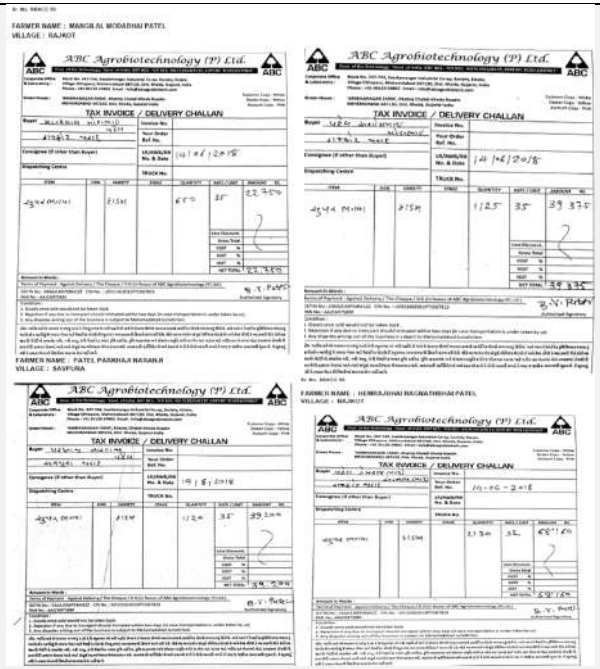
PROJECT REVIEW REPORT

This project review report includes findings raised during Verra's review of the project specified below. The VVB must address the findings before the project request can be considered for approval by Verra. The project review report will be made publicly available on the Verra Registry. Confidential information may be provided in separate attachments.

Project ID	3562
Project Name	Agroforestry Plantations in India
Review Type	Registration and Verification
Program(s)	VCS
Verification Period	18-June-2018 to 17-March-2024
Project Proponent	Shivbhadra Agro Private Limited (SAPL)
Methodology	AR-ACM0003: Afforestation and reforestation of lands except wetlands, v2.0
VVB	4K Earth Science Private Limited
Assessment Criteria	VCS Standard, v4.7
Date of First Issue	23 June 2025
Date of Second Issue	09 September 2025
Date of Third Issue	31 October 2025
Review Conclusion	Approved
Date of Final Issue	03 December 2025

FINDINGS

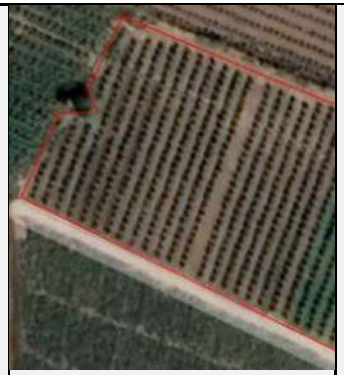
#	Finding Description	VVB Response	Status
1	**Insufficient justification of project start date**		
	Issue 1. Under Section 1.9 of the PD/MR, the evidence provided to justify the project start date (plantation bills and/or agreements) does not directly demonstrate the start of activities likely to generate GHG emission reductions or removals, as required by Section 3.8 of the VCS Standard v4.7. 2. In Section 3.1 of the VVR, it is unclear how	**Round 1** VVB Response 1. In line with Section 3.8 of the VCS Standard v4.7, the project start date is defined as the commencement of 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 14/06/2018, in accordance with best practices that recommend acquiring seedlings 2 to 5 days prior to planting.	Closed

	payment receipts for plant purchases made in the name of the project owners is appropriate evidence to demonstrate the start of planting activities. Action Required 1. The VVB must ensure the project updates Section 1.9 of the PD/MR to clearly specify the activity used to establish the project start date. 2. The VVB must update Section 3.1 of the VR to justify how the receipts for plant purchases are used as evidence of planting. Program Rule(s) *VCS Standard, v4.7,* Section 3.8	 Also, as outlined in the resource management plan, the seedlings were transported to farmers' fields and planting commenced shortly thereafter. The plan also mentions that the project will be commenced from July 2018. This timeline is further supported by satellite and temporal analysis of the land parcels included in the project. Satellite imageries confirms that emission reduction activities began after the official project start date of June 2018. A comparison of satellite images shows that before this date, the area had little vegetation and very limited human activity. However, images after June 2018 clearly show more vegetation and signs of agroforestry, such as organized rows of trees and expanding canopy cover. These visible changes in land use confirm that GHG removal activities started as claimed and meet the start date requirements per under the VCS Standard (v4.7, Section 3.8). Table 1: Evidence for project start date activities.	

		Name	Lat, long	Remarks	Imagery evidence	
		Dhudabhai Vaghaji Patel	24.62790619, 71.43119410	Project activities commenced after the official start date of June 2018. Satellite imagery in April which just before the project start indicates the absence of any visible interventions in farm activities and shows clear bare land and reduced vegetation cover, whereas imagery from 2021 demonstrates clear signs of land-use change and the establishment of agroforestry activities.	4th April 2018 before start date  22nd Oct 2018 - start date  6th Nov 2023- after start date 	
		Andaji	24.51000184,	The project activities	3rd March 2016 – before	

		Hemaji Patel	71.49948051	are not there as seen image dated 2016 while the interventions started during the project start date in second image and established activities during the recent image dated 2023. This evidence shows a clear picture of following the project start date.	start date  7th Nov 2018- start date  12th May – 2020	

						
		Jagatabhai Jodhabhai Patel	24.14218705, 71.73550371	Same as above and follow the images in this row for exact project start date evidence.	5th March 2016  7th Nov 2018 – Project start date	

					 15th Oct 2021 – after start date 	
		In addition, interviews and discussions with beneficiaries and other stakeholders during the site visit confirmed the timeline of implementation. Hence, based on the nursery bills, Resource management plan, site visit interviews with the plot owners and the temporal confirmation the VVB concludes that the project commenced on and after 18th June 2018. 2. In Section 3.1 of the joint VVR v1, the VVB has assessed the project start date based on payment receipts for plant purchases, review of the				

		Resource Management Plan, and site visit interviews with direct beneficiaries and other stakeholders. However, following VERRA's findings, the VVB has strengthened its assessment by incorporating a spatial and temporal analysis. Accordingly, Section 3.1 of the VVR v1.1 has been updated, and the assessment of the start date has been revised to provide more clarity and evidence.	
		Verra Response Section 1.9 of the PD/MR and Section 3.1 of the VVR have been updated to provide sufficient demonstration of the project start date and its compliance with start date requirements in the VCS Standard. No further action is required, and the finding is closed.	

2	**Incomplete justification of scope 3 emissions**		
	Issue 1. Section 1.17.3 of the PD/MR does not specify if 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. Action Required 1. The VVB must ensure the project updates Section 1.17.3 to specify if 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. If yes, the project must specify if the project	**Round 1** VVB Response PP has updated section 1.17.3 of the PDMR v5.1 and has now clearly specified that the project activities specified in Section 1.12 does not affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain. The audit team has also updated section 3.1 of the joint VVR v1.1 and has further elaborated that the project activities does not affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain. The audit team concludes that the project is not currently participating under any emission trading or other binding limit program or mechanism. This matter was	Closed

	proponent(s) or authorized representative is a buyer or seller of the product(s) (goods or services) that are part of a supply chain and provide sufficient justification to demonstrate the same. A public statement if required must be issued by the validation date. 2. The VVB must update Section 3.1 of the VVR accordingly. <u>Program Rule(s)</u> *VCS Standard, v4.7,* Section 3.24.7	discussed with PP, and they have subsequently provided an undertaking document to confirm their commitment. The PP or authorized representative is not a buyer or seller of a product whose emissions footprint is changed by the project activities. The ARR project does not generate or involve the production, processing, or distribution of goods or services that are part of a broader supply chain. The project activities described in Section 1.12 of the PDMR are limited to afforestation and reforestation interventions on degraded land and do not result in any commercial products whose carbon footprint could be affected. As such, there is no change in the emissions footprint of any upstream or downstream products or services attributable to the project. Therefore, no supply chain-related emission impacts need to be assessed under this section.	

		Verra Response Section 1.17.3 of the PD/MR has been updated to specified that the project activities specified in Section 1.12 does not affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain. Section 3.1 of the VVR has been updated to provide additional assessment and confirmation that the project t proponent is not a buyer or seller of a product (i.e., a good or service) that is in a supply chain and whose product emissions footprint is changed by the project activities specified in the project description. No further action is required, and the finding is closed.	

3	**Insufficient demonstration of project's sustainable development contributions**		
	Issue 1. In Section 1.18 of the PD/MR a. The project contribution does not use the same quantifying metric as the indicator. See background. b. It is unclear how the project contributions, such as SDG awareness training and Climate Change Awareness, are used to monitor the	**Round 1** VVB Response 1. PP has updated Section 1.18.2 a. The SDG indicators have been revised to align with the project's actual contributions and the official list of SDG targets and indicators, as per the SDG Global Indicator Framework (SDG Indicators — SDG Indicators). The project's contributions now correspond to the quantifying metrics	Closed

	impact on the indicator '8.3.1: Proportion of informal employment in total employment, by sector and sex." Further, it is unclear if these programs are a one-time activity for stakeholders, or if trainings are provided to the same stakeholders throughout the project lifetime. c. There is insufficient evidence to demonstrate the implementation of activities for SDGs related to (i) seasonal employment of 1,073-man days, including both men and women who perform manual tasks, and (ii) SDG awareness training and Climate Change Awareness programs. <u>Action Required</u> 1. The VVB must ensure the project updates Section 1.18.2 of the PD/MR to a. Ensure the project contributions use the same quantifying metric as the indicator. b. Demonstrate how project contributions such as SDG awareness training and Climate Change Awareness are used to monitor the impact on the indicator '8.3.1: Proportion of informal employment in total employment, by sector and sex.'. Further, the project must clarify if these programs are a one-time activity for stakeholders or if trainings are provided to the same stakeholders throughout the project's lifetime. d. Provide sufficient evidence to demonstrate (i) seasonal employment for 1,073-man days and	associated with the selected SDG targets/indicators. These contributions are quantified using the same metrics defined in the official SDG indicator framework to ensure consistency and traceability. b. We have now replaced SDG indicator 8.3.1 (Proportion of informal employment in total employment) to 8.5.1 (Average hourly earnings of female and male employees, by occupation, age and persons with disabilities). The revision is made as 8.3.1 was not directly relevant to the project's activities. The revised indicator more accurately reflects the project's employment-related outputs. To support this indicator, the PP has submitted: • Employment generation records demonstrating 1,073 man-days of seasonal employment, inclusive of both men and women engaged in manual labor, The training programs are conducted annually and will continue throughout the project's crediting period. These are offered to both existing and new stakeholders across current and future instances of the project activity. However, to ensure that only concrete and monitorable benefits are reported, the PP has chosen not to claim SDG-related benefits from these training activities in the current monitoring period. These contributions may be re-assessed and included in future monitoring periods, subject to the availability of verifiable impact data. c. In response to VERRA's observation, the PP has removed SDG Targets 2.3 and 1.1 from this monitoring period. These targets will be reassessed and may be re-included in future monitoring reports once measurable and verifiable (e.g., substantial increased income, measurable poverty alleviation) impacts are demonstrated during subsequent verification cycles. The employment and training activities	

(ii)SDG awareness training and Climate Change Awareness programs for 103 persons.

2. The VVB must update Section 3.1 of the VVR accordingly.

Program Rule(s)
VCS Standard, v4.7, Section 3.17

Background
Issue 1a
The following are examples of the project's contributions to SGGs where the quantifying metric of the project contribution does not match the quantifying metric of the selected target/indicator.

Quantifying metric of the selected target and indicator:	Quantifying metric of the Project Contribution
Average income of small-scale food producers, by sex and indigenous status	Number of farmers enrolled.
Proportion of the population living below the international poverty line by sex, age, employment status and geographic location (urban/rural)	Number of person days, and remuneration per person per day
8.3.1 Proportion of informal employment in total employment, by sector and sex	Number of individuals provided with awareness sessions.

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referenced above are now solely attributed to SDG Indicator 8.5.1, reflecting the project's contribution toward promoting full and productive employment and decent work for all.

The following table summarizes changes made in Section 1.18.2 of the revised PDMR.

Quantifying metric of the selected target and indicator:	**Quantifying metric of the Project Contribution**
Average income of small-scale food producers, by sex and indigenous status	The number of enrolled farmers was provided to estimate the beneficiaries expected to generate supplementary income through carbon credit revenues and secondary produce. However, this SDG Target (2.3) has now been excluded from the table in Section 1.18.2 of the VCS PDMR. The SDG will be included once any tangible impact is reflected in upcoming verification cycles within the crediting period.
Proportion of the population living below the international poverty line by sex, age, employment status and geographic location (urban/rural)	The number of employment days were provided in SDG Target 1.1 to represents the total employment that was generated through plantation and management activities under PAI-1. We have now excluded the SDG Target 1.1 from VCS PDMR. The SDG will be included once any tangible impact is reflected in upcoming verification cycles within the crediting period.
8.3.1 Proportion of informal employment in total employment, by sector and sex	The indicator has now been revised and replaced with 8.5.1. The record of the same has been shared with VVB.

Verra Response

		Section 1.18.2 of the PD/MR has been updated. However, the issues raised have not been sufficiently addressed, and the finding cannot be closed. <u>Issue</u> 1. In Section 1.18 of the PD/MR a. The project contribution still does not use the same quantifying metric as the indicator. See background. b. There is insufficient evidence to demonstrate the implementation of activities for SDGs related to employment of 110 farmers for 1,073-man days, <u>Action Required</u> 1. The VVB must ensure the project updates Section 1.18.2 of the PD/MR to a. Ensure the project contributions use the same quantifying metric as the indicator. b. Provide sufficient evidence to demonstrate (i) seasonal employment for 110 farmers and 1,073-man days <u>Program Rule(s)</u> *VCS Standard, v4.7,* Section 3.17 <u>Background</u> The quantifying metric for indicator 8.5.1 should be the average hourly earnings of female and male employees, by occupation, age and persons with disabilities. However, the project uses a metric of number of farmers and person days of employment.	
		Round 2	
		VVB Response In line with VERRA's finding, the PP has revised and updated Section	

		1.18.2 to align with SDG Indicator 8.5.1. The project contribution is now quantified in terms of "*average hourly earnings of female and male employees, by occupation, age and persons with disabilities*", which is the metric defined for this indicator. Since direct wage data expressed in hours was not comprehensively available at the project level (given its small scale and reliance on man-day calculations, where one day equals 8 hours), the PP has applied a proxy approach. This method uses government guidelines and relevant scientific studies to establish prevailing working hours in the project region. Daily wages recorded under the project are then converted into average hourly earnings to ensure consistency with the SDG metric. Rationale for the approach: Employment generated under the project is predominantly informal, seasonal, and task-based, with workers paid daily wages rather than hourly rates. Disaggregating by hours is not feasible, as such data is not systematically maintained and would impose an unnecessary administrative burden. Instead, the PP reports the following: • Name • Age • Caste/sex/ Category • Daily Wage (INR) • Total Days Worked (person physically worked) • Number of Days (official days counted/approved for payment purposes) • Total Amount (INR) • Signature None of the people with disabilities has been included as of now. Average working hours are derived using government publications and peer-reviewed studies. **Project Impact Under current monitoring period**	

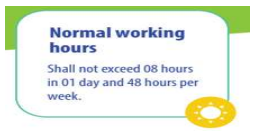
		To estimate the project's impact for 8.5.1, the PP has now applied a proxy method, using average daily working hours reported in government publications and scientific studies relevant to the project region • The Government of India prescribes a standard working day of 8 hours the most widely implemented rural employment scheme, the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), which explicitly specifies an 8-hour workday[1]. Further, India, as a member of the International Labour Organization (ILO)[2], aligns its domestic framework with the internationally recognized norm of an 8-hour standard working day.	

[1] https://nregaplus.nic.in/netnrega/writereaddata/Circulars/AMC_2024-25-English.pdf

9.6 **Unskilled wage, Semi-skilled wage and Skilled wage:** The schedule of rates of wages for various unskilled labourers shall be fixed so that an adult person who has worked for eight hours, including an hour of rest, will earn a wage equal to the stipulated wage rate. The working hours of an adult worker shall be flexible, but shall not spread over more than twelve hours on any day. Services of the semi-skilled workers other than mates and skilled workers may be procured by the Project Implementing Agencies by following transparent processes. Wages payable to such workers will also be decided by the Project Implementing Agencies.

[2] https://labour.gov.in/lcandilasdivision/india-ilo

https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@asia/@ro-bangkok/@ilo-hanoi/documents/publication/wcms_814650.pdf



		• Thomas B. and Bhatia R. (2012)[3], Gujarat: Laborers under the MGNREGA scheme work an average of 8 hours/day[4]. • Behara D.K. (2014)[5], Gujarat: Agricultural laborers typically work 8 hours/day. • Rajasthan[6]: Agricultural laborers generally work 8 hours/day under normal conditions. During the current monitoring period, the PAI-1 project directly benefited 110 farmers and community members, generating 1,073 person-days of employment through activities such as land preparation, planting, plantation maintenance, and project	

[3] https://www.researchgate.net/publication/330497483_Impact_of_NREGA_Scheme_A_Study_on_the_overall_Quality_of_Life_of_Its_Beneficiaries_A_Study_Undertaken_among_beneficiaries_of_3_districts_of_Gujarat_State

The wages are paid mainly on the basis of the amount of work done by the workers and not on the basis of time taken to do the work even if on an average 7-8 hours they are supposed to work.

[4] schedulefile

19. (*a*) The schedule of rates of wages for various unskilled labourers shall be fixed up so that an adult person worked for eight hours which include an hour of rest will earn a wage which is equal to the stipulated wage rate;

[5] Behera, D., 2014. Socio-Economic Condition of Agricultural Labour: A Case Study of Mahesana District in Gujarat. *Behera, DK (2014). Socio-Economic Condition of Agricultural Labour: A Case Study of Mahesana District in Gujarat. Man & Development*, *36*(3), pp.65-74.

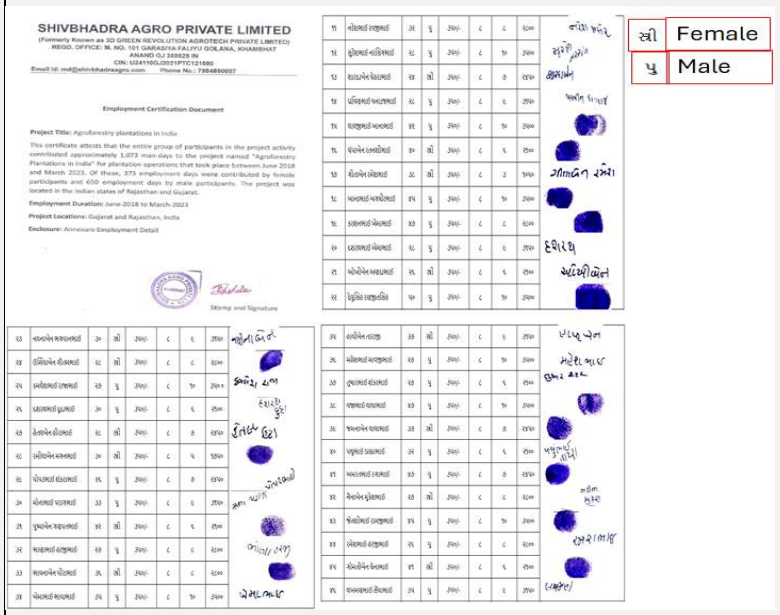
Wages of Agricultural Labour[2]

Generally an agricultural worker normally works for eight hours daily. In Gujarat the wages per day range from Rs 100.00 (Minimum) to Rs 180.40 (Maximum). On December 31, 2010, the range value of wage rate was Rs 80.40 (Labour Bureau 2012).

[6] https://eands.da.gov.in/AWIS/AWI%207-8/Rajasthan%207-8.pdf

DAILY AGRICULTURAL WAGES (In Rs.) for 2007-08 IN RAJASTHAN

Nature of Labour	Type of Labour	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
District : AJMER Center : DADIYA	SKILLED LABOUR	Normal Daily Working Hours : 8											

		management. Applying the 8-hour proxy, this equals 8,584 work hours (1,073 × 8). Workers were paid an average daily wage of INR 350, significantly above MGNREGA levels[7]. Converted to an hourly rate, this equals INR 43.75 (350 ÷ 8). This demonstrates that the project not only creates meaningful rural employment opportunities but also ensures fair remuneration above government benchmarks, thereby directly contributing to SDG 8.5.1. 	

[7] https://agriculture.vikaspedia.in/viewcontent/agriculture/policies-and-schemes/rural-employment-related-1/mgnrega/state-wise-wage-rate-for-unskilled-manual-workers-under-mgnrega?lgn=en 266/day Rajasthan and 280/days Gujarat FY 2023-2024

		As the project operates on a small scale at village level, where no formal pay slips are issued. Instead, signatures or thumb impressions are recorded against the number of man-days worked. The PP submitted attendance sheets on official company letterhead, documenting 110 farmers, 1,073 man-days (8,584 work hours), and wage payments of INR 350/day (INR 43.75/hour). Labour-hour assumptions were calculated with scientific studies, MGNREGA data, and state Rural Development circulars, ensuring that the calculations of employment hours and earnings are transparent, evidence-based, and conservative. Hence, it was concluded **Response to VERRA finding (i):** PP has now updated the PDMR and contribution uses the same quantifying metric as the indicator which is “average hourly earnings of female and male employees, by occupation, age and persons with disabilities”. **Response to VERRA finding (ii):** As explained above, the project operates on a small scale at the village level, where formal pay slips are not issued. Instead, workers’ signatures or thumb impressions are recorded against the number of man-days worked. The PP submitted attendance sheets on official company letterhead, documenting employment of 110 farmers, totaling 1,073 man-days (8,584 work hours), with wage payments of INR 350/day (equivalent to INR 43.75/hour). Given the small scale of operations and the socio-economic context of the project area, the evidence submitted is considered acceptable. During the VVB site visit, the employment records were cross-checked and verified through interviews. Multiple workers confirmed that they had been employed under the project and had received payments at the rate reported by the PP. Accordingly, section 3.1 of the VVR has been updated.	
		Verra Response Section 1.18.2 of the PD/MR has been updated to report project	

		contributions using the same quantifying metric as the indicator. The VVB has provided an assessment of the evidence to demonstrate seasonal employment for 110 farmers and 1,073-man days. No further action is required, and the finding is closed.	

4	Insufficient demonstration of project safeguards		
	Issue 1. *Stakeholder identification* a. Section 2.1.1 of the PD/MR does not demonstrate how the project activities contribute to changes in well-being, such as biodiversity conservation, sustainable agricultural practices, bolstered water security, improved food security, etc. b. Section 3.3.1.1 of the VVR does not sufficiently assess whether the identified stakeholder groups are correct and that no other relevant stakeholder groups are present in the project. 2. *Stakeholder Engagement* a. Section 2.1.2 of the PD/MR does not sufficiently demonstrate how project information was provided to all farmers. See background. b. Per Section 2.1.2 of the PD/MR: 'Second, every supporter of the project should approach every farmer and hold group meetings to consult with them on the issue.'- there is insufficient demonstration with evidence to support this.	**Round 1** VVB Response *1. Stakeholder identification* a. In accordance with VCS Standard v4.7, Section 3.18.1, Section 2.1.1 of the PDMR now outlines how the project contributes to expected change well-being. Activities focus on restoring soil, enhancing water retention, and promoting climate-resilient agriculture. These interventions improve food and water security, strengthen livelihoods, and support ecosystem health, with active community involvement ensuring sustainability. A minor revision has also been made in section 3.3.1.1. b. Section 3.1.1.1 of the joint VVR has now been updated. In the previous versions of the PDMR and the validation report, the list of identified stakeholders was incomplete, and a few key stakeholders were inadvertently omitted. This has been corrected in section 2.1.1 of the revised PDMR and Section 3.3.1.1 of the joint VVR now include a comprehensive list of all identified stakeholders. The updated list was cross-verified during the audit site visit, and it was confirmed that all listed stakeholders are either directly or indirectly involved in the project at various stages of implementation. The revisions ensure that	Closed

	c. Per Section 2.1.2 of the PD/MR, 'The participation of all stakeholders in the project has been inclusive, according to individual and gender-independent capacities, cultural identity, and religion.' However, there is no demonstration of the processes followed by the project to ensure that the engagement process was inclusive, and what individual and gender-independent capacities, cultural identity, and religion factors were considered in the design of the project's stakeholder engagement processes. 3. *Grievance mechanism* a. In section 2.1.4 of the PD/MR, the neutral third party in case of arbitration/mediation is not clearly defined. The process mentions only the project staff and the PP. b. Section 2.1.4 of the PD/MR mentions 'All the project activity are implemented on the private or farmers owned land. So, this indicate that the procedure is easily accessible to stakeholders for ongoing consultation'. However, this does not indicate whether any grievances were received during this monitoring period. Further, Section 3.3.1.4 of the VVR does not describe how the VVB assessed and confirmed that no grievances were received during this monitoring period. <u>Action Required</u> 1. The VVB must ensure relevant sections of the PD/MR	stakeholder identification and documentation are now accurate and aligned with applicable requirements of section 3.18.1 of the VCS standard v4.7. 2. *Stakeholder Engagement* a. PP has revised Section 2.1.2 of the PDMR in line with VCS Standard v4.7, Section 3.18.1. The updated section provides a detailed description of the stakeholder consultation process, starting with how project-related information was initially disseminated to local farmers. Local community leaders were first engaged to support the identification of key stakeholder groups, including women and youth. With their assistance, the PP carried out targeted outreach to ensure inclusive participation. To promote open and equitable dialogue, separate or small-group meetings were organized specifically for women and youth, facilitating their active involvement. Meeting materials were prepared in Hindi, English, and local dialects to accommodate participants with varying literacy levels and language preferences. Invitations were distributed 8–10 days in advance through culturally appropriate channels, such as public notices at the Gram Sabha office and verbal communication via community messengers. Meeting venues were selected in coordination with local leaders to ensure accessibility and cultural appropriateness, particularly for women and elderly participants. Accordingly, a few updates have also been made in section 3.3.1.2 of the joint VVR to reflect these improvements.	

	are updated to address the points raised in Issues 1-3. 2. The VVB must ensure the VVR is updated as required to assess the updates in the PD/MR. Program Rule(s) *VCS Standard, v4.7,* Sections 3.18.1, 3.18.2, 3.18.4 Background Issue 2a PD/MR, Section 2.1.2: "meetings were arranged to explain the project to **social entities and leaders who served as representative members** of the community."	b. This statement was written in error. PP and its representatives conducted meetings with farmers in small groups to consult with them on the relevant issues. Photographic evidence in supporting documents have already been provided to the VVB to confirm these consultations. According to this, the section 2.1.2 of PDMR has been updated. c. The PP has now revised Section 2.1.2 of the PDMR to clarify how the stakeholder consultation process incorporated considerations of gender, cultural identity, religion, and individual capacities. Local community leaders were first consulted to help identify vulnerable or underrepresented groups. The PP ensured culturally appropriate, gender-sensitive, and religion-neutral participation through separate consultations for women and youth, inclusive venue selection, and materials developed in different official and local languages. Attendance records and interviews during the audit visit confirmed that stakeholders across different demographic profiles were actively engaged and informed, in line with Section 3.18.1 of the VCS Standard v4.7. During site visit, the audit team interviewed participants across gender and religious backgrounds, confirming their understanding and voluntary participation. Attendance records and photos (including images of women, youth, etc) submitted confirms the same. *3. Grievance mechanism* a) PP has revised Section 2.1.4 of the PD/MR to include a	

		neutral third party for arbitration and mediation, ensuring fair and unbiased resolution of any disputes. The PP has now clearly mentioned that 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 third party may include respected community figures such as the Panchayat head, agricultural experts, or other locally recognized impartial individuals. All mediation processes are conducted in a culturally appropriate and fair manner to ensure balanced resolution. As no grievances were raised during the current monitoring period, there were no updates to report under this section. Accordingly, section 3.3.1.4 of the joint VVR has also been updated. b) In response to Verra's observation, Section 2.1.4 of the PDMR has been revised to clearly state that no grievances were received during this monitoring period. To verify this, the VVB undertook the following steps: a. Reviewed the grievance portal on the Shivbhadra Agro website [8], where stakeholders can lodge complaints digitally. No entries or submissions were found for the current monitoring period. b. Checked the Verra project landing page[9] for any public grievances or comments submitted during the reporting period. No concerns were recorded.	

[8] https://shivbhadraagro.com/lodge-your-grievance/

[9] https://registry.verra.org/app/projectDetail/VCS/3562

		c. Conducted interviews and consultations with randomly selected local stakeholders during the site visit to confirm that no grievances had been submitted or unresolved. However, during the audit it was observed that systematic recordkeeping (both digital and physical) of grievances was not adequately maintained by the PP. While no grievances were received, formal documentation to demonstrate the absence of grievances was missing. To address this, the VVB had raised FAR 01, requiring the PP to establish and maintain a comprehensive grievance record system to ensure transparency and traceability in future monitoring periods. Section 3.3.1.4 of the joint VVR has been updated to provide an improved assessment.	
		Verra Response Sections 2.1.1, 2.1.2, and 2.1.4 of the PD/MR and Sections 3.3.1.1, 3.3.1.2, and 3.3.1.4 of VVR have been updated. All issues raised have been sufficiently addressed. No further action is required, and the finding is closed.	

5	**Insufficient demonstration of additionality**		
	Issue 1. Section 3.5 of the PD/MR does not sufficiently demonstrate the project's additionality.	**Round 1** VVB Response a) Section 3.5.1 of the PDMR has been revised to sufficiently demonstrating that the project meets the regulatory surplus requirement. The national and international laws and regulations listed in section 1.15 of the PDMR have been thoroughly checked and based on which it is confirmed that	Closed

a. Section 3.5.1 does not sufficiently demonstrate that the project meets regulatory surplus.
b. The common practice assessment does not sufficiently demonstrate that the existing schemes listed in the PD/MR have not been implemented in the project area.
c. Per Section 3.5 of the PD/MR, the forestry/horticulture plantation necessitates a substantial initial investment encompassing expenses such as the cost of seedlings, labor, organic manures, fertilizers, and drip irrigation systems. However,
    i. it is unclear in Section 1.12 (or other relevant sections) if project activities include fertilizer application or installation of drip irrigation, or

project activities have not been mandated by any law, statute, or other regulatory framework, or for UNFCCC non-Annex I countries, any systematically enforced law, statute, or other regulatory framework.

c) PP has revised the Common Practice Assessment in section 3.5 of the PDMR to clearly demonstrate that the existing schemes listed have not been effectively implemented within the project area.

State	Geographical Area (Sq. Km)	2023		2009		Diffusion	
		Forest Cover (Sq.km)[10]	Tree Cover (Sq.km)[11]	Forest Cover (Sq.km)[12]	Tree Cover (Sq.km)[13]	Forest Cover Change in area with respect to 2009 (sq. km)	Tree Cover Change in area with respect to 2009 (sq. km)
Gujarat	196,244	15,016.64	6,632.29	14,620	8,390	394.64	-1,757.71
Rajasthan	342,239	16,548.21	10,841.12	16,036	8,274	512.21	2,567.12

To support this has provided forest and tree cover change data for the project area from 2009 to 2023 (refer to the table above), which reveals only marginal improvements over the 14-year period. Gujarat—accounting for over 90% of the project area—recorded a net loss of 1,757.71 sq. km in forest and tree cover during this time. A spatio-temporal study by Dehingia and Surendra (2001–2019)[14] also highlights consistent forest decline and land degradation across multiple

[10] https://fsi.nic.in/uploads/isfr2023/isfr_book_eng-vol-2_2023.pdf
[11] https://fsi.nic.in/uploads/isfr2023/isfr_book_eng-vol-1_2023.pdf
[12] india_sfr_2009.pdf
[13] india_sfr_2009.pdf
[14] https://sciresol.s3.us-east-2.amazonaws.com/srs-j/bu_journals/GE/pdf/volume-9/Issue-2/GE_v9i2_Dec_2020_10.pdf

	ii. if the project activities address the investment barrier sufficiently i.e., do the project activities enable the participating farmers to overcome the barrier presented by substantial costs involved including labour, manures, fertilizers etc. b. Per Section 2.1.1 of the PD/MR, "Farmers encompass both those with small landholdings grappling with financial challenges and those with medium-sized farms experiencing relatively consistent incomes.". it is unclear if similar barriers e.g., financial barriers are faced by all participating farmers, and how the different	regions of Gujarat. Although Rajasthan shows a marginal increase in green cover, Sharma et al. (2021)[15] report that more than 67% of its land remains affected by land degradation and desertification. Moreover, the reported gains are often linked to monoculture or scattered agroforestry, which contribute little to long-term ecological resilience. These observations strongly indicate that government schemes have had negligible or no measurable impact on land use or forest regeneration within the project boundary. Therefore, it is evident that the project activity is not a common practice in the region, and the existing schemes have not contributed to significant improvements in forest cover or tree regeneration. A latest report mentions that All states in India recorded a net loss in forest cover during 2015 - 2019, according to the research.[16] As explained in the VVR section 3.4.5, some government plantation programs exist in the project area. However, despite investments from both state and national governments, plantation efforts on smallholder and private farms remain limited. Many government schemes focus only on specific target areas, and large-scale plantation projects are rare. As outlined above and in section 3.5.2 of the PDMR, plantation activities in the project area are not easily feasible due to the land's infertility, water scarcity, technological and social limitations, and climate variability, which present major challenges to land use. Additionally, plantation projects often face funding shortages, delays in fund approvals, and a lack of reliable data. Many afforestation programs fail to be sustainable because they do not create long-term assets or address the immediate needs of local communities. While cultivation is a common practice for the farmers in the state, the financial stability is still not present, and the farmers rely mostly on the subsistence agriculture practices. Adoption of agroforestry models comes with several incentives. However, without carbon incentives and financial aids of carbon investments, project activity for the proposed crediting period is not feasible.	

[15]https://www.researchgate.net/publication/285206773_Land_degradation_and_sustainable_agriculture_in_Rajasthan_India

[16] India biodiversity | India lost 18 times more forest than it gained, TN, Bengal led deforestation: IIT study - Telegraph India

	socio-economic conditions and farm sizes have been considered in the project's demonstration of additionality. Action Required 1. The VVB must ensure the project updates Section 3.5 of the PD/MR to a. Demonstrate with evidence that the project meets regulatory surplus. b. Demonstrate that the existing schemes listed in the PD/MR have not been implemented in the project area. 2. The VVB must ensure the project justifies the investment barrier including. a. Clarification on the activities listed in the barrier analysis and the project activities, and if they are comparable. b. Modify this is the answer of	d) I) Section 1.12 of the PDMR has been updated to align with the project's management manual, explicitly confirming that drip irrigation systems are part of the project activities where necessary, particularly in areas prone to water scarcity. Additionally, the section clarifies that only organic pesticides are used, and only in cases where pest infestations occur. The use of organic fertilizers is minimal and not a regular component of the plantation activity. Therefore, to accurately reflect the actual investment requirements, Section 3.5 of the PDMR has been revised to exclude the cost of organic fertilizers from initial investment barriers. These updates ensure consistency across sections. ii) In section 3.5 of the PDMR the project is trying to effectively addresses the investment barrier faced by farmers. On the other hand, the proposed project effectively addresses the identified barriers. High upfront costs associated with forestry and horticulture plantations are mitigated through the provision of subsidized, high-quality seedlings, reduced-cost drip irrigation systems, and continuous technical support (all these points were cross checked during the audit visit interviews as well as supporting evidence submitted by the PP). These interventions significantly lower entry barriers and enhance the long-term viability of plantations. In contrast, the baseline scenario lacks such support, rendering plantation activities financially unfeasible for farmers especially during periods of financial or environmental stress. The PP has cited Navdeep Singh et al. (2024),[17] which reinforces the argument that sustained external assistance, including carbon finance, is essential for the long-term maintenance of agroforestry systems. This view is further supported by several published studies highlighting that India requires strong financial and technological support to implement robust and durable AFOLU projects.[18].	

[17] https://www.arccjournals.com/journal/agricultural-science-digest/D-6066?utm_source

[18]https://www.researchgate.net/publication/393891662_Enhancing_Farmer%27s_Income_and_Achieving_Net_Neutrality_through_Agroforestry_A_Proposal_for_India

https://www.ceew.in/sustainable-forest-management

https://india.mongabay.com/2022/02/commentary-forest-restoration-challenges-and-opportunities-for-india/#:~:text=Adequate%20financing%20is%20another%20concern,be%20replicated%20in%20other%20states.

	Demonstration that the project activities enable the participating farmers to overcome the barrier presented by substantial costs involved including labour, manures, fertilizers etc. c. Justification that similar barriers including investment barriers are faced by all participating farmers, and how the different socio-economic conditions and farm sizes have been considered in the project's demonstration of additionality. 3. The VVB must update Section 3.4.5 of the VVR accordingly. <u>Program Rule(s)</u> *Combined tool to identify baseline scenario and demonstrate additionality in A/R CDM project activities, v.01.*	1. b) As outlined in Section 2.1.1 of the PD/MR, the project involves both small and marginal farmers. While these groups differ in landholding sizes and income stability, both face significant financial barriers that hinder the adoption of agroforestry systems. These challenges include limited access to institutional credit, high interest rates on loans, and inadequate financial. Also as explained in response to finding 8 of the PRR, the project area includes both small and medium-sized farmers, but the baseline activity across both groups is predominantly subsistence farming, as confirmed through field surveys, stakeholder consultations, and socioeconomic assessments. In Gujarat and Rajasthan, farming is largely low-input, rain-fed, and non-mechanized, csonstrained by: o Severe land degradation and topsoil erosion, o Water scarcity and erratic rainfall, o Poor soil fertility and high salinity, o Fragmented landholdings and limited access to credit or extension services. Due to these conditions, even medium-sized farmers grow mainly for household consumption, with little or no surplus for market sale. Several reports suggests that most of the farmers (about 99 per cent of households have reported that income generated from farming is not adequate.[19] Livelihood diversification typically involves wage labor or seasonal migration rather than commercial agriculture. The above assessment is further supported by: • PP's baseline survey demonstrates that almost all the farmers included in the project depend on subsistence cropping. • Published reports and literature confirming subsistence-oriented farming in dryland Gujarat and Rajasthan and highlighting low agricultural returns in the	

[19] https://desagri.gov.in/wp-content/uploads/2024/04/2020-21-Market-Imperfections-and-Farm-Profitability-in-Gujarat-1.pdf

		region (NITI Aayog[20], World Bank[21] and other published reports[22]; The baseline land use yields limited economic return. The project offers an improved land-use pathway (agroforestry) with potential carbon revenues and co-benefits. This aligns with the VCS Non-Permanence Risk Tool guidance for subsistence-driven baselines and supports a reduced risk rating for economic opportunity cost. Section 3.5 of the PDMR and section 3.4.5 of the VVR further emphasizes that these financial constraints are prevalent across all participating farmers, regardless of their landholding sizes.	
		Verra Response Section 3.5 of the PD/MR has been updated. The issues raised have been sufficiently addressed. No further action is required, and the finding is closed.	

6	Insufficient justification for ERRs

[20] https://www.niti.gov.in/sites/default/files/2023-03/A-New-Paradigm-for-Indian-Agriculture-from-Agroindustry-to-Agroecology.pdf

[21] https://documents1.worldbank.org/curated/en/539731636402340823/pdf/India-Rajasthan-Agricultural-Competitiveness-Project.pdf

[22] https://prsindia.org/files/budget/budget_parliament/2025/DFG_Analysis_2025-26_Agriculture_%26_Farmers_Welfare.pdf
https://timesofindia.indiatimes.com/city/ahmedabad/crops-cities-creeks-struggle-to-adapt-to-changing-rainfall-pattern-in-gujarat/articleshow/122394170.cms
https://ijarsct.co.in/Paper15682.pdf

	Issue 1. It is unclear how the VVB has determined that the allometric equations applied for ex post estimation of carbon stocks in tree biomass meet the requirements of AR-TOOL17, v1, Paragraph 6 2. Section 3.2.30 of the VCS Standard, Version 4.7, has not been followed in establishing the period over which the long-term average (LTA) GHG benefit is calculated. 3. Section 3.4.6 of the VVR does not independently assess potential leakage from the project.	**Round 1** VVB Response 1. PP has used the following equation for ex post estimation: - To ensure that the allometric equations for biomass estimation in this project follows the criteria outlined in Tool 17 of the A/R CDM methodological guidance, PP has revised the allometric equation of two species – Guava and Custard apple. Allometric equations are considered valid for ex post carbon stock estimation when they meet at least one of three conditions: (a) they are used in the national forest or GHG inventory of the host country; (b) they have been applied in the commercial forestry sector of the host country for at least ten years; or (c) they are derived from peer-reviewed studies based on a minimum of 30 sample trees, with an R^2 value of 0.85 or higher. In this project, now all the species fulfil condition (c), with equations sourced from peer-reviewed literature supported by statistically robust datasets. This approach ensures that the biomass estimates are scientifically credible, regionally appropriate, and methodologically compliant. i) **Pomegranate**- For estimating the biomass of pomegranate trees, the PP has used a biomass regression equation commonly applied to tropical tree species: $Y = 10^{(-0.535 + \log_{10}(BA))}$[23].This equation meets the conditions outlined under Condition (c) of Paragraph 6 of CDM Tool 17, as it is based on a sample size greater than 30 and demonstrates a high R^2 (0.94). • *No. sample – 371 trees, R^2:0.94* **ii) Guava: -** PP has revised the biomass calculation equation for guava to: $Y = 3.264 \times X^{1.012}$[24].This equation was developed by the ICAR Research Complex for the Eastern Region, Farming System Research Centre for Hill and Plateau Region, Ranchi, Jharkhand, which nearly similar agro-ecological conditions to the project region. It is based on destructive sampling and harvesting of 30 guava trees, and the resulting regression model showed a high R^2 (0.92), indicating strong predictive accuracy. This equation satisfies Condition (c) of Paragraph 6 of CDM Tool 17, as it is derived from a sample size of 30 trees and demonstrates robust statistical reliability. The revised equation gives a higher estimation of biomass. However, considering its adherence to AR TOOL 17, this is species specific equation. Also, the area under guava plantation (only 12.84 ha out of 502.51 ha – 2.55%) is very less in the PAI1, hence it has a least impact on the net ERR.	Closed

[23] 3. METHODS FOR ESTIMATING BIOMASS DENSITY FROM EXISTING DATA

[24] Microsoft Word - May25O

4. In Sections 1.11 and 5.4 of the PD/MR, the ERRs for calendar year 2024 is split into two parts i.e., 01 January 2024 to 17 March 2024, and 18 March 2024 to 31 December 2024.

Action Required

1. The VVB must explain how they determined that that the allometric equations applied for ex-post estimation of carbon stocks in tree biomass meet the requirements of AR-TOOL17, v1, Paragraph 6

- *No of sample 30, R^2: 0.981*

iii) Mahoghany: - PP has used an allometric equation (Y= exp (-2.302+0.894 Ln(D2*H)[25])developed in Bangladesh, which shares similar edaphic and climatic conditions with the project region in India. For mahogany, the equation was developed based on destructive sampling and harvesting of more 30 trees, and the resulting R^2 is more than 0.85. This equation meets the requirements outlined under Condition (c) of Paragraph 6 of CDM Tool 17. (Edaphic-climate comparison of Bangladesh and India-https://www.worlddata.info/climatecomparison.php?r1=bangladesh&r2=india.)

- *No of sample 280, R^2: 0.974*

iv) Custard Apple: - the equation for the species has also been revised to ensure that it meet the requirements of AR-TOOL17, v1, Paragraph 6. The PP has now applied the common equation used for tropical tree species:

$Y = 10^{(-0.535 + \log_{10}(BA))}$[26]

This equation meets the conditions outlined under Condition (c) of Paragraph 6 of CDM Tool 17, as it is based on a sample size greater than 30 and demonstrates a high R^2 (0.94).

Also, the revised equation gives almost half the biomass than previous one which also provide a much conservative approach.

- *No. sample – 371 trees, R^2:0.94*

Species Name	Equation	Applicable under AR-TOOL 17, v1, Paragraph 6
Pomegranate	$Y = 10^{(-0.535 + \log_{10}(BA))}$[27]	This equation applicable under condition C
Guava	$Y = 3.264 \times X^{1.012}$[28]	This equation applicable under condition C
Mahoghany	Y= exp (-2.302+0.894 Ln(D2*H)	This equation applicable under condition C

[25] Development and Evaluation of Species-Specific Biomass Models for Most Common Timber and Fuelwood Species of Bangladesh

[26] 3. METHODS FOR ESTIMATING BIOMASS DENSITY FROM EXISTING DATA

[27] 3. METHODS FOR ESTIMATING BIOMASS DENSITY FROM EXISTING DATA

[28] Microsoft Word - May25O

	2. The VVB must ensure that Section 3.2.30 of the VCS Standard, Version 4.7 is followed in establishing the period over which the (LTA) is calculated. 3. The VVB must ensure Section 3.4.6 of the VVR is updated to assess the project's leakage in Sections 5.3 and 7.4 of the PD/MR. 4. The VVB must ensure the project updates the ERR tables in the PD/MR and ERR sheet to present the ERRs in a calendar year format.	Custard Apple	$Y = 10^{(-0.535 + \log_{10}(BA))}$[29]	This equation applicable under condition C	

2. The project adopts the LTA approach for estimating net GHG removals, in accordance with VCS Standard v4.7, Section 3.2.30. As per this section, projects applying even-aged management systems must include at least one complete harvest/cutting cycle, including the final harvest. The project involves species managed under defined 15-year harvest cycles, and to ensure full compliance, it models two complete 15-year rotations for each planting cohort. Species-specific, real-time growth curves—based on observed biomass accumulation patterns—are used to simulate carbon sequestration dynamics across the entire period. Harvesting is planned at the end of each rotation, with immediate replanting to maintain continuous forest cover and avoid interruption of carbon stock accumulation. For the PAI, plantations were established in a staggered manner between 2018 and 2022; hence, the modeling period extends to 2052 to cover two full rotations for all initial planting years. In the grouped project scenario, where plantation activities are scheduled through 2030, the modeling horizon is extended to 2060 to encompass two complete 15-year cycles for all planted areas. The same has now been elaborated in section 5.2 of the PDMR. The LTA estimation has already been explained in section 3.4.6.4 of the VR, v1.
3. The VVB confirms that Section 3.4.6 of the VVR already includes a comprehensive assessment of potential leakage in accordance with the applied methodology and Sections 5.3 and 7.4 of the PDMR. As detailed in the VVR, the project activity does not lead to the displacement of agricultural or grazing activities outside the project boundary. Site visit observations, stakeholder consultations, and supporting documentation submitted by the PP confirm that:
    a. **No Displacement of Agricultural Activities:** Agricultural activities are confined to land legally owned and managed by the participating farmers allowing farmers to continue their agricultural activities. The VVB found no evidence no evidence of land use shift attributable to the project.

[29] 3. METHODS FOR ESTIMATING BIOMASS DENSITY FROM EXISTING DATA

	Program Rule(s) AR-ACM0003, v2.0, Section 5.6 *AR-TOOL14, v4.2* *VCS Standard, v4.7,* Sections 3.2.28, 3.2.29, 3.2.30	 b. **No Displacement of Grazing Activities:** Project lands are degraded and barren, with no history or current evidence of open grazing. Stall feeding is the predominant livestock management practice across all land parcels.	

Based on this assessment, leakage emissions have been justifiably accounted for as zero (Lk,t = 0). This conclusion was further substantiated the resolution of CAR 34, as referenced in Appendix 4 of the VVR. In light of the above, the VVB concludes that leakage has already been thoroughly assessed and no further assessment is required. However, evidence for no displacement of agricultural practices by the beneficiaries has now been added in the VVR v1.1.

4. The PP has updated all ER tables in the PDMR and the accompanying ER sheet to present the ERs in a calendar year format. Accordingly, as the ER values have changed due to the update of the allometric equation for Guava and Custard apple, the estimated ERs have also been revised across the joint VVR, version 1.1 as well.

Verra Response

- The PD/MR and ERR sheet have been updated to present the ERRs in a calendar year format.

		• Section 3.4.6 of the VVR has been updated. • Section 5.2 of the PD/MR has been updated to provide additional justification on the period over which the long-term average is calculated.. Issues 2,3, and 4 have been sufficiently addressed. However, Issue 1 has not been sufficiently addressed, and the finding cannot be closed. <u>Issue</u> 1. It has not been discussed whether, for each species, the allometric equations used for ex-post estimation of carbon stocks meet the requirement of AR-TOOL17, v1, Paragraph 6 to be species-specific or group-of-species-specific equations derived from trees growing under similar edapho-climatic conditions. <u>Action Required</u> 1. The VVB must assess whether for each species, the allometric equations used for ex-post estimation of carbon stocks meet the requirement of AR-TOOL17, v1, Paragraph 6 to be species-specific or group-of-species-specific equations derived from trees growing under similar edapho-climatic conditions and update the VR as needed. The PD must be updated accordingly. <u>Program Rule(s)</u> *AR-TOOL14, v4.2,* *AR-TOOL17, v1.0.0 "Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities"* <u>Background</u> The VVB has discussed how each allometric equation used for ex post estimation of tree biomass meets at least one of the three conditions (a), (b), and (c) in Paragraph 6 of AR-TOOL17, v1; however, it has not discussed whether the equations are species-specific or group-of-species-specific equations derived from trees growing under similar edapho-climatic conditions, as required by the tool.	
		Round 2	
		<u>VVB Response</u> VVB in section 3.4.6.4 has now updated and discussed whether the equations are species-specific or group-of-species-specific equations derived from trees growing under similar edapho-climatic conditions, as required by the	

		tool. Following explanation has been added in the VVR.			
		Pomegranate- (*Punica granatum)*	Y = 10^(-0.535 + $\log_{10}$(BA))[30]	The allometric equation developed by Martínez-Yrizar *et al*. (1992)[31] is used for estimating the aboveground biomass of trees in tropical dry forest ecosystems. This equation was developed based on empirical data collected from the destructive harvesting of 191 various species (n=371) in dry forests. It is specifically designed for use in dry zones receiving less than 900 mm of annual rainfall. *Eq. 3.2.1 revised from Brown et al. (1989) for dry forest in India, and Eq. 3.2.2 from Martinez-Yrizar et al. 1992 for dry forest in Mexico (original equation based on BA). For dry zones with rainfall less than 900 mm/year use equation 3.2.2 and for dry zones with rainfall > 900 mm/year use equation 3.2.1. "exp" means "e to the power of". For *Punica granatum* (pomegranate), this equation is appropriate because the species is predominantly cultivated in arid and semi-arid regions.[32] Within the PAI-1 project boundary, the states of Gujarat (North Gujarat and Saurashtra regions)[33], and Rajasthan (Barmer and Jalore districts)[34, 35] are included. These areas are characterized by semi-arid climates with annual rainfall consistently below 900 mm, directly corresponding to the edapho-climatic conditions under which the Martínez-Yrizar *et al.* equation was developed.	
		Guava- (*Psidium guajava*)	Y = 3.264 ×	For the calculation of guava (*Psidium guajava*) biomass, the PAI-1 project has utilized	

[30] 3. METHODS FOR ESTIMATING BIOMASS DENSITY FROM EXISTING DATA

[31] 3. METHODS FOR ESTIMATING BIOMASS DENSITY FROM EXISTING DATA
Perez-Jimenez, E., Rincon, J.M., Maass, A., Magallanes, S. and Cervantes, L. (1992) Above-Ground Phytomass of a Tropical Deciduous Forest on the Coast of Jalisco, Mexico. Journal of Tropical Ecology, 8, 87-96

[32] https://www.researchgate.net/publication/376238182_POMEGRANATE_-_A_REMUNERATIVE_CROP_OF_ARID_AND_SEMI_ARID_REGIONS

[33] https://swhydrology.gujarat.gov.in/sites/default/files/AverageRainfall.pdf

[34]https://phedwater.rajasthan.gov.in/content/dam/doitassets/water/Ground%20Water/Pdf/PublicReports/Groundwater_Atlas/Districts/Districtwise%20Atlas%20-%20Barmer.pdf

[35]https://phedwater.rajasthan.gov.in/content/dam/doitassets/water/Ground%20Water/Pdf/PublicReports/Groundwater_Atlas/Districts/Districtwise%20Atlas%20-%20Jalor.pdf

			X^1.012[36]	the allometric equation developed by Naik S.N. *et al*. (2021)[37], which is specifically tailored for guava. This equation was derived from empirical data obtained through the destructive harvesting of guava trees at the ICAR-System Research Centre for Hill and Plateau Region, Ranchi, Jharkhand which is in the same host country of the project. While Ranchi is located in the eastern region of India, the PAI-1 project is implemented in western India. Despite the geographic difference, both regions exhibit similar edapho-climatic conditions in terms of temperature ranges, humidity levels, and seasons are broadly comparable, making the application of this equation relevant. There is difference in in rainfall amount, and soil type. However, in both – i.e., the project area and the paper's study area, guava plantations are managed as plantations/orchards with controlled spacing, pruning, and irrigation practices. This management minimizes differences that might otherwise arise from local rainfall, further supporting applicability of the equation. A detailed comparison of the site-specific conditions and their similarity is provided in the table below- **Climate Comparison[38]: India Eastern vs India Western**			
				Parameter	**India Eastern**	**India Western**	
				Climate Zone	Subtropics to Tropics	Tropics	
				Latitudes	27°10′ N to 18°7′ N	24°31′ N to 15°2′ N	
				Distance to Equator	2,000 – 3,000 km	1,700 – 2,700 km	
				Daytime Maximum Temperature	32.6 °C	32.7 °C	
				Daily Low Temperature	21.9 °C	21.9 °C	
				Water Temperature	27.2 °C	27.3 °C	
				Humidity	68%	64%	
				Precipitation	1,511 mm	1,332 mm	
				Rain Days	92.4 days	68.4 days	
				Hours of Sunshine	1,825 hrs	2,519 hrs	

[36] Microsoft Word - May25O

[37] https://www.currentscience.ac.in/Volumes/120/10/1627.pdf

[38] Climate comparison: East-India / West-India

		Custard Apple- (*Annona squamosa*)	Y = 10^(-0.535 + $\log_{10}$(BA))[39]	The allometric equation developed by Martínez-Yrizar *et al*. (1992)[40] is used for estimating the aboveground biomass of trees in tropical dry forest ecosystems. This equation was developed based on empirical data collected from the destructive harvesting of 191 various species (n=371) in dry forests. It is specifically designed for use in dry zones receiving less than 900 mm of annual rainfall. •Eq. 3.2.1 revised from Brown et al. (1989) for dry forest in India, and Eq. 3.2.2 from Martinez-Yrizar et al. 1992 for dry forest in Mexico (original equation based on BA). For dry zones with rainfall less than 900 mm/year use equation 3.2.2 and for dry zones with rainfall > 900 mm/year use equation 3.2.1. "exp" means "e to the power of". For *Annona squamosa* (Custard Apple), this equation is appropriate because the species is predominantly cultivated in arid and semi-arid regions[41]. Within the PAI-1 project boundary, the states of Gujarat (North Gujarat and Saurashtra regions)[42], and Rajasthan (Barmer and Jalore districts)[43][44] are included. These areas are characterized by semi-arid climates with annual rainfall consistently below 900 mm, directly corresponding to the edapho-climatic conditions under which the Martínez-Yrizar *et al.* equation was developed. Just for the purpose of comparison, VVB has checked a study that has been conducted by Ramulu *et al.* (2015)[45] in the host country but in a different agroecological zone/South part of India has reported that the total AGB biomass of 5-year-old custard apple trees ranged from 51.37 (with intercropping) to 66.76 (custard apple alone) kg	

[39] 3. METHODS FOR ESTIMATING BIOMASS DENSITY FROM EXISTING DATA

[40] 3. METHODS FOR ESTIMATING BIOMASS DENSITY FROM EXISTING DATA
Perez-Jimenez, E., Rincon, J.M., Maass, A., Magallanes, S. and Cervantes, L. (1992) Above-Ground Phytomass of a Tropical Deciduous Forest on the Coast of Jalisco, Mexico. Journal of Tropical Ecology, 8, 87-96

[41] https://www.emergentresearch.org/uploads/38/15524_pdf.pdf

[42] https://swhydrology.gujarat.gov.in/sites/default/files/AverageRainfall.pdf

[43]https://phedwater.rajasthan.gov.in/content/dam/doitassets/water/Ground%20Water/Pdf/PublicReports/Groundwater_Atlas/Districts/Districtwise%20Atlas%20-%20Barmer.pdf

[44]https://phedwater.rajasthan.gov.in/content/dam/doitassets/water/Ground%20Water/Pdf/PublicReports/Groundwater_Atlas/Districts/Districtwise%20Atlas%20-%20Jalor.pdf

[45] ROC 16(3) Sept. 28-09-2015.p65

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<td>per tree. In the PAI-1 project, using the Martínez-Yrizar et al. (1992) allometric equation, the average total AGB of a 5.75-year-old custard apple tree was estimated to be 36.05 kg per tree. This indicates a conservative approach undertaken by the PP. The following table presents a comprehensive comparison
<table>
<tr><th>Age</th><th>Ramulu et al. Reported total AGB (Kg/Tree)</th><th>Age (Monitoring age)</th><th>total AGB (Kg/Tree) with using Martínez-Yrizar et al equation</th></tr>
<tr><td>5</td><td>51.37 (with intercropping) to 66.76 (custard apple alone) kg</td><td>5.75</td><td>36.05</td></tr>
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<td>Mahoghany- Swietenia macrophylla</td>
<td>Y= exp (-2.302+0.894 Ln(D2*H)</td>
<td>The allometric equation used in the PAI-1 project was originally developed in Bangladesh by Mahmood Hossain et al. (2020). This model was specifically calibrated for Swietenia macrophylla across a broad DBH–height range (9.9–90.5 cm; 6.5–32 m), demonstrating high predictive accuracy with an R^2 of 0.974. Bangladesh shares strong eco-geographic and biophysical similarities with parts of western India where the project is located[46], making this equation a relevant reference point. Both areas are part of South Asia
To further validate applicability, the project reviewed additional scientific literature on Swietenia macrophylla growth and carbon sequestration across tropical Asia. For example:</td>
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[46] Bangladesh and western India exhibit strong eco-geographic and biophysical parallels that support the transferability of the Mahmood Hossain et al. (2020) equation for Swietenia macrophylla. Both regions fall within the humid to sub-humid tropical belt, with overlapping annual rainfall regimes of approximately 900–2,500 mm and mean annual temperatures of 24–28 °C, conditions well suited for tropical hardwood growth. The soils across large tracts of Bangladesh and western India are predominantly lateritic and alluvial, providing moderately fertile to degraded substrates that sustain mahogany plantations under similar edaphic conditions. Land-use histories in both landscapes are characterized by mosaics of degraded forests, agricultural fallows, and plantation blocks, which create comparable ecological contexts for tree establishment and growth. Importantly, S. macrophylla has been widely introduced and managed in both regions for decades, with similar silvicultural practices and spacing regimes applied to promote straight boles and rapid height growth.

- Elenita *et al.* (2019)[47] conducted a 10-year analysis of *Swietenia macrophylla* plantations in the Philippines, showing comparable growth trajectories under humid tropical conditions.

Comparative Growth Performance of *Swietenia macrophylla*

Parameter	Philippines (Elenita et al., 2019 – Mount Makiling, 10-year plantation)	India (PAI-1 Project, 2018 – 2024 monitoring, 7-year stand)	Observed Similarity
Age of stand	10 years	7 years	Younger in India
Mean DBH	9–25 cm	7.1 cm (range: 4.8–10.4 cm)	Consistent with younger stand age
Mean Height	8–18 m	6.4 m (range: 5.4–9.1 m)	Lower but consistent with stand age

[47] Racelis, E., Racelis, D., & Luna, A. (2019). Carbon sequestration by large leaf mahogany (Swietenia macrophylla King.) plantation in Mount Makiling forest reserve, Philippines: a decade after. Journal of Environmental Science and Mana gement, 22(1)

Carbon sequestration by large leaf Mahogany (Swietenia macrophylla King.) plantation in Mount Makiling Forest Researve, Philippines: a decade after

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Abstract
The study on monitoring carbon accumulation and sequestration potential of Large Leaf Mahogany (*Swietenia macrophylla* King.) plantation in Mount Makiling Forest Reserve was a continuation of the same study conducted in 2000. It aimed to look into the sequestration rate of the plantation after a 10-year period. The study measured the biomass, C, and CO2 stored in the aboveground, ground, and belowground biomass. It also quantified the rate of C captured with the 2000 study as baseline data. The latest study showed that the plantation has a total biomass production of 1,120 Mg ha-1 which is equivalent to 542 Mg ha-1 of C and 1,989 Mg ha-1 of CO2. Within a 10-year period, it registered a biomass buildup of 43 Mg ha-1 yr-1 and sequestered carbon at 22 Mg ha-1 yr-1 and 81 Mg ha-1 yr-1 of CO2. Its carbon-storing capacity surpasses that of an old-growth forest, natural stand and other types of vegetation. It can be concluded that the potential of forest plantation to sequester carbon can be maximized given a good-site condition, appropriate silvicultural practices applied, and less human disturbances thus allowing the stand to attain its optimum growth as manifested by the plantation studied.

Cumulative biomass	~430 Mg ha^{-1} (10 years)	57.3 Mg ha^{-1} (7 years)	Lower, as expected for age
MAI (biomass)	43 Mg ha^{-1} yr^{-1}	~8.2 Mg ha^{-1} yr^{-1}	India shows moderate increments
Carbon sequestration	22 Mg C ha^{-1} yr^{-1} (≈ 81 Mg CO_2 ha^{-1} yr^{-1})	~4 Mg C ha^{-1} yr^{-1} (≈ 15 Mg CO_2 ha^{-1} yr^{-1})	Lower, age-related difference

- Toribin *et al*. (2021)[48] reported carbon sequestration rates of appx 86 MgC/ha in Indonesia, highlighting the species' strong sequestration potential in Southeast Asian tropical contexts.

Table 8. Tree species, density, mean diameter, mean tree height, estimated aboveground living biomass (AGB), and aboveground living carbon (AGC) of *wono* in the Batur Agung, Ledok Wonosari, and Pegunungan Sewu zone of Gunungkidul District, Indonesia

Species	Density (stems ha^{-1})	Relative density (%)	Mean diameter (cm)	Mean tree height (m)	AGB (ton ha^{-1})	AGC (ton C ha^{-1})
Batur Agung zone						
Swietenia macrophylla	613	71.94	23.22 ± 0.638	13.29 ± 0.160	182.38	85.72

While the comparative climate conditions show some differences what matters for allometric transferability is whether trees in both regions exhibit similar diameter–height relationships and wood density. Evidence from the monitoring report from the project area in India and other regions indicates that DBH growth trajectories are at par with those reported in Bangladesh studies, growth lies well within the species' global range.

These shared growth and structural characteristics are critical for biomass modeling. Below is the comparison between the project area and the study area of the equation applied:

[48] Tohirin, T., Suryanto, P., & Sadono, R. (2021). Vegetation structure, aboveground biomass, and carbon storage of wono a local forest management in Gunungkidul, Yogyakarta, Indonesia, across three geomorphological zones. Biodiversitas Journal of Biological Diversity, 22(8)

Parameter	India – PAI-1 Project (2018, 7-yr plantation)	Bangladesh – Hossain et al. (2020, calibration dataset)	Observed Similarity
Stand age	7 years	5–30+ years (destructive sampling across age classes)	India data lies within calibration range
Mean DBH	7.1 cm (range: 4.8–10.4 cm)	9.9–90.5 cm	Indian values fall at the lower end (younger stands)
Mean Height	6.4 m (range: 5.4–9.1 m)	6.5–32 m	Indian values at lower end, within calibration range
Cumulative biomass	57.3 Mg ha^{-1} (at age 7)	Wide range depending on DBH/height; calibration across destructive samples	Indian values consistent with expected trajectory
Model type	MR field monitoring using Bangladesh equation	Species-specific allometric equation derived from destructive sampling of *S. macrophylla*	Methodological consistency

Furthermore, the Bangladesh equation is based on direct destructive sampling of *S. macrophylla*, whereas pan-tropical models (e.g., Chave 2014) are generalized across species and ecosystems. Adopting a species-specific model reduces structural error risk, provided that DBH and height fall within the calibration range which they do for the project sites.

Also, higher sequestration rates reported in Philippine and Indonesian studies serve as external benchmarks, showing that the chosen equation provides estimates on the conservative end of the spectrum.
Given the species specificity, overlapping DBH and height ranges, and demonstrated growth comparability between Bangladesh and project plantations, the Mahmood Hossain et al. (2020) equation represents a scientifically robust and conservative choice for biomass and carbon estimation in the PAI-1 project. Regional differences in rainfall and humidity are acknowledged, but these are unlikely to significantly alter the fundamental allometry of *Swietenia macrophylla* trees. Moreover, growth performance

				in the project area has been evaluated and confirmed to fall well within the calibration range of the Bangladesh dataset, thereby reinforcing the validity of applying this equation under local conditions.
		Verra Response Section 3.4.6.4 of the VVR has been updated to confirm that the project applies equations that are species-specific or group-of-species-specific equations derived from trees growing under similar edapho-climatic conditions. However, this finding cannot be closed. Issue: 1. It has not been sufficiently demonstrated how the edapho-climatic conditions in Bangladesh where the allometric equation for *S. macrophylla*, from Mahmood Hossain et al. (2020) was derived compare with those of the project area in India. Action required 1. The VVB must ensure that the PP sufficiently demonstrates how the edapho-climatic conditions in Bangladesh, where the allometric equation for *S. macrophylla* (Mahmood Hossain et al., 2020) was derived, compare with those of the project area in India. Any deviations from the methodology must be reported and assessed as a methodology deviation. 2. The VVB must assess the revised PD/MR and update the VVR as needed. Program rules *AR-TOOL17, v1.0.0,* Paragraph 6 Background Public data indicate that Bangladesh[1] and the western Indian states of Gujarat and Rajasthan[2] have distinct eco-geographic and biophysical characteristics.		
		Round 3		
		VVB Response The project applies a species-specific allometric equation for Swietenia macrophylla (mahogany) to estimate above-ground biomass (AGB): TAGB = exp (–2.302 + 0.894 × ln (D^2 × H))[49]		

[49] https://www.scirp.org/journal/paperinformation?paperid=97990

Where,
D = diameter at breast height (cm)
H = height (m).

This model was developed through destructive sampling across tropical moist-deciduous and semi-evergreen forest sites in Bangladesh (20˚34' and 26˚38' north latitude and 88˚01' and 92˚41' east longitude).[50]
It meets the requirements of AR-TOOL17 v13, section 6 (c), as it is:

- Species-specific,
- Derived from > 30 sample trees, and
- Exhibits R^2 > 0.85 (actual appx. 0.974).

No locally derived or nationally accepted S. macrophylla equations exist for western India; therefore, a regionally appropriate peer-reviewed model is applied in line with VCS/CDM tool requirements.

Both Bangladesh (Hossain 2020 calibration sites) and the Gujarat–Rajasthan project area fall within comparable tropical latitudinal belt (20°–27° N) and environmental condition like - temperature regime, photoperiod, soil texture and pH, etc.

Parameter	Bangladesh (Hossain 2020)	Gujarat – Rajasthan (Project)	Justification
Latitude (°N)	20˚34' and 26˚38' north latitude and 88˚01' and 92˚41' east	Gujarat - 22.6708° N, 71.5724° E[51] Rajasthan - 27.0238° N,	Both are in tropical belt and photoperiod regimes are very much comparable. Seasons are also comparable[53]

[50] Gujarat - 22.6708° N, 71.5724° E
Rajasthan - 27.0238° N, 74.2179° E
[51] https://www.mapsofworld.com/lat_long/gujarat.html
[53] https://en.banglapedia.org/index.php/Season
https://testbook.com/gujarat-gk/climate-in-gujarat
https://www.welcomerajasthan.com/climate-of-rajasthan.htm

			longitude	74.2179° E5[52]		
		Temperat ure (°C)	Mean 24–37[54]	Mean 24–38[55]	Comparable temperature regimes regulate wood growth and density[56]	
		Rainfall (mm yr⁻¹)	1 500–5 000	600–900 (semi-arid / sub-humid)	Lower rainfall in India reduces growth rate but does not affect DBH–H geometry. Project management ensures soil moisture is maintained via irrigation and mulching.	
		Relative humidity (%)	63–83	55–70	Within species tolerance limit (average 45%)[57] 3,000 mg L^{-1} of IBA, with averages of 73.89 %, 0.036 g, and 2.22 cm shade and 60 % relative humidity, with an average survival rate of 91.6 be a valuable tool for the rescue, conservation, and restoration of eco climate change. The agroforestry database notes: "It grows best in areas where annual daytime temperatures are within the range 20-30 °C, but can tolerate 11-39 °C. [58]	
		Soil texture / pH	Silty- to clay-loam; pH 5.5–8.3	Sandy- to loam; pH 6.5–8.0[59]	Both have neutral to slightly alkaline soils. Mahogany grows best in soils that drain water easily but still have good nutrient-holding capacity, typically medium to heavy textured soils like loam, clay-loam, or silty-loam[60] Soil type: S. macrophylla grows best on well-drained sites with medium to heavy soils.	

[52] [5] https://rajasthan.gov.in/

[54] https://climateknowledgeportal.worldbank.org/sites/default/files/country-profiles/16813-WB_Bangladesh%20Country%20Profile-WEB.pdf

[55] https://www.rajasthandriver.com/travel-info/best-time-to-visit-rajasthan-climate-weather/ https://climatetracker.gujarat.gov.in/en/climate-variability

[56] https://www.sciencedirect.com/science/article/pii/S1125786523001121

[57] https://www.scielo.cl/pdf/bosque/v45n3/0717-9200-bosque-45-03-485.pdf

[58] https://pfaf.org/user/Plant.aspx?LatinName=Swietenia+macrophylla&utm

[59] https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/sandy-loam-soils
https://guj-nwrws.gujarat.gov.in/showpage.aspx?contentid=1455&lang=english
https://rajras.in/ras/pre/rajasthan/geography/soils/

[60] https://apps.worldagroforestry.org/treedb2/AFTPDFS/Swietenia_macrophylla.PDF

		Elevation (m amsl)	0–60	0 - 50–300[61]	Both lowland plains. negligible lapse-rate effect. Mahogany is only planted in Gujarat as of now. (total area planted in the MP = 13.25 ha which is 2.63% of the total project area)
		Mean DBH (cm)	9.9–90.5	7.1 (range 4.8–10.41)	Project plantations are in the early growth phase (DBH 4.8–10.4 cm, average = 7.1 cm) which is at the lower edge of the range used to develop the Hossain et al. (2020) equation (9.9–90.5 cm).Even though the project trees are smaller, the equation can still be applied because the equation includes both DBH and height terms (D^2H), which means it captures the real structure of the tree. This allows accurate prediction of small trees as long as DBH and H are measured directly in the field.
		Mean height (m)	6.5–32	6.4 (range 5.4–9.1)	The project includes young plantation, and the values are within calibration domain. so, their diameters (H 5.85– 9.1 cm, average = 6.41 cm) which is at the lower edge of the range used to develop the Hossain et al. (2020) equation (6.6 – 32 m). Even though the project trees are smaller, the equation can still be applied because the equation includes both DBH and height terms (D^2H), which means it captures the real structure of the tree. This allows accurate prediction of small trees as long as DBH and H are measured directly in the field.
		PP has also provided additional open-source and publicly available data demonstrating that the edapho-climatic conditions in Bangladesh are comparable to those in the project region. Climate Comparison[62]			

Parameter	Bangladesh	India Western
Climate Zone	Subtropics to Tropics	Tropics
Latitudes	26° 20' N to 20° 52' N	24°31′ N to 15°2′ N
Distance to Equator	2,300 – 2,900km	1,700 – 2,700 km
Daytime Maximum Temperature	30.90 °C	32.7 °C
Daily Low Temperature	21.70 °C	22 °C
Humidity	74%	64%

[61] https://seiaa.gujarat.gov.in/DSR%20Banaskantha%20District.pdf

[62] Climate comparison: Bangladesh / West-India

Precipitation	2,343 mm	1,361 mm
Rain Days	128.4 days	70.8 days
Hours of Sunshine	1,825 hrs	2,519 hrs

These comparisons confirm that the edapho-climatic determinants of biomass allometry are comparable across both regions. Rainfall and humidity are different. Lower rainfall affects growth rate but not D^2H geometry. Also, project management ensures proper soil moisture supplemented through irrigation/mulching.

However, VVB would also like to add a finding of a published paper – One key finding is that while temperature and rainfall are essential drivers of tree growth in tropical regions, the specific effects of these factors can vary widely depending on local conditions. For example, in some areas, increased rainfall may lead to higher rates of wood formation, while in others, it may have little effect or even be detrimental to tree growth. Another key finding is that tree species can exhibit different cambium activity and wood formation patterns, even within the same region. These observations highlight the need for careful species-level studies to understand the factors influencing tree growth in tropical regions fully. Some studies have also found that extreme events, such as droughts and floods, can significantly impact tree growth and wood formation in tropical regions. Which means even the similar temperature and rainfall does not ensure similar growth of a tree, but it mostly depends on the local condition[63].

Pandey et al. (2013) compiled carbon data for 72 tree species in Gujarat, reporting a mean carbon stock of 10.72 kg

63

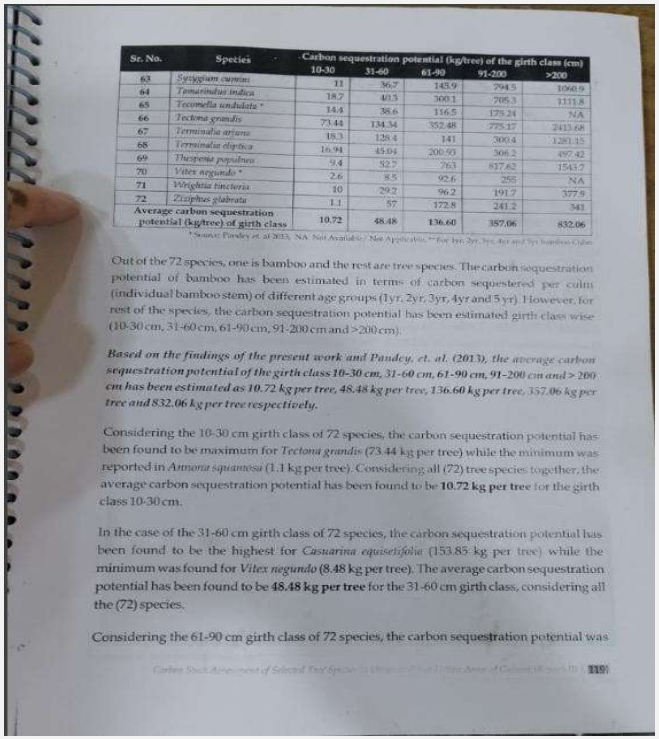
Abstract

A review of papers related to cambium activity and wood formation in tropical and subtropical trees and their response to climate in South America, tropical Africa, Southwest Asia, and Southeast Asia reveals a complex picture of the factors that influence tree growth and wood formation. One key finding is that while temperature and rainfall are essential drivers of tree growth in tropical regions, the specific effects of these factors can vary widely depending on local conditions. For example, in some areas, increased rainfall may lead to higher rates of wood formation, while in others, it may have little effect or even be detrimental to tree growth. Another key finding is that tree species can exhibit different cambium activity and wood formation patterns, even within the same region. These observations highlight the need for careful species-level studies to understand the factors influencing tree growth in tropical regions fully. Some studies have also found that extreme events, such as droughts and floods, can significantly impact tree growth and wood formation in tropical regions. These events can lead to cambium activity and wood density changes and may have long-term effects on forest structure and composition. Overall, this review suggests that much is still to be learned about the complex interactions between climate, soil, and other environmental factors that influence tree growth and wood formation in tropical and subtropical regions. Continued research and monitoring efforts will be essential for understanding these important ecosystems and developing effective conservation and management strategies.

Since the equation depends solely on measured D and H, its predictions remain valid when those parameters are recorded in situ.

C tree^{-1} for 10–30 cm girth (≈3–10 cm DBH). Although Mahogany was not included in the study, this dataset provides a strong regional reference for small-diameter tropical trees. The report is not publicly available online; however, snapshot of the xerox copy (personal communication with a peer) of the original publication has been retained and attached as supporting evidence.

Sr. No.	Species	Carbon sequestration potential (kg/tree) of the girth class (cm) 10-30	31-60	61-90	91-200	>200
24	*Casuarina equisetifolia*	90.03	153.85	270.74	848.77	1008.33
25	*Cocos nucifera**	45	51.1	69.7	99.4	140
26	*Cordia dichotoma*	9.1	49.44	60.88	185.05	255
27	*Cordia gharaf**	10.1	35	163.6	400	745
28	*Dalbergia sissoo*	41.91	73.92	139.2	355.84	941
29	*Dolonix regia**	16.1	77.9	195.9	539	677
30	*Delonix regia*	8.38	44.48	89.53	330.39	603.54
31	*Dendrocalamus strictus***	2.67	5.23	5.5	5.49	5.5
32	*Diospyros melanoxylon*	9.73	57.35	119.91	562.82	1306.50
33	*Diospyros sylvestris*	14.94	39.4	97.5	522.57	1086.07
34	*Emblica officinalis*	4.82	28.4	112.94	176.9	340.89
35	*Erythrina variegata*	5.5	14.35	35.48	NA	NA
36	*Eucalyptus globulus*	15.6	62.8	210.3	887.6	2736.9
37	*Ficus benghalensis*	21.1	54.7	107.9	283.6	706.9
38	*Ficus racemosa*	17.88	39.8	97.5	431.69	998.8
39	*Ficus religiosa*	7.1	49.5	71.5	189.3	679.2
40	*Ficus virens**	8.9	29.7	98.4	202.6	1105.5
41	*Garuga pinnata*	8.58	58.1	102.33	352.96	887.61
42	*Grewia tiliaefolia*	5	82.38	104.51	120	143
43	*Grewia villosa**	10.5	97.1	111.7	145	155
44	*Holoptelea integrifolia*	8.3	58.4	146.7	766	905.17
45	*Leucaena leucocephala**	1.9	72.3	112	140	166
46	*Madhuca indica*	17.98	30.25	155.1	539.2	611.7
47	*Mangifera indica*	11.3	40.5	85.3	727.4	810.7
48	*Manilkara zapota**	4.2	19.2	76	48	NA
49	*Melia azadirachta*	17.3	59.04	81.75	142.32	NA
50	*Moringa oleifera**	13.3	29.8	67.3	298.7	780
51	*Moringa oliefera**	11.3	17.1	40.6	87.7	165
52	*Nyctanthus arbortristis*	5.3	11.5	55.1	NA	NA
53	*Peltophorum pterocarpum*	10.4	83.32	131.84	494.6	1018.9
54	*Phoenix dactylifera**	3.5	15.3	71.7	142.3	320
55	*Pithecellobium dulce*	16.48	84.07	137.31	386.47	669.43
56	*Polyalthia longifolia**	7.4	108.2	130.9	497.4	1590
57	*Prosopis cineraria*	5.01	50.35	100.34	218.36	1166.8
58	*Prosopis juliflora*	6.23	91.5	192.51	401.36	810
59	*Salvadora oleoides*	2.1	10.5	58.9	96	367.9
60	*Salvadora persica*	6.5	39.8	68.5	112.9	NA
61	*Sapindus emarginatus*	4.5	44.4	229.48	316.89	NA
62	*Sterculia urens*	1.6	40.4	64.9	224.7	NA



Sr. No.	Species	Carbon sequestration potential (kg/tree) of the girth class (cm) 10-30	31-60	61-90	91-200	>200
63	*Syzygium cumini*	11	36.7	145.9	294.5	1060.9
64	*Tamarindus indica*	18.2	40.3	300.1	705.3	1111.8
65	*Tecomella undulata**	14.4	38.6	116.5	178.24	NA
66	*Tectona grandis*	73.44	134.34	352.48	775.17	2413.68
67	*Terminalia arjuna*	18.3	128.4	141	300.4	1281.15
68	*Terminalia elliptica*	16.94	45.04	200.93	306.2	497.42
69	*Thespesia populnea*	9.4	52.7	763	837.62	1543.7
70	*Vitex negundo**	2.6	8.5	92.6	255	NA
71	*Wrightia tinctoria*	10	29.2	96.2	191.7	377.9
72	*Ziziphus glabrata*	1.1	57	172.8	241.2	343
	Average carbon sequestration potential (kg/tree) of girth class	**10.72**	**48.48**	**136.60**	**357.06**	**832.06**

* Source: Pandey et. al 2013, NA: Not Available, ** Not Applicable, *** For 1yr, 2yr, 3yr, 4yr and 5yr bamboo Culm

Out of the 72 species, one is bamboo and the rest are tree species. The carbon sequestration potential of bamboo has been estimated in terms of carbon sequestered per culm (individual bamboo stem) of different age groups (1yr, 2yr, 3yr, 4yr and 5 yr). However, for rest of the species, the carbon sequestration potential has been estimated girth class wise (10-30 cm, 31-60 cm, 61-90 cm, 91-200 cm and >200 cm).

Based on the findings of the present work and Pandey, et. al. (2013), the average carbon sequestration potential of the girth class 10-30 cm, 31-60 cm, 61-90 cm, 91-200 cm and > 200 cm has been estimated as 10.72 kg per tree, 48.48 kg per tree, 136.60 kg per tree, 357.06 kg per tree and 832.06 kg per tree respectively.

Considering the 10-30 cm girth class of 72 species, the carbon sequestration potential has been found to be maximum for *Tectona grandis* (73.44 kg per tree) while the minimum was reported in *Annona squamosa* (1.1 kg per tree). Considering all (72) tree species together, the average carbon sequestration potential has been found to be **10.72 kg per tree** for the girth class 10-30 cm.

In the case of the 31-60 cm girth class of 72 species, the carbon sequestration potential has been found to be the highest for *Casuarina equisetifolia* (153.85 kg per tree) while the minimum was found for *Vitex negundo* (8.48 kg per tree). The average carbon sequestration potential has been found to be **48.48 kg per tree** for the 31-60 cm girth class, considering all the (72) species.

Considering the 61-90 cm girth class of 72 species, the carbon sequestration potential was

The mahogany equation, when applied to project plantations (DBH ≈ 5–10 cm), yields comparable or lower values confirming conservativeness relative to regional baselines.

Plot No.	Plant No.	DBH (cm)		Height (meter)	AGB (Kg/plant)	BGB (Kg/Plant)	TGB (Kg/Plant)
Plot 1	1	5.41	17.01	5.85	9.95	2.49	12.43
	2	10.41	32.72	9.1	47.55	11.89	59.44
	3	8.50	26.71	7.47	27.74	6.93	34.67
	4	6.08	19.11	5.9	12.34	3.09	15.43
	5	6.15	19.31	5.95	12.67	3.17	15.84
	6	6.43	20.21	5.95	13.74	3.44	17.18
	7	6.69	21.01	8.15	19.52	4.88	24.40
	8	5.73	18.01	5.85	11.02	2.75	13.77
	9	4.84	15.21	5.45	7.64	1.91	9.55
	10	7.01	22.01	6.15	16.49	4.12	20.61
	11	7.26	22.81	6.15	17.58	4.39	21.97
	12	6.69	21.01	6.15	15.17	3.79	18.97
	13	7.39	23.21	6.25	18.40	4.60	23.00
	14	6.69	21.01	6.15	15.17	3.79	18.97
	15	7.04	22.11	6.15	16.63	4.16	20.78
	16	5.99	18.81	5.85	11.91	2.98	14.88
	17	8.18	25.71	6.55	23.04	5.76	28.80
	18	5.45	17.11	5.85	10.05	2.51	12.56
	19	7.83	24.61	6.45	21.01	5.25	26.27
	20	6.21	19.51	5.75	12.52	3.13	15.65
	21	7.77	24.41	6.25	20.13	5.03	25.17
	22	6.21	19.51	5.75	12.52	3.13	15.65
	23	7.77	24.41	6.25	20.13	5.03	25.17
	24	9.52	29.92	7.25	33.07	8.27	41.33
	25	6.21	19.51	5.85	12.71	3.18	15.89
	26	7.52	23.61	5.85	17.88	4.47	22.35
	27	7.55	23.71	6.45	19.66	4.91	24.57
	28	7.26	22.81	6.25	17.83	4.46	22.29
	29	7.48	23.51	6.95	20.70	5.17	25.87
	30	7.87	24.71	7.15	23.21	5.80	29.01
	31	5.83	18.31	5.75	11.17	2.79	13.97
	32	5.80	18.21	5.75	11.06	2.77	13.83
	33	7.90	24.81	6.85	22.50	5.62	28.12
	34	7.80	24.51	6.85	22.01	5.50	27.52
	35	7.93	24.91	7.05	23.25	5.81	29.06
	36	9.17	28.81	7.55	32.06	8.02	40.08
		7.10		6.41		average	22.92

Assuming 50 % carbon fraction, mean carbon is 11.46 kg C tree^{-1}.

Also, as explained in the Round 2 response Elenita et al. (2019) (Philippines) and Tohirin et al. (2021) (Indonesia) reported much higher sequestration rates for S. macrophylla. Selecting the Bangladesh equation therefore represents a lower-bound, conservative approach for Indian conditions

Though a registered project cannot be formally cited as a precedent, it is presented here to support the justification. A grouped ARR project registered under Verra (ID 2479) covering Maharashtra, Karnataka, Telangana, Gujarat and Madhya Pradesh, uses the same Hossain (2020) equation (R^2 = 0.974) for both ex-ante and ex-post AGB estimation.

The VVB for that project confirmed that the equation satisfies the methodological requirements of AR-TOOL14 v4.2 and AR-TOOL17 v1.0, and that the project areas share similar edapho-climatic conditions with the Bangladesh calibration region.

Verra Response

The VVB has provided additional justification for the appropriateness of the allometric equation used to estimate the

		biomass of *S. macrophylla.* No further action is required, and the finding is closed.	

7	**Insufficient description of implementation and monitoring of leakage and non -permanence risks**		
	Issue 1. Section 4.1 of the PD/MR does not sufficiently describe the implementation of activities related to leakage or non-permanence. 2. Section 6.3 of the PD/MR does not include a monitoring plan for leakage and non-permanence risks. Action Required 1. The VVB must ensure the project updates Sections 4.1 and 6.3 of the PD/MR to address the points raised in Issues 1 and 2.	**Round 1** VVB Response 1. PP has revised the Section 4.1 of the PDMR in accordance of VCS Joint Project Description and Monitoring Report Template, v4.4 with sufficiently describe the implementation of activities related to leakage or non-permanence. 2. PP has updated the Section 6.3 of the PDMR in accordance of VCS Joint PDMR Template, v4.4 with including monitoring plan for leakage and non-permanence risks. 3. To reflect the changes made by the PP, VVB has updated VVR section 4.1 (in response to finding 7.1) and section 3.4.8 (in response to finding 7.2).	Closed

	2. The VVB must ensure the VVR is updated accordingly. Program Rule(s) *VCS Joint Project Description and Monitoring Report Template, v4.4*, Sections 4.1 and 6.3	Verra Response Sections 4.1 and 6.3 of the PD/MR, and Sections 4.1 and 3.4.8 of the VVR have been updated to include additional information/assessment of the project's implementation and monitoring of activities related to leakage and non-permanence risks. No further action is required, and the finding is closed.	

8	**Insufficient justification and assessment of project's non-permanence risks**		
	Issue 1. *Opportunity costs*: It is insufficiently demonstrated in the non-permanence risk report (NPRR) that the baseline activities are subsistence driven in the entire project area. See background. 2. *Land Tenure*: The assessment in Section 3.5 of the VVR is inconsistent with the NPRR and other project documents.	**Round 1** VVB Response *1. Opportunity Costs:* The project area includes both small and medium-sized farmers, but the baseline activity across both groups is predominantly subsistence farming, as confirmed through field surveys, stakeholder consultations, and socioeconomic assessments. In Gujarat and Rajasthan, farming is largely low-input, rain-fed, and non-mechanized, constrained by (these issues were already provided in section 3.5 of the PDMR and section 3.4.5 of the VVR): ○ Severe land degradation and topsoil erosion, ○ Water scarcity and erratic rainfall, ○ Poor soil fertility and high salinity, ○ Fragmented landholdings and limited access to credit or extension services. Due to these conditions, even medium-sized farmers grow mainly for household	Closed

	See background. 3. *Natural Risks:* a. The NPRR does not sufficiently justify the likelihood and significance scores for natural risks. b. Section 3.5 of the VVR does not sufficiently assess the project's natural risks, including the significance, likelihood and mitigation for each natural risk; the future climate impact; or the adaptive capacity.	consumption, with little or no surplus for market sale. Several reports suggests that most of the farmers (about 99 per cent of households have reported that income generated from farming is not adequate.[64] Livelihood diversification typically involves wage labor or seasonal migration rather than commercial agriculture. The above assessment is further supported by: PP's baseline survey demonstrates that almost all the farmers included in the project depend on subsistence cropping. Published reports and literature confirming subsistence-oriented farming in dryland Gujarat and Rajasthan and highlighting low agricultural returns in the region (NITI Aayog[65], World Bank[66] other published reports[67]; Thus, the opportunity cost of joining the project is low, as baseline land use yields limited economic return. The project offers an improved land-use pathway (agroforestry) with potential carbon revenues and co-benefits. This aligns with the VCS Non-Permanence Risk Tool guidance for subsistence-driven baselines and supports a reduced risk rating for economic opportunity cost. 2. *Land Tenure: The typographical error has been corrected, and Section 3.5 of the Joint VVR has now been updated.* 3. *Natural Risks:* a. The NPRR risk scores has been updated for all the categories of natural risks such as for fire (3), pest and disease outbreaks (PD) (1), Extreme weather(W)	

[64] https://desagri.gov.in/wp-content/uploads/2024/04/2020-21-Market-Imperfections-and-Farm-Profitability-in-Gujarat-1.pdf
[65] https://www.niti.gov.in/sites/default/files/2023-03/A-New-Paradigm-for-Indian-Agriculture-from-Agroindustry-to-Agroecology.pdf
[66] https://documents1.worldbank.org/curated/en/539731636402340823/pdf/India-Rajasthan-Agricultural-Competitiveness-Project.pdf
[67] https://prsindia.org/files/budget/budget_parliament/2025/DFG_Analysis_2025-26_Agriculture_%26_Farmers_Welfare.pdf
https://timesofindia.indiatimes.com/city/ahmedabad/crops-cities-creeks-struggle-to-adapt-to-changing-rainfall-pattern-in-gujarat/articleshow/122394170.cms
https://ijarsct.co.in/Paper15682.pdf

	Action Required 1. The VVB must ensure the project updates the NPRR to address the points raised in Issues 1 and 3a. Any revisions to the risk scores must be consistently revised across all project documents. 2. The VVB must update Section 3.5 of the VVR to address the points raised in Issues 2 and 3b. The assessment must describe the steps taken to assess the non-permanence risk rating determined by the project proponent. For each risk factor, the VVB must provide a. an assessment of all rationale, assumptions and justifications used to support the risk score. b. An assessment of the quality of documentation and data provided to support the risk score. c. A conclusion	(2) and geological risk (G) (1), justifying the likelihood and significance score for natural risks. b. Section 3.5 of the joint VVR has now been updated and VVB has provided sufficient assessment for the natural risks including the significance, likelihood and mitigation for each natural risk; the future climate impact; or the adaptive capacity. The overall risk score for the natural risk parameter has now been revised from 1.68 to 1.93, however it is not impacting the overall risk score. The risk score for buffer estimation is still 19%. Verra Response The project's NPRR and Section 3.5 of the VVR have been updated. Issues 1,2 and 3a have been addressed. However, Issue 3b has not been sufficiently addressed, and the finding cannot be closed. Issue 1. Section 3.5 of the VVR still does not sufficiently assess future climate impacts, or adaptive capacity. Action Required 1. The VVB must update Section 3.5 of the VVR to assess the project's justification for future climatic impacts and how the project meets at least five adaptive capacity criteria. Program Rule(s) *AFOLU Non-permanence Risk Tool, v4.2* **Round 2** PP has revised the NPRR with updated information on future climate impacts and adaptive capacity. In the earlier submission, the PP had indicated "Yes," confirming that the project demonstrated at least five criteria of adaptive capacity. In the revised version, the PP has now responded "No" to this criterion to ensure accuracy and compliance. The option "yes" was chosen by mistake. The section on future climate impacts has also been strengthened with updated analysis. These revisions provide a clearer and more robust assessment of the	

	regarding the appropriateness of the risk score. Program Rule(s) *AFOLU Non-permanence Risk Tool, v4.2* *VCS Joint Validation and Verification Template, v4.4*, Section 3.5 Background Issue 1 PD, Section 2.1.1: "Farmers encompass both those with small landholdings grappling with financial challenges and those with medium-sized farms experiencing relatively consistent incomes." Issue 2 VVR, Section 3.5: "The rights to trees and other intangible benefits arising from the plantation activities are with the Gram Panchayats. The VERs from the trees are with PP. This is transferred through resolutions with the Gram Panchayats to the PP."	project's alignment with NPRR requirements. The VVB notes that in the earlier review, the selection of "Yes" for adaptive capacity and the associated requirement for a detailed assessment of future climate impacts under NPRR v4.2 were not fully addressed. This has now been rectified in Section 3.5 of the VVR, where a detailed assessment has been included in line with the revised NPRR submitted by the PP through the Verra project hub. It must be noted that there is no impact on the overall risk score and it remains the same i.e., 19%. Verra Response Section 3.5 of the VVR has been updated to include a complete assessment of the project's natural risks, and corrected the adaptive capacity score. No further action is required, and the finding is closed.	

9	Ineligible area within project area polygons in the KML		
	Issue 1. Satellite images show that trees covered some project polygons before the project start date (see background). Action Required 1. The VVB must ensure that only the areas planted at or after the project start date are included in the project boundary. Areas planted before the project start date must be excluded. The ERRs and relevant sections of the project documents must be updated accordingly. 2. The VVB must provide evidence and additional clarification on the methods used to verify that planting occurred in the project area at the project start date, including the procedures to differentiate planted trees from pre-existing trees. Program Rule(s) *VCS Standard v4.7, Sections 3.11.2 & A1.1* Background An image from Google Earth Pro dated 11 July 2018, covering the area around coordinates N24°07'57.54" & E71°43'32.75" and N24°07'57.72" & E71°43'40.34", shows vegetation cover with spatial patterns and density consistent with planted trees.	**Round 1** VVB Response An image from Google Earth Pro, originally cited with the date 11 July 2018, covering the area around coordinates N24°07'57.54" & E71°43'32.75" and N24°07'57.72" & E71°43'40.34", shows visible vegetation cover with spatial patterns and density that are consistent with planted trees. However, the actual date of this satellite image is 7 November 2018, which is after the official project start date. This confirms that the vegetation observed in the image corresponds to the plantation activities implemented under the project. The observed land cover in the designated area exhibits clear signs of seasonal vegetation, which has been verified through a chronological assessment using Google Earth Pro's historical imagery (timestamp feature). By examining high-resolution satellite images across multiple years and seasons, it becomes evident that the vegetation cover varies significantly during different times of the year. In the wet or growing season, the imagery reveals a dense green cover, indicative of active vegetation growth. Conversely, during the dry season, the same area appears sparse and brownish, consistent with senescent or dormant vegetation. These cyclical patterns confirm that the land cover is not permanent forest or shrubland, but rather seasonally dependent vegetation, likely comprising grasses, herbaceous plants, or seasonally cultivated fields. This temporal variation is a typical characteristic of seasonal ecosystems and supports the interpretation that the observed greenness is not static forest cover but is subject to climatic and land-use changes over the course of the year. Therefore, Earth Pro's timestamped imagery provides strong visual evidence to justify this classification as seasonal vegetation, helping to distinguish it from perennial natural forest or other non-seasonal land cover types. Location: 24.13255460, 71.72599451 and 24.13287322, 71.72786173	Closed

		Image 1 dated 4th June 2002 with clear sign of no dense tree or vegetation		
		Image 2 dated 1st Dec 2010 with clear sign of no dense tree or vegetation in the project land parcels indicating a pure agriculture land.		

		Image 3 dated 14th Oct 2013 with clear sign of no dense tree or vegetation in the project land parcels indicating a pure agriculture land and presence of seasonal short vegetation in some parts around the land parcel.		
		Image 4 dated 5th Mar 2016 shows presence of seasonal short vegetation in some parts around the land parcel and it clearly shows absence long term dense trees and hence proves the eligibility.		

		Image 5 dated 11th Nov 2018 shows presence of project activities, and this confirms that the vegetation observed in the image corresponds to the plantation activities implemented under the project.		
		Image 6 dated 15th October 2021 shows presence of project activities, and this confirms that the vegetation observed in the image corresponds to the plantation activities implemented under the project.		

		Image 7 dated 30th January 2022 shows presence of project activities, and this confirms that the vegetation observed in the image corresponds to the plantation activities implemented under the project.		
		Image 8 dated 11th November 2023 shows presence of project activities, and this confirms that the vegetation observed in the image corresponds to the plantation activities implemented under the project.		

		The satellite images show that before the project began, there was very little vegetation in the area and that the vegetation cover varies significantly during different times of the year. The land looked mostly barren or in poor condition. After the official project start date, the images show steady plant growth, which suggests that tree planting took place. These time-stamped images clearly show that the current vegetation is the result of project activities and was not there before the project started.	
		<u>Verra Response</u> The VVB has provided additional clarification on the methods used to verify that planting occurred in the project area at the project start date, including the procedures to differentiate planted trees from pre-existing trees. No further action is required, and the finding is closed.	

10	**Clarification needed on the grouped project eligibility criteria**		
	<u>Issue</u> 1. Section 1.5 of the PD/MR mentions possible future expansion to other states. However, it is unclear how the project intends to comply with Section 3.6.10 of the VCS Standard, v4.7, which prohibits including geographic areas without initial PAIs unless the same	**Round 1** 1. The geographic location of the initial PAIs includes two states—Gujarat and Rajasthan—within the geographical boundary of the grouped project (India).In accordance with Section 3.6.10 of the VCS Standard v4.7, any new PAIs located in geographic areas not covered by the initial PAI	Closed

	or a more conservative baseline scenario and rationale for demonstrating additionality can be demonstrated. 2. The species to be planted have not been specified under grouped project eligibility criterion 2. 3. The way the technologies will be applied has not been specified under grouped project eligibility criterion 3. <u>Action Required</u> 1. The VVB must ensure that the project demonstrates how it intends to comply with Section 3.6.10 of the VCS Standard, v4.7. 2. The VVB must ensure that the PP specifies the species to be planted under grouped project eligibility criterion 2 to ensure clarity for future PAIs. 3. The VVB must ensure that the PP clearly defines how the technologies will be applied under eligibility criterion 3 to ensure clarity for future PAIs. <u>Program Rule(s)</u> *VCS Standard v4.7, Sections 3.11.2 & A1.1*	may only be included if it can be clearly demonstrated that these areas share the same or a more conservative baseline scenario and a justification for additionality that aligns with or exceeds the rigor applied to the initial PAIs. Any future PAIs added to the project will be implemented only in areas where the baseline scenario and rationale for additionality are the same as, or more conservative than, those established for the initial PAIs. 2. For future PAIs, the PP will apply the same measures as described in Section 1.12 of the Project Description, following a consistent implementation approach across all PAIs. However, the specific plant species selected may vary based on beneficiaries' preferences, local ecological conditions, soil types, and climate suitability. The justification provided by the PP is considered acceptable, given that the host country spans diverse agroecological zones, and a uniform species mix cannot be applied across the entire project boundary. This clarification has been added in Section 1.5 of the revised PDMR. Furthermore, variations in species selection or plantation density will not impact the baseline or additionality assessment. The PP will ensure that any new PAI adheres to the same or a more conservative baseline scenario, and that the demonstration of additionality is at least equivalent in rigor to that of the initial PAIs. 3. For future PAIs, PP will apply the same—as described in Section 1.12 of the PDMR. These activities will follow the same implementation approach to ensure consistency across all PAIs. Except the species planted as explained above.	

		Assessment has been included for all the additions made above in section 3.1 of the joint VVR, v1.1. Verra Response This finding cannot be closed. Issue While India is presented as the grouped project area (i.e., where future instances may be developed), it has not been sufficiently demonstrated that factors relevant for determining the baseline or demonstrating additionality are consistent across the entire India, including common practice, laws, regulatory frameworks, policies, regional grid emission factors, and historical deforestation and degradation rates. Action required 1. The VVB must ensure that the project sufficiently demonstrates that factors relevant for determining the baseline or demonstrating additionality are consistent across all of India, including common practice, laws, regulatory frameworks, policies, regional grid emission factors, and historical deforestation and degradation rates. Otherwise, India cannot be considered a grouped project area. 2. The VVB must assess the revised PD and update the VR as needed. Program rule(s): VCS Standard, v4.7, Section 3.6.15. **Round 2** VVB Response Sections 1.5, 3.4, and 3.5 of the PDMR have been updated to provide a clear and evidence-based demonstration that factors relevant to baseline determination and additionality are consistent	

		across the grouped project geographic area, i.e., India. The assessment covers common practice, applicable laws, regulatory frameworks, and policies, in accordance with VCS Standard v4.7, Section 3.6.15. Correspondingly, the VVB has revised Sections 3.1, and 3.4.5 of the VVR. The analysis presented in the PD demonstrates that: • Common practice in agroforestry and land-use systems relevant to the project type is broadly consistent across India, with no significant regional variations that would undermine baseline assumptions. The same has now been clearly demonstrated and assessed in section 3.5 of the PD and section 3.5.5 of the VVR respectively. • Laws, statutes, and regulatory frameworks (e.g., forest conservation, land-use regulations, and climate policies) are set at the national level and uniformly applicable across all Indian states. • Regional grid emission factors NA for this PA. • Historical deforestation and degradation rates, NA for this PA. In Section 3.1 of the VVR, the VVB confirms that baseline scenario determination and additionality demonstration for all PAIs, will be conducted consistently and with the same standards applied. Each new PAI will be defined by geodetic polygons, as per VCS Standard v4.7, Section 3.6.10. As per 3.16.10, geographic areas with no initial project activity instances will only be included in the project unless it can be demonstrated that the same (or at least as conservative) baseline scenario and rationale for the demonstration of additionality is applicable to such an area as a geographic area that does include initial project activity instance. Accordingly, the project documentation makes clear that the grouped project area may extend across India only where consistency of factors can be demonstrated. Should significant	

		regional variations for baseline and additionality be identified, the PP will limit the grouped project area to those states/regions where conditions align with the baseline and additionality demonstration established in the initial instance. On this basis, the VVB concludes that the revised PD now adequately addresses VCS Standard 3.6.15 and VERRA's finding, ensuring that India may be considered as the grouped project area with appropriate rationale and precautions in place.	
		Verra Response This finding cannot be closed. Issue 1. Under Section 3.4.5 of the VR, the VVB has not sufficiently explained how it determined that the project activity is not mandated by law (national, regional and local level) in the geographic area selected for the grouped project. 2. Under the common practice analysis in section 3.4.5 of the VR, the VVB has not accounted for the variability in the implementation of India's agroforestry policy across different states (see background). 3. The barrier analysis does not account for variations in incentives for tree planting and in climatic, biophysical, and environmental conditions across India's states, all of which may affect the feasibility and adoption of the project activities (see background). Action required 1. The VVB must sufficiently explain how they determined that the project activity is not mandated by law, including the evidences that were assessed for all the states within the geographic area. 2. The VVB must under the common practise analysis account for the variability in the implementation of India's agroforestry policy across different states. The VVBs reporting must include an objective state wise assessment	

		and rationale on how the entire geographic area selected by the project demonstrates same baseline scenario and additionality as the initial project instance despite the variability in agroforestry policy across different states in India. 3. The VVB must under the barrier analysis account for variations in incentives for tree planting and in climatic, biophysical, and environmental conditions across the states of India. The VVBs reporting must include an objective state wise assessment and rationale on how the entire geographic area selected by the project demonstrates same barriers as the initial project instance despite the variability in tree planting incentives and other environmental conditions across different states in India. 4. The inclusion of the entire country of India cannot be justified if agroforestry policies are implemented differently, tree planting incentives vary, and climatic, biophysical, and environmental conditions differ across states. The VVB must present their justification through an objective assessment of these factors across the entire project area. 5. Alternatively, the grouped project eligibility criteria should be revised to include only areas in India where factors influencing baseline and additionality, such as tree planting incentives, agroforestry policies and their implementation, climatic conditions, land use, environmental factors, tenure (private, communal, and state), and other barriers, align with those of the initial PAIs. <u>Background</u> – Public sources(source A and source B) indicate that the implementation of the agroforestry policy varies across different states in India.	

		– Public sources indicate that incentives for tree planting exist in India, but their implementation varies across different states.	
		Round 3	
		VVB Response In response to Verra's findings, PP has now restricted the grouped project boundary to the two states where PAI-1 has been implemented, i.e., Gujarat and Rajasthan. All assessments required by VCS Standard v4.7 (regulatory surplus, common practice and barrier analysis) were performed at this state level and therefore apply consistently across the grouped area, satisfying Section 3.6.10. Regulatory surplus is demonstrated specifically for Gujarat and Rajasthan: neither national nor state law mandates private landholders to carry out tree planting, maintenance, or conservation, and the legal evidence reviewed for these two states. The common practice and barrier analyses developed for PAI-1 have been shown to be valid for future PAIs because inclusion criteria restrict new instances to lands exhibiting the same or more conservative conditions as PAI-1. This ensures methodological consistency and avoids the inconsistencies that, in Verra's view, may arise from expanding the boundary to additional Indian states. Accordingly, the PDMR has been updated (Sections 1.1, 1.5, 1.12, 1.13, 2.1.1, 3.3, 3.4, 3.5, 4.1) to reflect the restricted geographic boundary and associated assessments, and the VVB has revised Section 3.1 and 3.4.5 of the joint VVR to align with these changes.	
		Verra Response Section 1.5 of the PD/MR has been updated to clarify the geographic area for the grouped project. Sections 1.1, 1.12, 1.13,	

		2.1.1, 3.3, 3.4, 3.5, and 4.1 of the PD/MR have been updated accordingly. No further action is required, and the finding is closed.	