

# 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.

<b>Project ID</b>	3031
<b>Project Name</b>	Global Cookstove Program (EKI Phase 12)
<b>Review Type</b>	Registration and Verification
<b>Verification period</b>	22 January 2023 to 30 April 2023
<b>Program(s)</b>	VCS Program
<b>Project Proponent</b>	EKI Energy Services Limited
<b>Methodology</b>	VMR0006 “Methodology for Installation of High Efficiency Firewood Cookstoves” version 1.1
<b>VVB</b>	LGAI Technological Center, S.A. (Applus+ Certification)
<b>Assessment Criteria</b>	VCS Standard, v4.4
<b>Date of First Issue</b>	21 September 2023
<b>Date of Second Issue</b>	07 February 2024
<b>Date of Third Issue</b>	23 May 2024
<b>Date of Forth issue</b>	22 August 2024
<b>Review Conclusion</b>	Approved
<b>Date of Final Issue</b>	21 October 2024

## FINDINGS

#	Finding Description	VVB Response	Status
1	<p><b>Dates of the PCP are missing</b></p> <p><u>Issue</u> In section 2.4, dates when the project was listed for the public commenting period (PCP) are not included.</p> <p><u>Action item</u> The VVB must ensure that PP provides information on dates when the project was open on the Verra website for public comments is missing.</p> <p><u>Program rule(s)</u> VCS Joint Project Description and Monitoring Report Template v4.2, section 2.4</p>	<p><b>Round 1</b></p> <p><u>VVB Response</u> Section 2.4 of the PD-MR updated to include information regarding the listing of the project between 16/05/2022 to 15/06/2022</p> <p><u>Verra Response</u> This finding is now closed, and no further response is required.</p>	closed
2	<p><b>Lack of clarification on the wood saving</b></p> <p><u>Issue</u> Table 1 in section 1.17.2 of the project description, it is indicated that 8,621 tons would be saved. In the ex-ante spreadsheet, the sum of 18.66 t/device over 7 years is indicated. The source of the 8,621 tons is unclear.</p> <p>The value is in the ex-post spreadsheet for this MP for the 18,000 ICSs. And in the ex-post spreadsheet, the calculation ends on April 9, and not end of this MP (30th).</p>	<p><b>Round 1</b></p> <p><u>VVB Response</u></p> <ol style="list-style-type: none"> <li>1. The amount of Wood saved (8,621 tons) as presented in section 1.17.2 of the PD is the actual wood savings (calculated) from use of 18,000 ICS during the monitoring period. Detailed calculation is presented in the ex-post ER estimation Sheet (Sub tab ER-cellIQ18008).</li> <li>2. The ICSs (18,000 Nos) were distributed between 22-January-2023 to 9-april-2023 and the date wise distribution is presented in ex-</li> </ol>	closed

<p><b>Action item</b></p> <ol style="list-style-type: none"> <li>The VVB must ensure that project proponent clarifies the amount of wood saved in Section 1.17.2 of the project description, v4.4.</li> <li>The VVB must ensure that the project proponent clarifies the period over which the 18,000 ICSs is distributed.</li> </ol> <p><b>Program rule(s)</b> VCS Joint Project Description and Monitoring Report Template v4.2, section 1.17</p>	<p>post spreadsheet. The calculation of emission reduction is carried out till end of monitoring period i.e., 30-April-2023. 9-april 2023 is the date of ICS distribution, for the particular distribution date ER is estimated for the period of 9-April-2023 to 30-April-2023.</p>	
	<p><b>Verra Response</b></p> <p>This has been clarified, 8,621 tons is the actual saving during the monitoring period, also corrected in the PDMR. The period over which the monitoring is done is clarified. This finding is now closed, and no further response is required.</p>	

3 Further information and assessment on calculation of fNRB		
<p><b>Issue</b></p> <p>As per the information provided in the project description in section 4.4 related to the ex-ante calculation of f<sub>NRB</sub> it is not clear:</p> <ol style="list-style-type: none"> <li>If it has been estimated using the most recent historical year for which data is available.</li> <li>How H has been calculated as per Section 3.1 of the TOOL30, v.04.0;</li> <li>How RB has been calculated as per Section 3.2 of the TOOL30, v.04.0;</li> <li>f<sub>NRB</sub> calculation sheet has not been submitted.</li> </ol>	<p><b>Round 1</b></p> <p><b>VVB Response</b></p> <ol style="list-style-type: none"> <li>Latest data in particular to the quantity of fuel wood demand, commercial wood demand, area under forest and tree outside forest category that are used for estimation of fNRB are available at different vintage. Thus, in accordance to paragraph 10 of Tool 30 that allows consideration of information from different vintage in case of unavailability of data/information for a same vintage the available information are being used for estimation of fNRB. Details regarding the input parameter and estimation of fNRB is included in section 5.4 of the PD with details of data vintage for all parameters.</li> <li>VVB verifies that, PP has submitted the final Version of f<sub>NRB</sub> sheet.</li> <li>VVB confirmed that the project proponent elaborated on the calculation of fNRB in accordance with TOOL30, v.04.0, utilizing the latest data sourced from the "Socio-Economic Contribution of Forests: Production and Consumption of Forest Resources in India" and the "Indian Forest Report 2021." The detailed calculations for H, Rb, and NRB as per TOOL30, incorporating the most recent data available, were provided by the project proponent in Section 5.4 of the JPD-MR. Moreover, VVB justification is added in section 3.4.6 of the Joint validation &amp; verification report.</li> </ol>	closed
	<p><b>Verra Response</b></p> <p>Details of how the f<sub>NRB</sub> was calculated are included in the project description. The f<sub>NRB</sub> calculation sheet has been submitted. The VVB has included an assessment in the VCS joint VR/VR.</p> <p>However, this finding cannot be closed.</p>	
	<p><b>Round 2</b></p> <p><b>Issue</b></p> <p>The following issues have been identified in the estimation of consumption of woody biomass</p> <ol style="list-style-type: none"> <li>How has the VVB ensured that double counting does not occur in estimation of woody biomass consumption when considering small timber and bamboo use by FFVs in addition to household wood consumption in</li> </ol>	

<p><b>Action item</b></p> <ol style="list-style-type: none"> <li>1) The VVB must ensure the PD includes details of how the <math>f_{NRB}</math> was calculated and how it complies with the provisions of TOOL30 in section 4.4 of project description.</li> <li>2) The VVB must ensure that PP submits the final version of the <math>f_{NRB}</math> calculation sheet.</li> <li>3) The VVB must further elaborate in VCS joint VR/VR how it validated that the <math>f_{NRB}</math> has been calculated in line with the TOOL30, v.04.0.</li> </ol> <p><u>Program rule(s)</u>          TOOL30, v.04.0;  <i>VCS Joint Project Description and Monitoring Report Template v4.2, section 2.4</i></p>	<p>construction, furniture and as fuel.</p> <p>The following issues have been identified in the estimation of renewable biomass.</p> <ol style="list-style-type: none"> <li>2. The source of MAI is not accessible. It is unclear how density of selective species can be used for converting a pan India volumetric MAI value to tons/ha/year value.</li> <li>3. PP has considered entire Protected and Reserved forest as inaccessible (Pforest,i), however as per Indian Forest conservation Act 1927 activities like lumbering, grazing, fuelwood collection and hunting are allowed within protected forest unless prohibited and allowed with restrictions in Reserved forests hence 100 percent of these areas cannot be considered in-accessible.</li> <li>4. PP has included trees outside forest for renewable biomass estimation, however the MAI value applied for calculating this biomass is same as that of forest biomass.</li> </ol> <p><u>Action required.</u></p> <ol style="list-style-type: none"> <li>1. VVB to ensure that double counting of wood consumption sources do not occur in estimation of non-renewable biomass.</li> <li>2. The VVB must ensure that the source of MAI is accessible. VVB must justify how it assessed that density of specific trees found in the region could be used for converting pan India MAI value.</li> <li>3. The VVB must ensure that the project proponent explains why the entire Protected and Reserved forest area is considered as inaccessible (Pforest,i).</li> <li>4. The VVB must ensure that the PP includes justification for using MAI forest for assessing AGB of trees outside recorded forest.</li> </ol> <p><u>VVB Response</u></p> <ol style="list-style-type: none"> <li>1. VVB team verified that, the overall consumption of woody biomass has been now verified and validated, PP updated the <math>f_{NRB}</math> calculation by excluding the consumption of tiny timber and bamboo. That makes sure that when calculating the consumption of fuelwood and construction wood, there is no double counting when determining the amount of non-renewable biomass used.</li> <li>2. VVB team verified that, Project proponent used national statistics to estimate biomass growth rates as localized data were not available. Moreover, to verify the same, PP has submitted the Indian State of Forest Survey report 2021 to the VVB team to verify the source of MAI applied.</li> <li>3. VVB team verified that, there are no conserved forests in the vicinity of the households receiving Improved Cookstoves (ICS) from PP. As observed during the onsite and it was confirmed from the beneficiaries during the interview that they collect wood from nearby naturally growing trees and bushes in the regions where the ICS were scattered. VVB team further verified that, there is no</li> </ol>	
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		<p>grazing, fuelwood collection from the protected forest. Thus, section 26 of Indian Forest Conservation Act of 1927 is unaffected.</p> <p>4. VVB team had reviewed the developing yield table for few tree species grown in farm settings and verified that, there is no MAI value available for India's other land areas. Thus, in accordance with tool 30 version 04 guidelines, Due to unavailability of the MAI value for other land areas, PP has solely utilized the MAI value for forest areas available for India in m<sup>3</sup>/ha/yr unit.</p> <p>VVB has further noted that with revised values, the fNRB value revises to 0.8934. The reason for the up-dation of the value is as follows which are checked and confirmed based on the submitted fNRB worksheet:</p> <ul style="list-style-type: none"> <li>a. In the row 21 of 'consumption of woody biomass' tab, For calculating the roundwood equivalent 30% conversion loss was considered in Commercial Wood Consumption.</li> <li>b. Consumption of small timber and bamboo is now removed from the calculation of consumption of woody biomass.</li> <li>c. In tab 'Renewable Biomass', calculation mistake (Wrong cell selection) is now corrected for <i>MAI<sub>forest,i</sub> &amp; MAI<sub>other,i</sub></i>.</li> </ul> <p>The above correction has been done by PP, same is found inline with in accordance with CDM Tool 30 v4.0 , same is reflecting in fNRB calculation sheet.</p> <p>VVB noted the calculated fNRB value of 0.8934 complies with the PRR comments and correct calculation approach. Projects that PP has previously registered with VERRA (VCS 2942 &amp; VCS 2944) have an authorized value of 0.8920. Consequently, the team has decided to choose 0.8920 as the value for fNRB in order to maintain consistency and uphold the conservativeness criterion. The VVB deems this method appropriate. In accordance, VVB team has updated the section 3.4.6 of the FVR for the value of fNRB and PP revised the PD-MR.</p> <p><u>Verra response</u></p> <p>The VVB responses have been assessed and some issues raised were addressed while additional information is still required for others as explained below.</p> <p>This finding cannot be closed.</p> <p><b>Round 3</b></p>	
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		<ol style="list-style-type: none"> <li>1) The VVB has verified that double-counting does not occur when determining the amount of non-renewable biomass as the PP has updated the fNRB calculation by excluding the consumption of tiny timber and bamboo. <b>Closed</b></li> <li>2) MAI is sourced from national statistics and PP has submitted the Indian State of Forest Survey report 2021 to the VVB team to verify the source of MAI applied. PP has used National data from a government document which provides direct value for the mean annual increment (MAI) of India's forests, however, as per the submitted reference the MAI value is sourced from a 1997 FAO document. The review team noted that as per Tool 30, Data/Parameter Table 5, vintage of MAI data shall not be before year 2000. Moreover, as per same table, if national studies or government data or official statistics are used, PP has to provide comparison of the considered value with FAO and IPCC defaults and provide justification of PP has not provided any such comparison. <b>This finding is still open.</b></li> <li>3) It is unclear how density of selective species can be used for converting a pan India volumetric MAI value to tons/ha/year value.</li> <li>4) The VVB team verified that, there are no conserved forests in the vicinity of the households receiving Improved Cookstoves (ICS) from PP, therefore, all area is considered inaccessible. As per Tool Pforest is the extent of forest area where extraction of wood is either prohibited or the area is geographically remote. All other areas within a forest area should be considered as potential area for supply of renewable biomass. It is not clear how the VVB verified that the collection of timber and fuelwood is prohibited from protected forests. <b>This finding is still open</b></li> <li>5) Since there is no data for MAI other, MAI forest is used in line with the guidelines of the applied tool. the source of MAI applied. However, besides the sources of MAI submitted by the project proponent to determine MAI value for other land areas, the VVB does not mention any other sources that were looked into to conclude the approach taken for this data parameter. <b>This finding is still open</b></li> </ol> <p><u>Action required.</u></p> <ol style="list-style-type: none"> <li>1) The VVB must ensure that the data sources for MAI are in line with the data requirements of the applied Tool 30.</li> <li>2) The VVB must justify how it assessed that density of specific trees found in the region could be used for converting pan India MAI value.</li> <li>3) The VVB must explain how they verified that all inaccessible forest is protected forest considering that the P<sub>forest</sub> definition in the applied tool. The VVB must further provide evidence on how they verified that collection of fuelwoods is prohibited from protected forest.</li> <li>4) The VVB must provide other data sources checked to conclude on the approach taken for determining MAI for other lands besides those provided by the project proponent.</li> </ol> <p><u>PP Response</u></p>	
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<sup>1</sup> [FAO Global Forest Resources Assessment 2000 by the FAO for "Distribution of total forest area by ecological zone" \(Table 14\)](#)

<sup>2</sup> [https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4\\_Volume4/19R\\_V4\\_Ch04\\_Forest%20Land.pdf](https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch04_Forest%20Land.pdf)

		<p>referenced a same Indian government data source<sup>3</sup>, affirming the consistency and reliability of PP's data source.</p> <p>In conclusion, the data sources used by PP for MAI are in full compliance with the data requirements of the applied TOOL 30.</p> <p>2) MAI was calculated by multiplying the 'growth rate of biomass' in m<sup>3</sup>/ha/year by the 'average wood density' in ton/m<sup>3</sup>. In the absence of regional data for biomass growth rates, the project proponent (PP) used national data. To convert this value to ton/ha/year, PP needed to employ a density value in ton/m<sup>3</sup>. India's country-level average wood density is less than 0.63<sup>4</sup>, while regional values have been found to be 0.64, which is slightly higher. This regional value is considered more conservative, potentially resulting in a higher MAI value. Therefore, by incorporating a specific value for the region, PP ensures a more conservative estimate of MAI.</p> <p>3) Below is PP's detailed response against the concerns raised by the VERRA registry regarding the classification of protected forests as inaccessible for the supply of wood and timber:</p> <p><b>a) Data Source and Classification:</b> The data source used<sup>5</sup> for calculating the value of Pforest,i bifurcates the total forest cover into three categories: Very Dense Forest (VDF), Moderately Dense Forest (MDF), and Open Forest (OF). While calculating Pforest,i, PP has conservatively considered the Open Forest Area in both Reserve Forests and Protected Forests as accessible. This is despite the previous establishment that the entire Reserve Forest Area is completely inaccessible.</p> <p><b>b) Wood Extraction Permissions:</b> Chapter III, Section 32 of the Indian Forest Act, 1927, permits granting licenses to local inhabitants for extracting trees, timber, or other forest produce for personal use from protected forests. However, these activities are highly regulated and typically restricted to the peripheral areas of the forest. The interior parts of protected forests are often characterized by difficult terrain and dense vegetation, making them less accessible to the general population. Additionally, there is a significant risk of attacks by wild animals in these regions. Consequently, local inhabitants generally prefer collecting forest</p>	
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<sup>3</sup> <https://moef.gov.in/wp-content/uploads/2019/06/Pacific.pdf>

<sup>4</sup> Rajashekar, G., Fararoda, R., Reddy, R. S., Jha, C. S., Ganeshiah, K. N., Singh, J. S., & Dadhwal, V. K. (2018). Spatial distribution of forest biomass carbon (Above and below ground) in Indian forests. Ecological Indicators, 85, 742–752. doi:10.1016/j.ecolind.2017.11.024

<sup>5</sup> [chapter-13.pdf \(fsi.nic.in\)](#), Refer: page 369

		<p>produce from the more accessible peripheral areas.</p> <p><b>c) Alternative Calculation Approach:</b>                  Despite the conservative approach mentioned above, PP has recalculated the <math>P_{forest,i}</math> value considering the entire Reserve Forest as inaccessible and the Protected Forest as completely accessible to address the registry's concern. This led to a higher value of <math>P_{forest,i}</math> and fNRB.</p> <p><b>Data Used:</b>                  Recorded Forest Area: 9,468,900 ha                  Reserved Forest: 6,188,600 ha                  Protected Forest: 3,109,800 ha</p> <p><b>Percentages:</b>                  % of Recorded Forest Area under Reserved Forest: 65.36%                  % of Recorded Forest Area under Protected Forest: 32.84%                  Total Forest Cover (<math>F_{forest,i}</math>): 6,477,200 ha                  Area under open forest: 2,832,600 ha</p> <p><b>Original Calculation:</b>                  Considering non-Accessible Area (VDF and MDF) for both Reserved Forest and Protected Forest:  <math>P_{forest,i} = (Total\ Forest\ Cover - Area\ under\ open\ forest) * (\% \text{ of Recorded Forest Area under Reserved Forest} + \% \text{ of Recorded Forest Area under Protected Forest})</math>  <math>P_{forest,i} = (6,477,200 - 2,832,600) * (65.36\% + 32.84\%) = 3,578,974.2\ ha</math>                  RB = 1.62 million tonnes                  NRB = 13.54 million tonnes                  fNRB = 89.34%</p> <p><b>Calculation with considering protected forest as zero:</b>                  Considering only Reserved Forest (VDF, MDF, and OF) and taking Protected Forest as Zero:  <math>P_{forest,i} = (Total\ Forest\ Cover * \% \text{ of Recorded Forest Area under Reserved Forest}) + (0 * Total\ Forest\ Cover)</math>  <math>P_{forest,i} = (6,477,200 * 65.36\%) + (0 * 6,477,200) = 4,233,311\ ha</math>                  RB = 1.4 million tonnes                  NRB = 13.76 million tonnes                  fNRB = 90.75%</p> <p><b>Conclusion:</b>                  For the sake of conservativeness, PP has considered the inaccessible part of the total forest cover (i.e.</p>	
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		<p>VDF &amp; MDF) while calculating the <math>P_{forest,i}</math> value in the fNRB sheet submitted earlier. As explained above, this approach ensures that PP's calculations remain robust and aligned with the requirements of the TOOL 30. PP has added the above calculation in the fNRB sheet and resubmitted the same along with PRR-3 response for reference.</p> <p>VVB Response: -</p> <ol style="list-style-type: none"> <li>VVB would like to present response to point no. 02 regarding MAI source in pointwise manner as below:</li> </ol> <p>VVB team verified that; According to a 1997 FAO report, "the actual production was estimated to be 294 million cubic meters, while the net annual increment of growing stock from all sources (public and private) was assessed to be 127 million cubic meters in 1994. In the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Above-ground biomass growth rates for distinct ecological zones), the MAI values for above-ground biomass growth rates are stated for the Asia-Pacific region, not only India. Thus, it was not feasible to compare directly with statistics from the Indian government. Same has been verified with IPCC data. The "Source of data" option (d), which reads "National studies or government data or official statistics," is used in accordance with Table 5 of TOOL 30. The information presented in the document that was utilized is post-2015, which satisfies the condition stated in tool para. 10 of tool 30 that "the vintage of the above data shall not be before the year 2000." Additionally, PP has followed a QA/QC protocol in accordance with TOOL 30's Table 5. After attempting to compare the values with FAO and IPCC defaults. PP has submitted the MAI document to the assessment team and it is found consistent and thus accepted.</p> <ol style="list-style-type: none"> <li>Moreover, VVB has checked registered project with VCS and noted that following registered project has also considered same <math>MAI_{forest}</math> value (<math>0.5 \text{ m}^3/\text{ha}/\text{yr}</math>), affirming the consistency and reliability of PP's data source. The source document for this value was another Indian government data source, thus found appropriate. This finding supports the consistency and reliability of PP's data source.</li> </ol> <table border="1" data-bbox="617 1076 1791 1320"> <thead> <tr> <th>Registry</th> <th>Registry ID</th> <th>Weblink</th> <th>MAI values considered</th> <th>Registry</th> </tr> </thead> <tbody> <tr> <td>VCS</td> <td>2983</td> <td><a href="https://registry.verra.org/app/projectDetail/VCS/2983">https://registry.verra.org/app/projectDetail/VCS/2983</a></td> <td> <math>MAI_{forest,i}</math> - 0.5  <math>MAI_{other,i}</math> - not considered                 </td> <td>VCS</td> </tr> </tbody> </table> <p>The source document uses <math>\text{m}^3/\text{ha}/\text{yr}</math>, requiring conversion to tonnes/ha/yr for the RB calculation. PP achieved this by multiplying the value with an "average wood density" (<math>0.654 \text{ tonnes}/\text{m}^3</math>). This resulted</p>	Registry	Registry ID	Weblink	MAI values considered	Registry	VCS	2983	<a href="https://registry.verra.org/app/projectDetail/VCS/2983">https://registry.verra.org/app/projectDetail/VCS/2983</a>	$MAI_{forest,i}$ - 0.5 $MAI_{other,i}$ - not considered	VCS	
Registry	Registry ID	Weblink	MAI values considered	Registry									
VCS	2983	<a href="https://registry.verra.org/app/projectDetail/VCS/2983">https://registry.verra.org/app/projectDetail/VCS/2983</a>	$MAI_{forest,i}$ - 0.5 $MAI_{other,i}$ - not considered	VCS									

		<p>in an MAI<sub>forest,i</sub> value of 0.33 tonnes/ha/yr and an MAI<sub>other,i</sub> value of 0.32 tonnes/ha/yr (using a different density for “trees outside forests”).</p> <p>The referenced project (VCS 2983) employed a wood density of 0.56 tonnes/m<sup>3</sup>, leading to a lower MAI<sub>forest,i</sub> value (0.28 tonnes/ha/yr). Notably, this project did not consider MAI<sub>Other,i</sub>.</p> <p>3. 'Growth rate of biomass' in m<sup>3</sup>/ha/year multiplied by 'average wood density' in tons/m<sup>3</sup> yielded MAI. The project proponent (PP) used national statistics for biomass growth rates as there were no regional data available. PP have to use a density value in ton/m<sup>3</sup> in order to convert this figure to ton/ha/year. The average wood density in India is less than 0.63 at the national level, although somewhat higher 0.64 values have been reported at the regional level. Because of its perceived conservatism, this regional value may have a higher MAI value. Thus, PP provides a more conservative assessment of MAI by adding a particular value for the location.</p> <p>3) Regarding the classification of protected forests as inaccessible for the supply of wood and timber, VVB would like to present the following information.</p> <p>The entire amount of forest cover is divided into three categories by the data source used to calculate P<sub>forest,i</sub>: Very Dense Forest (VDF), Moderately Dense Forest (MDF), and Open Forest (OF). The Open Forest Area in Reserve Forests and Protected Forests has been cautiously regarded by PP as accessible when computing P<sub>forest,i</sub>. The submitted fNRB workbook - Renewable Biomass worksheet - cell C15 makes this clear. The whole Reserve Forest Area was previously confirmed to be fully inaccessible and hence accepted, but this is still the case. Indian Forest Act, 1927, Chapter III, Section 32 authorizes local residents to get licenses for harvesting trees, wood, or other forest products for their own use from forests that are protected. But they are strictly regulated activities that are usually limited to the forest's edges. VVB noted that with the approach selected by PP i. e. consideration of the inaccessible part of the total forest cover while calculating the P<sub>forest,i</sub> value has ensured that PP's calculation remain robust and aligned with the requirements of the TOOL 30 and hence accepted.</p> <p>4) About cross checking the values for conclusion of the approach taken by PP.</p> <p>Applying MAI Values to Other Land Areas:</p> <p>VVB team conform that; Table 5 of TOOL 30 states that "the MAI value for forest areas may be used as the MAI value for other land areas if the MAI value for other land areas is not available in a country while only the MAI value for forest areas exists." PP has taken into account the same MAI value for both MAI<sub>forest,i</sub> and MAI<sub>other,i</sub> because the MAI value for other land areas in India is unavailable. The FAO and IPCC defaults were compared with MAI values as part of the QA/QC process in accordance with Table 5 of TOOL 30. The ensuing</p>	
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		<p>observations were noted: Table 14 from the FAO's Global Forest Resources Assessment 2000 only shows the percentage distribution of different forest types by nation and is insufficient to draw any conclusions regarding MAI, making it inappropriate for comparison. VVB team verified that; India is not included in the MAI figures for above-ground biomass growth rates mentioned in the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories; rather, they apply to the Asia area as a whole. Consequently, it was inappropriate to compare directly with statistics from the Indian government. VVB made its conclusion that the project proponent's method for calculating MAI for other lands complies with TOOL 30 standards. The technique is supported by the precedent set in other recently registered projects, as shown in the above table, and the use of the same MAI value for both forest and other land areas is justified by the lack of particular MAI data for other land types in India.</p> <p><b>Verra response</b></p> <ol style="list-style-type: none"> <li>1) The VVB has clarified how the MAI value used meets the requirement of Tool 30. The document used refers to the MAI value of FAO document 1997 to triangulate the reported MAI value, however these are not the values used in the calculated. The value of 0.5 that is quoted by the document is used. This document is published after 2000, which meets Tool 30 data sources requirements. The VVB has checked registered project with VCS and noted that following registered project has also considered same MAI<sub>forest</sub> value (0.5 m<sup>3</sup>/ha/yr)., affirming the consistency and reliability of PP's data source. <b>This finding is cannot be closed.</b></li> <li>2) MAI was calculated by multiplying the 'growth rate of biomass' in m<sup>3</sup>/ha/year by the 'average wood density' in ton/m<sup>3</sup>. In the absence of regional data for biomass growth rates, the project proponent (PP) used national data. <b>This finding is now closed, and no further response is required.</b></li> <li>3) The VVB has justified why protected areas are considered inaccessible areas, including how accessible forest is defined, and the regulation of permits. The recalculation Considering non-Accessible Area (VDF and MDF) for both Reserved Forest and Protected Forest: vs Considering only Reserved Forest (VDF, MDF, and OF) and taking Protected Forest as Zero: indicates that the former is more conservative. <b>This finding is now closed, and no further response is required.</b></li> <li>4) The VVB has provided data sources checked to conclude on the approach taken for determining MAI for other lands besides those provided by the project proponent, including FAO and IPCC. <b>This finding is now closed, and no further response is required.</b></li> </ol> <p><b>Additional round Issue</b></p> <p>Low MAI Value- The supporting document submitted for MAI value of 0.5 m<sup>3</sup>/ha/yr, mentions that "In Indian tropical moist deciduous and dry deciduous forests, sal and teak have a forest cover area about 60 percent of total forest area. In such areas, the MAI is much higher than the average". Therefore, it can be concluded from this report that MAI of 0.5m<sup>3</sup>/ha/yr is not the accurate assessment of MAI of Indian Forest</p>	
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		<p>falling under tropical moist deciduous and dry deciduous ecological zones. The project proponent has considered MAI of 0.5 m<sup>3</sup>/ha/yr for all the geographic regions included under the present project activity without classifying them on the basis of ecological zones, in particular if any of the regions consists of tropical moist deciduous and dry deciduous forest types resulting in higher MAI values.</p> <p><b>Action required</b></p> <ol style="list-style-type: none"> <li>1. VVB must justify its assessment of accuracy of MAI of 0.5m<sup>3</sup>/ha/yr with respect to each of the geographic boundary included under the grouped project, specifically in light of the information presented on tropical moist deciduous and dry deciduous ecological zones.</li> <li>2. Also, the VVB must explain how it assessed this value to be conservative when other documents (IPCC; SINGHAL, R. &amp; KUMAR, SUDHIR &amp; JEEVA, V. (2003). Forests and forestry research in India. 44) suggest a higher MAI value for Indian forests.</li> </ol> <p><b>PP response</b></p> <ol style="list-style-type: none"> <li>1. The project proponent acknowledges that the composition of forest types across the states in India is not uniform as there would be some states with more deciduous forest and some with less. However, the information on local/state specific MAI values are not available in the public domain. Therefore, in absence of local/state level information, the project proponent has gone ahead with the country level MAI value which is available at multiple public sources.</li> </ol> <p>The MAI value has been sourced from a research project report on “Developing Yield Table for few tree Species grown in Farm setting” prepared by the research team headed by Dr. A. Balasubramanian, Ph.D. Professor and Head (Forestry) Department of Silviculture Forest College and Research Institute Tamil Nadu Agricultural University<sup>6</sup>. This report also states that the MAI value for deciduous forests is higher than the average value. However, regarding MAI values of deciduous forest, this may please be noted that presence of more deciduous forest in a particular region may not necessarily bring a higher MAI value. As mentioned in the research paper published by Indian Council of Forestry Research and Education (ICFRE)<sup>7</sup> (the same journal recommended by Verra under “action required” for comparison), a study has suggested to consider the MAI value of 0.5 m<sup>3</sup>/ha/yr for the moist deciduous forest. A screenshot of the report page 56 is provided below.</p>	
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<sup>6</sup> <https://tnau.ac.in/site/college-fcri-mettupalayam/department-of-snrm-hods-desk/>

<sup>7</sup> <https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=81d8b0a4a405f957ca0d943c74c5a60abbd4f384>

		<p style="text-align: center;">A recent study in Kerala has estimated the current average increments, in the natural ever-green and moist deciduous forests as 1.0 and 0.5 m<sup>3</sup> ha<sup>-1</sup> yr<sup>-1</sup> respectively. Yet another report suggests that the average productivity of Sal forests of India is at the level of 54.7 million m<sup>3</sup> ha<sup>-1</sup>. In fact figures are often quoted which would give Indian forest an annual productivity of 0.5 m<sup>3</sup> ha<sup>-1</sup>. If theoretical potential productivity could be achieved, this would increase to about 525 million m<sup>3</sup>ha<sup>-1</sup>yr<sup>-1</sup>.</p> <p>Furthermore, even though the Indian forest has a higher concentration of deciduous plants, as per the country report on the state of the world's forest genetic resources for India published by Food and Agriculture Organization of the United Nations<sup>8</sup>, the productivity of Indian forest is very less due to fire, grazing, overexploitation and non-recycling of biomass in forest. Another source<sup>9</sup> also suggests low productivity of Indian forest due to the below factors.</p> <ul style="list-style-type: none"> <li>• Challenges in exploitation due to uneven distribution and inaccessibility;</li> <li>• Uncontrolled felling without adequate regeneration through compensatory forestry;</li> <li>• Insufficient transport and infrastructure facilities;</li> <li>• Overutilization due to unregulated grazing;</li> <li>• Forest depletion caused by fires;</li> <li>• Inefficient and unscientific methods of felling, crafting, and seasoning;</li> <li>• Unscientific economic activities, such as slash-and-burn agriculture, leading to the destruction of fragile forest covers on slopes;</li> <li>• Dependence on static conservancy, relying on natural growth rather than regenerating through afforestation;</li> <li>• Insufficient information on forest resources and inadequate research facilities;</li> <li>• Degradation of forest covers due to industrial and irrigation projects, illegal felling, or 'poaching'.</li> </ul>	
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8 <https://www.fao.org/4/i3825e/i3825e32.pdf>, Page No. 01

9 <https://edukemy.com/blog/problems-of-indian-forestry-upsc-indian-geography-notes/#:~:text=ASSOCIATED%20WITH%20FORESTRY-,Inaccessibility%20of%20Forests%3A,national%20product%20compared%20to%20agriculture.>

		<p>Apart from the source used by the project proponent, the following is an additional source that clearly mentions the same MAI value for India, i.e., 0.5 m<sup>3</sup>/ha/year.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Published by</th> <th style="width: 40%;">Title</th> <th style="width: 15%;">Year of publication</th> <th style="width: 15%;">Page no.</th> </tr> </thead> <tbody> <tr> <td>Food and Agriculture Organization of the United Nations (FAO)</td> <td>Country Report on The State of Forest Genetic Resources <a href="https://www.fao.org/4/i3825e/i3825e32.pdf">https://www.fao.org/4/i3825e/i3825e32.pdf</a></td> <td>2012</td> <td>1 &amp; 16</td> </tr> </tbody> </table> <p>Thus, PP considered the MAI value of 0.5 m<sup>3</sup>/ha/yr since the MAI value for each geographic boundary within the grouped project is not available. Additionally, as discussed above, based on the research paper (IPCC; Singhal, R., Kumar, Sudhir, &amp; Jeeva, V. (2003). <i>Forests and Forestry Research in India</i>), referred by the registry for comparison, the MAI value remains the same for deciduous forests.</p> <p>2. This is to be noted that the document (IPCC; SINGHAL, R. &amp; KUMAR, SUDHIR &amp; JEEVA, V. (2003). <i>Forests and forestry research in India</i>. 44) referred by the registry for comparison of the MAI value does not suggest any higher value of MAI, rather it suggests the same MAI value, 0.5 m<sup>3</sup>/ha/yr for the moist deciduous forest in India.</p> <p>The project proponent has also compared their Mean Annual Increment (MAI) value with that of the recently registered projects by Verra. Below is the list of projects which have considered same MAI value, 0.5 m<sup>3</sup>/ha/yr.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">S.I No.</th> <th style="width: 35%;">Project Title</th> <th style="width: 15%;">Registry/Ref no.</th> <th style="width: 45%;">Weblink</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Clean Cooking Access for Women in Rural Maharashtra</td> <td>VERRA/ VCS 3151</td> <td><a href="https://registry.verra.org/app/projectDetail/VCS/3151">https://registry.verra.org/app/projectDetail/VCS/3151</a> (refer ER sheet)</td> </tr> <tr> <td>2</td> <td>Distribution of high Efficient Cook Stoves</td> <td>VERRA/ VCS 2983</td> <td><a href="https://registry.verra.org/app/projectDetail/VCS/2983">https://registry.verra.org/app/projectDetail/VCS/2983</a> (refer ER sheet)</td> </tr> </tbody> </table> <p>Thus, it can be concluded that the value of MAI considered for current projects are comparable with other registered projects.</p> <p><b>VVB Response:</b></p>	Published by	Title	Year of publication	Page no.	Food and Agriculture Organization of the United Nations (FAO)	Country Report on The State of Forest Genetic Resources <a href="https://www.fao.org/4/i3825e/i3825e32.pdf">https://www.fao.org/4/i3825e/i3825e32.pdf</a>	2012	1 & 16	S.I No.	Project Title	Registry/Ref no.	Weblink	1	Clean Cooking Access for Women in Rural Maharashtra	VERRA/ VCS 3151	<a href="https://registry.verra.org/app/projectDetail/VCS/3151">https://registry.verra.org/app/projectDetail/VCS/3151</a> (refer ER sheet)	2	Distribution of high Efficient Cook Stoves	VERRA/ VCS 2983	<a href="https://registry.verra.org/app/projectDetail/VCS/2983">https://registry.verra.org/app/projectDetail/VCS/2983</a> (refer ER sheet)
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		<p>1. The VVB team that there is variation in the distribution of forest types throughout the Indian states, with some having more deciduous forest than others. Nevertheless, public access to information about state- or local-specific MAI values is restricted. The project proponent has thus chosen to use the national MAI value, which is accessible from a number of public sources, in the absence of information at the local or state level.</p> <p>VVB team further added that; The MAI value was obtained from the research team led by Dr. A. Balasubramanian, Ph.D., Professor and Head (Forestry) Department of Silviculture Forest College and Research Institute Tamil Nadu Agricultural University<sup>10</sup>.</p> <p>However, regarding MAI values of deciduous forest, this may please be noted that presence of more deciduous forest in a particular region may not necessarily bring a higher MAI value. As mentioned in the research paper published by Indian Council of Forestry Research and Education (ICFRE)<sup>11</sup> (the same journal recommended by Verra under “action required” for comparison), a study has suggested to consider the MAI value of 0.5 m<sup>3</sup>/ha/yr for the moist deciduous forest.</p> <p>The VVB team has examined the above-mentioned project proponent factor and reviewed the other sources<sup>12</sup>, which resulted in a decrease in forest production and it is also find that the Food and Agriculture Organization of the United Nations<sup>13</sup> reported that although the Indian forest has a higher concentration of deciduous plants, the productivity of the Indian forest is very low as a result of fire, grazing, overexploitation. Another source claims that the following causes contribute to the low productivity of Indian forests.</p> <p>Apart from the source used by the project proponent, VVB team has reviewed the following is an additional source that clearly mentions the same MAI value for India, i.e., 0.5 m<sup>3</sup>/ha/year.</p>	
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<sup>10</sup> <https://tnau.ac.in/site/college-fcri-mettupalayam/department-of-snrm-hods-desk>

<sup>11</sup> <https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=81d8b0a4a405f957ca0d943c74c5a60abbd4f384>

<sup>12</sup> <https://edukemy.com/blog/problems-of-indian-forestry-upsc-indian-geography-notes/#:~:text=ASSOCIATED%20WITH%20FORESTRY-.Inaccessibility%20of%20Forests%3A.national%20product%20compared%20to%20agriculture> .

<sup>13</sup> <https://www.fao.org/4/i3825e/i3825e32.pdf>, Page No. 01

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<p>VVB team verified that; since the value of MAI for each geographic boundary under the grouped project is not available, VVB noted that PP is appropriately considering the value of MAI of 0.5 m<sup>3</sup>/ha/yr. Thus, PP considered the MAI value of 0.5 m<sup>3</sup>/ha/yr since the MAI value for each geographic boundary within the grouped project is not available. Additionally, as discussed above, based on the research paper (IPCC; Singhal, R., Kumar, Sudhir, &amp; Jeeva, V. (2003). <i>Forests and Forestry Research in India</i>), referred by the registry for comparison, the MAI value remains the same for deciduous forests.</p> <p>2. VVB team clarified that, as discussed above based on the research paper i. e. (IPCC; SINGHAL, R. &amp; KUMAR, SUDHIR &amp; JEEVA, V. (2003). <i>Forests and forestry research in India</i>. 44) referred by the registry for comparison of the MAI value, the value of MAI for deciduous forests remains the same. It should be noted that the document (IPCC; SINGHAL, R. &amp; KUMAR, SUDHIR &amp; JEEVA, V. (2003). <i>Forests and forestry research in India</i>. 44) that the registry referred to in order to compare the MAI value does not recommend a higher MAI value; instead, it suggests the same MAI value, 0.5 m<sup>3</sup>/ha/yr, for India's moist deciduous forests. Additionally, the project proponent has contrasted their Mean Annual Increment (MAI) figure with those of the most recent Verra-registered projects. The projects listed below have all taken into consideration the same MAI value, which is 0.5 m<sup>3</sup>/ha/yr.</p>				
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		<p>As a result, it can be said that the present project's MAI value is equivalent to that of other registered projects.</p> <p><b>Verra Response</b></p> <p>VVB and project proponent acknowledges that the composition of forest types across the states in India is not uniform however, in absence of local/state level information, the project proponent has used country level MAI value which is available at multiple public sources.</p> <p>VVB has analysed the information on MAI in the the document (IPCC; SINGHAL, R. &amp; KUMAR, SUDHIR &amp; JEEVA, V. (2003). Forests and forestry research in India stating that it also states the MAI of 0.5t/ha/yr is recommended.</p> <p>Other documents that use the same MAI both within and outside Verra are quoted including FAO that uses the same value in the “Country Report on The State of Forest Genetic Resources.</p> <p>This finding is now closed, and no further response is required.</p>	
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4 fNRB value: comparison with literature is missing															
	<p><b>Issue</b> Tool 30 version 4 requires a comparison of the fNRB achieved with those from other literature. The project proponent does not provide this comparison in the VCS joint PD/MR.</p> <p><b>Action Required</b></p> <ol style="list-style-type: none"> <li>1. The VVB must ensure the project proponent provides the comparison on the values achieved and those reported.</li> <li>2. The VVB must ensure to provide an assessment on the influence the factors mentioned could have in the value achieved of Fraction of non-renewable biomass.</li> <li>3. The VVB must ensure to provide further analysis with other relevant scientific literature.”</li> </ol> <p><b>Program Rule(s)</b> Tool 30 v4.0, Para 6 VCS Joint Project Description &amp; Monitoring Report Template: v4.2, Section 7.5</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr style="background-color: #2c4e64; color: white;"> <th colspan="2" style="text-align: left; padding: 5px;">Round 1</th> </tr> <tr> <td style="width: 5%; padding: 5px;">1.</td> <td style="padding: 5px;">The comparison of the estimated <math>f_{NRB}</math> with the literature referred to under Tool 30 is included in the section 5.4 of joint PD-MR (included in the response sheet also)</td> </tr> <tr> <td style="padding: 5px;">2.</td> <td style="padding: 5px;">VVB team confirm that, <math>f_{NRB}</math> is estimated in accordance to the methodological approach stipulated under Tool 30 on the basis of total wood consumption and Renewable Biomass availability in the project area. Following are the justification presented in regard to the conservativeness of each value considered. same is reflecting in section 3.4.6 of the verification report.                     <ol style="list-style-type: none"> <li>a. Wood Consumption - The wood consumption is estimated as sum of fuel wood consumption and consumption of commercial wood.</li> </ol> </td> </tr> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px;"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 15%; padding: 5px;">Parameter</th> <th style="padding: 5px;">Justification of Data Source and assessment of Influence</th> </tr> <tr> <td style="padding: 5px;">Fuel Wood</td> <td style="padding: 5px;">The fuel wood demand used for estimation</td> </tr> </table> </td> </tr> </table>	Round 1		1.	The comparison of the estimated $f_{NRB}$ with the literature referred to under Tool 30 is included in the section 5.4 of joint PD-MR (included in the response sheet also)	2.	VVB team confirm that, $f_{NRB}$ is estimated in accordance to the methodological approach stipulated under Tool 30 on the basis of total wood consumption and Renewable Biomass availability in the project area. Following are the justification presented in regard to the conservativeness of each value considered. same is reflecting in section 3.4.6 of the verification report. <ol style="list-style-type: none"> <li>a. Wood Consumption - The wood consumption is estimated as sum of fuel wood consumption and consumption of commercial wood.</li> </ol>		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 15%; padding: 5px;">Parameter</th> <th style="padding: 5px;">Justification of Data Source and assessment of Influence</th> </tr> <tr> <td style="padding: 5px;">Fuel Wood</td> <td style="padding: 5px;">The fuel wood demand used for estimation</td> </tr> </table>	Parameter	Justification of Data Source and assessment of Influence	Fuel Wood	The fuel wood demand used for estimation	Closed
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			<p>Commercial Wood Consumption</p>	<p>The commercial wood demand used for estimation of fNRB is considered from the State of Forest Report 2011 (chapter 7) published by Forest Survey of India, MoEFCC, Govt of India.</p> <p>Since the referred literature is the last publicly available data source relating to fuel wood demand in the state therefore in</p>	

			<p>accordance to paragraph 10 of Tool 30 older vintage data is being considered. It is in this context worthwhile to mention that 2011 value of commercial wood demand considered for estimation of fNRB is conservative as it has not accounted for the growth in demand of commercial wood linked with population growth in the state of Madhya Pradesh till 2022.</p>					
			<p>Consumption of Bamboo and small timber</p> <p>The commercial wood demand used for estimation of fNRB is considered from the State of Forest Report 2019 (chapter 10) published by Forest Survey of India, MoEFCC, Govt of India. Since the referred literature is the last publicly available data source relating to fuel wood demand in the state therefore in accordance to paragraph 10 of Tool 30 different vintage data is being considered. As the data relates to official statistics of Govt of India the same is considered as most conservative.</p>					
			<p>b. Renewable Biomass-</p> <table border="1" data-bbox="1108 1047 1766 1408"> <thead> <tr> <th data-bbox="1108 1047 1274 1146">Parameter</th> <th data-bbox="1274 1047 1766 1146">Justification of Data Source and assessment of Influence</th> </tr> </thead> <tbody> <tr> <td data-bbox="1108 1146 1274 1408">Mean Annual Increment</td> <td data-bbox="1274 1146 1766 1408">The mean annual increment of India Forest as published by Government of Tamil Nadu which also outlines the average value for India forest is considered. Since the value considered is the publicly available national statistics the same is considered for estimation of fNRB.</td> </tr> </tbody> </table>	Parameter	Justification of Data Source and assessment of Influence	Mean Annual Increment	The mean annual increment of India Forest as published by Government of Tamil Nadu which also outlines the average value for India forest is considered. Since the value considered is the publicly available national statistics the same is considered for estimation of fNRB.	
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		<p>Area under Forest</p>	<p>The data and value related to area under forest is obtained from latest State of Forest Report 2021 (chapter 13) published by Forest Survey of India, MoEFCC, Govt of India.</p>											
		<p>Area under Non Forest Land</p>	<p>The data and value related to area under non-forest land is obtained from latest State of Forest Report 2021 (chapter 13) published by Forest Survey of India, MoEFCC, Govt of India.</p>											
		<p>Since all the input values obtained are sourced from national published statistics and most conservative therefore none of the input value will have any impact on the estimated value of fNRB.</p>												
		<p>3. Since there are no other publicly available literature outlining the value of fNRB for the state of Madhya Pradesh therefore comparison has been presented with the value of FNRB with which ICS projects are registered under VERRA. Justification regarding the same is provided in section 3.4.6 of the verification report. Comparison of fNRB of the current project with other registered project activity</p>												
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		<p>Since the value of fNRB considered in the registered PD- MR is higher than the fNRB value estimated for the project activity (87.31%)</p>												

		<p>therefore the fNRB value considered is deemed to be much more conservative.</p>	
		<p><u>Verra Response</u>          The values used to calculate the fNRB is from the latest literature. In comparison with other projects in literature, it is lower and hence considered more conservative. The f<sub>NRB</sub> or rather NRB (as stated in the Baillis report) is estimated based on the <b>wood fuel demand</b> (only) considering 2009 as base year instead of the total wood demand is to be estimated as sum of average consumption of wood fuel per household, including fuelwood and charcoal, commercial woody biomass consumption for energy applications and commercial woody biomass consumption for non-energy applications in accordance to equation 3 of Tool 30, meaning would potentially result in lower fNRB. The justification provided is reviewed and accepted. This finding is now closed, and no further response is required.</p>	

5 Justification on debundling and unique identification of ICS			
	<p><b>Issue</b>          In section 3.4 of the VCS joint PD/MR, the project proponent states “he baseline scenario is also evident from other project implemented by the project proponent (EKI) in the same state and same geography (VCS 2473) that the baseline scenario in project location is three stone fire or traditional stove using fuelwood.” The projects are using similar technology (stove model) and same project proponent. It is unclear whether the proposed grouped project activity is not a debundled component of a larger grouped project or program.</p> <p><b>Action Required</b>          1. The VVB must ensure that project proponent provides justification on whether the proposed grouped project activity is not a debundled component of a larger grouped project or program.</p>	<p><b>Round 1</b>  <b>VVB Response</b></p> <ol style="list-style-type: none"> <li>1. The project activity is grouped project including distribution of 18,000 ICS (one improved cookstove (ICS) is considered as one instance under the project activity) in Chhindwara district of Madhya Pradesh, India, As a part of the project activity the beneficiary/user of the ICS (instances) has transferred the ownership rights of the carbon assets generated from ICS usage (this project activity) to EKI Energy Services Ltd (project proponent) for which the current project activity is being developed. The project activity is not a de-bundled component as the beneficiary or users of the ICS are different in different project activity and the project boundary of the registered project activity VCS 2473, is not within 1 km of the project boundary of the proposed grouped project activity at the closest point.</li> </ol>	<p>Closed</p>

<p>2. The VVB shall ensure that project proponent provides details of how the stoves from both grouped projects will be uniquely distinguished.</p> <p>3. The VVB must reassess the updated information and revise validation report as needed.</p> <p>Program Rule(s)  <i>VCS Joint Project Description and Monitoring Report Template v4.2, Sections 1.4 and 3.4</i></p>	<p>2. VVB team would like to confirm that, ensuring that the ICS from both grouped projects will be uniquely distinguished each ICS is being assigned with a unique serial number. This number is recorded during the registration process (signing of end user agreement) together with the following beneficiary information: (a) Name of ICS user or head of the household (b) Address/ Village name of ICS household (c) Stove model Distributed (d) Date of distribution/installation (e) ICS serial number (f) Retailer/distributor/Manufacturer information. All the information collected along with the end user agreement are stored in the hard copy and/or electronic database excel sheet which will serve as project database and cross checking to avoid any duplication.</p> <p>3. VVB team verified that, VVB has added the justification in section 1.4 of the Joint VR-VR.</p>	
	<p><b>Verra Response</b>          The VVB team confirmed that the ICS from both grouped projects will be uniquely distinguished each ICS is being assigned with a unique serial number. However, this finding cannot be closed.</p> <p><u>Issue</u>          1. VVB has stated that each ICS shall be uniquely identified, however review team observed that serial number of ICS implemented under the current grouped project is similar to the identification used for ICS belonging to other grouped projects being implemented by PP in the same region. All projects have same alpha numeric code beginning with GHG-22(or 23)/L1 (or L2, L3) followed by a unique numeral code. It is not clear from the Joint PD&amp;MR how PP will ensure that cross movement of stoves do not take place between different projects implemented by PP in the same region which is a possibility considering stove models are also same.</p> <p>Moreover, following issues have been identified in the project database-</p> <p>2. It is observed that for a number of entries in the database, multiple stoves have been registered in the name of same</p>	

		<p>beneficiary.</p> <p>3. There are also a number of entries for which the beneficiary's name does not appear to be correct. Please refer to following list for clarity.</p> <table border="1" data-bbox="1016 386 1554 776"> <thead> <tr> <th>Cook Stove Serial Number</th> <th>Beneficiary Name</th> </tr> </thead> <tbody> <tr> <td>GHG-23/L1/0629447</td> <td>NETO</td> </tr> <tr> <td>GHG-23/L2/0728564</td> <td>MEAN</td> </tr> <tr> <td>GHG-23/L1/0629374</td> <td>CHIOUIS</td> </tr> <tr> <td>GHG-23/L4/0107311</td> <td>OFFANLE</td> </tr> <tr> <td>GHG-23/L2/0734698</td> <td>TETECLYPRNDC</td> </tr> <tr> <td>GHG-22/L3/0747063</td> <td>IDHUJALO</td> </tr> <tr> <td>GHG-23/L2/0729443</td> <td>NEPAL</td> </tr> <tr> <td>GHG-23/L4/0129144</td> <td>PINK</td> </tr> <tr> <td>GHG-23/L1/0709271</td> <td>UASTAX</td> </tr> <tr> <td>GHG-23/L1/0708952</td> <td>ERROFMERT MS</td> </tr> </tbody> </table> <p>Action Required</p> <ol style="list-style-type: none"> <li>1. The VVB must justify how it has validated that stoves belonging to this grouped project will not be moved to other projects implemented by PP in the same region and vice versa.</li> <li>2. VVB must explain how it verified that each beneficiary received only a single ICS.</li> <li>3. VVB to explain the veracity of database in light of above-mentioned inaccuracies.</li> </ol> <p>VVB Response</p> <ol style="list-style-type: none"> <li>1. VVB team verified that, In order to avoid duplicate entries or double counting, the PP keeps a database of dispersed ICS units for each project activity in addition to giving each ICS a unique serial number. This eliminates the possibility of stoves being switched between other projects in the same area. VVB team further verified that, VVB team had checked the baseline survey, monitoring survey &amp; the name of the beneficiaries are found consistent with submitted records. Moreover, VVB team wants to</li> </ol>	Cook Stove Serial Number	Beneficiary Name	GHG-23/L1/0629447	NETO	GHG-23/L2/0728564	MEAN	GHG-23/L1/0629374	CHIOUIS	GHG-23/L4/0107311	OFFANLE	GHG-23/L2/0734698	TETECLYPRNDC	GHG-22/L3/0747063	IDHUJALO	GHG-23/L2/0729443	NEPAL	GHG-23/L4/0129144	PINK	GHG-23/L1/0709271	UASTAX	GHG-23/L1/0708952	ERROFMERT MS	
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		<p>clarify that PP's declaration excludes any double counting by confirming that the ICS is part of the aggregated project will not be utilized to claim credits under other GHG schemes.</p> <ol style="list-style-type: none"> <li>PP has signed the user agreement with the beneficiaries, PP has submitted the database that include name and unique id of ICS and beneficiaries' information to the VVB team, moreover assessment team during the site visit check the user agreement and found that the details of the beneficiaries including their id, ICS id are found that in-line with data base submitted by PP. Thus, VVB team verified that, beneficiary received only a single ICS. .</li> <li>VVB team verified that, PP has submitted the user agreement signed between PP and beneficiaries and it is observed that, the name of the beneficiaries was a typing error which is corrected by the project proponent, updated sheet has been submitted now.</li> </ol> <p><u>Verra response</u></p> <p>The VVB team has clarified that PP's declaration excludes any double counting by confirming that the ICS is part of the aggregated project will not be utilized to claim credits under other GHG schemes and the Project proponent has signed the user agreement with the beneficiaries and during the site visit, the VVB confirmed that beneficiary received only a single ICS and the errors in names were a typing error, and submitted an updated sheet.</p> <p>This finding cannot be closed.</p> <p><b>Round 3</b> <u>Issue</u></p> <p>The VVB has verified that each beneficiary received one stove. However, there appears to be duplicate entries where the beneficiaries' name, phone number and address are the same. In fact, also the unique ID such as "Adhaar ID number" is similar except for the last two digits. Example below</p> <table border="1"> <tbody> <tr> <td>16-Feb-23</td> <td>GHG-23A.07184713</td> <td>PANKAJ VERMA</td> <td>Aadhaar(UID)</td> <td>595375891647</td> <td>9399519939</td> <td>8</td> <td>charyabhurdi</td> <td>amanara</td> <td>CHHINDWARA</td> </tr> <tr> <td>08-Mar-23</td> <td>GHG-23A.07184713</td> <td>PANKAJ VERMA</td> <td>Aadhaar(UID)</td> <td>595375891672</td> <td>9399519939</td> <td>8</td> <td>charyabhurdi</td> <td>amanara</td> <td>CHHINDWARA</td> </tr> <tr> <td>08-Mar-23</td> <td>GHG-23A.07070200</td> <td>KANDEVA</td> <td>Aadhaar(UID)</td> <td>807233181818</td> <td>9251252197</td> <td>08</td> <td>lahaura</td> <td>chhindwara</td> <td>CHHINDWARA</td> </tr> <tr> <td>09-Mar-23</td> <td>GHG-23A.07070463</td> <td>KANDEVA</td> <td>Aadhaar(UID)</td> <td>23872502538</td> <td>9336966179</td> <td>8</td> <td>lahaura</td> <td>chhindwara</td> <td>CHHINDWARA</td> </tr> <tr> <td>13-Feb-23</td> <td>GHG-23A.07273269</td> <td>ANAND</td> <td>Aadhaar(UID)</td> <td>516726831774</td> <td>7389207604</td> <td>10</td> <td>charyabhurdi</td> <td>amanara</td> <td>CHHINDWARA</td> </tr> <tr> <td>13-Feb-23</td> <td>GHG-23A.07273269</td> <td>ANAND</td> <td>Aadhaar(UID)</td> <td>516726831777</td> <td>7389207604</td> <td>10</td> <td>charyabhurdi</td> <td>amanara</td> <td>CHHINDWARA</td> </tr> <tr> <td>08-Mar-23</td> <td>GHG-23A.07070918</td> <td>ANAND</td> <td>Aadhaar(UID)</td> <td>541038001888</td> <td>9719300613</td> <td>08</td> <td>lahaura</td> <td>chhindwara</td> <td>CHHINDWARA</td> </tr> <tr> <td>09-Mar-23</td> <td>GHG-23A.07070918</td> <td>ANAND</td> <td>Aadhaar(UID)</td> <td>54704804388</td> <td>9719300613</td> <td>08</td> <td>lahaura</td> <td>chhindwara</td> <td>CHHINDWARA</td> </tr> </tbody> </table>	16-Feb-23	GHG-23A.07184713	PANKAJ VERMA	Aadhaar(UID)	595375891647	9399519939	8	charyabhurdi	amanara	CHHINDWARA	08-Mar-23	GHG-23A.07184713	PANKAJ VERMA	Aadhaar(UID)	595375891672	9399519939	8	charyabhurdi	amanara	CHHINDWARA	08-Mar-23	GHG-23A.07070200	KANDEVA	Aadhaar(UID)	807233181818	9251252197	08	lahaura	chhindwara	CHHINDWARA	09-Mar-23	GHG-23A.07070463	KANDEVA	Aadhaar(UID)	23872502538	9336966179	8	lahaura	chhindwara	CHHINDWARA	13-Feb-23	GHG-23A.07273269	ANAND	Aadhaar(UID)	516726831774	7389207604	10	charyabhurdi	amanara	CHHINDWARA	13-Feb-23	GHG-23A.07273269	ANAND	Aadhaar(UID)	516726831777	7389207604	10	charyabhurdi	amanara	CHHINDWARA	08-Mar-23	GHG-23A.07070918	ANAND	Aadhaar(UID)	541038001888	9719300613	08	lahaura	chhindwara	CHHINDWARA	09-Mar-23	GHG-23A.07070918	ANAND	Aadhaar(UID)	54704804388	9719300613	08	lahaura	chhindwara	CHHINDWARA	
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		<p><u>Action required.</u> The VVB must justify how they verified that each beneficiary received one single stove when there appear to be duplicate entries in the database.</p> <p><u>PP Response</u> PP has conducted a thorough review and provided the following clarifications and updates to address the concerns raised regarding apparent duplicate entries in the project database:</p> <ol style="list-style-type: none"> <li>1. Beneficiary Identification: PP acknowledges that some entries may appear similar at first glance. However, PP confirms that each entry represents a unique beneficiary. In rural Indian communities, it's common to find multiple individuals with identical names. PP has carefully verified each beneficiary's identity using their unique IDs.</li> <li>2. Updated Database: PP has revised the project database to eliminate any confusion. Each entry now clearly represents a distinct beneficiary who has received a single improved cookstove (ICS).</li> <li>3. Geo-coordinates: To provide unambiguous proof that no household received more than one ICS, PP has added unique geo-coordinates for each household to our database. This allows for precise location verification of each beneficiary.</li> <li>4. Address Information: In many rural Indian villages, standardized addressing systems are not common. House numbers are often absent from official government IDs. Given this, PP has removed the House Number column from our database as it could not be consistently verified and was not adding value to beneficiary identification.</li> <li>5. Phone Numbers: PP recognizes that the use of distributor or community representative phone numbers for multiple beneficiaries created confusion. Many rural beneficiaries do not own personal mobile phones. To address this, PP has removed the phone number column from our database.</li> <li>6. Aadhaar ID Numbers: The similarity in some Aadhaar ID numbers, differing only in the last two digits, was due to typographical errors during data transfer to Excel. PP has corrected these errors in our updated database.</li> </ol>	
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		<p>7. Cross-verification: PP has cross-checked the details of each beneficiary against their respective Carbon Credit Ownership Agreement to ensure accuracy.</p> <p>PP has taken the above steps to guarantee the integrity of their data and to demonstrate clearly that each beneficiary received only one ICS. PP's updated database now provides a more accurate and verifiable record of the project's implementation.</p> <p>VVB Response: VVB team verified that; VVB team has reviewed the beneficiaries name and sample has been generated randomly, no discrepancies have been observed. During site visit no double of ICS found at the beneficiary's house. However, some entries could look same at first inspection. PP affirms that every entry, however, identifies a distinct beneficiary. There is often more than one person with the same name in rural Indian areas. PP has revised the project database to eliminate any confusion. PP also updated our database with each household's distinct geocoordinates. The House Number column was eliminated by PP from our database as it was inconsistently validated and did not enhance beneficiary identification. VVB team has reviewed the data base and found it consistent thus accepted.</p> <p><b>Verra Response</b> An updated database has been submitted.</p> <p>This finding cannot be closed.</p> <p><b>Additional round Issue</b> There are a number of entries in the database for which there is no conclusive evidence of them being uniquely identifiable. The end-user names and contact details are the same and the geo-coordinates also appear to be closely located. VVB has not explained adequately how it assessed such entries to be distinct from each other, the evidence it checked and if any other method was used for cross verification of same.</p> <table border="1" data-bbox="1016 1333 1470 1395"> <thead> <tr> <th>Sr. no</th> <th>Registration number</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>GHG-23/L1/0629315</td> </tr> </tbody> </table>	Sr. no	Registration number	1.	GHG-23/L1/0629315	
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		<p><b>Action Required</b></p>																				
		<ol style="list-style-type: none"> <li>1. The VVB must provide an explanation on the process undertaken for evaluating validity of database.</li> <li>2. As evidence of above, VVB must submit its assessment of unique identification of following project stoves along with the scanned copies of original registration form/stove distribution form for each.</li> </ol>																				
		<p><b>PP Response:</b></p>																				
		<ol style="list-style-type: none"> <li>1. The PP has shared an updated project database that has been thoroughly reviewed, with corrections made where necessary, particularly focusing on clarifying the geographical locations of beneficiaries. To ensure accuracy and eliminate any potential confusion, especially in cases where beneficiaries share the same name or come from the same village or tehsil, the PP has also provided beneficiary agreements and Govt IDs on a random basis for cross-checking purposes. This step was taken to ensure the integrity of the data and to confirm the correct identification of each beneficiary.</li> <li>2. As evidence for the above ICS list provided, the PP has submitted the asked end-user agreements and Govt IDs for the project activity.</li> </ol>																				
		<p><b>VVB Response:</b></p>																				
		<ol style="list-style-type: none"> <li>1. VVB based on host country experience can confirm that it is possible to have people with same first and last name within</li> </ol>																				

		<p>the same village. VVB based on host country experience can confirm that it is possible to have people with same first and last name within the same village. Further, in the host country, villages, even towns have houses which are very next to each other / on the same land parcel (e. g. multiple families living on the same land parcel. in huts/rooms/other form of shelter). Hence, finding persons with same first and last name, having geographical co-ordinates very closely located is quite possible and is acceptable to the VVB. For end users with the same or similar names and geolocation, VVB had asked to provide beneficiary agreements or government IDs at random. VVB has confirmed that the database entries are accurate because of this document. Additionally, VVB has verified that the contact information, name, and address provided for each stakeholder differ from one another, as indicated by the corresponding information in the beneficiary agreements. During the on-site inspection, it was verified that not every end user had access to a phone or mobile device; as a result, PP does not consider this, which is acceptable.</p> <p>2. The paragraph above refers to the VVB's assessment of each project instance's unique identity, which is done through the beneficiary agreements (original registration forms/stove distribution forms) and each one's government ID. VERRA is receiving the supportive.</p> <p>Verra response</p> <p>The VVB explained that it is possible to have people with same first and last name within the same village. The PP has provided the government IDs and the end user agreement to validate the users in the database with similar names. This finding is closed and no further action is required.</p>	
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<b>6</b>	<b>Lack of clarification on the sample size</b>		
		<b>Round 1</b>	closed

<p><b>Issue</b></p> <p>Sampling is done for two parameters monitored ex-post. The VVB calculated an acceptance sample of 8. It is unclear whether the data was based on dual sampling for these two parameters.</p> <p>The VVB also states ‘8 randomized samples for each state’. The number of states involved is not specified.</p> <p>The VVB does not justify the selected AQL and UQL given the small sample size and India is not an LDC or with less than 10 CDM projects (CDM Sampling standard para. 39). Further for AQL of 1% and UQL of 20%, 5% producer risk and consumer risk of 20%, the acceptance sample will be 14, with acceptance number as 1. Therefore, their sample size of 8 is questionable.</p> <p><b>Action item</b></p> <ol style="list-style-type: none"> <li>The VVB must clarify whether the data was based on dual sampling for these two parameters, or to justify why a minimum of 8 is appropriate</li> <li>The VVB must specify the number of states involved in the randomised sample under Section 2.1 of the validation report.</li> <li>The VVB must justify the selected sample size and how the sample size of 8 was derived under Section 2.4 of the VCS joint VR/VR</li> </ol> <p><u>Program rule(s)</u></p> <p>VCS Joint Validation and Verification Report Template v4.2, Sections 2.1 and 2.4</p>	<p><u>VVB Response</u></p> <ol style="list-style-type: none"> <li>The two ex-post, <math>N_{y,i,j}</math> , <math>B_{y=1,new,I,j,survey}</math> are both covered by single monitoring survey so no dual sampling was done as one monitoring survey consist of covered both parameter.</li> <li>VVB team has specify the state name Madhya Pradesh which is involved in randomized sampling in section 2.1 of the joint validation verification report.</li> <li>VVB team would like to confirm that, producer risk 5% was a typing error, which is corrected now as per 10% of producer risk on the basis of that sample size is 8 selected. The detailed explanation regarding selected sampling size is now updated in section 2.1 of the Joint Validation and verification report.</li> </ol>	<p>closed</p>
	<p><u>Verra Response</u></p> <p>The VVB has clarified that the sampling for these two parameters <math>N_{y,i,j}</math> , <math>B_{y=1,new,I,j,survey}</math>, and how the minimum of 8 was selected, including the states from which the randomised sample was drawn. This finding is now closed, and no further response is required.</p>	

<b>7</b>	<b>Inconsistent technical weight of the ICS</b>		
<p><b>Issue</b></p> <p>The Weight of the ICS is 3.8kg in Section 1.11 and 3.3kg in Section 2.2 of the VCS joint PD/MR.</p>	<p><b>Round 1</b></p> <p><u>VVB Response</u></p> <p>VVB team verified that, proponent has corrected the information under section 2.2 regarding the weight of ICS is corrected to 3.8 kg in revised PD&amp;MR.</p>	<p>closed</p>	

<p><b>Action item</b></p> <p>4) The VVB must ensure that the project proponent corrects this inconsistency in the technical specifications of the ICS.</p> <p><u>Program rule(s)</u></p> <p>VCS Joint Project Description and Monitoring Report Template v4.2, sections 1.11 and 2.2</p>	<p><u>Verra Response</u></p> <p>This finding is now closed, and no further response is required.</p>	
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<p><b>8 Monitoring Survey</b></p>		
<p><u>Issue</u></p> <p>According to the VCS joint PD/MR (page #5), the monitoring survey for the first monitoring period of the parameters Ny,i,j and By=1,new,i,j,survey was conducted between 18 April 2023 and 23 April 2023. With this timing, it is not clear how it was determined that the ICS distributed between 23 April 2023 to 30 April 2023 were installed and operational and why they were not considered for the monitoring.</p> <p><u>Action Required</u></p> <p>The VVB shall confirm how they have assessed the appropriateness and validity of the outcome of this monitoring survey conducted before monitoring period.</p> <p><u>Program Rule(s)</u></p> <p>VCS Validation and Verification Report Template, v4.2, Section 4.1</p>	<p><b>Round 1</b></p> <p><u>VVB Response</u> (Pending)</p> <p>VVB team confirms that, 18,000 Nos. of ICS were distributed between the 22-Jan-2023 to 9-April-2023. Since the monitoring survey was carried out between 18 April 2023 and 22 April 2023 therefore there has been no issue in assessing the operation of any ICS distributed under the project activity as all the ICS were distributed prior to the monitoring survey. PP has submitted the baseline survey and monitoring survey report. VVB team checked the monitoring survey report and found it consistent.</p> <p><u>Verra Response</u></p> <p>The distribution of ICS ended on 9 April 2023; however, this finding cannot be closed.</p> <p><u>Issue</u></p> <ol style="list-style-type: none"> <li>1. It is unclear how the VVB was able to confirm that the ICS were operational between 23 April 2023 to 30 April 2023 since survey for Ny,i,j was carried out between 18<sup>th</sup> to 22<sup>nd</sup> April 2023.</li> <li>2. In section 6.2 of joint PD&amp;MR, PP has mentioned that B<sub>y new survey</sub> is 'Determined in the first year of the introduction of the devices (e.g., during the first year of the crediting period, y=1) through measurement campaigns at representative households and/or</li> </ol>	<p>closed</p>

		<p>sample surveys’ however, there is no clarity on the approach used for measurement of this parameter. Moreover, no detail has been provided with respect to make, model, accuracy class, calibration etc of the measuring instrument.</p> <p><b>Action Required</b></p> <ol style="list-style-type: none"> <li>1. The VVB must explain how they confirmed that ICS were operational between 23 April 2023 to 30 April 2023.</li> <li>2. VVB must ensure that PP includes all details with respect to monitoring of <math>B_{y \text{ new survey}}</math> in section 6.2 of joint PD&amp;MR.</li> </ol> <p><b>VVB Response-</b></p> <ol style="list-style-type: none"> <li>1. VVB team had conducted the onsite audit of project activity on 1-May-2023 to 2-May-2023 and visited a randomly selected set of cook stoves and performed a site assessment and found that every single one of them was working. It was confirmed from the project beneficiaries that they have been continuously using the ICS since the day they have received and they have not faced any issue so far. Also PP customer service number in case of any damaged happened to the ICS or in-case of any service ICS required.</li> <li>2. VVB team verified that, PP has added the required details in section 6.2 of the Joint PD&amp;MR, Same has s been updated in section 4.1 of final joint validation and verification report. Moreover the calibration details of the weighing scale is found inline with calibration certificate.</li> </ol> <p>Verra response</p> <p>The VVB has now explained how they confirmed that ICS were operational between 23 April 2023 to 30 April 2023, and also included more details on the monitoring of <math>B_{y \text{ new survey}}</math> under Section 4.1 of the VCS joint PD/MR. This finding is now closed, and no further response is required.</p>	
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**Comparison of the calculated value against scientific literature**

**Delineation of project boundary for fNRB estimation**

Fraction of woody biomass that is established as non-renewable is estimated in accordance to the guidelines stipulated under Tool 30. The basis of estimation of the fraction of non-renewable biomass includes estimation of the proportion of the biomass consumed that have not been sustainably extracted/harvested. It’s worthwhile to note that fuel wood consumption (*Bošković, Chakravorty, Pelli, & Risch, January 2023*) are the major drivers of deforestation in India and are result of unsustainable extraction/harvest. The consideration of the subnational/ state boundary for estimation of  $f_{NRB}$  is based on the delineation of forest boundary by Government of India for the purpose of regulation and conservation of the forest. In addition, following justification are also outlined to establish the consideration of subnational boundary for estimation of  $f_{NRB}$ .

1. The ecological conditions differ at the subnational level in India resulting in difference in the mean-annual increment/ growth of wood biomass within and outside forest area resulting in the difference of the sustainably extraction potential of woody biomass across a defined geography. This is also justified by the fact the availability of the land area under forest and for trees outside forest differs across state resulting in the difference of the sustainably extraction potential of woody biomass to cater the local demand of wood.
2. The “forest” although on Concurrent list of Indian Constitutions its delineation/ boundary is defined at a subnational level. As the regulatory provision of Forest Conservation Act 1980 and Forest Conservation Rules 2003 allowing wood harvest are supervised by the State Forest Department, it does not allow cross boundary wood extraction/harvest and therefore the state boundary is considered for estimation of the supply provision.
3. The regulatory provision as stipulated under “The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006” allows collection of NTFP including firewood for traditional forest dwellers only , thereby restricting the forest rights locally without provision of cross boundary collection.
4. Since most of the woody biomass used as fuel wood (mostly at the village and peri urban area) are collected locally therefore the state/subnational boundary is most appropriate for estimation of fuel wood demand and supply.

Also, as per para 6 b of tool 30, the selection of project area is allowed (the country/region or the project area (hereinafter referred as the applicable area)), thus consideration of state for calculation of  $f_{NRB}$  is appropriate.

**Comparison of the calculated value against scientific literature.**

$f_{NRB}$  is estimated as ratio of the Quantity of non-renewable biomass (NRB) consumed in the applicable area and summation of the quantity of non-renewable biomass (NRB) and quantity of renewable biomass (RB). NRB as specified under the tool is estimated as difference of total consumption of woody biomass (H) and quantity of renewable biomass. In accordance to paragraph 6 of tool 30 the section below compares and analyse the calculated values against the values for  $f_{NRB}$  reported in relevant scientific literature and justify the differences

**1. Total Wood Consumption**

- a. The entire rationale of  $f_{NRB}$  is developed around the unsustainable extraction/ harvest of wood for fuels and for commercial applications. As per the relevant scientific literature (Bailis, Drigo, & Ghilardi, 2015) referred to under Tool 30, the  $f_{NRB}$  or rather NRB (as stated in the report) is estimated based on the **wood fuel demand** (only) considering 2009 as base year<sup>14</sup>. In accordance to equation 3 of Tool 30 the total wood demand is to be estimated as sum of average consumption of wood fuel per household, including fuelwood and charcoal, commercial woody biomass consumption for energy applications and commercial woody biomass consumption for non-energy applications and not only the demand of wood fuel as has been considered in the literature. Since estimate of  $f_{NRB}$  is directly proportional to quantity of wood consumed the consideration of wood fuel only might have resulted in lower  $f_{NRB}$  value presented in the literature in compared to that have been estimated for the purpose of estimation of GHG emission avoidance. The table below presents wood consumption in the state of Madhya Pradesh based on secondary information.

Consumer type	Quantity	Cumulative Consumption	Percentage of total consumption
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<sup>14</sup> Pg 2 of the relevant literature

Domestic	13.67 million tonnes	13.67 million Tonnes <sup>15</sup>	83%
Commercial Wood Consumption	1.149 million tonnes	1.78 million Tonnes <sup>16</sup>	7%
Small timber by Forest Infringe	0.964 million tonnes	0.964 million Tonnes <sup>17</sup>	6%
Bamboo collection by million tonnes	0.63 million tonnes	0.63 million Tonnes <sup>18</sup>	4%

- b. The total consumption of woody biomass in the state of Madhya Pradesh is conservatively considered from report published by MoEFCC (Ministry of Environment, forest and Climate Change, Government of India) in 2011<sup>19</sup> (MoEFCC, 2011) is more recent data in compared to that used in the referred literature (2009 data<sup>20</sup> extracted from wood fuel demand available from national and sub-national studies supplemented by data from the Food and Agriculture Organization (FAO), International Energy Agency (IEA), and United Nations (UN)). Since the publication of the wood demand by MoEFCC (Official statistics) is line with the provision of Data / Parameter table 1 of Tool 30. Therefore, consideration of the information related to wood consumption is deemed to be appropriate.
- c. Moreover, cross verification has been made to assess the wood fuel demand (83% of the cumulative wood demand)<sup>21</sup> in the state Madhya Pradesh using alternate approach as specified under Equation 3 of the Tool 30 and the MoEFCC estimated value of fuel wood demand for the state of Madhya Pradesh are found to be more conservative and used for the estimation of the total consumption of woody biomass.

<sup>15</sup> [https://fsi.nic.in/cover\\_2011/chapter7.pdf](https://fsi.nic.in/cover_2011/chapter7.pdf)

<sup>16</sup> [https://fsi.nic.in/cover\\_2011/chapter7.pdf](https://fsi.nic.in/cover_2011/chapter7.pdf)

<sup>17</sup> Estimated based on the small timber consumption value obtained from <https://fsi.nic.in/isfr19/vol1/chapter10.pdf> and wood density of specific species sourced from <https://www.fao.org/3/w4095e/w4095e0c.htm#TopOfPage>

<sup>18</sup> <https://fsi.nic.in/isfr19/vol1/chapter10.pdf>

<sup>19</sup> *India State of Forest Report*. [https://fsi.nic.in/cover\\_2011/chapter7.pdf](https://fsi.nic.in/cover_2011/chapter7.pdf).

<sup>20</sup> Pg 2 of the referred literature

<sup>21</sup> Against wood fuel demand specified in the MoEFCC report

Parameters	Value	Unit	Source	
Total Population	72626809	Nos.	Census 2011	<a href="https://censusindia.gov.in/census.website/data/census-tables">https://censusindia.gov.in/census.website/data/census-tables</a>
Rural Population	52557404	Nos.	Census 2011	<a href="https://censusindia.gov.in/census.website/data/census-tables">https://censusindia.gov.in/census.website/data/census-tables</a>
Total Household	15093256	Nos.	Census 2011	<a href="https://censusindia.gov.in/census.website/data/census-tables">https://censusindia.gov.in/census.website/data/census-tables</a>
Rural Household	11080278	Nos.	Census 2011	<a href="https://censusindia.gov.in/census.website/data/census-tables">https://censusindia.gov.in/census.website/data/census-tables</a>
Persons/household (Rural)	4.74			
Rural Household using firewood	93.8%		NSS Report No. 558: Household Consumption of Various Goods and Services in India, 2011-12	<a href="https://www.mospi.gov.in/sites/default/files/publication_reports/Report_no558_rou68_30june14.pdf">https://www.mospi.gov.in/sites/default/files/publication_reports/Report_no558_rou68_30june14.pdf</a>
Default per capita firewood usage	0.4	ton/capita	Tools for $f_{NRB}$ calculation	
Default per capita firewood usage	0.4	ton/capita	Tools for $f_{NRB}$ calculation	
Rural Household firewood usage	1.897	tonne/annum		
Total Firewood usage (rural)	19.72	million tonnes		
<b>Total Firewood usage</b>	<b>19.72</b>	<b>million tonnes</b>		

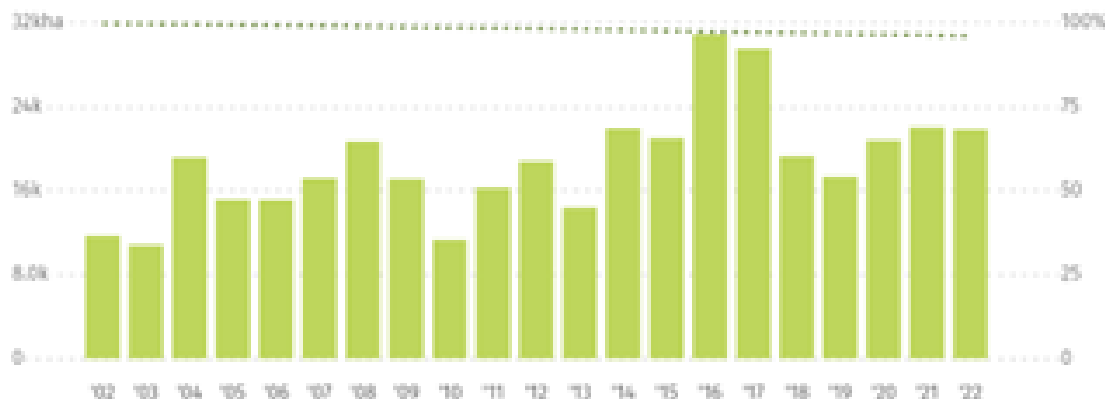
Therefore, from above it can be inferred that the wood consumption considered for estimation of  $f_{NRB}$  are more recent, conservative and authentic (as published by Govt of India entitled agency)

## 2. Renewable Biomass

In accordance to Paragraph 19, Equation 4 of Tool 30 renewable biomass (RB) available in the applicable area is estimated as factor of annual Increment of woody biomass in forest and non-forest area. The Renewable biomass component as estimated under the project activity considers plantation across both forest and non -forest area published by MoEFCC in 2021 and mean annual increment of different Indian forest type published for national level. On the other hand, the renewable biomass component as estimated in the referred literature is based on the satellite image of a particular locations during 2009.

The quantum of renewable biomass available in a particular geography is a factor of deforestation. The status of deforestation in India as articulated below through review of secondary literature is in contradiction to referred literature (Bailis, Drigo, & Ghilardi, 2015) that highlight the afforestation aspects of state forest in India.

In accordance to Global Forest Watch<sup>22</sup>, India lost 393 kha of humid primary forest between 2002-2022 making up 18% of its total tree cover loss in the same time period and equivalent to decrease in total area of humid primary forest in India by 3.9%. The year wise deforestation is presented in the figure below.



The deforestation also includes loss of 2.19 Mha of tree cover, equivalent to a 5.6% decrease in tree cover since 2000. The deforestation in the country is also confirmed by report published by “Down to Earth” which outlines a deforestation of 668,400 hectares (ha), between 2015 to 2020 (2<sup>nd</sup> country after Brazil)<sup>23,24</sup>. The deforestation is inordinately high when compared to the 384,000 ha of forests between 1990 and 2000.

### 3. Difference in AGB

AGB/ Above Ground Biomass is the key component for estimation of Renewable biomass in the referred literature and clearly articulate the difference with the nationally published statistics

Referred Literature	India State of forest Report 2021
15067 million tones	2319 million tonnes

<sup>22</sup> <https://www.globalforestwatch.org/dashboards/country/IND/?category=undefined>

<sup>23</sup> <https://www.downtoearth.org.in/news/wildlife-biodiversity/india-lost-668-400-ha-forests-in-5-years-2nd-highest-globally-report-88337>

<sup>24</sup> <https://indiacr.in/india-has-lost-around-668400-hectares-of-forestry-to-deforestation-2nd-highest-in-the-world/>

Since RB is inversely proportional to fNRB estimate therefore higher RB is resulting in lower fNRB as depicted in the referred literature.

#### 4. Approach of Estimating fNRB

In accordance to the referred literature recent maps of land cover and ecological zones are being assigned an AGB stock using three types of sources 1) AGB distribution maps, 2) geo-referenced field plots, and 3) forest inventories from known locations for specific forest types where AGB distribution was derived from different datasets. To accommodate disagreements in the datasets, woody components not typically used for woodfuels (twigs, leaves, and stumps), to build a map of “Dendro-energy” biomass (DEB) stock are subtracted. The wood fuel supply is then estimated as the “mean annual increment” (MAI) of DEB, which is modeled via a functional relationship between ~2,800 spatially explicit field observations of MAI and corresponding AGB. Land cover change is accommodated by estimating the amount of DEB produced by deforestation and afforestation processes based on data from FAO using data from Forest Monitoring for Action (FORMA). Such approach although a peer-reviewed is not in line with paragraph 19 that outlines the approach for estimation of quantity of renewable biomass.

#### Conclusion

The above justification clearly articulates the appropriateness of the fNRB estimate in line with the Tool 30.

PP has used most recent data available for calculation of FnrB which is in line with para 10 of tool 30 which says “10. In the case of ex ante calculation of fNRB, the parameter fNRB shall be estimated using the most recent historical year for which data is available”

#### BIBLIOGRAPHY

Bailis, R., Drigo, R., & Ghilardi, A. &. (2015). *The carbon footprint of traditional woodfuels*. Nature Climate Change.  
MoEFCC. (2011). *India State of Forest Report*. [https://fsi.nic.in/cover\\_2011/chapter7.pdf](https://fsi.nic.in/cover_2011/chapter7.pdf).

State wise AGB<sup>25</sup>( Source: Chapter 13, State of Forest Report 2021, by the Forest Survey of India, an organisation under the Ministry of Environment, Forest and Climate Change (MoEFCC), Govt of India )

State/UT	AGB (million Tonnes)
Andhra Pradesh	63.951
Arunachal	340.351
Assam	87.07
Bihar	14.743
Chhattisgarh	152.714
Delhi	0.263
Goa	8.863
Gujrat	28.602
Haryana	2.326

<sup>25</sup> Above Ground Biomass

State/UT	AGB (million Tonnes)
Himachal Pradesh	114.269
Jharkhand	51.017
Karnataka	122.741
Kerala	61.802
Madhya Pradesh	171.587
Maharashtra	137.831
Manipur	47.59
Meghalaya	55.241
Mizoram	48.157
Nagaland	39.339
Odisha	131.015
Punjab	3.42
Rajasthan	26.714
Sikkim	18.024
Tamil Nadu	60.459
Telangana	44.413
Tripura	24.349
UP	32.543
Uttarakhand	159.674
WB	45.365
Andaman	47.56
Chandigarh	0.047
Dadra NH	0.558
J&K	163.897
Ladakh	13.293
Lakshadweep	0.046
Puducherry	0.076
	2319.91

