bali Reddy Kandriga	2022	Mango	0.11	13.3499	79.3548
Ambika	Chittoor	Bali Reddy Kandriga	2018	Mango	0.41	13.3507	79.3549
Ambika	Chittoor	Bali Reddy Kandriga	2021	Mango	0.27	13.3516	79.3588
Munirathanam	Chittoor	Bali Reddy Kandriga	2021	Mango	0.44	13.3512	79.3583
Thulasi krishna	Chittoor	Bali Reddy Kandriga	2022	Mango	0.36	13.3506	79.3557
Chiranjeevi	Chittoor	Bali Reddy Kandriga	2022	Mango	0.19	13.3506	79.3553

Chiranjeevi	Chittoor	Bali Reddy Kandriga	2021	Mango	0.19	13.3503	79.3580
J narasimha Reddy	Chittoor	Bali Reddy Kandriga	2021	Mango	0.24	13.3502	79.3583
Narasihmareddy	Chittoor	Bali Reddy Kandriga	2021	Mango	0.25	13.3499	79.3586
Ranemma	Chittoor	Bali Reddy Kandriga	2021	Mango	0.16	13.3497	79.3588
Radha	Chittoor	Balireddykandiga	2021	Mango	0.17	13.3566	79.3547
Radha	Chittoor	Balireddykandiga	2021	Mango	0.24	13.3570	79.3528
Desamma	Chittoor	Balireddykandiga	2021	Mango	0.25	13.3567	79.3522
Desamma	Chittoor	Balireddykandiga	2021	Mango	0.26	13.3571	79.3524
Vinodhkumar	Chittoor	Balireddykandiga	2021	Mango	0.76	13.3495	79.3621
Subramanyam	Chittoor	Balireddykandiga	2021	Mango	0.22	13.3491	79.3623
Subramanyam	Chittoor	Balireddykandiga	2021	Mango	0.18	13.3516	79.3615
Subramanyam	Chittoor	Balireddykandiga	2021	Mango	0.18	13.4385	80.1521
Ragunadha reddy	Chittoor	Papireddypalli	2022	Mango	0.1	13.2639	79.1843
Ramireddy	Chittoor	Papireddypalli	2021	Mango	1.2	13.2608	79.1940
Girija	Chittoor	Papireddypalli	2021	Mango	0.34	13.2586	79.1900
Subramanyam reddy	Chittoor	Papireddypalli	2019	Mango	0.73	13.2594	79.1905
Subramanyam reddy	Chittoor	Papireddypalli	2019	Mango	0.52	13.2635	79.1864
Krisnareddy	Chittoor	Papireddypalli	2019	Mango	0.14	13.2636	79.1857
Krisnareddy	Chittoor	Papireddypalli	2019	Mango	0.16	13.2620	79.1859
A. Srinivasulu reddy	Chittoor	Papireddypalli	2019	Mango	0.25	13.2607	79.1855
Venugopal	Chittoor	Balireddykandiga	2021	Mango	0.31	13.3488	79.3618
Venu Gopal	Chittoor	Balireddykandiga	2021	Mango	0.31	13.3482	79.3622
Pushpalata	Chittoor	Balireddykandiga	2021	Mango	0.21	13.3481	79.3627
Subbamandadi	Chittoor	Balireddykandiga	2022	Mango	0.1	13.3487	79.3635
Subbamandadi	Chittoor	Balireddykandiga	2022	Mango	0.1	13.3495	79.3639
Rajamma	Chittoor	Balireddykandiga	2021	Mango	0.3	13.3517	79.3621
Sankar	Chittoor	Balireddykandiga	2021	Mango	0.54	13.3512	79.3617
Chinnabba	Chittoor	Balireddykandiga	2021	Mango	0.12	13.3504	79.3577
P.sudarshan	Chittoor	Podalapalli	2021	Mango	0.31	13.3484	79.3532

Munilakshmi	Chittoor	Chillamakula Palli	2021	Mango	0.23	13.3442	79.3524
Munilakshmi	Chittoor	Chillamakula Palli	2021	Mango	0.24	13.3441	79.3520
Munilakshmi	Chittoor	Chilli Makula Palli	2021	Mango	0.13	13.3437	79.3524
Munilakshmi	Chittoor	Chillamakula Palli	2021	Mango	0.17	13.3436	79.3521
Guruswammy reddy	Chittoor	Chillamakula Palli	2021	Mango	0.12	13.3436	79.3517
Guruswammy reddy	Chittoor	Chillamakula Palli	2021	Mango	0.17	13.3433	79.3523
Peddulamma	Chittoor	Chillamakula Palli	2021	Mango	0.28	13.3426	79.3537
Peddulamma	Chittoor	Chillamakula Palli	2021	Mango	0.29	13.3433	79.3560
Manohar reddy	Chittoor	Chillamakula Palli	2021	Mango	0.22	13.3467	79.3568
Neeresa	Chittoor	Bhukkireddypalli	2019	Mango	0.66	13.3056	79.1876
Jayamma	Chittoor	Bhukkireddypalli	2019	Mango	0.48	13.3037	79.1828
Jayyamma	Chittoor	Bhukkireddypalli	2019	Mango	0.35	13.3034	79.1822
Himadama reddy	Chittoor	Bhukkireddypalli	2019	Mango	0.27	13.3035	79.1812
Himadama reddy	Chittoor	Bhukkireddypalli	2019	Mango	0.34	13.3039	79.1819
Neeresa	Chittoor	Bhukkireddypalli	2019	Mango	0.51	13.3056	79.1871
Neeresa	Chittoor	Bhukkireddypalli	2019	Mango	0.26	13.3062	79.1878
Ranemma	Chittoor	Bhukkireddypalli	2019	Mango	0.54	13.3084	79.1854
O subbaih	Chittoor	Nanda Noor	2022	Mango	0.37	13.2745	79.1814
V Ramanamm	Chittoor	Nanda Noor	2020	Mango	0.2	13.2691	79.1600
V nnagaraju	Chittoor	Nanda Noor	2019	Mango	0.52	13.2697	79.1612
V munikrishna iah	Chittoor	Nanda Noor	2019	Mango	0.18	13.2680	79.1607
P Rajamani reddy	Chittoor	Nanda Noor	2021	Mango	0.23	13.2724	79.1588
P Rajamani reddy	Chittoor	Nanda Noor	2021	Mango	0.2	13.2718	79.1591
P Rajamani reddy	Chittoor	Nanda Noor	2021	Mango	0.35	13.2717	79.1586
P Rajamani reddy	Chittoor	Nanda Noor	2021	Mango	0.17	13.2726	79.1591
P Sai Krishna	Chittoor	Nanda Noor	2021	Mango	0.38	13.2722	79.1583
N annill	Chittoor	Papi Reddy Palli	2022	Mango	0.25	13.2724	79.1699
N annill	Chittoor	Papi Reddy Palli	2022	Mango	0.28	13.2720	79.1693
K premala	Chittoor	Nanda Noor	2019	Mango	0.45	13.2632	79.1619

P.Sudarshan	Chittoor	Podalapalli	2021	Mango	0.32	13.3484	79.3528
Naresh	Chittoor	Podalapalli	2021	Mango	0.34	13.3493	79.3532
Subramanyam	Chittoor	Podalapalli	2018	Mango	0.5	13.3438	79.3617
Pattabhi	Chittoor	Podalapalli	2018	Mango	0.25	13.3423	79.3602
Kumari	Chittoor	Podalapalli	2021	Mango	0.12	13.3419	79.3605
Kumari	Chittoor	Podalapalli	2021	Mango	0.15	13.3421	79.3609
Suman	Chittoor	Podalapalli	2021	Mango	0.76	13.3444	79.3609
Suman	Chittoor	Podalapalli	2022	Mango	0.28	13.3445	79.3619
Mariyamma	Chittoor	Podalapalli	2022	Mango	0.22	13.3445	79.3623
Naresh	Chittoor	Podalapalli	2022	Mango	0.22	13.3445	79.3616
Chittemma	Chittoor	Podalapalli	2021	Mango	0.29	13.3428	79.3584
Chittemma	Chittoor	Podalapalli	2021	Mango	0.1	13.3425	79.3583
Karthvarayan	Chittoor	Podalapalli	2021	Mango	0.15	13.3421	79.3590
Kiran kumr	Chittoor	Bhuddareddypalli	2022	Mango	0.16	13.3060	79.1793
Kirankumar	Chittoor	Bhuddareddypalli	2022	Mango	0.1	13.3060	79.1796
Devanryareddy	Chittoor	Bhuddareddypalli	2022	Mango	0.1	13.3057	79.1794
Devanarayana reddy	Chittoor	Bhuddareddypalli	2022	Mango	0.35	13.3058	79.1801
P. Ravi	Chittoor	Bhuddareddypalli	2021	Mango	0.17	13.3048	79.1787
Doraswami reddy	Chittoor	Bhuddareddypalli	2022	Mango	0.13	13.3050	79.1797
Jyothi	Chittoor	Bhuddareddypalli	2021	Mango	0.28	13.3072	79.1812
Jyothi	Chittoor	Bhuddareddypalli	2021	Mango	0.28	13.3073	79.1815
Jyothi	Chittoor	Bhuddareddypalli	2021	Mango	0.1	13.3067	79.1811
Sanbasivayya	Chittoor	Maniyanam Palli	2021	Mango	0.3	13.3063	79.1752
Sabasivayya	Chittoor	Bhuddareddypalli	2021	Mango	0.23	13.3063	79.1763
Jayarami naydu	Chittoor	Bhuddareddypalli	2022	Mango	0.28	13.3046	79.1767
Jayaramnaydu	Chittoor	Bhuddareddypalli	2021	Mango	0.12	13.3053	79.1752
Jayamanaydu	Chittoor	Bhuddareddypalli	2021	Mango	0.1	13.3052	79.1768
Jayaramnaydu	Chittoor	Bhuddareddypalli	2021	Mango	0.1	13.3058	79.1768
Santhamma	Chittoor	Bhuddareddypalli	2019	Mango	0.6	13.3047	79.1808

L Sampoornamma	Chittoor	Kalijavedu	2019	Mango	0.42	13.2437	79.1738
D hari Prasad	Chittoor	Kalijavedu	2018	Mango	0.24	13.2406	79.1743
M lalitha	Chittoor	Gd Nellore	2019	Mango	0.94	13.2400	79.1757
K lokanatham reddy	Chittoor	Papi Reddy Palli	2022	Mango	0.17	13.2687	79.1723
K lokanatham reddy	Chittoor	Papi Reddy Palli	2022	Mango	0.23	13.2686	79.1730
N vijaya kumari	Chittoor	Papi Reddy Palli	2021	Mango	0.66	13.2774	79.1723
N Vijay Kumar	Chittoor	Papi Reddy Palli	2021	Mango	0.26	13.2779	79.1720
M yagama reddy	Chittoor	Papi Reddy Palli	2020	Mango	0.35	13.2634	79.1743
G venkatadiri naidu	Chittoor	Papi Reddy Palli	2019	Mango	0.24	13.2545	79.1745
P Rupavathi	Chittoor	Papi Reddy Palli	2022	Mango	0.36	13.2530	79.1714
V Eswramma	Chittoor	Papi Reddy Palli	2021	Mango	1.1	13.2576	79.1737
E jamuna	Chittoor	Kalijavedu Venkatapuram	2019	Mango	0.62	13.2758	79.1819
A gangulareddy	Chittoor	Kalijavedu	2019	Mango	0.31	13.2137	79.2193
A gangulareddy	Chittoor	Chinavepanjeri	2019	Mango	0.17	13.2138	79.2190
E vanamm	Chittoor	Chinavepanjeri	2019	Mango	0.16	13.2138	79.2188
A mohan	Chittoor	Bangareddy Palli	2020	Mango	0.4	13.2168	79.2179
A mohan	Chittoor	Bangareddy Palli	2020	Mango	0.26	13.2168	79.2188
D yugandhar	Chittoor	Kalijavedu	2019	Mango	0.1	13.2523	79.1628
P sudhakar reddy	Chittoor	Kalijavedu	2021	Mango	0.49	13.2526	79.1660
E R prathap chandra reddy	Chittoor	Kalijavedu	2019	Mango	0.19	13.2489	79.1620
T. Sudharsan reddy	Chittoor	Bandarlla Palli	2019	Mango	0.54	13.3157	79.1749
Shailaja	Chittoor	Kondrajupuram	2019	Mango	0.43	13.2888	79.1831
B.Giri babu	Chittoor	Balakrishnapuram	2023	Mango	0.21	13.1590	79.2775
B.Giri babu	Chittoor	Balakrishnapuram	2023	Mango	0.14	13.1590	79.2772
B.Giri babu	Chittoor	Balakrishnapuram	2023	Mango	0.1	13.1592	79.2771
M.sushma	Chittoor	Balakrishnapuram	2022	Mango	0.33	13.1584	79.2713
J.Shivayya naidu	Chittoor	Amudala Puttur	2023	Mango	0.36	13.1554	79.2715
Savithramma	Chittoor	Bandarlla Palli	2022	Mango	0.49	13.2917	79.1839
Ruubee	Chittoor	Nellepalli Hw	2018	Mango	0.78	13.2833	79.2247

Pubal	Chittoor	Nellepalli Hw	2018	Mango	1	13.2809	79.2114
Saraswathi	Chittoor	Nellepalli	2018	Mango	1.23	13.2784	79.2155
Munaswami	Chittoor	Nellepalli Hw	2019	Mango	0.48	13.2690	79.2157
Kumari	Chittoor	Vejjupalli	2022	Mango	0.43	13.2987	79.1956
Vasantha	Chittoor	Vejjupalli	2022	Mango	0.14	13.2988	79.1963
Vasantha	Chittoor	Vejjupalli	2022	Mango	0.99	13.2939	79.2063
P Ammulu	Chittoor	Ramakrishnapuram	2021	Mango	2.22	13.1765	79.2766
E nagamma	Chittoor	Kotthvenkatapuram	2021	Mango	0.74	13.2393	79.3378
G ramachandra naidu	Chittoor	Kottha Venkatapuram	2020	Mango	0.24	13.1888	79.2986
G ramachandra naidu	Chittoor	Kottha Venkatapuram	2018	Mango	0.59	13.1621	79.2675
G ramachandra naidu	Chittoor	Kottha Venkatapuram	2019	Mango	0.37	13.1629	79.2747
m jayapal naidu	Chittoor	Kottha Venkatapuram	2018	Mango	0.19	13.1732	79.2833
T meri	Chittoor	Balakrishnapuram	2018	Mango	0.15	13.1749	79.2849
M ramalingam naidu	Chittoor	Kotthvenkatapuram	2022	Mango	0.25	13.1630	79.2694
Krisnamma	Chittoor	Nellepalli	2019	Mango	1	13.2788	79.2220
AM sadak ali	Chittoor	Thugundram	2022	Mango	0.16	13.2496	79.3349
Venkatesh	Chittoor	Kapukandiga	2022	Mango	0.1	13.2499	79.3353
V pungavanam	Chittoor	Thugundram	2023	Mango	0.21	13.2029	79.2464
Narasimha reddy	Chittoor	Peddhamitta Palli	2018	Mango	0.24	13.2916	79.2128
Narasimha reddy	Chittoor	Peddhamitta Palli	2018	Mango	1.34	13.2910	79.2138
Gajalakshmi	Chittoor	Chinnamitta Palli	2018	Mango	0.42	13.3029	79.2181
Ravendra reddy	Chittoor	Chinnamitta Palli	2018	Mango	0.45	13.2916	79.2195
Bhaskr reddy	Chittoor	Chinnamitta Palli	2018	Mango	0.1	13.2845	79.2222
G Govindhamma	Chittoor	R R Puram	2023	Mango	0.35	13.2912	79.3463
S Babu naidu	Chittoor	Arimakulapalle	2020	Mango	0.48	13.2121	79.2508
S Babu naidu	Chittoor	Arimakulapalle	2020	Mango	0.51	13.2126	79.2511
E Babu naidu	Chittoor	Thugundram	2018	Mango	0.24	13.2085	79.2536
E Rangappa naidu	Chittoor	Thugundram	2023	Mango	0.21	13.2072	79.2569
R illaraja	Chittoor	Bukkapatnam	2020	Mango	0.25	13.2183	79.2538

B syamala	Chittoor	Thugundram	2018	Mango	0.43	13.2139	79.2707
G Eswraredd	Chittoor	Bukkapatnam	2022	Mango	0.4	13.2183	79.2729
G subramanyam reddy	Chittoor	Bukkapatnam	2018	Mango	0.64	13.2167	79.2732
G prakash reddy	Chittoor	Bukkapatnam	2022	Mango	0.1	13.2151	79.2628
G Raja reddy	Chittoor	Bukkapatnam	2018	Mango	1.3	13.2182	79.2636
A subramanyam reddy	Chittoor	Bukkapatnam	2022	Mango	0.2	13.2215	79.2665
A subramanyam reddy	Chittoor	Bukkapatnam	2018	Mango	0.2	13.2226	79.2684
A purushotham reddy	Chittoor	Bukkapatnam	2018	Mango	0.71	13.2188	79.2655
Devarajulu	Chittoor	Lakshmi Reddy Palli	2020	Mango	0.22	13.2268	79.2170
Devarajulu	Chittoor	Lakshmireddy Palli	2019	Mango	0.63	13.2985	79.2266
Uma	Chittoor	Lakshmireddy Palli	2021	Mango	0.41	13.3004	79.2283
Uma	Chittoor	Lakshmireddy Palli	2023	Mango	0.56	13.3001	79.2279
Amarnad	Chittoor	Lakshmireddy Palli	2023	Mango	0.1	13.2981	79.2147
Venugopal	Chittoor	Lakshmireddy Palli	2018	Mango	0.2	13.2968	79.2348
Girija	Chittoor	Assala Puram	2023	Mango	0.25	13.2895	79.2271
Mahesh	Chittoor	Assala Puram	2023	Mango	0.35	13.2888	79.2275
Geetha	Chittoor	Bodireddy Kandriga	2021	Mango	0.12	13.2672	79.3232
A bhaskar naidu	Chittoor	Amudala	2022	Mango	0.36	13.1958	79.3376
Sarasamma	Chittoor	Kammavariooru	2018	Mango	0.65	13.2725	79.3248
Elumalai	Chittoor	Padmapuram	2021	Mango	1.24	13.2735	79.3421
Kannaiah reddy	Chittoor	Bukkapatnam	2020	Mango	0.45	13.2259	79.2806
Rajamma	Chittoor	P.C.Mitta	2020	Mango	1.11	13.2443	79.3040
Damodar reddy	Chittoor	Nellepalli	2023	Mango	0.17	13.2889	79.2267
Damodar reddy	Chittoor	Nellepalli	2023	Mango	0.13	13.2890	79.2271
Jamuna	Chittoor	Nellepalli	2022	Mango	0.13	13.2905	79.2281
Chinnama	Chittoor	Venkatapuram	2018	Mango	0.87	13.2807	79.2199
Sarth babu	Chittoor	Venkata Puram	2020	Mango	0.4	13.2946	79.2285
Nelakanta reddy	Chittoor	Venkata Puram	2018	Mango	0.29	13.2898	79.2198
Chandra	Chittoor	Appireddy Kandriga	2018	Mango	0.36	13.2743	79.2222

Jeevamma	Chittoor	Appireddy Kandriga	2020	Mango	0.73	13.2728	79.2200
Venktapathi	Chittoor	E.K.Kandiga	2020	Mango	0.1	13.2352	79.3278
Munirathnam	Chittoor	E.K.Kandiga	2018	Mango	0.13	13.2364	79.3264
Srinivasulunaidu	Chittoor	E.K.Kandiga	2018	Mango	0.77	13.2349	79.3186
Subramanyam	Chittoor	Nellepalli	2021	Mango	0.39	13.2804	79.2230
Subramanyam	Chittoor	Nellepalli	2019	Mango	0.38	13.2786	79.2229
Bhupathi naidu	Chittoor	Kv Puram	2022	Mango	0.41	13.1708	79.2616
Mj chittibabu	Chittoor	Kv Puram	2018	Mango	0.27	13.1706	79.2633
Mk chittibabu	Chittoor	Kv Puram	2018	Mango	0.14	13.1706	79.2636
P Ramajaju	Chittoor	Kv Puram	2018	Mango	0.78	13.1651	79.2527
P ramraju	Chittoor	Pv Puram	2019	Mango	0.16	13.1647	79.2529
Devarajulunaidu	Chittoor	C.M.Kandiga	2023	Mango	0.75	13.2355	79.3109
Chandrasekar	Chittoor	Damaragunta	2020	Mango	0.44	13.2943	79.2144
Krishnamma naidu	Chittoor	Patha Palyam	2018	Mango	0.56	13.1788	79.2600
J karunakar	Chittoor	Kotthvenkatapuram	2019	Mango	0.4	13.1516	79.2638
J karunakar	Chittoor	Kotthvenkatapuram	2019	Mango	0.38	13.1510	79.2646
E Kodanda naidu	Chittoor	Mitta Kothur	2018	Mango	0.22	13.1821	79.2658
Konda reddy	Chittoor	Damaragunta	2018	Mango	0.24	13.1826	79.2658
Narasimha reddy	Chittoor	Damaragunta	2019	Mango	0.21	13.3075	79.2276
Narasimha reddy	Chittoor	Bandarlla Palli	2021	Mango	0.22	13.2983	79.1956
Rajarao	Chittoor	Ek.Kandiga	2022	Mango	0.29	13.2320	79.3241
Samivel	Chittoor	Pv Puram	2018	Mango	0.51	13.1521	79.2488
J aruna	Chittoor	Pv Puram	2023	Mango	0.42	13.1475	79.2494
A balakrishnaiah chetty	Chittoor	Patha Palyam	2022	Mango	0.2	13.1798	79.2605
E varadarajulu naidu	Chittoor	Chinavepanjeri	2021	Mango	0.17	13.2026	79.2357
E varadarajulu naidu	Chittoor	Gd Nellore	2018	Mango	0.53	13.2019	79.2340
E varadarajulu naidu	Chittoor	Chinavepanjeri	2022	Mango	0.48	13.2054	79.2363
Prameela	Chittoor	Pullur.Hw	2021	Mango	0.95	13.2549	79.3383
Raja	Chittoor	Pullur.Hw	2021	Mango	0.41	13.2553	79.3381

Kumari	Chittoor	Damaragunta	2019	Mango	0.2	13.3078	79.2137
Sanjeevachetty	Chittoor	N.Rpuram	2019	Mango	0.28	13.2692	79.3280
Parvathamma	Chittoor	Maredu Palli	2021	Mango	1.17	13.2718	79.1945
Parvathamma	Chittoor	Maredu Palli	2019	Mango	0.41	13.2727	79.1980
Parvathamma	Chittoor	Maredupalli	2022	Mango	0.33	13.2782	79.1973
Nagamma	Chittoor	Maredupall	2021	Mango	1.28	13.2773	79.1904
V kuppi reddy	Chittoor	Ve Panjeree	2020	Mango	0.6	13.2221	79.2388
Prameela	Chittoor	Yella Palli	2023	Mango	0.19	13.1703	79.2245
Bakathvasu lu naidu	Chittoor	Yella Palli	2021	Mango	0.45	13.1701	79.2237
Prameela	Chittoor	Yella Palli	2021	Mango	0.75	13.1725	79.2288
N Jayalakshmi	Chittoor	Mitta Kothur	2022	Mango	0.36	13.1834	79.2692
K Ramya sree	Chittoor	Edhara Pallam	2018	Mango	0.8	13.1733	79.2361
V janakirama naidu	Chittoor	Edhara Pallam	2018	Mango	0.42	13.1772	79.2311
Porukodi	Chittoor	Ambodhara Palli	2018	Mango	0.1	13.1842	79.2419
K savitri	Chittoor	Ambodhara Palli	2018	Mango	0.79	13.1779	79.2417
K seshamma	Chittoor	Ambodhara Palli	2021	Mango	0.24	13.1791	79.2365
Prathibha Rani katta	Chittoor	Ambodhara Palli	2021	Mango	0.14	13.1799	79.2339
Vimala	Chittoor	Maredupall	2018	Mango	0.56	13.2776	79.2056
D narasamma	Chittoor	Vepanjeri	2021	Mango	0.35	13.2305	79.2295
Rammbabu	Chittoor	Vaddipalli	2019	Mango	0.19	13.2733	79.2050
Manandareddy	Chittoor	Chinnavepanjeri	2021	Mango	0.12	13.2050	79.2254
Mallika	Chittoor	Dasarigunta	2020	Mango	0.1	13.2877	79.3752
Subramanyam	Chittoor	Padmapuram	2023	Mango	0.34	13.2674	79.3526
Gowramma	Chittoor	Padmapuram Hw	2022	Mango	0.33	13.2619	79.3499
Gowramma	Chittoor	Padmapuram Hw	2022	Mango	0.28	13.2624	79.3496
Markonda reddy	Chittoor	Pedhagunta Palli	2021	Mango	0.69	13.2670	79.1883
Markonda reddy	Chittoor	Pedhagunta Palli	2021	Mango	0.28	13.2675	79.1887
Markondareddy	Chittoor	Pedhagunta Palli	2021	Mango	0.17	13.2672	79.1891
Eswarreddy	Chittoor	Pedhagunta Palli	2020	Mango	0.36	13.2619	79.3493

A chinnaswamy reddy	Chittoor	Gd Nellore	2021	Mango	0.71	13.2389	79.2380
A jamuna	Chittoor	Vepanjeri	2019	Mango	0.12	13.2369	79.2372
K konda reddy	Chittoor	Vepanjeri	2019	Mango	1	13.2266	79.2457
G sampoornamma	Chittoor	Vepanjeri	2020	Mango	0.48	13.2267	79.2473
A.chinnaswamyreddy	Chittoor	Vepanjeri	2022	Mango	0.23	13.2333	79.2339
Venktamuninaidu	Chittoor	Padmapuram	2020	Mango	0.46	13.2245	79.2463
Sivaliga reddy	Chittoor	Varathuru	2023	Mango	0.42	13.2185	79.2428
K panchalamma	Chittoor	Gd Nellore	2021	Mango	0.22	13.2177	79.2421
B Bharathi	Chittoor	Vepanjeri	2020	Mango	0.18	13.2408	79.2428
N.jagadamma	Chittoor	Veerakanellor	2020	Mango	0.47	13.2420	79.2412
A.sudakar reddy	Chittoor	Vepanjeri	2023	Mango	0.82	13.2516	79.2433
Sambsivareddy	Chittoor	Ugranam Palli	2021	Mango	0.12	13.2978	79.1958
M jaganath	Chittoor	Veerakanellore	2018	Mango	0.32	13.2569	79.2456
N sarath kumar	Chittoor	Veerakanellore	2018	Mango	0.74	13.2552	79.2334
G chandra shekhar naidu	Chittoor	Veerakanellore	2018	Mango	0.27	13.2500	79.2345
C Eswrareddi	Chittoor	Veerakanellore	2018	Mango	0.79	13.2509	79.2447
M thulasiram	Chittoor	Veerakanellore	2020	Mango	0.21	13.2599	79.2340
Pattabi reddy	Chittoor	Pullukallu	2022	Mango	0.19	13.3006	79.1880
Subadramma	Chittoor	Pulikallu	2019	Mango	0.52	13.2986	79.1835
Subadramma	Chittoor	Pulikkallu	2019	Mango	0.24	13.2987	79.1840
Subadramma	Chittoor	Pullikallu	2019	Mango	0.76	13.2958	79.1864
Subadramma	Chittoor	Pulikallu	2019	Mango	0.22	13.2968	79.1863
Rajamma	Chittoor	Pulikallu	2019	Mango	0.42	13.2983	79.1812
Rajamma	Chittoor	Pulikallu	2019	Mango	0.65	13.2978	79.1816
Chandrasekar reddy	Chittoor	Pullikallu	2019	Mango	0.42	13.3084	79.1937
Saylaja	Chittoor	Pullikallu	2019	Mango	0.41	13.3093	79.1937
C subrahmanyam reddy	Chittoor	Veerakanellore	2018	Mango	0.14	13.2574	79.3462
Hemanth	Chittoor	Padmapuram	2023	Mango	0.68	13.2568	79.3408
Bhaskarnaidu	Chittoor	Padmapuram	2022	Mango	0.62	13.2556	79.3381

Ruthu pavan	Chittoor	U M Puram	2021	Mango	0.69	13.2958	79.3450
Ramesh	Chittoor	Umpuram	2022	Mango	0.28	13.3048	79.3477
Dhanamma	Chittoor	Umpuram	2020	Mango	0.63	13.3034	79.3447
Harinath	Chittoor	Umpuram	2022	Mango	0.42	13.3004	79.3444
Shanmugam	Chittoor	Umpuram	2022	Mango	0.33	13.3000	79.3444
Prabhakar	Chittoor	Umpuram	2019	Mango	0.23	13.3130	79.1951
Chandrasekar reddy	Chittoor	Simgamvariuru	2019	Mango	0.51	13.3129	79.1945
M januu bee	Chittoor	Gd Nellore	2021	Mango	0.21	13.3120	79.2016
M jannu bee	Chittoor	Gd Nellore	2021	Mango	0.16	13.3120	79.2020
E venkateshsulu reddy	Chittoor	Gd Nellore	2021	Mango	0.11	13.3120	79.2022
V ramachandra reddy	Chittoor	Gd Nellore	2019	Mango	0.39	13.2374	79.2064
V Lakshmimma	Chittoor	Gd Nellore	2019	Mango	0.37	13.2364	79.2100
V dharma mandadi	Chittoor	Gd Nellore	2019	Mango	2.32	13.2362	79.2158
B venkata Reddy	Chittoor	Gd Nellore	2020	Mango	0.17	13.2426	79.2152
K Rambabu	Chittoor	Agara Mangalam	2021	Mango	0.18	13.2425	79.2197
K Hari Reddy	Chittoor	Vinjam	2022	Mango	0.95	13.2474	79.2535
Narasimha reddy	Chittoor	Simgamvariuru	2018	Mango	0.29	13.3198	79.1999
Narasimha reddy	Chittoor	Simgamvariuru	2018	Mango	0.41	13.3194	79.2005
Pedhabbareddy	Chittoor	Simgamvariuru	2018	Mango	0.87	13.3200	79.1981
Pedhabbareddy	Chittoor	Simgamvariuru	2018	Mango	0.55	13.3221	79.1989
Pedhabbareddy	Chittoor	Simgamvariuru	2018	Mango	0.79	13.3232	79.1987
Harikrisnareddy	Chittoor	Balijapalli	2019	Mango	0.35	13.2770	79.1699
Subramanyam reddy	Chittoor	Balijapalli	2019	Mango	0.68	13.2820	79.1704
K bhanu	Chittoor	Gd Nellore	2019	Mango	0.45	13.2447	79.2047
A Venkatesulu naidu	Chittoor	Veerakanellore	2019	Mango	0.46	13.2433	79.2324
M munirathnam naidu	Chittoor	Agara Mangalam	2019	Mango	0.29	13.2435	79.2315
M munirathnam naidu	Chittoor	Agara Mangalam	2018	Mango	1.1	13.2450	79.2219
V sirish	Chittoor	Veerakanellore	2023	Mango	0.22	13.2681	79.2463
V siresha	Chittoor	Veerakanellore	2023	Mango	0.16	13.2679	79.2476

M Sudha	Chittoor	Varathuru	2023	Mango	0.32	13.2332	79.2743
Munirathnam naidu	Chittoor	Varathuru	2022	Mango	0.31	13.2333	79.2749
T sumalatha	Chittoor	Kodepaali	2021	Mango	0.44	13.2693	79.2688
Jyothi prakash	Chittoor	Gmrpuram	2020	Mango	0.52	13.2902	79.3753
Kumari	Chittoor	Gmrpuram	2018	Mango	0.72	13.2905	79.3770
Jagada	Chittoor	Gmrpuram	2020	Mango	0.33	13.3007	79.3786
Leelaveni	Chittoor	Kodepaali	2018	Mango	0.71	13.2844	79.2420
M ellamma	Chittoor	Kodepaali	2019	Mango	0.43	13.2793	79.2379
M vallemma	Chittoor	Kodepaali	2019	Mango	0.27	13.2798	79.2382
Murliprsad	Chittoor	Maniyanam Palli	2019	Mango	0.15	13.2630	79.1593
Sujatha	Chittoor	Bhukkireddypalli	2019	Mango	0.63	13.2985	79.1798
K thurumalaih naidu	Chittoor	Nanda Noor	2018	Mango	0.3	13.2641	79.1594
V markondaa naidu	Chittoor	Nanda Noor	2020	Mango	0.1	13.2642	79.1599
Kodandareddy	Chittoor	Thimmireddy Palli	2019	Mango	0.66	13.2652	79.1829
Venkat reddy	Chittoor	Papireddypalli	2019	Mango	0.12	13.2645	79.1821
Venkat reddy	Chittoor	Papireddypalli	2019	Mango	0.1	13.2645	79.1817
Subramanyam	Chittoor	Papireddypalli	2019	Mango	0.47	13.2679	79.1850
Venkata reddy	Chittoor	Papireddypalli	2022	Mango	0.2	13.3581	79.3533
Vinodhkumar	Chittoor	Balireddykandiga	2022	Mango	0.12	13.3580	79.3536
Gopamma	Chittoor	Balireddykandiga	2022	Mango	0.14	13.3563	79.3509
Jyothiswar reddy	Chittoor	Papireddypalli	2021	Mango	0.51	13.2644	79.1892
A. Srinivasulu reddy	Chittoor	Papireddypalli	2019	Mango	0.72	13.2596	79.1841
Rajeswari	Chittoor	Balireddykandiga	2022	Mango	0.3	13.3479	79.3640
Bharathi	Chittoor	Bhukkireddypalli	2019	Mango	0.47	13.3037	79.1852
Kumari	Chittoor	Podalapalli	2021	Mango	0.38	13.3435	79.3566
P. Ravi	Chittoor	Bhuddareddypalli	2022	Mango	0.19	13.3055	79.1775
P. Ravi	Chittoor	Bhuddareddypalli	2019	Mango	0.63	13.3069	79.1767
Ravi	Chittoor	Bhuddareddypalli	2019	Mango	2.1	13.2721	79.1726
Venkates	Chittoor	Bhuddareddypalli	2019	Mango	0.55	13.3080	79.1828

N Vijay Kumari	Chittoor	Papi Reddy Palli	2019	Mango	0.71	13.2770	79.1774
N Vijay Kumari	Chittoor	Papi Reddy Palli	2019	Mango	0.39	13.2743	79.1768
M amaravati	Chittoor	Papi Reddy Palli	2019	Mango	0.92	13.2762	79.1736
U lokanadha reddy	Chittoor	Thugundram	2018	Mango	0.38	13.2034	79.2638
C vijaya kumar	Chittoor	Gd Nellore	2018	Mango	0.94	13.2310	79.1986
K pragathi	Chittoor	Mukulathuru	2020	Mango	0.12	13.2158	79.2069
K pragathi	Chittoor	Mukulathuru	2022	Mango	0.1	13.2156	79.2071
K pragathi	Chittoor	Mukulathuru	2020	Mango	0.2	13.2159	79.2075
Shankar Reddy	Chittoor	Ambodhara Palli	2018	Mango	0.28	13.1876	79.2404
Shankar Reddy	Chittoor	Ambodhara Palli	2018	Mango	0.18	13.1874	79.2407
P subrahmanyam reddy	Chittoor	Mukulathuru	2018	Mango	0.72	13.2143	79.2071
K Balaji	Chittoor	Mukulathuru	2018	Mango	0.43	13.2153	79.2041
P markondaa reddy	Chittoor	Mukulathuru	2023	Mango	0.1	13.2148	79.2122
P markondaa reddy	Chittoor	Mukulathuru	2018	Mango	0.49	13.2141	79.2125
B Somasekhar naidu	Chittoor	Mukulathuru	2020	Mango	0.1	13.2148	79.2097
B Somasekhar naidu	Chittoor	Mukulathuru	2018	Mango	0.1	13.2146	79.2108
A muni sekhar	Chittoor	Mukulathuru	2018	Mango	0.35	13.2087	79.2101
A muni sekhar	Chittoor	Mukulathuru	2020	Mango	0.43	13.2098	79.2093
A muni sekhar	Chittoor	Mukulathuru	2018	Mango	0.47	13.2097	79.2100
C pattabi naidu	Chittoor	Mukulathuru	2018	Mango	0.55	13.2095	79.2108
C sridevi	Chittoor	Mukulathuru	2020	Mango	0.1	13.2080	79.2102
T nagama	Chittoor	Chillamakulla Palli	2018	Mango	0.23	13.3461	79.3558
Nagamma	Chittoor	Chillamakulla Palli	2020	Mango	0.19	13.3455	79.3556
Nagamma	Chittoor	Chillamakulla Palli	2022	Mango	0.1	13.3477	79.3559
-Nagamma	Chittoor	Chillamakulla Palli	2021	Mango	0.17	13.3485	79.3567
Nagamma	Chittoor	Chillamakulla Palli	2021	Mango	0.42	13.3485	79.3571
Nagamma	Chittoor	Chillamakulla Palli	2021	Mango	0.14	13.3485	79.3576
Damodara reddy	Chittoor	Chillamakulla Palli	2021	Mango	0.1	13.3488	79.3578
Damodar reddy	Chittoor	Chillamakulla Palli	2021	Mango	0.18	13.3466	79.3565

Damodar reddy	Chittoor	Chillamakulla Palli	2021	Mango	0.18	13.3490	79.3572
Damodar reddy	Chittoor	Chillamakulla Palli	2021	Mango	0.1	13.3495	79.3577
Damodar reddy	Chittoor	Chillamakulla Palli	2021	Mango	0.1	13.3493	79.3572
Damodar reddy	Chittoor	Chillamakulla Palli	2018	Mango	0.42	13.3468	79.3597
Saraswati Amma	Chittoor	Chillamakulla Palli	2021	Mango	0.22	13.3480	79.3563
Saraswati Amma	Chittoor	Chillamakulla Palli	2021	Mango	0.12	13.3467	79.3563
Saraswati Amma	Chittoor	Chillamakulla Palli	2022	Mango	0.1	13.3478	79.3584
Hema Priya	Chittoor	Chillamakulla Palli	2021	Mango	0.24	13.3458	79.3562
Nagi reddy	Chittoor	Chillamakulla Palli	2021	Mango	0.17	13.3454	79.3564
Nagi reddy	Chittoor	Chillamakulla Palli	2021	Mango	0.21	13.3455	79.3560
P anjali	Chittoor	Gd Nellore	2019	Mango	0.27	13.2251	79.1912
P anjali	Chittoor	Gd Nellore	2019	Mango	0.27	13.2251	79.1917
P anjali	Chittoor	Gd Nellore	2019	Mango	0.14	13.2251	79.1921
K kanthamm	Chittoor	Gd Nellore	2021	Mango	0.53	13.2232	79.1888
E naresh	Chittoor	Mukulathuru	2022	Mango	0.36	13.2069	79.1966
E Lalitha	Chittoor	Mukulathuru	2022	Mango	0.1	13.2073	79.1969
E Lalitha	Chittoor	Mukulathuru	2021	Mango	0.32	13.2064	79.1967
K janrandn pillai	Chittoor	Mukulathuru	2019	Mango	0.63	13.2097	79.1950
K s payani	Chittoor	Mukulathuru	2021	Mango	0.41	13.2100	79.1965
C Narendra	Chittoor	Mukulathuru	2021	Mango	0.69	13.2119	79.1939
C Narendra	Chittoor	Mukulathuru	2021	Mango	1.13	13.2116	79.1932
C Lakshmi	Chittoor	Mukulathuru	2022	Mango	0.78	13.2106	79.2024
C chittimma	Chittoor	Mukulathuru	2022	Mango	0.1	13.2082	79.1972
C chittemm	Chittoor	Gd Nellore	2019	Mango	0.14	13.2091	79.1941
M kuchaiah	Chittoor	Mukulathuru	2021	Mango	0.56	13.2086	79.2019
K padhabanab naidu	Chittoor	Mukulathuru	2021	Mango	0.37	13.2114	79.2032
K padhabanab naidu	Chittoor	Mukulathuru	2023	Mango	0.39	13.2118	79.2041
T esthar	Chittoor	Mukulathuru	2021	Mango	0.18	13.2138	79.1944
E chandrasekhar naidu	Chittoor	Mukulathuru	2018	Mango	0.1	13.2044	79.1984

E prema	Chittoor	Mukulathuru	2022	Mango	0.28	13.2027	79.1980
E prahaladha naidu	Chittoor	Mukulathuru	2021	Mango	0.38	13.2022	79.1986
E prahaladha naidu	Chittoor	Mukulathuru	2021	Mango	0.1	13.2018	79.2004
R chittibabu naidu	Chittoor	Mukulathuru	2018	Mango	0.27	13.2010	79.1990
Harikrishna naidu v	Chittoor	Mukulathuru	2022	Mango	0.32	13.2033	79.2062
Kannayanaydu	Chittoor	Maniyanampalli	2021	Mango	0.23	13.3017	79.1760
Kannayanaydu	Chittoor	Maniyanampalli	2021	Mango	0.15	13.3019	79.1764
Kannayanaydu	Chittoor	Maniyanampalli	2021	Mango	0.1	13.3016	79.1757
Visvanadhanaydu	Chittoor	Maniyanampalli	2021	Mango	0.58	13.2995	79.1785
Mohannaydu	Chittoor	Maniyanampalli	2019	Mango	0.44	13.2982	79.1795
Mahan naydu	Chittoor	Maniyanampalli	2019	Mango	0.26	13.2979	79.1794
Mohan naydy	Chittoor	Maniyanampalli	2022	Mango	0.34	13.2980	79.1804
J. Naresh	Chittoor	Maniyanampalli	2021	Mango	0.8	13.3019	79.1752
J.Naresh	Chittoor	Maniyanampalli	2021	Mango	0.65	13.3010	79.1747
Vasudevanaydu	Chittoor	Maniyanampalli	2022	Mango	0.1	13.3017	79.1725
M. Guna	Chittoor	Maniyanampalli	2021	Mango	0.91	13.3026	79.1716
M. Guna	Chittoor	Maniyanampalli	2021	Mango	0.17	13.3021	79.1719
Santhamma	Chittoor	Maniyanampalli	2021	Mango	0.22	13.3033	79.1707
Santhamma	Chittoor	Maniyanampalli	2019	Mango	0.73	13.3031	79.1699
Krisnama naydu	Chittoor	Maniyanampalli	2019	Mango	0.5	13.3027	79.1695
Ranemma	Chittoor	Maniyanampalli	2022	Mango	0.38	13.3059	79.1667
A Gopi naidu	Chittoor	Mukulathuru	2019	Mango	0.23	13.1966	79.2093
A Rajeswari	Chittoor	Mukulathuru	2018	Mango	0.2	13.1775	79.1972
K Anjineyula naidu	Chittoor	Mukulathuru	2018	Mango	0.2	13.1949	79.2049
K Bakthavatchala naidu	Chittoor	Mukulathuru	2018	Mango	0.13	13.1949	79.2053
A herendra naidu	Chittoor	Mukulathuru	2018	Mango	0.44	13.1979	79.2003
A yasodhamma	Chittoor	Mukulathuru	2021	Mango	0.46	13.1974	79.2000
A Devarajulu naidu	Chittoor	Mukulathuru	2019	Mango	0.19	13.1786	79.1951
K sridhar naidu	Chittoor	Mukulathuru	2018	Mango	0.23	13.1964	79.2064

A suguna	Chittoor	Chinavepanjeri	2021	Mango	0.26	13.2046	79.2164
Nirmala. M	Chittoor	Maniyanampalli	2021	Mango	0.33	13.2996	79.1724
M. Nirmala	Chittoor	Maniyanampalli	2021	Mango	0.32	13.2990	79.1724
Sidhaareddy	Chittoor	Pedharasipalli	2021	Mango	0.78	13.3022	79.1687
Rajamma	Chittoor	Pedharasipalli	2019	Mango	0.68	13.3025	79.1635
Damodar reddy	Chittoor	Pedharasipalli	2019	Mango	0.87	13.3010	79.1620
Lokanadam reddy	Chittoor	Pedharasipalli	2019	Mango	0.22	13.3015	79.1614
E. Subramanyam reddy	Chittoor	Pedharasipalli	2021	Mango	0.18	13.2949	79.1652
Subramanyam reddy	Chittoor	Pedharasipalli	2021	Mango	0.18	13.2950	79.1657
Bhala subramanyam	Chittoor	Pedharasipalli	2019	Mango	0.33	13.2993	79.1657
Redemma	Chittoor	Pedharasipalli	2019	Mango	0.31	13.2989	79.1653
Redemma	Chittoor	Pedharasipalli	2019	Mango	0.18	13.2993	79.1650
Redemma	Chittoor	Pedharasipalli	2019	Mango	0.15	13.2997	79.1649
Redemma	Chittoor	Pedharasipalli	2019	Mango	0.12	13.2993	79.1652
Bhalasubramanyam reddy	Chittoor	Pedharasipalli	2019	Mango	0.27	13.2985	79.1657
M Rajamm	Chittoor	Chinavepanjeri	2021	Mango	0.33	13.2265	79.1905
D Gurumurthy	Chittoor	Chinavepanjeri	2020	Mango	0.2	13.2096	79.2228
D kanna Reddy	Chittoor	Chinavepanjeri	2020	Mango	0.1	13.2098	79.2244
D harish	Chittoor	Chinavepanjeri	2019	Mango	0.15	13.2088	79.2245
D gunsekhar reddy	Chittoor	Chinavepanjeri	2020	Mango	0.25	13.2121	79.2246
D gunsekhar reddy	Chittoor	Chinavepanjeri	2020	Mango	0.1	13.2125	79.2253
D varadan	Chittoor	Chinavepanjeri	2018	Mango	0.29	13.2026	79.2123
D varadan	Chittoor	Chinavepanjeri	2018	Mango	0.3	13.2029	79.2131
D varadan	Chittoor	Chinavepanjeri	2018	Mango	0.46	13.2020	79.2129
C madhava Naidu	Chittoor	Mukulathuru	2020	Mango	0.32	13.2069	79.2045
B vasudeva naidu	Chittoor	Mukulathuru	2019	Mango	0.21	13.2075	79.2104
Janakiramanaydu	Chittoor	Maniyanam Palli	2021	Mango	0.48	13.3049	79.1744
Janakiram naydu	Chittoor	Maniyanampalli	2021	Mango	0.29	13.3048	79.1750
Janakiram naydu	Chittoor	Maniyanampalli	2021	Mango	0.17	13.3043	79.1747

Visvanadha naydu	Chittoor	Maniyanampalli	2019	Mango	0.93	13.2978	79.1771
Vasudevanaydu	Chittoor	Maniyanampalli	2019	Mango	0.88	13.3003	79.1705
Vasudeva naydu	Chittoor	Maniyanampalli	2019	Mango	0.5	13.3002	79.1680
Vasudev naydu	Chittoor	Maniyanampalli	2019	Mango	0.12	13.2991	79.1703
A subrahmanyam naidu	Chittoor	Mukulathuru	2018	Mango	0.43	13.1973	79.2008
K Ravindra naidu	Chittoor	Murithinayan Palli	2021	Mango	0.54	13.1946	79.2020
Narasamma	Chittoor	Bedharasipalli	2020	Mango	0.74	13.2999	79.1624
Narasamma	Chittoor	Pedharasipalli	2020	Mango	0.65	13.3002	79.1633
Narasamma	Chittoor	Pedharasipalli	2020	Mango	0.47	13.3004	79.1640
Chinnareddy	Chittoor	Pedharasipalli	2020	Mango	0.1	13.3008	79.1641
Chinnama reddy	Chittoor	Pedharasipalli	2022	Mango	0.53	13.2985	79.1614
E. Leelakar reddy	Chittoor	Pedharasipalli	2021	Mango	0.32	13.2942	79.1672
Leelaprakash reddy	Chittoor	Pedharasipalli	2019	Mango	0.16	13.2926	79.1682
Leelaprakash reddy	Chittoor	Pedharasipalli	2021	Mango	0.74	13.2922	79.1671
Leelaprakash reddy	Chittoor	Pedharasipalli	2019	Mango	0.29	13.2908	79.1682
M srinivasulu naidu	Chittoor	Chinavepanjeri	2018	Mango	0.74	13.2163	79.2332
K china subrahmanyam naidu	Chittoor	Chinavepanjeri	2018	Mango	0.7	13.2031	79.2126
K Hari	Chittoor	Chinavepanjeri	2018	Mango	0.78	13.1977	79.2167
Y Sankar Reddy	Chittoor	Chinnathayyur	2020	Mango	1.43	13.3023	79.3131
M.zamruth	Chittoor	Gd Nellore	2018	Mango	0.55	13.2310	79.1912
Bharat reddy	Prakasam	Dadhireddy palli	2020	Red Sanders	19	15.2015	79.4234
Bharat reddy	Prakasam	Dadhireddy palli	2019	Red Sanders	6.75	15.2014	79.4193
Bharat reddy	Prakasam	Dadhireddy palli	2019	Red Sanders	10	15.2064	79.4318
Bharat reddy	Prakasam	Dadhireddy palli	2021	Red Sanders	2	15.2067	79.4302
Bharat reddy	Prakasam	Dadhireddy palli	2019	Red Sanders	5.34	15.2598	79.4795
Bharat reddy	Prakasam	Dadhireddy palli	2022	Red Sanders	21.3	15.5002	79.4530
Kartikey	Prakasam	Dadhireddy palli	2022	Red Sanders	6.47	15.2850	79.4265
Subba Rao	Prakasam	Dadhireddy palli	2021	Red Sanders	10.1	15.2992	79.4309

Number of for Madhya Pradesh in PAI-1

Farmer name	District	Village name	Plantation year	Species Name	Area ha.	Latitude	Longitude
Vinod	Dhar	Bidwal	2018	Guava	0.55	22.8196	75.1986
Tejalal	Dhar	Borali	2018	Guava	0.55	22.9655	75.2523
Unkar	Dhar	Tilgara	2018	Guava	0.48	23.0638	75.1363
Munnalal Dayaram	Dhar	Jabda	2018	Guava	0.22	23.1021	75.1093
Anil	Dhar	Jabda	2018	Guava	0.51	23.0999	75.1088
Angurbala	Dhar	Sandla	2018	Guava	0.42	23.0429	75.1408
Ramchandra Patidar	Ratlam	Rupakheda	2018	Guava	0.84	23.2315	75.0673
Deepak Patidar	Ratlam	Titri	2018	Guava	0.54	23.2631	75.0383
Khushal Patidaar	Ratlam	Kushalgarh	2018	Guava	1.2	23.5583	75.0135
Khemraj	Ratlam	Kushalgarh	2018	Guava	0.44	23.5583	75.0127
Dhapu Bai	Ratlam	Kushalgarh	2018	Guava	0.4	23.5575	75.0116
Vinod Ji Patidar	Ratlam	Kushalgarh	2018	Guava	1.54	23.5585	75.0112
Fhatehlal ji Patidar	Ratlam	Kushalgarh	2018	Guava	1.32	23.5575	75.0130
Bhimraj Ji Patidar	Ratlam	Alniya	2018	Guava	1.13	23.2591	75.0546
Indersing Ji Rajput	Ratlam	Shakarkhedi	2018	Guava	0.44	23.6989	75.0388
Paras Ji Patidar	Ratlam	Shakarkhedi	2018	Guava	3.84	23.2688	75.0535
Muni Bai Patidar	Ratlam	Birmawal	2018	Guava	1.37	23.1430	75.1239
Tara Chandra Ji	Dhar	Roopkhera	2019	Guava	0.36	23.0929	75.1616
Hariom	Dhar	Tilgara	2019	Guava	0.43	23.0586	75.1680
Bapu Singh	Dhar	Dhamana	2019	Guava	0.73	23.0902	75.2453
Kelash Chandra	Dhar	Ghatgara	2019	Guava	0.88	22.9669	75.2553
Kanhaya Lal	Dhar	Indraval	2019	Guava	0.14	22.7993	75.1733
Suraj Bai	Dhar	Bhesola	2019	Guava	0.36	23.0195	75.0658
Vishnu	Dhar	Tilgara	2019	Guava	0.35	23.0628	75.1599
Narendra	Dhar	Dhaolana	2019	Guava	0.65	23.0389	75.3245
Shantilal	Dhar	Dholana	2019	Guava	0.13	23.0425	75.3181
Ishwar	Dhar	Jabda	2019	Guava	1.31	23.0983	75.1188
Chmpalal	Dhar	Jabda	2019	Guava	0.33	23.1021	75.1089
Parvati	Dhar	Jabda	2019	Guava	0.4	23.1000	75.1162
Chhotulal	Dhar	Jabda	2019	Guava	0.34	23.1037	75.1116
Munnalal	Dhar	Jabda	2019	Guava	0.66	23.1011	75.1113
Kanhaiya Lal	Dhar	Jabda	2019	Guava	1.32	23.0919	75.1111
Shyamu Bai	Dhar	Sandla	2019	Guava	0.7	23.0305	75.1490
Jagdish	Dhar	Jabda	2019	Guava	1.19	23.1008	75.1180
Kelash	Dhar	Jabda	2019	Guava	0.97	23.0948	75.1179
Sitaram	Dhar	Jabda	2019	Guava	0.3	23.0791	75.1468
Badrilal	Dhar	Tilgara	2019	Guava	0.16	23.0804	75.1393

Sukhdev Ji Patidar	Ratlam	Rupakheda	2019	Guava	0.75	23.2340	75.0643
Rajkuvar Ji	Ratlam	Badayala	2019	Guava	0.54	23.5936	74.9960
Fhuli Bai Patidar	Ratlam	Kushalgarh	2019	Guava	0.66	23.5584	75.0122
Balmukund Patidar	Ratlam	Kushalgarh	2019	Guava	1.15	23.5588	75.0081
Sunil Ji Patidar	Ratlam	Alniya	2019	Guava	0.77	23.2471	75.0460
Mukesh Patidar	Ratlam	Delanpur	2019	Guava	0.66	23.3938	75.0078
Vijay Patidar	Ratlam	Kuajhagar	2019	Guava	1.1	23.2405	75.0427
Bansilal Ji Patidar	Ratlam	Birmawal	2019	Guava	0.5	23.1369	75.1212
Himmat Patidar	Ratlam	Birmawal	2019	Guava	0.33	23.1328	75.1129
Shreepal Ji Patidar	Ratlam	Aamba	2019	Guava	0.73	23.1266	75.1388
Hiralalji Patidar	Ratlam	Jethana	2019	Guava	1.1	23.2412	75.0447
Jitendar Patidar	Dhar	Roopkhera	2020	Guava	0.55	23.0836	75.1654
Shripal	Dhar	Roopkhera	2020	Guava	0.24	23.0817	75.1605
Murali Patidar	Dhar	Roopkhera	2020	Guava	0.28	23.0853	75.1538
Rahul Patidar	Dhar	Tilgara	2020	Guava	0.27	23.0607	75.1650
Surendra Singh	Dhar	Dhamana	2020	Guava	0.15	23.0896	75.2462
Munni Bai	Dhar	Ghatgara	2020	Guava	1.25	22.9710	75.2677
Nandram	Dhar	Tilgara	2020	Guava	0.22	23.0649	75.1188
Prakash	Dhar	Bhesola	2020	Guava	0.16	23.0039	75.0733
Gopal	Dhar	Indraval	2020	Guava	0.4	22.7987	75.1824
Girdhari	Dhar	Jabda	2020	Guava	0.22	23.0984	75.1147
Ramesh	Dhar	Jabda	2020	Guava	0.44	23.0999	75.1172
Unkar	Dhar	Jabda	2020	Guava	0.2	23.1036	75.1173
Koshalya	Dhar	Sandla	2020	Guava	0.44	23.0462	75.1427
Gordhan Lal	Dhar	Sandla	2020	Guava	0.6	23.0307	75.1503
Nathulal	Dhar	Jabda	2020	Guava	0.22	23.1043	75.1105
Mukesh	Dhar	Jabda	2020	Guava	0.4	23.0977	75.1149
Laxminarayan	Dhar	Sandla	2020	Guava	0.71	23.0353	75.1341
Babulal Patidar	Ratlam	Titri	2020	Guava	0.4	23.2774	75.0396
Soyam Patidar	Ratlam	Titri	2020	Guava	1	23.2788	75.0459
PurushotamPatidar	Ratlam	Harthali	2020	Guava	0.8	23.2926	74.9927
Ratan Bai	Ratlam	Uparwada	2020	Guava	0.32	23.5905	75.0459
Babulal Ji Patidar	Ratlam	Alniya	2020	Guava	0.46	23.2645	75.0515
Pushpa Bai	Ratlam	Chipiya	2020	Guava	0.46	23.7042	75.0102
Radheshyam Ji	Ratlam	Harthali	2020	Guava	0.93	23.3007	75.0160
Radheshyam Patidar	Ratlam	Shakarkhedi	2020	Guava	0.36	23.7211	75.0427
Durgesh Ji Patidar	Ratlam	Sherpur	2020	Guava	0.71	23.5654	74.9177
Kala Bai Patidar	Ratlam	Aamba	2020	Guava	0.77	23.5374	74.9015
Radha Bai Patidar	Ratlam	Aamba	2020	Guava	0.54	23.5453	74.9017
Gopal Ji	Ratlam	Harthali	2020	Guava	0.67	23.2920	74.9924
Gordhan Ji	Ratlam	Chipiya	2020	Guava	0.46	23.7053	75.0510
Nandram Ji	Dhar	Roopkhera	2021	Guava	0.33	23.0921	75.1658

Balchandra	Dhar	Roopkhera	2021	Guava	0.18	23.0909	75.1660
Kanhaiya Lal	Dhar	Roopkhera	2021	Guava	0.26	23.0821	75.1551
Jagdeesh Ji	Dhar	Roopkhera	2021	Guava	0.32	23.0834	75.1505
Umashanker	Dhar	Saktalee	2021	Guava	0.86	22.9645	75.2501
Rahul	Dhar	Tilgara	2021	Guava	0.41	23.0643	75.1497
Vashudev Patidar	Dhar	Tilgara	2021	Guava	0.62	23.0608	75.1655
Narayan Patidar	Dhar	Tilgara	2021	Guava	0.34	23.0654	75.1498
Balmukand	Dhar	Tilgara	2021	Guava	0.18	23.0590	75.1686
Parbulal	Dhar	Bakhatgarad	2021	Guava	0.1	22.9577	75.1984
Manju Bala	Dhar	Ghatgara	2021	Guava	1.11	22.9707	75.2664
Babblu	Dhar	Tilgara	2021	Guava	0.48	23.0681	75.1216
Bharat	Dhar	Bakhatpura	2021	Guava	0.22	23.0196	75.0677
Mukesh	Dhar	Bakhatpura	2021	Guava	0.33	23.0208	75.0626
Motilal Ji	Dhar	Bhesola	2021	Guava	0.16	23.0183	75.0647
Ramchandra	Dhar	Bakhatpura	2021	Guava	0.28	23.0402	75.0591
Babulal	Dhar	Tilgara	2021	Guava	0.34	23.0643	75.1331
Mangilal	Dhar	Tilgara	2021	Guava	0.2	23.0634	75.1356
Mangu Bai	Dhar	Tilgara	2021	Guava	0.27	23.0671	75.1337
Gangabai	Dhar	Indraval	2021	Guava	0.49	22.8022	75.1864
Anokhilal	Dhar	Indraval	2021	Guava	0.13	22.8090	75.1755
Radheshyam	Dhar	Tilgara	2021	Guava	0.28	23.0717	75.1428
Bhagvanta Bai	Dhar	Tilgara	2021	Guava	0.22	23.0638	75.1440
Harkuvar Bai	Dhar	Tilgara	2021	Guava	0.33	23.0637	75.1476
Ranchod	Dhar	Tilgara	2021	Guava	0.4	23.0681	75.1373
Ishwar	Dhar	Jabda	2021	Guava	0.57	23.0965	75.1132
Jagdish	Dhar	Jabda	2021	Guava	0.52	23.1058	75.1132
Girdhari	Dhar	Jabda	2021	Guava	0.34	23.0991	75.1149
Ghanshyam	Dhar	Jabda	2021	Guava	0.55	23.0992	75.1175
Gopal	Dhar	Jabda	2021	Guava	0.22	23.0994	75.1200
Gopal	Dhar	Jabda	2021	Guava	0.33	23.1003	75.1191
Nathulal	Dhar	Jabda	2021	Guava	0.26	23.0999	75.1156
Lakhan	Dhar	Jabda	2021	Guava	0.22	23.0983	75.1194
Bhagvati	Dhar	Jabda	2021	Guava	0.3	23.0987	75.1177
Sohan Lal	Dhar	Jabda	2021	Guava	0.38	23.1074	75.1096
Gopal	Dhar	Jabda	2021	Guava	0.42	23.1062	75.1103
Banshilal	Dhar	Jabda	2021	Guava	0.43	23.1044	75.1110
Mangilal	Dhar	Jabda	2021	Guava	0.27	23.1008	75.1213
Munnalal	Dhar	Jabda	2021	Guava	0.68	23.0998	75.1107
Ranalal	Dhar	Jabda	2021	Guava	0.31	23.0921	75.1079
Paras	Dhar	Jabda	2021	Guava	0.4	23.0983	75.1091
Javaharlal	Dhar	Jabda	2021	Guava	0.27	23.0983	75.1088
Ramesh	Dhar	Jabda	2021	Guava	0.15	23.0976	75.1099

Jawahar	Dhar	Jabda	2021	Guava	0.3	23.0921	75.1076
Babulal	Dhar	Jabda	2021	Guava	0.82	23.0911	75.1075
Kanhaiya Lal	Dhar	Jabda	2021	Guava	1.98	23.0915	75.1099
Kanhaiya	Dhar	Jabda	2021	Guava	0.49	23.0984	75.1097
Babulal	Dhar	Jabda	2021	Guava	0.46	23.0878	75.1093
Motiram	Dhar	Jabda	2021	Guava	0.2	23.1038	75.1159
Vjeram	Dhar	Jabda	2021	Guava	0.33	23.1030	75.1152
Ratanlal	Dhar	Janda	2021	Guava	0.27	23.1112	75.1083
Shanti Bai	Dhar	Jabda	2021	Guava	0.5	23.1100	75.1101
Radheshyam	Dhar	Jabda	2021	Guava	0.55	23.0942	75.1090
Jwaharlala	Dhar	Jabda	2021	Guava	0.49	23.1004	75.1269
Manju Bai	Dhar	Sandla	2021	Guava	0.77	23.0311	75.1526
Manak	Dhar	Sandla	2021	Guava	0.26	23.0390	75.1328
Gulab Bai	Dhar	Sandla	2021	Guava	0.28	23.0394	75.1402
Gulab Bai	Dhar	Sandla	2021	Guava	0.22	23.0372	75.1405
Gulab Bai	Dhar	Sandla	2021	Guava	0.18	23.0372	75.1407
Govind	Dhar	Sandla	2021	Guava	0.3	23.0408	75.1399
Rameshwar	Dhar	Bakhatpura	2021	Guava	0.26	23.0363	75.0689
Samrat Ji	Dhar	Tilgara	2021	Guava	0.32	23.0642	75.1338
Samrat	Dhar	Tilgara	2021	Guava	0.2	23.0606	75.1291
Hiralal	Dhar	Dholana	2021	Guava	0.7	23.0427	75.3274
Bherulal	Dhar	Tilgara	2021	Guava	0.41	23.0633	75.1363
Omprakash Ji	Ratlam	Riyavan	2021	Guava	0.84	23.7152	74.9857
Bharat Lal patidar	Ratlam	Titri	2021	Guava	0.95	23.2662	75.0383
Ramkanya Bai	Ratlam	Chiklana	2021	Guava	0.44	23.7502	75.0677
Jagdish Ji	Ratlam	Harthali	2021	Guava	0.74	23.2937	74.9945
Mangilal	Ratlam	Chiklana	2021	Guava	0.28	23.7605	75.0938
Ram Krishna	Ratlam	Chiklana	2021	Guava	0.45	23.2895	74.9963
Badrilal Ji	Ratlam	Chiklana	2021	Guava	0.59	23.7661	75.0840
Devram Ji Patidar	Ratlam	Titri	2021	Guava	0.8	23.2636	75.0373
Ramesh Ji	Ratlam	Harthali	2021	Guava	0.77	23.2899	74.9977
Suresh Ji Gargama	Ratlam	Chiklana	2021	Guava	0.6	23.7589	75.0812
Kamla Bai Malviya	Ratlam	Akatwasa	2021	Guava	0.22	23.5533	75.0560
Ramlal Ji Sen	Ratlam	Pipliya Jhoda	2021	Guava	0.11	23.8054	75.1226
Mahendra Pal Solnki	Ratlam	Uparwada	2021	Guava	0.22	23.5912	75.0474
Devi Bai Suthar	Ratlam	khedi	2021	Guava	0.22	23.5540	75.0328
Jiten Ji Patidar	Ratlam	Alniya	2021	Guava	0.31	23.2604	75.0547
Gangabai Patidar	Ratlam	Alniya	2021	Guava	0.68	23.2472	75.0436
Ramakrishna Patidar	Ratlam	Alniya	2021	Guava	0.55	23.2496	75.0441
Himmat Lal Ji Patidar	Ratlam	Alniya	2021	Guava	0.67	23.2593	75.0554

Lalsing Ji Rajput	Ratlam	Bilnadpur	2021	Guava	0.2	23.6991	75.0194
Bahadur Rajput	Ratlam	Bilnadpur	2021	Guava	0.22	23.6992	75.0198
Bhuli Bai	Ratlam	Chipiya	2021	Guava	0.11	23.7048	75.0090
Dhana Lal Ji Malviya	Ratlam	Chipiya	2021	Guava	0.22	23.7068	75.0078
Ramniwas Ji Patidar	Ratlam	Chiklana	2021	Guava	0.9	23.7669	75.0841
Tika Kuwar	Ratlam	Shakarkhedi	2021	Guava	0.62	23.7069	75.0363
Bharat Shing Mesh	Ratlam	Shakarkhedi	2021	Guava	0.18	23.5921	75.0453
Dasrath Bhatiya	Ratlam	Delanpur	2021	Guava	0.77	23.7026	75.0176
Ramesh Ji Patidar	Ratlam	Kuajhagar	2021	Guava	0.66	23.2412	75.0487
Raja Ram Ji Patidar	Ratlam	Kuajhagar	2021	Guava	1.13	23.2405	75.0493
Omparkash patidar	Ratlam	Kuajhagar	2021	Guava	0.44	23.2414	75.0452
Sankarlal Ji	Ratlam	Jethana	2021	Guava	0.17	23.6776	75.0106
Punam Chandar	Ratlam	bilandpur	2021	Guava	0.4	23.7503	75.0087
Narsingh Jii	Ratlam	Harthali	2021	Guava	1.47	23.2892	74.9931
Ram Krishna	Ratlam	Harthali	2021	Guava	1.28	23.2904	74.9965
Hariom	Dhar	Roopkhera	2022	Guava	0.47	23.0828	75.1632
Vashu Dev	Dhar	Tilgara	2022	Guava	0.4	23.0605	75.1640
Narayan Patidar	Dhar	Tilgara	2022	Guava	0.41	23.0654	75.1495
Lalita Bai	Dhar	Bakhatgarad	2022	Guava	0.66	22.9552	75.2102
Kunta Bai	Dhar	Ghatgara	2022	Guava	1.14	22.9717	75.2677
Badri Patel	Dhar	Tilgara	2022	Guava	0.49	23.0673	75.1181
Banshilal Patidar	Dhar	Tilgara	2022	Guava	0.24	23.0680	75.1231
Samrath	Dhar	Bakhatpura	2022	Guava	0.32	23.0369	75.0649
Rameshwar	Dhar	Bakhatpura	2022	Guava	0.11	23.0360	75.0683
Rameshwar	Dhar	Bakhatpura	2022	Guava	0.1	23.0360	75.0684
Kelash	Dhar	Bakhatpura	2022	Guava	0.23	23.0299	75.0720
Kelash	Dhar	Bakhatpura	2022	Guava	0.34	23.0211	75.0698
Ramlal	Dhar	Bakhatpura	2022	Guava	0.39	23.0204	75.0695
Raghunandan	Dhar	Bhesola	2022	Guava	0.16	23.0038	75.0735
Sharda Bai	Dhar	Bhesola	2022	Guava	0.22	23.0108	75.0680
Purushottam Patidar	Dhar	Bhesola	2022	Guava	0.44	23.0217	75.0615
Savitra Bai	Dhar	Bhesola	2022	Guava	0.22	23.0141	75.0766
Jhamak Lal	Dhar	Bhesola	2022	Guava	0.18	23.0183	75.0658
Sharda	Dhar	Bhesola	2022	Guava	0.25	23.0198	75.0702
Sagar Bai	Dhar	Tilgara	2022	Guava	0.16	23.0685	75.1380
Bherulal	Dhar	Tilgara	2022	Guava	0.66	23.0603	75.1356
Gopal	Dhar	Tilgara	2022	Guava	0.4	23.0629	75.1432
Bherulal	Dhar	Tilgara	2022	Guava	0.4	23.0650	75.1339
Gopal	Dhar	Tilgara	2022	Guava	0.33	23.0643	75.1373
Unkarlal	Dhar	Tilgara	2022	Guava	0.16	23.0657	75.1367
Mahesh	Dhar	Indraval	2022	Guava	0.45	22.8016	75.1829
Jhamak Lal	Dhar	Tilgara	2022	Guava	0.6	23.0636	75.1479

Ranchod	Dhar	Tilgara	2022	Guava	0.3	23.0686	75.1372
Badrilal	Dhar	Dholana	2022	Guava	0.33	23.0420	75.3210
Manish Patel	Dhar	Dholana	2022	Guava	0.33	23.0387	75.3211
Narendra	Dhar	Dholalna	2022	Guava	0.57	23.0387	75.3234
Narayan	Dhar	Dholana	2022	Guava	0.77	23.0462	75.3075
Madan Lal	Dhar	Dholana	2022	Guava	0.66	23.0424	75.3278
Banshilal	Dhar	Jabda	2022	Guava	0.42	23.1009	75.1135
Kelash	Dhar	Jabda	2022	Guava	0.27	23.1052	75.1102
Bharatlal	Dhar	Jabda	2022	Guava	0.2	23.1055	75.1106
Ishwar	Dhar	Jabda	2022	Guava	0.36	23.1036	75.1126
Gagan	Dhar	Jabda	2022	Guava	0.6	23.1032	75.1120
Bharatlal	Dhar	Jabda	2022	Guava	0.28	23.1022	75.1126
Mangilal	Dhar	Jabda	2022	Guava	0.38	23.1014	75.1212
Lakhmichand	Dhar	Jabda	2022	Guava	0.76	23.0998	75.1215
Munnalal	Dhar	Jabda	2022	Guava	0.53	23.1024	75.1220
Jaydntilal	Dhar	Jabda	2022	Guava	0.49	23.1003	75.1220
Babulal	Dhar	Jabda	2022	Guava	0.39	23.0877	75.1076
Mukesh	Dhar	Jabda	2022	Guava	0.24	23.0942	75.1098
Badrilal	Dhar	Jabda	2022	Guava	0.33	23.1026	75.1168
Munnalal	Dhar	Jabda	2022	Guava	0.22	23.1047	75.1142
Badrilal	Dhar	Tilgara	2022	Guava	0.11	23.0806	75.1385
Manju Bai	Dhar	Sandla	2022	Guava	0.84	23.0324	75.1502
Shubhash	Dhar	Sandla	2022	Guava	0.33	23.0414	75.1399
Manak Ji	Dhar	Sandla	2022	Guava	0.19	23.0394	75.1335
Kanti Lal	Dhar	Sandla	2022	Guava	0.17	23.0396	75.1335
Manak	Dhar	Sandla	2022	Guava	0.35	23.0383	75.1332
Paras	Dhar	Sandla	2022	Guava	0.32	23.0391	75.1336
Rameshwar Patidar	Dhar	Roopkhera	2022	Guava	0.68	23.0945	75.1633
Raju	Dhar	Jabda	2022	Guava	0.1	23.1022	75.1129
Ashok Bhil	Ratlam	Titri	2022	Guava	0.25	23.2642	75.0370
Kamlesh Vaktariya	Ratlam	Riyavan	2022	Guava	0.66	23.7174	74.9831
Bharat Lal ji	Ratlam	Harthali	2022	Guava	0.91	23.3012	75.0174
Anil	Ratlam	Chiklana	2022	Guava	0.22	23.7614	75.0937
Nirmala Bai Patidar	Ratlam	Umar Thana	2022	Guava	0.33	23.1781	75.1170
Ramchandra Prajapti	Ratlam	Akatwasa	2022	Guava	0.37	23.5500	75.0566
Ramlal Patidar	Ratlam	Delanpur	2022	Guava	0.44	23.3942	74.9968
Bharatlal	Ratlam	Delanpur	2022	Guava	0.68	23.3905	75.0009
Rajkumar Ji Patidar	Ratlam	Alniya	2022	Guava	0.61	23.2478	75.0441
Janki Lal Ji Mehta	Ratlam	Moyakheda	2022	Guava	0.22	23.7804	75.1250
Bheru Singh Ji Rajput	Ratlam	Moyakheda	2022	Guava	0.24	23.7805	75.1360
Laksman Ji Mehta	Ratlam	Moyakheda	2022	Guava	0.5	23.7816	75.1262

Ramchandra Ji Bagri	Ratlam	Moyakheda	2022	Guava	0.22	23.7836	75.1382
Dinesh Ji Patidar	Ratlam	Aamba	2022	Guava	0.1	23.5624	74.9108
Vinod Patidar	Ratlam	Bilandpur	2022	Guava	0.53	23.3935	75.0072
Dashrath Ji Patidar	Ratlam	Kuajhagar	2022	Guava	0.68	23.2409	75.0416
Govind Ji Patidar	Ratlam	Birmawal	2022	Guava	0.5	23.1408	75.1132
Kanayalal Ji Patidar	Ratlam	Birmawal	2022	Guava	0.33	23.1414	75.1240
Arpit Ji Patidar	Ratlam	Birmawal	2022	Guava	0.33	23.1388	75.1132
Dinesh Ji Patidar	Ratlam	Birmawal	2022	Guava	0.75	23.1245	75.1388
Basntilal Ji Patidar	Ratlam	Birmawal	2022	Guava	0.27	23.1384	75.1133
Sumitra Bai Patidar	Ratlam	Bilandpur	2022	Guava	0.2	23.1422	75.1130
Hirala Ji Patidar	Ratlam	Birmawal	2023	Guava	0.66	23.2407	75.0441

Number of for Tamil Nadu in PAI-1

Farmer name	District	Village name	Plantation year	Species Name	Area ha.	Latitude	Longitude
Kanagamma	Thiruvallur	Periya Vazhuthalambedu	2022	Mango	0.27	13.4345	80.1577
LALITHA	Thiruvallur	Thandalam	2020	Mango	0.28	13.4358	80.1600
Rajesh	Thiruvallur	Periya Vazhuthalambedu	2020	Mango	0.17	13.4372	80.1574
Dhevainthiran	Thiruvallur	Periya Vazhuthalambedu	2022	Mango	0.14	13.4361	80.1601
Ravi	Thiruvallur	Periya Vazhuthalambedu	2022	Mango	0.22	13.4374	80.1606
Vengatesan	Thiruvallur	Periya Vazhuthalambedu	2022	Mango	0.1	13.4341	80.1564
Ganapathy	Thiruvallur	Periya Vazhuthalambedu	2022	Mango	0.23	13.4317	80.1547
Sundramurthy	Thiruvallur	Periya Vazhuthalambedu	2022	Mango	0.1	13.4367	80.1581
Venkatesan	Thiruvallur	Periya Vazhuthalambedu	2022	Mango	0.23	13.4383	80.1549
Boobathy	Thiruvallur	Periyavazhuthalambedu	2020	Mango	0.1	13.5045	80.0637
Angu reddy	Thiruvallur	Periya Vazhuthalambedu	2023	Mango	1.6	13.5018	80.0670
Govindaswamy	Thiruvallur	Periya Vazhuthalambedu	2022	Mango	0.1	13.4342	80.1536
G subrahmanyam naidu	Thiruvallur	Veerakanellore	2023	Mango	0.62	13.5029	80.0654
M Vijay Kumar	Thiruvallur	Amudala	2022	Mango	0.24	13.4338	80.1392
Ramesh	Thiruvallur	Thambureddypalayam	2020	Mango	0.23	13.4336	80.1391
Nagammal s	Thiruvallur	Ragavareddymedu	2020	Mango	0.23	13.4333	80.1390
Kumar	Thiruvallur	Ragavareddymedu	2020	Mango	0.16	13.4330	80.1389
Arichanthiran	Thiruvallur	Santhur	2022	Mango	0.48	13.4446	80.1301
Renuga	Thiruvallur	Thambureddypalaiyam	2023	Mango	0.72	13.3387	79.9879
S.surya	Thiruvallur	Sengarai	2022	Mango	0.42	13.2310	79.2779
N.Baskar	Thiruvallur	Perumudivakkam	2019	Mango	0.2	13.4417	80.1375
Govindan	Thiruvallur	Mangavaram	2022	Mango	0.29	13.4387	80.1562
Muthu	Thiruvallur	Mangavaram	2020	Mango	0.14	13.4375	80.1542
Muthu	Thiruvallur	Periya Vazhuthalambedu	2020	Mango	0.22	13.4401	80.1588
Pazhani	Thiruvallur	Mangavaram	2020	Mango	0.13	13.4404	80.1590

Viswanathan	Thiruvallur	Mangavaram	2020	Mango	0.16	13.4402	80.1585
Elumalai	Thiruvallur	Magavaram	2020	Mango	0.19	13.4397	80.1579
Elumalai	Thiruvallur	Magavaram	2020	Mango	0.13	13.4393	80.1578
Logu	Thiruvallur	Magavaram	2020	Mango	0.36	13.4394	80.1583
Logu	Thiruvallur	Mangavaram	2020	Mango	0.15	13.4386	80.1584
Pazhani	Thiruvallur	Mangavaram	2020	Mango	0.11	13.4384	80.1599
Natesan	Thiruvallur	Mangavaram	2022	Mango	0.18	13.4387	80.1602
Mohan	Thiruvallur	Mangavaram	2021	Mango	0.39	13.3299	79.9270
K.Prabhakaran	Thiruvallur	Senjiagaram	2022	Mango	0.11	13.3296	79.9261
K.Prabhakaran	Thiruvallur	Senjiagaram	2022	Mango	0.19	13.4386	80.1608
Rammurthy	Thiruvallur	Mangavaram	2020	Mango	0.26	13.4390	80.1581
Arumugam	Thiruvallur	Mangavaram	2020	Mango	0.18	13.4403	80.1583
Lalitha	Thiruvallur	Periya Vazhuthalambedu	2022	Mango	0.14	13.4365	80.1592
Saravanan	Thiruvallur	Ragavareddymedu	2023	Mango	0.17	12.3970	78.3326
Thangavel.A	Thiruvallur	Thambureddypalayam	2022	Mango	0.14	13.4417	80.1403