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Validation Report

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VALIDATION OF THE CDM-PROJECT: INDIA: HIMACHAL PRADESH REFORESTATION PROJECT – IMPROVING LIVELIHOODS AND WATER- SHEDS

REPORT NO. 1309006

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TÜV SÜD Industrie Service GmbH
Carbon Management Service
Westendstr. 199 - 80686 Munich – GERMANY

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Subject: Validation of a CDM Project			
Accredited TÜV SÜD Unit: TÜV SÜD Industrie Service GmbH Certification Body "climate and energy" Westendstr. 199 80686 Munich, Germany		TÜV SÜD Contract Partner: TÜV SÜD Industrie Service GmbH Carbon Management Service Westendstr. 199 80686 Munich Germany	
Project Participant: Mid-Himalayan Watershed Development Project (MHWDP) International Bank for Reconstruction and Development as a trustee for BioCarbon Fund Kingdom of Spain		Project Site(s): Regions of Dharamshala and Bilaspur in the state of Himachal Pradesh, India. The PDD includes information on geographic boundary. Digital boundary files are provided jointly with this report (submitted as shape-file, in compliance with EB 41 guidance item 34).	
Project Title: India: Himachal Pradesh Reforestation Project – Improving Livelihoods and Watersheds			
Applied Methodology / Version:		Scope: 14 Technical Area(s): 14.2 and 14.3	
AR-ACM0001 / Version 03			
First PDD Version: Date of issuance: 26 Jan 2009 Version No.: 01 Starting Date of GSP 07 Apr 2009		Final PDD version: Date of issuance: 25 Nov 2010 Version No.: 06	
Estimated GHG removal:		828,016 t CO ₂ -e after the 20 year crediting period (=41,400 t CO ₂ -e average annual GHG removal)	
Assessment Team Leader: Sebastian Hetsch Validator: Juan Chang Martin Schröder		Technical Reviewer Robert Scharpenberg Certification Body responsible: Thomas Kleiser	
Summary of the Validation Opinion: <input checked="" type="checkbox"/> The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence to determine the fulfilment of all stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM. Hence TÜV SÜD is recommending the project for registration by the CDM Executive Board if letters of approval of all Parties involved will be available before the expiring date of the applied methodology(ies) or the applied methodology version respectively. <input type="checkbox"/> The review of the project design documentation and the subsequent follow-up interviews did not provide TÜV SÜD with sufficient evidence to determine the fulfilment of all stated criteria. Hence TÜV SÜD will not recommend the project for registration by the CDM Executive Board and will inform the project participants and the CDM Executive Board on this decision.			

Abbreviations

AR-ACM	Approved Consolidated Methodology for Afforestation and Reforestation
AR-AM	Approved Methodology for Afforestation and Reforestation
AR-AMS	Approved Methodology Small Scale for Afforestation and Reforestation
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM-EB	CDM Executive Board
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
CR / CL	Clarification Request
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
EIA / EA	Environmental Impact Assessment / Environmental Assessment
ER	Emission Reduction
FAR	Forward Action Request
FSC	Forest Stewardship Council
GHG	Greenhouse Gas(es)
GIS	Geographic Information System
GPG	Good Practice Guidance
GPS	Global Positioning System
IPCC	Intergovernmental Panel on Climate Change
IRL	Information Reference List
IRR	Internal Rate of Return
KP	Kyoto Protocol
LULUCF	Land-Use, Land-Use Change and Forestry
MP	Monitoring Plan
NGO	Non Governmental Organisation
PDD	Project Design Document
PP	Project Participant
tCER	temporary Certified Emission Reduction
TARAM	Tool for Afforestation and Reforestation Approved Methodologies (spreadsheet based calculation tool)
TÜV SÜD	TÜV SÜD Industrie Service GmbH
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual

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INTRODUCTION

1.1 Objective

The validation objective is an independent assessment by a Third Party, a Designated Operational Entity (DOE) of a proposed project activity against all defined criteria set forth by the registration under the Clean Development Mechanism (CDM). Validation is part of the CDM project cycle and results in a conclusion by the executing DOE whether or not a project activity is valid and should be submitted for registration to the CDM Executive Board (CDM-EB). The ultimate decision on the registration of a proposed project activity rests with the CDM-EB and the Parties involved.

The project activity covered by this validation report was submitted under the following project title: “India: Himachal Pradesh Reforestation Project – Improving Livelihoods and Watersheds”.

1.2 Scope

The scope of any assessment is defined by the underlying legislation, regulation and guidance given by relevant entities or authorities. In the case of CDM project activities the scope is set by:

- The Kyoto Protocol, in particular § 12 and modalities and procedures for the CDM
- Decision 2/CMP1 and Decision 3/CMP.1 (Marrakech Accords)
- Further COP/MOP decisions with reference to the CDM (e.g. decisions 4 – 8/CMP.1)
- Decisions and specific guidance by the EB published under <http://cdm.unfccc.int>
- Guidelines for Completing the Project Design Document (CDM-AR-PDD), and the Proposed New Baseline and Monitoring Methodology (CDM-AR-NM)
- Baselines and monitoring methodologies (including GHG inventories)
- Management systems and auditing methods
- Environmental issues relevant to the applicable sectoral scope
- Applicable environmental, social impacts, and aspects of CDM project activity
- Sector specific technologies and their applications
- Current technical and operational knowledge of the specific sectoral scope and information on best practice

The validation is not meant to provide any consulting towards the project participant (PP). However, stated requests for clarifications, corrective actions, and/or forward actions may provide input for improvement of the project design.

Once TÜV SÜD receives the PDD, it is made publicly available at the UNFCCC webpage and at TÜV SÜD's webpage to start a 45 day global stakeholder consultation process (GSP). In special circumstances, such as when a project design changes, the GSP may need to be repeated. Information on the PDDs is presented on page 1 of this report.

The purpose of a validation is to demonstrate compliance or non-compliance of the project with all stated and valid CDM requirements. Additionally, the purpose of validation is to enable the registration of CDM projects, which is only a part of the total CDM project cycle. Therefore, TÜV SÜD cannot be held liable by any party for decisions made, or not made, based on the validation opinion that go beyond this purpose.

2 METHODOLOGY

The project assessment applies standard auditing techniques to assess the correctness of the information provided by the project participants. The assessment is based on the “Clean Development Mechanism Validation and Verification Manual” version 1.02. The work starts with the appointment of the team covering the technical scope(s), technical area(s) and relevant host country experience for evaluating the CDM project activity. Once the project is made available for the stakeholder consultation process, members of the team carry out the desk review, follow-up actions, resolution of issues identified, and finally preparation of the validation report. The prepared validation report and other supporting documents then undergo an internal quality control by the CB “climate and energy” before submission to the CDM-EB.

In order to ensure transparency, assumptions are clear and explicitly stated; the background material is clearly referenced. TÜV SÜD developed methodology-specific checklists and protocol customised for the project. The protocol shows, in a transparent manner, criteria (requirements), the discussion of each criterion by the assessment team, and the results from validating the identified criteria.

The validation protocol serves the following purposes:

- To organize the details and provision of clarifications on the requirements of which a CDM project is expected to meet
- To elucidate how a particular requirement has been validated as well as to document the results of the validation and any adjustments made to the project design document.

The validation protocol consists of three tables. The different columns in these tables are described in the figure below.

Validation Protocol Table 1: Conformity of Project activity and PDD				
Checklist Topic / Question	Reference	Comments	PDD in GSP	Final PDD
<i>The checklist is organised in sections following the arrangement of the applied PDD version. Each section is then sub-divided. The lowest level constitutes a checklist question / criterion.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found in case the comment refers to documents other than the PDD.</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is used to explain the conclusions reached. In some cases sub-checklist are applied indicating yes/no decisions on the compliance with the stated criterion. Any Request has to be substantiated within this column</i>	<i>Conclusions are presented based on the assessment of the first PDD version. This is either acceptable based on evidence provided (☑), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). Clarification Request (CR) is used when the validation team identified a need for further clarification. Forward Action Request (FAR) to highlight issues related to project implementation that requires review during the first verification.</i>	<i>Conclusions are presented in the same manner based on the assessment of the final PDD version and further documents including assumptions presented in the documentation.</i>

Validation Protocol Table 2: Resolution of Corrective Action and Clarification Requests			
Clarifications and corrective action requests	Ref. to table 1	Summary of project owner response	Validation team conclusion
<i>If the conclusions from table 1 are a Corrective Action, a Clarification or a Forward action Request, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 1 where the issue is explained.</i>	<i>The responses given by the client or other project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the discussion on and revision to project documentation together with the validation team's responses and final conclusions. The conclusions should be reflected in Table 1, under "Final PDD".</i>

In case of a denial of the project activity more detailed information on this decision will be presented in Table 3. Table 3 is also used for listing of any Forward Action Request.

Validation Protocol Table 3: Unresolved Corrective Action, Clarification Requests, Forward Action Requests			
Clarifications Request, Corrective Action Request, Forward Action Request	Id. of CAR / CR / FAR	Explanation of the Conclusion for Denial, or Background of Forward Action Request	
<i>Referenced request if final conclusions from table 2 resulted in a denial.</i>	<i>Identifier of the Request.</i>	<i>Detailed explanation of why the project is considered non-compliant with a criterion and a clear reference to the criterion</i>	

The completed validation protocol is enclosed in Annex 1 to this report.

2.1 Appointment of the Assessment Team

According to the technical scopes and experiences in the sectoral or national business environment TÜV SÜD composed a project team in accordance with the appointment rules of the TÜV SÜD certification body "climate and energy". The composition of an assessment team has to be approved by the Certification Body (CB) to assure that the required skills are covered by the team. The CB TÜV SÜD operates five qualification levels for team members that are assigned by formal appointment rules:

- Assessment Team Leader (ATL)
- Greenhouse Gas Validator (Validator) and Verifier (Verifier)
- Greenhouse Gas Auditor Trainee (T)
- Experts (E)
- Technical Reviewer (TR)

It is required that the sectoral scope linked to the methodology has to be covered by the assessment team.

Assessment Team:

Name	Qualification	Coverage of scope	Coverage of technical area	Host country experience
Sebastian Hetsch	ATL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Juan Chang	Validator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Martin Schröder	Validator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Sebastian Hetsch is appointed as Assessment Team Leader (ATL) and GHG-Validator by the certification body "climate and energy" of TÜV SÜD. Mr Hetsch holds a university degree in forest science. He passed extensive training on auditing of GHG projects. Before joining TÜV SÜD he worked for several years in the field of international forest policy and management at the United Nations' Food and Agricultural Organization (FAO) and at university.

Juan Chang is appointed as GHG-Validator by the certification body "climate and energy" of TÜV SÜD. He is a forest engineer with more than ten years working experience in forestry and land-use related projects. Since 2007 he has participated in more than ten audits as member of the Audit Team for forestry projects under the CDM and different voluntary standards. He has successfully taken part in the training program for GHG auditors developed by TÜV SÜD.

Martin Schröder is appointed as GHG-Validator by the certification body "climate and energy". He holds a Masters degree in forestry and passed successfully internal training schemes in the field of auditing as well as the technical features of landfill and energy related projects. Before entering the company, he worked in the field of development projects in the Amazon Region and managed forestry based carbon offset projects.

2.2 Review of Documents

The PDD for the GSP was submitted by the PP to the DOE in January 2009. This PDD version and additional background documents related to the project design and baseline were reviewed to verify the correctness, credibility, and interpretation of the presented information. As a further step of the validation process, information provided by the PP was cross-checked with information from other sources (if available). A complete list of all documents and proofs reviewed is attached as Annex 2 to this report.

2.3 Follow-up Interviews

On 08-18 April 2009, TÜV SÜD performed interviews with project stakeholders and physical site inspection to confirm relevant information, and to resolve issues identified in the first document review. The table below provides a list of all persons interviewed in this context.

Name	Organisation
Rama Reddy	World Bank officer
Ranjan Samantaray	Senior NRM World Bank officer
Indu K. Murthy	Indian Institute of Science
Ravindranath	Indian Institute of Science
S.D. Sharma	HP MHWP

R.K. Kapoor	Chief Project Director HP MHWP
Arvind Kumar	Executive Director HP MHWP
Subhash Ashutosh	Joint Director Forest Survey of India

2.4 Cross-check

During the validation process the team made reference to available information related to similar projects or technologies as the CDM project activity. The documentation was also reviewed against the approved methodology applied to confirm the appropriateness of formulae and correctness of calculations.

2.5 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to resolve the requests for corrective actions, clarifications, and any other outstanding issues which need to be clarified for TÜV SÜD's conclusion on the project design. The CARs and CRs raised by TÜV SÜD are resolved during communication between the client and TÜV SÜD. To guarantee the transparency of the validation process the concerns raised and responses that were given are documented in more detail in the validation protocol in Annex 1.

The final PDD version submitted in November 2010 served as the basis for the final assessment presented. Changes are not considered to be significant with respect to the qualification of the project as a CDM project based on the two main objectives of the CDM: an achievement of reduction of anthropogenic GHG emissions and a contribution to sustainable development.

2.6 Internal Quality Control

Internal quality control is the final step of the validation process and is conducted by the CB "climate and energy" who checks the final documentation, which includes the validation report and annexes. The completion of the quality control indicates that each report submitted has been approved either by the head of the CB or the deputy (a veto person is used if necessary). In projects where either the Head of the CB or his/her deputy is part of the assessment team, the approval is given by the one not serving on the project team.

After confirmation of the PP the validation opinion and relevant documents are submitted to the EB through the UNFCCC web-platform.

3 SUMMARY

The assessment work and the main results are described below in accordance with the VVM reporting requirements. The reference documents indicated in this section and Annex 1 are listed in the Information Reference List (IRL) in Annex 2.

3.1 Approval

The project participants are (i) the Mid-Himalayan Watershed Development Project (MHWDP), (ii) the International Bank for Reconstruction and Development as Trustee of the BioCarbon Fund, and (iii) Spain as Party to the Kyoto Protocol. The host Party India and further participant party Spain meet the requirements to participate in the CDM.

The DNA of India issued a LoA (IRL 3) on 07 July 2009 authorizing the Mid-Himalayan Watershed Development Project as a project participant. The DNA of Spain also issued a LoA (IRL 4) on 02 December 2009, authorizing the International Bank for Reconstruction and Development as Trustee of the BioCarbon Fund as a project participant. TÜV SÜD received these letters from the project participants and considers the provided letters as authentic.

Both letters were issued by the respective Party's DNA: the "Ministry of Environment and Forest" of India, and the Spanish "Oficina Española de Cambio Climático, Ministerio de Medio Ambiente y Medio Rural y Marino".

The authenticity of the Indian LoA was confirmed through their website (IRL 130); the authenticity of the Spanish LoA was confirmed by email from the Spanish DNA to the DOE (IRL 129).

TÜV SÜD confirms that both letters refer to the precise proposed CDM project activity title in line with the title in the PDD "India: Himachal Pradesh Reforestation Project – Improving Livelihoods and Watersheds".

Both letters also indicate that each participating Party is a Party to the Kyoto Protocol, and that the participation in the "India: Himachal Pradesh Reforestation Project – Improving Livelihoods and Watersheds" project is voluntary. The Indian LoA also confirms that the proposed CDM project activity contributes to the sustainable development of India (host country).

Based on the information given in these letters, TÜV SÜD considers the approval as unconditional with respect to these items. TÜV SÜD considers that the requirements of VVM (§§ 45-48) are met.

3.2 Participation

The participants of the project activity were approved by the corresponding Parties, which is confirmed with the issued LoAs. The means of validation used are the same as described in section 3.1, specifically in regard to the approval process of the project activity.

3.3 Project design document

The PDD complies with the relevant form and guidance provided by UNFCCC. The PDD was updated to the most recent version of the template (version 05). TÜV SÜD considers that the guidelines for the completion of the PDD in their most recent version were followed. Relevant information was provided by the participants in the applicable PDD sections. Completeness was assessed through the checklist included in Annex 1 of this report.

3.4 Project description

The following description of the project as per PDD was verified during the on-site audit:

The project activity consists of reforestation of 4003.07 ha of degraded lands with native species in order to facilitate, among others, the production fuel wood and non timber forest products like fruits and fodder collection for livestock. The project area is located on North-Western Himalayan region of India in the regions of Dharamsala and Bilaspur in the state of Himachal Pradesh. The project is carried out by the MHWP under the umbrella of the World Bank portfolio. The baseline scenario is continuous degradation.

In order to address the non-permanence of AR-CDM projects, the PPs opted for tCERs over a 20 year renewable crediting period.

The overall objective of the project is to recover degraded lands while providing labour and improved economic opportunities for the local community. The people from the community will participate in the actual planting activities. The community will also be involved in all other aspects of the project operation and benefit from the restored ecosystem services and the wood produced.

The information presented in the PDD on the technical design is consistent with the actual planning and implementation of the project activity as confirmed by:

- Review of data and information (see Annex 2), which was verified with other sources if available.
- An on-site visit was performed and relevant stakeholder and personnel with knowledge of the project were interviewed. If doubts arose, further investigations and additional interviews were conducted
- Finally, information related to similar projects or technologies as the CDM project activity were used (if available) to confirm the accuracy and completeness of the project description.

In conclusion, TÜV SÜD confirms that the project description, as included to the PDD, is sufficiently accurate and complete in order to comply with the requirements of the CDM.

3.5 Baseline and monitoring methodology

3.5.1 Applicability of the selected methodology

Compliance with each applicability condition as listed in the chosen baseline and monitoring methodology AR-ACM0001 version 03 was demonstrated. The GSP was started with a PDD according to the methodology version number 02. In the course of the validation, the PDD was updated to version 03 of the methodology, due to the expiration of the former version.

The assessment was carried out for each applicability criterion and included, among others, the compliance check of the local project setting with the applicability conditions in regard to baseline setting and eligible project measures. This assessment also included the review of secondary sources, which sustain that applicability conditions are complied with. The following documents confirmed the applicability conditions:

- National Remote Sensing Agency (2005): Wastelands Atlas of India. Dept of Space, Government of India. Ministry of Rural development Department of Land Resources. (IRL 26).
- Final Report on Baseline Study for Himachal Pradesh Mid-Himalayan Watershed Development project (IRL 10)

Following the requirements of the methodology, the following tools and procedures were correctly applied:

- Procedures to demonstrate the eligibility of lands for afforestation and reforestation CDM project activities;
- Combined tool to identify the baseline scenario and demonstrate the additionality in A/R CDM project activities;
- Tool for the identification of degraded or degrading lands for consideration in implementing A/R CDM project activities;
- Tool for estimation of emissions from clearing, burning and decay of existing vegetation due to implementation of an A/R CDM project activity;
- Tool for estimation of GHG emissions related to displacement of grazing activities in an A/R CDM project activity;
- Procedure to determine when accounting of the soil organic carbon pool may be conservatively neglected in A/R CDM project activities;
- Calculation of the number of sample plots for measurements within A/R CDM project activities;
- Tool for testing significance of GHG emissions in A/R CDM project activities.

The methodology-specific protocol, included in Annex 1, documents the assessment process. The results of the compliance check as well as relevant evidence are detailed in the protocol and the information reference list.

TÜV SÜD confirms that the chosen baseline and monitoring methodology is applicable to the project activity. Emission sources, which are not addressed by the applied methodology, and are expected to contribute more than 1% of the overall expected average annual emission reductions, were not identified.

3.5.2 Project boundary, pools and eligibility

The **project boundary** was assessed in the context of physical site inspection, interviews, and on the secondary evidence received on the design of the project.

The project area covers 4003.07 ha; it consists of 420 parcels, distributed in ten districts in the state of Himachal Pradesh, India. The boundary as defined in the field was found to be consistent with the indications in the PDD and the information presented in the digital boundary files (IRL 43). In the field, the boundary delineation was cross-checked by the audit team with GPS.

The most relevant documents assessed in order to confirm the project boundary are the following:

- Satellite imagery LANDSAT TM (1989), IRS P6 LISS III and IRS 1D PANCHROMATIC (2004) (IRL 7)
- Digital boundary files in a Geographic Information System (GIS) (IRL 43)
- Field sheets including coordinates obtained from GPS point documenting the assessment of the audit team during the onsite visits (IRL 44)

The boundaries were validated during the validation process using standard audit techniques, details of all observations are presented in the Annex 1. TÜV SÜD confirms that the identified boundaries as documented in the PDD and attached documents are adequately defined for the project activity.

TÜV SÜD confirms that **control over the project area** is established as per AR-CDM requirements. The project area is grouped in three different categories of tenure. 3177 ha are “degraded forestland” and 293 ha are “degraded community lands”, both belonging to the Government of Himachal Pradesh (IRL 20). As per cabinet approval (IRL 19) these lands were given to the Himachal Pradesh Mid-Himalayan Watershed Development Project (MHWDP) for the CDM

project. Contracts are also established between the communities and the MHWDP regarding the forest management and distribution of carbon revenues (IRL 17).

533 ha of the project area are belonging to individual private land owners/ farmers. Contracts are already signed or will be signed between the MHWDP and the land owners. These contracts govern the land use and the transfer and sale of the carbon credits generated by the project (IRL 18). The relevant documentation was reviewed and found in compliance with legal system of the host country. As the contracts with private land owners were not signed at the time of the onsite visit, the respective area (533 ha) is not considered to be fully under control. However, as this is only 13.3% of the overall project area, this is in compliance with AR-CDM procedures, as ruled in EB 44 Annex 16. In order to assure control over the project area the audit team imposed a *Forward Action Request 1*: Provide evidence on control over private land included in the project.

Hence, TÜV SÜD confirms that the identified boundary documented in the PDD is adequately defined for the project activity.

The **carbon pools** and the relevant emission sources and gases (compare sections on removals and emissions below) were selected and considered in line with the applicable methodology and this information is included accordingly in the PDD (IRL 2). Soil organic carbon is selected as carbon pool and the default value is applied.

In regard to **eligibility of lands**, the project area fully complies with the requirements of the most recent eligibility procedure as defined by the EB. Among others, the assessment of the compliance was based on the following evidence:

- Historical land use based on 1989 LANDSAT satellite imagery (IRL 7, 9)
- Satellite imagery from 2004 IRS P6 LISS III and IRS 1D PANCHROMATIC (IRL 7, 9)
- Ground based survey and PRA using cadastral maps, verified by local communities. (IRL 8, 23)

Vegetation at the time of the project start was assessed and found to be below the forest threshold (according to the DNA definition). It was assessed that the vegetation prior to project start would not have surpassed this threshold at maturity without the project activity (IRL 8). This assessment was reviewed by the audit team through field visits of the parcels of the project area (IRL 44). It was further cross-checked through current high resolution free available satellite images (IRL 45).

No forest had been on the project area on 31 December 1989, as assessed based on remote sensing analysis of satellite images (IRL 6, 7, 9) and the PRA exercise carried out (IRL 8, 23). The document was reviewed by the audit team. Eligibility was also verified during interviews with local stakeholders on site, who confirmed that the project area complies with the procedures for eligibility.

3.5.3 Baseline identification

The PDD identifies the baseline scenario as “Continuation of the existing land use or status quo”. This baseline scenario was determined by using the A/R Methodological tool “Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities” (Version 01) as required by the methodology.

The information presented in the PDD was validated by a document review, the on-site visit of the project area (IRL 44) and finally by cross-checking the information presented with similar relevant projects and literature (IRL 26). The sources referenced in the PDD were quoted correctly. The information was verified against credible sources, such as:

- Final Report on Baseline Study for Himachal Pradesh Mid-Himalayan Watershed Development project (IRL 10)
- Statement from Principal Chief Conservator of Forests, Himachal Pradesh on availability of funds for reforestation on private lands (IRL 31), and costs for reforestation (IRL 32)
- Reforestation statistics in Himachal Pradesh (IRL 30)

Field visits and interviews sustained the chosen baseline approach as per CDM Modalities and Procedures: *Existing or historical, as applicable, changes in carbon stock in the carbon pools within the project boundary*. In the case of this project, the historic land use of the project area prior to project start would also be the likely future land use in absence of the project.

TÜV SÜD confirms that no reasonable alternative baseline scenario was excluded in the analysis of baseline scenarios. Based on the validated assumptions, TÜV SÜD considers that the identified baseline scenario is reasonable. Taking the definition of the baseline scenario into account, TÜV SÜD confirms that all relevant CDM requirements, including relevant national and sectoral policies and circumstances, were identified correctly. A verifiable description of the baseline scenario was included in the PDD.

In regard to item 87 of VVM, TÜV SÜD confirms the following statements:

1. All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
2. All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
3. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence, and can be deemed reasonable;
4. Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
5. The approved baseline methodology was correctly applied to identify the most reasonable baseline scenario, and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

3.5.4 Algorithm and/or formulae used to determine GHG removals

TÜV SÜD assessed the calculations of baseline stocks and removals, project emissions, leakage and the expected net anthropogenic GHG removals by sinks. Corresponding calculations were carried out based on calculation spreadsheets (IRL 42). Correctness of calculations can be confirmed as they were replicated by the audit team using the information provided.

The values and estimates presented in the PDD are considered reasonable based on the documentation reviewed, further references and the result of the interviews during the onsite visit.

Based on the information reviewed it can also be confirmed that the sources used are correctly quoted and interpreted in the PDD. All assumptions and data indicated in the PDD and all relevant sources were checked and confirmed. Detailed information on the verification of parameters used in the equations are presented in Annex 1.

In essence, the methodology was correctly applied following the requirements. All values in the PDD are considered reasonable in the context of the proposed CDM project activity. Data sources are quoted correctly. Hence, the calculation of baseline stocks and removals, project emissions, leakage and the expected net anthropogenic GHG removals by sinks are considered correct.

3.5.5 Baseline stocks and greenhouse gas removals by sinks

The stratification process differentiated three baseline strata, degraded forestland, degraded community land and degraded and abandoned private land, based on land tenure and land use.

Baseline stocks were estimated and considered for all relevant types of vegetation. A study was elaborated indicating baseline carbon stocks for tree, non-tree biomass and soil (IRL 11, 27, 32, 33, 34).

The increment of baseline carbon stock was calculated in compliance with the applied methodology, choosing the carbon gain-loss method for tree biomass. Carbon stock changes in non-tree, dead wood and litter and soil are conservatively assumed to be zero as per applied methodology. The increment was determined to be 0.013 t carbon per hectare annually, which is considered insignificant according to EB 46 Annex 16.

The parameters and equations presented in the PDD and further documentation were cross-checked and compared with the requirements and guidelines of the applied methodology and respective tools. The review of the equation included all formulae presented in the PDD and the digital calculation files.

In summary the calculation of the baseline stocks and GHG removals are considered correct.

3.5.6 Project emissions

The methodology considers emissions from biomass burning, which is discussed in the PDD and respectively in the audit process. Respective data and calculations were reviewed by the DOE.

Biomass burning as potential source according to the methodology is assumed to be zero, which is sustained by the fact that no indications were found through onsite visit and interviews that burning for site preparation is not applicable to the project context.

3.5.7 Leakage

The leakage sources according to the chosen methodology are GHG emissions from displacement of pre-project grazing. The PP followed the respective tool for estimation of GHG emissions related to displacement of grazing activities in A/R CDM project activity.

No leakage is expected to occur in the project (step 1 of the tool), as only limited amount of fodder was provided under the baseline conditions and the project scenario will provide more fodder. The required information for conducting the calculation was obtained from the PRA exercise carried out for the project (IRL 37, 38).

3.5.8 Net anthropogenic greenhouse gas removals by sinks

All calculations on the expected anthropogenic removals which are likely to be achieved by the envisioned reforestations under the project scenario are in compliance with the applied AR-CDM methodology.

The BEF method is applied for estimating changes in carbon stocks of Tree Biomass. The estimates on the expected anthropogenic removals which are likely to be achieved by the envisioned reforestations under the project scenario are based on scientific studies. Considering the large variety of species that will be planted, the species were grouped and conservative values were applied for the determination of GHG removals of tree biomass.

Best available data for increment was used as detailed in the PDD (step 1 and 2). Considering the large variety of species that will be planted, the species were grouped into fast and slow growing and a conservative value was applied per strata for increment data (IRL 48 – 72).

For Root-Shoot ratio and Biomass Expansion Factor (BEF) data was gathered for several species (BEF: IRL 73 – 100, R: IRL 101 – 115). However in the ex-ante calculations conservative low values from IPCC GPG 2003 were applied (IRL 100), as detailed in step 3. Also for wood density (step 4) some species specific values were found (IRL 116 – 121), but in the ex-ante calculation a conservative IPCC value is applied.

Changes in carbon stocks of litter and dead wood are conservatively neglected. The default value for estimating changes in carbon stocks in soil organic carbon of 0.5 t C per ha and year is applied for 20 years. The applicability conditions as required by the methodology are justified in the PDD, validated and cross-checked by the audit team.

Over the crediting period of 20 years, total net anthropogenic removals of 828,016 t CO₂e are expected. The calculations of the net anthropogenic GHG removals were carried out with an Excel based tool provided by World Bank (TARAM) (IRL 42).

In summary, the calculations for net anthropogenic GHG removals are fully traceable, adequate for the project conditions and considered correct by TÜV SÜD.

3.6 Additionality

The additionality of the project was presented in the PDD following the combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities, using a barrier analysis.

The approach used in the PDD was assessed based on a document review, where following relevant documents were reviewed:

- Approval of HP Bio-Carbon Reforestation Project-Improving Rural Livelihoods and Watersheds (a sub-project of the Mid-Himalayan Watershed Development Project) in Himachal Pradesh (IRL 18)
- Government records on budget for reforestation in the area from 1999 to 2005 (IRL 30)

Furthermore, the additionality analysis was discussed onsite with the project team (IRL 1). Interviews on this topic were also carried out with relevant stakeholders (members of the participating communities and farmers) during the onsite visit (IRL 1, 44). The data, rationale, assumptions, justifications and documentation provided were checked using local knowledge and sectoral and financial expertise. The information provided by the PP was further cross-checked by:

- Wasteland Atlas of India, National Remote Sensing Agency (IRL 26)

Based on the aforementioned approach, TÜV SÜD confirms that the documentation provided is appropriate for this project. Further analysis of the additionality is summarized in the sections below (3.6.1 – 3.6.4).

In essence, the project is considered additional as degraded lands are reforested which otherwise would have remained degraded - among others due to unavailability of funding for such reforestation activities.

3.6.1 Start date and prior consideration of the CDM

The project started on 01 July 2006. The starting date of the project activity is determined by start of actual planting in the project area. In order to confirm the starting date the assessment team reviewed the Annual Plan of Operation (IRL 25) and further visited the planted areas during the onsite visit. The age and condition of the planted trees was consistent with the records.

The CDM consideration prior to project start was documented in the World Bank appraisal documents from November 2005 (IRL 24). The project therefore complies with the requirement of prior CDM consideration.

3.6.2 Identifications of alternatives

Relevant alternatives (baseline scenario) for land use of the project area were identified in the context of the additionality test: (i) continuation of existing land use (degraded land), and (ii) reforestation without carbon finance.

The presented alternatives include all plausible scenarios taking into account local and sectoral circumstances. Hence the list of alternatives is considered to be complete.

Based on the evidence provided and the discussion held with the project participants during the onsite visit, it is clear that the continuation of the current and historical land use is the most likely scenario in the absence of the project activity.

3.6.3 Barrier analysis

The project participants used the barrier analysis in order to demonstrate the additionality of the project. The presented barriers are

- Investment barrier
- Technological barrier
- Ecological barrier

The assessment team checked first if any barrier has a clear direct impact on the financial returns of the project activity which can be expressed with reasonable certainty in monetary terms. The PDD does not include barriers with insufficient financial returns.

The main barrier preventing the implementation of the project without carbon credits is the **investment barrier**. Due to insufficient funds of the Government of Himachal Pradesh for reforestation activities on degraded forest lands or community or private lands, no funding would be available for such reforestation activities. This barrier was assessed against official documents such as the confirmation from the Government of Himachal Pradesh on non-availability of funds for reforestation projects (IRL 19, 31). Further cross-checks were made to statistics on afforestation in Himachal Pradesh (IRL 30).

It was confirmed that there was no alternative financing available from the PPs for the project activity and that it has become recently available through the project and its carbon component. Thus, the investment barrier prohibits alternative (ii), implementation of project as an assisted natural regeneration without being registered as an A/R CDM project activity.

The **technological and ecological barriers** further sustain additionality, due to the low productivity of the project area (IRL 26, 36) and limited infrastructure for reforestation, in particular for private lands. Respective evidence was reviewed by the audit team and the barriers were also confirmed during the onsite visit of the project.

The result of this assessment shows clearly that the barriers presented in the PDD can be considered real. These barriers prevent the project activity from being implemented while it would not prevent at least the baseline of the project. This was confirmed based on the documentation review, interviews and local and sectoral expertise of the assessment team. The latter was e.g. confirmed by the interviewed stakeholders (IRL 1).

3.6.4 Common practice analysis

The region for the common practice analysis was defined as the geographical area of the State of Himachal Pradesh. The assessment team reviewed the approach presented in the PDD and can confirm that relevant parameters such as location, ecological conditions, economical situation, and development were taken into account in order to define the region. The chosen region

has unique characteristics in regard to forest structure, population structure and ethnic minorities. Therefore, the presented approach can be considered appropriate for the common practice analysis.

Since 1998 the budget for reforestation activities in the state has been declining, in 2003-2004 less than 14,000 ha were reforested (IRL 30). However, as sustained in an official letter from the Government of Himachal Pradesh (IRL 19), these reforestation activities are focussing on “reserved” and “demarcated” forest lands. The project area is classified as “degraded” lands (forest, community and private lands), and therefore not a common practice in the defined region.

3.7 Monitoring plan

The monitoring plan presented in the PDD complies with the requirement of the methodology. The assessment team checked all parameters presented in the monitoring plan against the requirements of the methodology. For the monitoring of carbon stock changes the requirements and parameter list as per methodology were followed.

Relevant parameters available at validation are listed in the PDD. Parameters not relevant in the project context are not listed. All relevant parameters that need to be monitored are listed in the PDD as required by the methodology.

The monitoring plan was included to the project documentation. The boundary and forest management monitoring was defined specifically for the project context. The sampling design was reviewed onsite and found to be in compliance with methodological requirements and good practice as defined e.g. in the IPCC GPG LULUCF (IRL 100). Further details are also outlined in the working plan for the respective forest divisions (IRL 16). The tool for calculation of the number of sample plots for measurements within AR-CDM project activities is correctly applied.

The procedures were reviewed by the assessment team on paper and through interviews with the relevant personnel (IRL 1); this information together with a physical inspection allows the assessment team to confirm that the proposed monitoring plan is feasible within the project design.

The major parameters to be monitored were discussed with the PPs, as well as the inventory processes, data management, quality assurance and quality control procedures that will be implemented in the context of the project. The PPs defined procedures for monitoring in Annex 4 of the PDD in order to ensure the collection of reliable field data in compliance with the applied methodology and good practice in forest monitoring.

TÜV SÜD concludes that the PP will be able to implement the monitoring plan to report ex-post GHG net anthropogenic removals, which can also be verified.

The chosen monitoring frequency of the parameters is in line with the methodology (frequency in years). It is considered that there is no systematic coincidence of verifications with peaks in carbon stocks since no timber harvesting operations are foreseen within the crediting period.

3.8 Sustainable development

The LoA of the Host Country India clearly presents a statement that the project contributes to the sustainable development of the Host Party.

3.9 Local stakeholder consultation

The stakeholder process was carried out in line with PDD guidance and was found to be documented through evidence on the consultation process. Workshops were carried out in the pro-

ject headquarter and regional headquarters (IRL 40), further a PRA exercise was carried out for information and feedback from local communities (IRL 10, 12, 23, 37).

The assessment team reviewed the documentation in order to validate the inclusion of relevant stakeholders and using the local expertise it is confirmed that the communication method used to invite the stakeholders can be considered appropriate.

The summary of comments presented in the PDD was cross-checked with the documentation of the stakeholder consultation (IRL 10, 40) and confirmed with interviews with stakeholders of the community by the audit team during the onsite visit, and it is found to be complete.

The relevant comments presented by the local stakeholders were taken into due account by the PP, the same was cross check with the information obtained during the interviews.

Hence the local stakeholder consultation was adequately performed according to the CDM requirements.

3.10 Environmental and socio-economic impacts

The PP undertook an analysis of environmental and socio-economic impacts according to the requirements of the guidelines for PDD completion. The assessment team carried out a document review of the information presented.

No Environmental Impact Assessment is required for afforestation activities in India, (IRL 124). However, the PP carried out an Environmental and Social Assessment according to the requirements of the World Bank. The environmental and social impacts of the project are analyzed in detail in this study (IRL 13).

In essence, the audit team concluded that no negative environmental and social impacts are expected. This conclusion was also sustained by the results of the field visit of the audit team as well as positive comments on the project by the consulted stakeholders.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

TÜV SÜD published the project documents on the UNFCCC website and invited comments by affected Parties, stakeholders, and non-governmental organisations during a 45 day period.

All key information gathered is presented in the table below

GSP Comments

webpage: http://cdm.unfccc.int/Projects/Validation/DB/ZUOWR7RIVG6BECVHP1E229QEN3GMQK/view.html	
Starting date of the global stakeholder consultation process: 07 April 2009	
Comment submitted by: No comments received.	Issues raised: None
Response by TÜV SÜD: -	

5 VALIDATION OPINION

TÜV SÜD performed a validation of the following proposed CDM project activity “India: Himachal Pradesh Reforestation Project – Improving Livelihoods and Watersheds”.

Standard auditing techniques have been used for the validation of the project. A methodology-specific protocol for the project has been prepared to conduct the audit in a transparent and comprehensive manner.


The review of the project design documentation, subsequent follow-up interviews, and further verification of references have provided TÜV SÜD with sufficient evidence to determine the fulfilment of stated criteria in the protocol. In the opinion of TÜV SÜD, the project meets all relevant UNFCCC requirements for the CDM if the underlying assumptions do not change. TÜV SÜD recommends the project for registration by the CDM Executive Board.

An analysis, as provided by the applied methodology, demonstrates that the proposed project activity is not a likely baseline scenario. GHG removals attributable to the project are additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of GHG removals as specified within the final PDD version.

The validation is based on the information made available to TÜV SÜD, as well as the engagement conditions detailed in this report. The validation has been performed following the VVM requirements. The single purpose of this report is its use during the registration process as part of the CDM project cycle. TÜV SÜD cannot be held liable by any party for decisions made, or not made, based on the validation opinion beyond this purpose.

Munich, 30 Nov 2010

Munich, 30 Nov 2010



Thomas Kleiser
Certification Body “climate and energy”
TÜV SÜD Industrie Service GmbH



Sebastian Hetsch
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TÜV SÜD Industrie Service GmbH



Annex 1: Validation Protocol

Table 1 Requirement Checklist

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
A. General Description of the Project Activity				
A.1 Title of the project activity				
Does the used project title clearly enable to identify the unique CDM activity?	2	Yes, the project title indicates brief project activity and location of project activities.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Are there any indication concerning the revision number and the date of the revision?	2	The version number and date is indicated. The GSP PDD version is 01, Date 26 January 2009	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Is this consistent with the time line of the project's history?	2	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.2 Description of the project activity				
Has the project been described in terms of purpose, how the project is undertaken, and the project proponent's view of the project's contribution to sustainable development? (indication on IAS or GMOs in large scale projects)	2	The project will be developed in the state of Himachal Pradesh at an altitude of 600 to 1800m above mean sea level. The project activity will be conducted on about 4003.07 ha of degraded lands. The guiding principles of the project are: i) Use of native and locally preferred tree species. ii) Involvement of local Gram Panchayats and small marginal farmers iii) Support from MHWDP to reforestation activities (technical, financial and capacity development) iv) Distribution of carbon revenue to the community	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl						
		The project objectives are: <ul style="list-style-type: none">- To improve degraded lands to productive- To improve livelihood and incomes Three plantation models are proposed: <ul style="list-style-type: none">- Restoration forestry model (3177 ha)- Community forest model (293 ha)- Farm forestry model (533 ha) The plantation density for the three models is 1,100 plant/ha.								
A.3 Project participants										
Have the Parties and project participants participating in the project been listed in the table as required?	2, 3, 4, 5	Table A.3 indicates that the project participants are the Mid-Himalayan Watershed Development Project (MHWDP), the International Bank for Reconstruction and Development as a trustee for BioCarbon Fund and Spain.	☑	☑						
Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	2, 3, 4, 129, 130	Letter of Approval of Spanish DNA, for the BioCarbon Fund and an updated version for the LoA of India (with the correct title of the PDD) was submitted to the audit team	☑	☑						
Do all participating Parties fulfil the participation requirements as follows: <ul style="list-style-type: none">- Ratification of the Kyoto Protocol- Designated a National Authority- Host Party DNA communicated minimum values for forest definition	2	India and Spain ratified the KP and appointed a DNA. The Indian forest definition is given in the table below: http://cdm.unfccc.int/DNA/ARDNA.html?CID=101 <table><tr><th>single minimum tree crown cover value between 10 and 30 per cent</th><th>A single minimum land area value between 0,05 and 1 hectare</th><th>A single minimum tree height value between 2 and 5 metres</th></tr><tr><td>15</td><td>0.05</td><td>2</td></tr></table>	single minimum tree crown cover value between 10 and 30 per cent	A single minimum land area value between 0,05 and 1 hectare	A single minimum tree height value between 2 and 5 metres	15	0.05	2	☑	☑
single minimum tree crown cover value between 10 and 30 per cent	A single minimum land area value between 0,05 and 1 hectare	A single minimum tree height value between 2 and 5 metres								
15	0.05	2								
A.4 Description of location and boundaries of the A/R CDM project activity										
A.4.1 Has the location of the project including Host Party, Region/State/Province and City/town/community been de-	2	The project is located in the Province of Himachal Pradesh, in the forest regions of Bilaspur and Dharamshala	☑	☑						

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
fined?				
A.4.2 Has an appropriately detailed geographic delineation of the project boundary including a unique identifier been included?	2, 6, 7, 8, 9, 43	<p>The selection process of gram panchayats (GP) and land categories suitable for A/R activities was done based on remote sensing analysis and participatory rural appraisal (PRA). Each discrete parcel of land ranges from 1 to 250 ha in each GP.</p> <p>The total number of parcels of land is 928 in 30 GP, the results of the remaining GP will be reviewed during onsite visit. GIS files with boundary information are provided</p> <p>A database (excel file) provides an overview over the discrete parcels of the project, providing a unique identification for each parcel.</p> <p><u>Corrective Action Request No 1.</u></p> <p>Provide district-wise maps with all eligible polygons in the PDD with scale, northing, coordinate and datum and include to PDD.</p> <p>Provide digital boundary files (e.g. GIS shape files) of all eligible parcels included in the project.</p>	CAR	☑
AR-ACM0001_ver2, section II.1				
Is the project boundary under control of the participants geographically delineated?	2, 6, 7, 8, 9, 43	<p>Forest land (degraded forest lands) and community forests are in the ownership of the province of HP. The Council of Ministers approved the project.</p> <p>In this cabinet decision the government of HP authorized the MHWDP to conduct the activities as described in the PDD (see letter from Chief Secretary (Forests) Govt of HP)</p> <p>In case of private land, contracts will be signed with the private land owners to ensure control over the area. Draft contracts are already set up and the private land owners are identified and an oral agreement is set.</p>	CR FAR	FAR 1

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
		<p><u>Clarification Request No 1</u></p> <p>Provide information on the percentage of private land out of the total project area. This private land is considered to be not under control. If less than 20% is private land, EB 44 allows to provide evidence on the control over the area at a later stage (see FAR below)</p> <p><u>Forward Action Request 1:</u></p> <p>Provide evidence on control over private land included in the project at verification.</p>		
Is it justified, that during the crediting period, each discrete area of land is expected to be subject to an afforestation or reforestation project activity under the control of the project participants?	2, 16	<p>Each discrete parcel shall be subject to reforestation. However, some parcels entail steep gullies that cannot be reforested</p> <p><u>Corrective Action Request No 2.</u></p> <p>During site visits areas have been identified that are not subject to reforestation. Exclude areas that are not subject to reforestation, e.g. due to steep slopes or rocky terrain (e.g. parcel SP006_P1), and provide respective evidence.</p>	CAR	☑
A.5 Technical description of the A/R CDM project activity				
A.5.1 Has a description of the present environmental conditions of the project area (including climate, hydrology, soils, ecosystems and land use) been included?	2, 10, 11, 26, 122, 125, 126, 127	<p>Conditions are described in the PDD for the state where the project occurs. Information is provided on:</p> <ul style="list-style-type: none"> - Physiography (5 physiographical zones in Himachal Pradesh) - Climate (3 climatic zones) - Hydrology (5 perennial rivers) - Soils (9 soil groups) - Flora and Fauna (66% of Himachal Pradesh is forest. Around 1200 bird species and 359 animal species identified in the region) - Ecosystems 	☑	☑

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
A.5.2 Have any rare or endangered species been defined as present?	2, 125	<p>A list of endangered flora and fauna and endemic species for the region of Himachal Pradesh is provided. The list was compiled by IUCN at national level (wildlife act of India).</p> <p><u>Clarification Request No 2</u></p> <p>Include information on the assessment of endangered species and provide reference for the sources (how the list was developed).</p> <p>Explain if any of the listed rare or endangered species are actually found in the project area.</p>	CR	<input checked="" type="checkbox"/>
A.5.3 Have the species and varieties to be grown been adequately described?	2, 14, 15, 16	<p>The characteristics of the major species (<i>Pinus roxburghii</i>, <i>Populus deltoides</i>, <i>Ailanthus excelsa</i>, <i>Grewia optiva</i>, <i>Azadirachta indica</i>, <i>Mangifera indica</i>) used for the reforestation project are described. More than 40 species will be used in the reforestation project. They will be planted according to altitudinal strata and reforestation model.</p> <p><u>Corrective Action Request No 3.</u></p> <ul style="list-style-type: none"> • Modify and update table A.5.1, identifying the stand models used in the project • Provide reference to the book describing the different species which will be planted in the project 	CAR	<input checked="" type="checkbox"/>
A.5.4 Has the technology to be employed (including environmentally safe and sustainable/renewable technologies) been adequately described?	2, 16	<p>The technology is described in terms of:</p> <ul style="list-style-type: none"> - Identification of lands suitable for the project (based on remote sensing an PRA) - Fencing (posts of wood, bamboo, and stone) - Seed collection (from mother trees) - Nursery (descentralized in different watershed divisions and panchayat level) - Site preparation (pits of 45x45x45cm, a total of 0,007% /ha 	CR	<input checked="" type="checkbox"/>

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
		<p>will be disturbed)</p> <ul style="list-style-type: none"> - Planting (including replacement of failed seedlings) - Fertilizer application (organic and inorganic) - Multiple-storied and multispecies plantations - Weeding (twice a year for 5 years) - Thinning, harvesting and tending operations <p>Reference for silvicultural practices were provided during onsite visits.</p> <p>PDD the reforestation management schedule is included in section C4</p> <p>Clarification Request No 3</p> <ul style="list-style-type: none"> • Provide reference to plan in section C4, clarify if the same procedure will be applied for all the species • Provide references/documentation regarding the techniques to be applied according to the project site environmental characteristics and species to be used (soil, precipitation, etc) as well as local capacities. 		
A.5.5 Has the know-how with specifications of whether it will be transferred to host Parties been adequately described?	2	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Section E.5.1 under the new PDD structure</p> <p>A.5.6 Has the proposed measures to be implemented to minimize potential leakage been adequately described?</p>	2,18	<p>The potential sources of leakage are:</p> <ul style="list-style-type: none"> - Displacement of pre-project activities: <ul style="list-style-type: none"> o agricultural crops o grazing o fuelwood collection - Increased use of wood and cement posts for fencing. <p>Measures to minimize potential leakage are described. In the agreement with the user groups, it is foreseen that fallen dry</p>	CR	<input checked="" type="checkbox"/>

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
		<p>dead wood can be collected</p> <p><u>Clarification Request No 4</u></p> <p>During onsite visits, small patches of agriculture have been observed in one parcel (SP030_C1). Please indicate in the PDD if agricultural crops and grazing activities are included in the project area. If it is the case, provide more detailed information (hectares under agriculture, number of heads/ha) in section A.5. If not, please exclude these areas.</p>		
A.6 Legal title to the land, land tenure and rights to issued tCERs/ICERs				
Have details of the legal title to the land, land tenure and rights to issued tCERs/ICERs been described?	2, 17, 18, 19, 20, 21, 22, 43	<p>The degraded forest land and degraded community land belong to the Government of Himachal Pradesh and given to the MHWDP project (see cabinet approval). The land tenure of the Government was checked in cadastral records</p> <p>Private land tenure was checked onsite through tax records</p> <p>Contracts with user communities and with private land holders are drafted and will be signed, once the project is registered.</p> <p>Draft reports were reviewed during the audit process</p> <p><i>See also CAR and FAR in A.4.2 and section E4</i></p>	CAR	FAR 1
A.7 Assessment of the eligibility of lands				
Has the latest version of the AR eligibility procedure been applied?	2	The latest version of "Procedures to demonstrate the eligibility of lands for afforestation and reforestation project activities (Version 01)" has been applied.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Is adequate evidence provided which demonstrates that a) the land in the project boundary is not forest at pro-	2, 6, 7, 8, 9, 26,	The analysis was done based on 1989/90 and 2004 satellite imagery.	CAR	<input checked="" type="checkbox"/>

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
ject start b) the activity is an afforestation or reforestation by indicating historic land use (reforestation: unstocked by Dec. 1989; afforestation: unstocked >50 y)	43, 44, 45	The satellite image analysis was presented by remote sensing experts and reviewed during onsite visits. In addition PRA exercises were carried out to identify the land to be included in the project. Eligibility of the land was also assessed during onsite visits. <u>Corrective Action Request No 4.</u> During field visits some parcels contained patches according to the Indian UNFCCC forests definition (e.g. CH008_F7, DS013_P1, CH014_F02, SP030_C1, SP0004_C1). Exclude patches of forest according to the Indian forest definition within the project area.		
Has the assessment of the eligibility of the land been adequately described?	2	The assessment of the eligibility is described properly	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.8 Approach for addressing non-permanence				
Has the approach to address non-permanence been specified (tCER, ICER)?	2	tCERs have been chosen. The planted tree species will not be harvested, therefore no temporal peaks in carbon stocks are expected <u>Corrective Action Request No 5.</u> Clarify and include in PDD how to avoid of coincidence of peaks in carbon stocks and verification, according to CDM VVM (paragraph 151).	CAR	<input checked="" type="checkbox"/>
A.9 Estimated amount of net anthropogenic GHG removals by sinks				
Has the table on estimated net anthropogenic removals over the chosen crediting period been completed?	2, 42	The table of estimated amount of net anthropogenic GHG removals is provided.	CAR	<input checked="" type="checkbox"/>

Ref. = Reference as included to Information Reference List (Annex 2)

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
		<u>Corrective Action Request No 6.</u> Include the information of section D and changes in project area, and update the table.		
A.10 Public Funding				
Is indication on public funding (from Annex I countries) included to the PDD?	2, 24	There is no public funding from Annex I countries. The funds from World Bank are a loan, not a grant. <u>Clarification Request No 5</u> Please provide a confirmation that no public funding comes from Spain	CR	<input checked="" type="checkbox"/>
B. Duration of the Project Activity / Crediting Period				
B.1 Starting date of the project and the crediting period				
Does the starting date reflect the date of implementation (or when real action began that resulted in changes to the actual net removals) and has it been adequately justified?	2, 25	PDD declares 1 July 2006 as the starting date of the Project. Documents to proof planting year is the Annual Plan of Operation (2006), as well as onsite observation by the audit team	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.2 Expected operational lifetime				
Has the expected operational lifetime been defined?	2	The operational life time is indicated to 60 years	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.3 Choice of crediting period				
Is the project fixed or renewable and does it has an appropriate crediting period length defined?	2	A renewable crediting period of 20 years is chosen.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C. Application of Baseline and Monitoring Methodology				
C.1 Title and reference of approved methodology				
Has the approved methodology and any other methodologies or tools used been properly referenced (including version no.)?	2	Used methodology is correctly referenced, including version number.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl								
C.2 Assessment and justification of selected methodology												
Does the project use the baseline approach from 5/CMP.1 paragraph 22 of the CDM A/R modalities and procedures: “Existing or historical, as applicable, changes in carbon stocks in the carbon pools within the project boundary”?	2, 19, 30	The project does consider the baseline approach of the most likely land use at project start.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								
Conditions of applicability												
<p>Is the selected AR project activity implemented on degraded lands, which are expected to remain degraded or to continue to degrade in the absence of the project, and hence the land cannot be expected to revert to a non-degraded state without human intervention?</p> <p>Is the “tool for the identification of degraded or degrading lands for consideration in implementing CDM A/R project activities” applied?</p>	2, 24, 26, 27	<p>The definition of degraded lands is provided from the Planning Commission and the National Remote Sensing Agency (NRSA) which describes degraded lands as wastelands, for the entire country - district-wise.</p> <p>The “tool for the identification of degraded or degrading lands for consideration in implementing CDM A/R project activities” applied is applied.</p> <table border="1"><tr><td>Incl. to PDD</td><td>Rationale / Assumptions referenced</td><td>Evidence provided</td><td>Conclusion</td></tr><tr><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td></tr></table> <p><u>Clarification Request No 6</u></p> <p>Provide the study from the Planning Commission and the National Remote Sensing Agency (NRSA) which describe degraded lands as wastelands</p> <p><i>See also CR below on soils</i></p>	Incl. to PDD	Rationale / Assumptions referenced	Evidence provided	Conclusion	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	CR	<input checked="" type="checkbox"/>
Incl. to PDD	Rationale / Assumptions referenced	Evidence provided	Conclusion									
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>									
Encroachment of natural tree vegetation that leads to the establishment of forests according to the host country definition of forest for CDM purposes is not expected to occur;	2, 10, 11	<p>A baseline study was carried out to assess natural vegetation, as well as remote sensing analysis.</p> <p>Natural tree vegetation is not expected to occur based on the degrading level of the land, lack of seed sources and non suitable site specific conditions for natural regeneration.</p>	CAR	<input checked="" type="checkbox"/>								

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl								
		<p>Onsite visits confirmed the findings, apart from patches of existing forests according to the Indian UNFCCC forest definition that were found in the project area. (see CAR in A.7)</p> <table><tr><td>Incl. to PDD</td><td>Rationale / Assumptions referenced</td><td>Evidence provided</td><td>Conclusion</td></tr><tr><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td></tr></table>	Incl. to PDD	Rationale / Assumptions referenced	Evidence provided	Conclusion	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Incl. to PDD	Rationale / Assumptions referenced	Evidence provided	Conclusion									
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>									
Flooding irrigation is not permitted;	2	<table><tr><td>Incl. to PDD</td><td>Rationale / Assumptions referenced</td><td>Evidence provided</td><td>Conclusion</td></tr><tr><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td></tr></table> <p>Flooding irrigation will not be used, the land categories are mostly undulated or steep terrain.</p>	Incl. to PDD	Rationale / Assumptions referenced	Evidence provided	Conclusion	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Incl. to PDD	Rationale / Assumptions referenced	Evidence provided	Conclusion									
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>									
If project activities are implemented on organic soils, drainage is not allowed and not more than 10% of the project area may be disturbed as result of soil preparation for planting;	2, 27	<p>The project is not conducted on organic soils, and no drainage is conducted. Soil samples were taken to identify the soil carbon content.</p> <table><tr><td>Incl. to PDD</td><td>Rationale / Assumptions referenced</td><td>Evidence provided</td><td>Conclusion</td></tr><tr><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td></tr></table> <p><u>Clarification Request No 7</u></p> <p>Include further information on statistical information on soil carbon surveys (standard error, accuracy, precision). Provide information on carbon contents of “non-degraded soils” in the area.</p>	Incl. to PDD	Rationale / Assumptions referenced	Evidence provided	Conclusion	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Incl. to PDD	Rationale / Assumptions referenced	Evidence provided	Conclusion									
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>									

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl														
Is the establishment of the project decreasing the availability of fuelwood?	2, 16, 44	<table><tr><td>Incl. to PDD</td><td>Rationale / Assumptions referenced</td><td>Evidence provided</td><td>Conclusion</td></tr><tr><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td></tr></table> <p>The availability of fuelwood is likely to increase, as areas that have been degraded are reforested. Degraded areas offered insignificant amount of fuelwood.</p>	Incl. to PDD	Rationale / Assumptions referenced	Evidence provided	Conclusion	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>						
Incl. to PDD	Rationale / Assumptions referenced	Evidence provided	Conclusion															
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>															
Are the carbon pools considered in the project activity in line with the requirements of the methodology? (“alternatively No” = it allows also for exclusion if transparent and verifiable information can be provided)	2	<p>Carbon pools selected comply with the requirements of the methodology.</p> <p>Since there are no forests (trees) in the project area prior to project start, both dead wood and litter is considered to have low stocks, subject to further decrease or low carbon steady state.</p> <table><tr><td>Carbon pools</td><td>Selected</td></tr><tr><td>Above ground</td><td>Yes</td></tr><tr><td>Below ground</td><td>Yes</td></tr><tr><td>Dead wood</td><td>No</td></tr><tr><td>Litter</td><td>No</td></tr><tr><td>Soil organic carbon</td><td>Yes</td></tr></table>	Carbon pools	Selected	Above ground	Yes	Below ground	Yes	Dead wood	No	Litter	No	Soil organic carbon	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Carbon pools	Selected																	
Above ground	Yes																	
Below ground	Yes																	
Dead wood	No																	
Litter	No																	
Soil organic carbon	Yes																	
Has an assessment of the appropriateness of choice of carbon pools and emission sources selected to the project activity been included to the PDD?	2	<p>Emission sources selected to the project activity included in the PDD in line with the methodology:</p> <table><tr><td>Sources</td><td>Gas</td><td>Included to meth.</td><td>Conclusion</td></tr><tr><td rowspan="3">Burning of biomass</td><td>CO2</td><td>No</td><td><input checked="" type="checkbox"/></td></tr><tr><td>CH4</td><td>Yes</td><td><input checked="" type="checkbox"/></td></tr><tr><td>N2O</td><td>No</td><td><input checked="" type="checkbox"/></td></tr></table>	Sources	Gas	Included to meth.	Conclusion	Burning of biomass	CO2	No	<input checked="" type="checkbox"/>	CH4	Yes	<input checked="" type="checkbox"/>	N2O	No	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sources	Gas	Included to meth.	Conclusion															
Burning of biomass	CO2	No	<input checked="" type="checkbox"/>															
	CH4	Yes	<input checked="" type="checkbox"/>															
	N2O	No	<input checked="" type="checkbox"/>															
C.3 Description of ex ante stratification																		
Have the strata been defined by: (i) Using procedures to stratify lands for A/R project activities under the CDM when approved by the EB; or (ii) On the basis of parameters that are key variables in any method (e.g., growth models, or yield curves/tables)	2, 10, 16, 43	<p>A step wise approach has been followed, which is not required by version 03 of the methodology, but acceptable..</p> <p>A total of 9 strata were defined, based on the three land categories (Degraded forestland, degraded community land and</p>	CAR	<input checked="" type="checkbox"/>														

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
used to estimate changes in biomass stocks: - For baseline net GHG removals by sinks - For actual net GHG removals by sinks (according to the project planting plan)		private land) and the altitudinal level (High 1400-1800m, Medium 1100-1400, Low 600-1100m) The planting year was not considered in stratification, since tree growth is expected to be slow and stocks are not considered to differ significantly between the different starting dates of plantation. Clarification Request No 8 <ul style="list-style-type: none"> • Move the information on biomass stock and increment, currently presented in section C.5.2 to this section (C.4). • Provide information on accuracy and precision of the results of study on baseline carbon stocks (AGB, BGB, SOC) and increments. Provide information for each of the nine baseline strata. 		
Are the results of the stratification included to the PDD?	2	The result of the stratification is composed with 9 strata and included to PDD	<input checked="" type="checkbox"/>	
C.4 Identification of baseline scenario				
C.4.1 Description of the application of the procedure to identify the most plausible baseline scenario	2, 6, 7, 8, 9, 10,	The “Combined tool to identify the baseline scenario and demonstrate the additionality in A/R CDM project activities” shall be used. Satellite image analysis was presented and reviewed during onsite visit (see IRL item 6, 7, 8), to identify current land cover. Corrective Action Request No 7. Follow the stepwise approach of the tools, as indicated in the description of the tool (see also C6). Provide copies of data sources used to assess historical land use as indicated in Step 3	CAR	<input checked="" type="checkbox"/>
C.4.2 Is the description of the baseline scenario applying to each stratum reasonable?	2	See CAR in C4	CAR	<input checked="" type="checkbox"/>
C.5 Assessment and demonstration of additionality (if the		n/a		

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
"Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities" is not used):				
C.6 Identification of the baseline scenario and demonstration of additionality using the "Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities" (if required by the selected approved methodology):		<i>See CAR in C.4.1</i>		
Step 0. Preliminary screening				
Has evidence been provided that the starting date of the A/R CDM project activity was after 31 December 1999, and that the incentive from the planned sale of GHG emission allowances was seriously considered in the decision to proceed with the project activity (documentation that was available to third parties at, or prior to, the start of the project activity)?	2, 16, 24	The starting date for the project was 1 July 2006 (IRL 16). It was documented in the project implementation document of the Mid Himalayan Watershed Development Project of 2006 the relevance of the CDM project activity as well as the importance of the incentives from selling CERs are documented in the Environment and Social Assessment Report of the Mid-Himalayan Watershed Development Project' of HPMHWDP (2006). Early CDM consideration is also mentioned in World Bank appraisal documents from November 2005 (IRL 24)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Step 1. Identification of alternative land use scenarios to the proposed A/R CDM project activity				
Have realistic and credible land-use alternative(s) [currently existing or that existed some time since 31 Dec.1989] been identified (sub-step 1a), at least including: <ul style="list-style-type: none"> Continuation of the pre-project land use AR of the land within the project boundary performed without being registered as the A/R CDM project activity If applicable, <ul style="list-style-type: none"> forestation of at least a part of the land within the project boundary of the proposed A/R CDM project at a rate resulting from <ul style="list-style-type: none"> legal requirements; or extrapolation of observed forestation activities in 	2	Realistic and credible land use alternatives are described and confirmed during onsite visits. For private lands: <ul style="list-style-type: none"> Continuation of existing land use or status quo Naturally grown grassland with extremely low productivity 	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
the geographical area with similar socioeconomic and ecological conditions to the proposed A/R CDM project activity occurring in a period since 31 December 1989, as selected by the PP.				
Are the alternative(s) in compliance with all applicable legal and regulatory requirements (sub-step 1b)? If that is not the case, an alternative can only be considered if applicable legal or regulatory requirements are systematically not enforced or the non-compliance with those requirements is widespread, i.e. prevalent on at least 30% of the area of the smallest administrative unit that encompasses the project area;	2	The implementation of A/R activity is not a mandatory requirement, the public and private lands would continue to be in the degraded state.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Is the project scenario not the only remaining alternative?	2	The project scenario is not the only remaining alternative, all other alternatives are remaining.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
STEP 2. Barrier analysis				
Is a complete list of barriers developed that prevent the different alternatives to occur (sub-step 2a)?	2, 19, 26, 30, 31	<p>A list of the following barriers is provided:</p> <p>a) Investment barrier Stating a lack of access to credits and international capital markets. The barrier is sustained with a letter from the <i>Principal Chief Conservator of Forests</i> of the Province of Himachal Pradesh (IRL 19), stating that there are no funds available for AR activities on private land, as well as a letter from the <i>Chief Secretary (Forests)</i> of the Province of Himachal Pradesh, stating insufficient funds for AR activities on forest lands.</p> <p>b) Institutional barrier: Stating a lack of institutional capacity at GP and individual farmer level. However, on degraded forest land and theoretically also on community lands, the forest department could implement refor-</p>	CAR	<input checked="" type="checkbox"/>

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
		estation activities. (<i>see CAR below</i>) c) Technological barrier: Stating a lack of quality planting material and infrastructure for implementing reforestation practices. However, during site visits, several nurseries from the forest service were observed in the area, <i>see CAR below</i>		
Is transparent and documented evidence provided on the existence and significance of these barriers?	2	Evidence for financial barrier is provided (see above) <u>Corrective Action Request No 8.</u> Provide evidence for existence of barriers and their prohibitive character (per land ownership). If not sufficient evidence can be provided, exclude the barrier.	CAR	<input checked="" type="checkbox"/>
Is it determined which land use scenarios identified in the Sub-step 1b are prevented by at least one of the barriers listed in sub-step 2a (sub-step 2b)?	2	A matrix lists the alternatives and barriers, including also social and ecological barriers. See CARs above	CAR	<input checked="" type="checkbox"/>
Is it substantiated that the barrier identified as preventing realization of a land use scenario is valid and conclusive in the context of the land use scenario in question (sub-step 2b)?	2	See CAR above	CAR	<input checked="" type="checkbox"/>
If the land within the boundary of the proposed A/R CDM project was at least partially forested since 31 December 1989 and the land is not a forest at the project start, is it demonstrated that under the current conditions (legal, financial, socio-economical, ecological or others) repetition of the reforestation performed without being registered as the A/R CDM project activity is not possible?	2	See above	CAR	<input checked="" type="checkbox"/>
STEP 3. Investment analysis				

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
Is the analysis method identified appropriately (sub-step 3a)?	2	Investment Analysis is not included in the PDD since the barrier analysis approach is followed described in PDD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
STEP 4. Common practice analysis				
Is the project activity common practice in the region?	2, 19, 30, 31	There has been reforestation activity in Himachal Pradesh since the 80's. Initially 20,000 to 25,000 ha/year were planted. During 2003/04 the rate decreased to 13,000ha because of reduced budget allocation to reforestation activities from the government. Statistics on reforestation rates were provided during onsite visit (IRL 30). There are no government funds for reforestation on private lands (IRL31).	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Has a common practice analysis been carried out in line with the requirement of the proposed A/R CDM project and are there essential distinctions between them?	2	The common practice analysis was carried out in line with the requirements of the proposed A/R CDM project. Yes there are essential distinctions between the reforestation activities, due to financial barriers.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(If there is reforestations in the region) Are there fundamental and verifiable changes in circumstances when compared to other projects	2, 19	As stated in the letter from the Chief Secretary (IRL 19) and discussed during a meeting with him, reforestation activities are only carried out in Reserved and Demarcated Forests. <u>Clarification Request No 9</u> Include information on differences between AR activities carried out by the forest service and the project area.	CR	<input checked="" type="checkbox"/>
C.7 Estimation of the ex ante baseline net GHG removals				
Have the ex-ante baseline removal calculations been provided in the table, do they correspond to the chosen crediting period and use the approach provided in the selected approved methodology?	2, 10, 32, 33, 34, 100	A baseline study was carried out as also described in Annex 3 (<i>see respective CARs in Annex 3</i>) The table is included, corresponding to crediting period of 20 years. The second table with the data used for calculation of the ex-ante baseline net GHG removals by sinks (archived for two years following the end of the (last) crediting period) is not	CR	<input checked="" type="checkbox"/>

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
		included. Clarification Request No 10 <ul style="list-style-type: none"> • Provide information and reference for the increment data mentioned in the PDD. (The source mentioned does not sustain the figure of annual increment of 0.054 m³/cu = 5.4% annual increment of the growing stock) • During onsite visit no information on baseline calculation were provided. The Excel tables send by emails are not self-explanatory. Provide calculation with respective explanation how the figures for growing stock were calculating (including information on standard error and precision level). See CAR in C3 <ul style="list-style-type: none"> • Include the table with the data used for calculation of the ex ante baseline net GHG removals by sinks (see PDD guidelines). 		
AR-ACM0001 (Estimation of baseline net GHG removals by sinks)				
Have the changes in carbon stock of above-ground and below-ground biomass of non tree vegetation been assumed to be zero for all strata in the baseline scenario?	2	Changes in AGB and BGB are considered to be zero.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Is it assumed that the sum of the changes in the carbon stocks of dead wood and litter carbon pools is zero for all strata in the baseline scenario?	2	The sum of the changes in the carbon stocks of dead wood and litter carbon pools are assumed to be zero for all strata in the baseline scenario.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Have the changes in carbon stock in soil organic carbon been assumed to be zero for all strata in the baseline scenario?	2	Changes in the carbon stocks of SOC are assumed to be zero for all strata in the baseline scenario. Clarification Request No 11 Carbon content in soils in the project area shall be referenced	CR	<input checked="" type="checkbox"/>

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
		from national districts		
Is the baseline net GHG removal considered for above and below ground biomass of trees in the baseline? (formula 1)	2	Baseline removals are discussed in the PDD (see CARs below)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4.1 Carbon stock changes in above-ground and below-ground tree biomass	2			
For estimation of carbon stock changes in above- and below-ground tree biomass in the baseline, is the formula included to the PDD and correctly applied? (formula 2)	2	Data used in the baseline study is taken from the Forest Survey of India. 5.4% increment on standing stock increment is assumed to be the baseline biomass increment (see CR below)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Is the baseline annual net carbon stock change in above-ground and below-ground biomass, estimated using one of following two methods (increment data vs. stock data): <ul style="list-style-type: none"> Method 1: Carbon gain-loss method Method 2: stock change method 	2	There is no indication about the method chosen Clarification Request No 12 <ul style="list-style-type: none"> Provide explanation and if required calculations with explanations, why the increment of the baseline is considered insignificant. Identify which method /carbon gain-loss or stock change) was used for the calculations 	CR	<input checked="" type="checkbox"/>
Has the corresponding formula been applied correctly, are used values in line with onsite conditions and are they clearly sustained / referenced? (formulae 3 ff)	2	See above	CR	<input checked="" type="checkbox"/>
In regard to Dj (wood density), BEF1,j (biomass expansion factor for conversion of increment), BEF2,j (biomass expansion factor for conversion of volume), CFj (carbon fraction for species) and Rj (root to shoot ratio). Have values been chosen with priority from local values to IPCC defaults?	2, 100	Belowground biomass is estimated using the IPCC default conversion factor of 0.26. Root-shoot ratio is taken from the publication by Cains et al. (0.24), Wood density of 0.6 is used, which is an average of several WD factors (see CR below). For carbon fraction a factor of 0.5 is taken (IPCC default)	CAR	<input checked="" type="checkbox"/>

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
		<p><u>Corrective Action Request No 9.</u></p> <ul style="list-style-type: none"> The BEF was assumed to be zero, since the trees on the project area were assumed to be lobbed. However, during onsite visits not all the trees onsite were observed as lobbed. To have a conservative approach a BEF shall be included in the calculation Provide a justification and reference for root-shoot ration and wood density in the PDD 		
If data from global or national databases has been used, have values been confirmed through local data from literature or inventory?	2	See CAR above	CAR	<input checked="" type="checkbox"/>
4.2 Steady state under the baseline conditions				
If the baseline net GHG removals by sinks are greater than zero, has it been assumed to be constant until steady state is reached under the baseline conditions?	2	The baseline increments are assumed to continue over 20 years of the first crediting period. No steady state (cap) is defined. The default value of 20 years can be applied.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D. Estimation of ex ante Actual Net Removals, Leakage and Net Anthropogenic Removals				
D.1 Estimation of ex ante actual net removals				
Are the calculations of ex ante actual net removals for the crediting period consistent with the approach in the selected methodology and adequately defined?	2, 42	<p>Calculations are done in TARAM. TARAM files were provided before the onsite visit. The TARAM tool used methodology AR-AM0003, which was then merged into AR-ACM0001.</p> <p><u>Corrective Action Request No 10.</u></p> <ul style="list-style-type: none"> Provide updated TARAM calculation based on the requests in section A (area), C (baseline) and D (see below). Ensure that the calculations are in compliance with methodology AR-ACM0001, and provide respective explanation. 	CAR	<input checked="" type="checkbox"/>
AR-ACM0001				
Estimation of changes in carbon stocks in the <u>project scenario</u> (section II.5.1)				

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
Has the formula for the calculation of actual changes in living biomass, dead wood, litter and soil organic carbon stocks been applied correctly?	2, 42	The formula is included in the PDD. TARAM is used as tool to calculate the emission educations (see CAR above)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>5.1.1 Tree Biomass</i>				
Has the mean carbon stock in above- and below-ground biomass per unit area been calculated under the biomass Expansion Factors (BEF) method, or the Allometric Equations method? Have all the steps followed according the methodology requirements for the selected method? (formulae 15-22)	2, 42	<u>Clarification Request No 13</u> <ul style="list-style-type: none"> Provide information in the PDD on the method used. Provide a summary (main steps / intermediate results) of the calculations in the PDD 	CR	<input checked="" type="checkbox"/>
<i>5.1.2 Dead Wood (if selected)</i>				
Has the changes in carbon stocks of dead wood been conservatively neglected for ex ante estimates? (differentiated to standing and lying deadwood)	2	n/a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>5.1.3 Litter (if selected)</i>				
Has the changes in carbon stocks of litter been conservatively neglected for ex ante estimates?	2	n/a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>5.1.4 Soil carbon (in selected)</i>				
Has the changes in carbon stocks of soil carbon been conservatively neglected for ex ante estimates, or assessed using the default method?	2	The default method was used to assess future carbon stock changes under the project scenario <u>Corrective Action Request No 11.</u> Please address soil organic carbon as required by the methodology.	CAR	<input checked="" type="checkbox"/>
<i>Estimation of GHGe (section II.5.2)</i>				
Is the increase of GHG _{emissions} (GHG _E) estimated according to methodology implications and is sustained and references input data used?	2	Formula for calculations of emissions are correctly referenced	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
Have GHG emissions from fossil fuel combustion been assessed according the latest version of the tool: Estimation of GHG emissions related to fossil fuel combustion in A/R project activities	2	<p>No significant emissions from burning of fossil fuels are expected in the project, since all labour is expected to be carried out manually. Furthermore, according to the report of the EB 42 meeting of the Executive Board, paragraph 35, GHG emissions from transport may be considered as insignificant and hence can be neglected in A/R baseline and monitoring methodologies and tools. In general fossil fuel combustion in A/R CDM project activities are considered insignificant in A/R CDM project activities and may therefore be neglected, according to EB 44.</p> <p>The GHG emissions from fossil fuel burning during use of machinery for land preparation and other activities, and biomass burning during site preparation are estimated.</p> <p>There is no clear indication whether the latest tool for estimation of GHG emissions related to fossil fuel combustion was used</p>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Have non-GHG emissions due to biomass burning been assessed according the latest version of the tool: Estimation of emissions from clearing, burning and decay of existing vegetation due to implementation of a A/R CDM project activity	2	The tool: "Estimation of emissions from clearing, burning and decay of existing vegetation due to implementation of a CDM A/R project activity" was used.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data and parameters that are available at validation				
Is the list of parameters presented in chapter D.1 considered to be complete with regard to the requirements of the applied methodology (section II.8)?	2, 41, 42	<p>Since many different species are used in the project, species used in the project are grouped into fast growing, medium growing and slow growing species. For each altitude group a different mix of these species was defined (IRL 39).</p> <p>Factors like BEF, RS, WD, allometric equations and increment values were taken for these species groups.</p> <p><u>Clarification Request No 14</u></p>	CR CAR	<input checked="" type="checkbox"/>

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
		<p>Include the grouping of species in the PDD and references for the different figures (wood density, MAI, BEF, AGB, RS). Explain how a conservative approach was ensured, when grouping the different species.</p> <p><u>Corrective Action Request No 12.</u></p> <p>The list of parameters available at validation as per methodology (section II.8) shall be included to the PDD. Assure to reflect on methodology requirements as specified in regard to source of data and comments. <i>(While it is recognised that mostly corresponding information is already included, this CAR refers to the methodology specific layout and presentation of data and defaults used for validation)</i></p>		
A BSL, i, y - area of baseline strata i Is the parameter and are requirements as per methodology included to the PDD?	2	See CAR above	CAR	☑
BEF _{1,j} – Biomass expansion Factor: Is the parameter and are requirements as per methodology included to the PDD?	2	See CR 19 and CAR 13	CAR	☑
BEF _{2,j} ; BEF _{2, DS} : Is the parameter and are requirements as per methodology included to the PDD?	2	See CAR above	CAR	☑
CF _{DW} – Carbon fraction of dry matter in dead wood Is the parameter and are requirements as per methodology included to the PDD?	2	na		
CF _j , CF _{DS} : Is the parameter and are requirements as per methodology included to the PDD?	2	See CAR above	CAR	☑
CF _{LI} : Is the parameter and are requirements as per methodology included to the PDD?	2	na		
D _j , D _{DS} : Is the parameter and are requirements as per methodology See CAR above included to the PDD?	2	See CR 19 and CAR 13	CAR	☑

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
D _{BW,dc} : Is the parameter and are requirements as per methodology included to the PDD?	2	na	CAR	☑
F _i (DBH,H): Is the parameter and are requirements as per methodology included to the PDD?	2	See CR 19 and CAR 13	CAR	☑
I _{v,j,i,t} : Is the parameter and are requirements as per methodology included to the PDD?	2	See CR 19 and CAR 13	CAR	☑
nTR _{j,i,t} : Is the parameter and are requirements as per methodology included to the PDD?	2	See CAR above	CAR	☑
R _j : Is the parameter and are requirements as per methodology included to the PDD?	2	See CR 19 and CAR 13	CAR	☑
RI _j : Is the parameter and are requirements as per methodology included to the PDD?	2	See CR above	CAR	☑
V _{tree,j,i,t} : Is the parameter and are requirements as per methodology included to the PDD?	2	See CAR above	CAR	☑
D.2 Estimation of ex ante leakage				
Are the calculations of ex ante leakage for the crediting period consistent with the approach in the selected methodology and adequately defined?	2	The following sources of leakage have been considered when assessing leakage, as required by the methodology: leakage through activity displacement.	☑	☑
AR-ACM0001, section II.6				
Estimation of LK <i>ActivityDisplacement</i> - Carbon stock decreases caused by displacement of pre-project agricultural activities, grazing and fuel wood collection: Have the emissions from LK <i>ActivityDisplacement</i> been estimated adequately and in line with the methodology requirements and has sufficient evidence provided on input values?	2	See CAR in A.5.6 for displacement of agricultural activities. Grazing and fuel wood collection is occurring on the project area prior to the project implementation. Clarification Request No 15 • Provide reference and explanation on the <u>PRA</u> related to grazing and field study on grass production (<i>Excel sheets provided after onsite visit are not self-explanatory</i>). If needed, values shall be adapted after review of these calculations	CR	☑

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
		<ul style="list-style-type: none"> Provide reference and explanation on the household survey related to fuel wood collection (<i>Excel sheets provided after onsite visit are not self-explanatory</i>) <i>If needed, values shall be adapted after review of these calculations</i> 		
Has the calculation of leakage due to conversion of land to grazing land been estimated using the tool: “Estimation of GHG emissions related to displacement of grazing activities in A/R CDM project activity”?	2	<p><u>Corrective Action Request No 13.</u></p> <p>Utilize the tool for “Estimation of GHG emissions related to displacement of grazing activities in the AR CDM activities”.</p>	CR	☑
<p>Estimation of leakage due to increased use of wood posts for fencing</p> <p>Have the emissions from $LK_{fencing}$ been estimated adequately and in line with the methodology requirements and has sufficient evidence provided on input values?</p>	2	Leakage due to fencing has been calculated. Since it is less than 1% of the actual ex-ante net removals, it can be considered as insignificant and be neglected. Also the update of the methodology to version 03 does not consider leakage due to fencing anymore.	☑	☑
E. Monitoring Plan				
E.1 Monitoring of the project implementation				
E.1.1 Has data to be collected for monitoring of forest establishment and management been listed adequately?	2	Yes, data are listed adequately.	☑	☑
In the collection of data for the monitoring of the project boundary, forest establishment or of forest management, do any measurements not follow typical forest mensuration practices and if so have they been adequately described?	2	Measurements follow typical forest mensuration.	☑	☑
E.1.2 Have the SOPs and quality control/quality assurance (QA/QC) procedures applied been adequately described according to the methodology requirements?	2	<p>SOPs have been defined in annex 4. No QA/QC procedures are yet defined.</p> <p><u>Corrective Action Request No 14.</u></p> <p>Develop QA/QC procedures for project implementation, summarize them in the PDD and provide the documents to the audit team during onsite visit.</p>	CAR	☑

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
		Refer to annex 4 for SOPs		
E.2 Sampling design and stratification				
Has the ex-ante stratification of the project area been included to the PDD, if not, is it justified?	2	Ex-ante stratification is included to the PDD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Have the conditions for ex-post strata update (within in GIS data base) been included to the PDD / Monitoring Plan?	2	<u>Clarification Request No 16</u> Include in the PDD the conditions for ex-post strata update.	CR	<input checked="" type="checkbox"/>
Is the sampling framework determined using the tool for the “Calculation of the number of sample plots for measurements within A/R CDM project activities”?	2	An Excel sheet developed by Winrock has been used to calculate the number of sample plots. It was calculated that 259 plots were needed <u>Corrective Action Request No 15.</u> <ul style="list-style-type: none"> • Provide clarification whether the tool used is in compliance with the methodology. • Clarify how the values for deviation are derived and adopt the values if needed, • Recalculate the number of sample plots per strata considering the updated input parameter. (<i>provide calculations to DOE</i>) <u>Clarification Request No 17</u> Revisit the sampling approach for SOC. Explain in the PDD how the approach sampling approach is applied in practice.	CAR CR	<input checked="" type="checkbox"/>
E.3 Monitoring of the baseline net removals				
Is monitoring of the baseline net removals required by the selected methodology? If yes, ▪ has the application of the procedure for selection of sam-	2	Baseline monitoring not required.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
<p>ple plots been adequately defined and has all data to be collected or used been listed?</p> <ul style="list-style-type: none"> has the application of the procedure for selection of sample plots been adequately defined and has all data to be collected or used been listed? 				
E.4 Monitoring of the actual net removals				
Has the data to be collected in order to monitor the <u>changes in carbon stock</u> resulting from the project been adequately defined?	2	<p>A list with data to be collected is available in the PDD.</p> <p><u>Corrective Action Request No 16.</u></p> <ul style="list-style-type: none"> Update the list of parameters to be monitored according to the methodology, and use the template given in the methodology Species composition shall be monitored, and included as monitoring parameter Ownership / contractual relations with private owners and user groups shall be included in monitoring 	CAR	☑
A _i ; is the parameter included and are monitoring requirements as per methodology included to the PDD?	2	See CAR above	CAR	☑
a _{i,sp} ; is the parameter included and are monitoring requirements as per methodology included to the PDD?	2	See above	CAR	☑
A _{sp,i} ; is the parameter included and are monitoring requirements as per methodology included to the PDD?	2	See above	CAR	☑
B _{LI_wet,i,sp} ; is the parameter included and are monitoring requirements as per methodology included to the PDD?	2	See above	CAR	☑
C _{SOCsample,i,p,t} ; is the parameter included and are monitoring requirements as per methodology included to the PDD?	2	See above	CAR	☑
D _{n,i,t} ; is the parameter included and are monitoring requirements as per methodology included to the PDD?	2	See above	CAR	☑
DBH, is the parameter included and are monitoring requirements	2	Parameter is included as well as monitoring requirements.	☑	☑

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
ments as per methodology included to the PDD?				
H; is the parameter included and are monitoring requirements as per methodology included to the PDD?	2	See above	CAR	☑
L, is the parameter included and are monitoring requirements as per methodology included to the PDD?	2	See above	CAR	☑
MP _L ; is the parameter included and are monitoring requirements as per methodology included to the PDD?	2	See above	CAR	☑
N; is the parameter included and are monitoring requirements as per methodology included to the PDD?	2	See above	CAR	☑
t ₁ and t ₂ , is the parameter included and are monitoring requirements as per methodology included to the PDD?	2	See above	CAR	☑
Has the data to be collected in order to monitor the <u>GHG emissions</u> that are increased as a result of the project activity within the project boundary been adequately defined?	2	<p>There is no indication on data to be collected in order to monitor GHG emissions that are increased as a result of the project activity. However, no GHG emissions are expected to occur in the project.</p> <p><u>Corrective Action Request No 17.</u></p> <p>Include a statement on non-significance of GHG emissions and their monitoring.</p>	CAR	☑
Are the procedures for measurements in the monitoring of the changes in carbon stocks or the monitoring of GHG emissions increased in the project clearly defined and do they follow typical forest mensuration practices?	2	See above	CAR	☑
E.5 Leakage				
E.5.1 If monitoring of leakage is required by the selected methodology has this been stated and has the data and information that will be collected to monitor leakage been adequately defined?	2	<p>It is indicated that leakage is not monitored.</p> <p><i>See CARs in section D2</i></p>	CAR	☑

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
Are the procedures for measurements for the monitoring of leakage clearly defined and do they follow typical forest mensuration practices?	2	<i>See above</i>	CAR	<input checked="" type="checkbox"/>
E.5.2 Have procedures for the periodic review of the implementation of activities and measures to minimize leakage been adequately defined?	2	The procedures were not defined. This section is left blank in the PDD. If no leakage occurs, no periodic review is required. See CARs in section D2	CAR	<input checked="" type="checkbox"/>
E.6 QA/QC procedures undertaken for data monitored				
Have QA/QC procedures been defined appropriately and are explanations of procedures (including their absence) reasonable?	2	Procedures are provided in a list, however the ID number for each data is not indicated in the table. <u>Corrective Action Request No 18.</u> Please include the ID number for each data mentioned in the table as required by the PDD guidelines	CAR	<input checked="" type="checkbox"/>
E.7 Operational and management structure of project operator				
Has the operational and management structure that the project operator will implement in order to monitor actual removals and leakage by the project been adequately defined?	2	The operational management structure has been described for all involved partners in the monitoring process. The organization chart includes the participation of project authorities, research institutions and Gram Panchayats. It will be coordinated by the MHWDP project directorate. <u>Clarification Request No 18</u> Include an updated chart and information on the operational and management structure for monitoring the actual net removals and local capacities.	CR	<input checked="" type="checkbox"/>
Person applying monitoring plan				
Has the person or entity applying the monitoring plan been named, are they listed as a project participant and has contact information been provided?	2	The entities applying the monitoring plan are: 1. MHWDP: Chief Project Director, Solan	CR	<input checked="" type="checkbox"/>

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
		<p>2. Universities / Research Institutes: Department of Forests, Department of Horticulture, Solan Agricultural University, Solan</p> <p>3. Gram Panchayats</p> <p>The only contact detail is provided in Annex 1 for MHWDP chief project director and is also a project participant.</p> <p><u>Clarification Request No 19</u></p> <p>Indicate the contact details for each of the entities mentioned in this section and clearly indicate that MHWDP is also a project participant listed in Annex 1 of the PDD</p>		
F. Environmental Impacts of the Project				
F.1 Documentation of analysis of environmental impacts				
Has an analysis of the environmental impacts including impacts on biodiversity and natural ecosystems and impacts outside the project boundary been adequately documented?	2, 10, 13, 124	<p>Positive impacts inside the project are:</p> <ul style="list-style-type: none"> - Watershed protection - Biodiversity enhancement (use of native species) - Suppression of alien invasive species - Grass production - Soil fertility <p>Outside the project area the pressure to forest, flooding and landslides will be reduced.</p> <p>The World Bank will conduct an assessment on environmental impacts every six month.</p> <p><u>Clarification Request No 20</u></p> <ul style="list-style-type: none"> • Describe in this section only the analysis of the environmental impacts (i.e. fuel wood production shall be described in section G.1). • Provide the Environmental Social Guidelines (ESG) and Environmental Social Management Framework (ESMF) developed under the MHWDP 	CR	<input checked="" type="checkbox"/>
Does the analysis include (where applicable) adequate infor-	2, 13	Potential risks and mitigation actions on fire, grazing, invasive		

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
mation on hydrology and soils, and risk of fires, pests and diseases?		species, site preparation and pests are described.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.2 Significant negative impacts				
If any negative impact is considered significant by the project participants or the host Party, has a statement that the project participants have undertaken an environmental impact assessment in accordance with the procedures required by the host Party (including conclusions and references to supporting information) been provided?	2, 13	No significant negative environmental impacts are expected. As a result of the project activity could cause temporary loss of grazing land for the livestock. No EIA is needed for AR activities in India.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.3 Remedial measures to address impacts				
Has a description of the planned monitoring and remedial measures to address significant environmental impacts been adequately defined?	2, 13	Monitoring the potential risks and any adverse impacts on local environment will be conducted. <u>Clarification Request No 21</u> If no significant negative environmental impacts are expected monitoring is not required. Please clarify/ ensure consistency with section F2.	CR	<input checked="" type="checkbox"/>
G. Socio-economic Impacts of the Project				
G.1 Documentation of analysis of socio-economic impacts				
Has an analysis of the socio-economic impacts including impacts outside the project boundary been adequately documented?	2, 13, 37, 38, 123	The expected socioeconomic impact are: - The flow of revenue - Land use change with more benefits - Employment opportunity - Woman empowerment - NTFP availability - Fuelwood supply - Financial benefits to landless and the poor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Does the analysis adequately include (where applicable) information on local communities, indigenous people, land tenure, local employment, food production, cultural and religious sites and access to fuel wood and other forest products?	2	A description of potential socioeconomic risks to indigenous people, loss of cultural and religious sites, access to grass, NTFP and fuelwood is provided.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
G.2 Significant negative impacts				
If any negative impact is considered significant by the project participants or the host Party, has a statement that the project participants have undertaken a socio-economic impact assessment in accordance with the procedures required by the host Party (including conclusions and references to supporting information) been provided?	2, 13, 37, 38, 123	No negative socio-economic impacts expected. See CR below	CR	<input checked="" type="checkbox"/>
G.3 Remedial measures to address impacts				
Has an adequate description of the planned monitoring and remedial measures to address significant socio-economic impacts been provided?	2, 13, 37, 38, 123	Monitoring the loss of access to indigenous people for grass production and Access to grass, fuelwood and NTFPs will be conducted. <u>Clarification Request No 22</u> If no significant negative socio-economic impacts are expected monitoring is not required. Please clarify / ensure consistency with section G2.	CR	<input checked="" type="checkbox"/>
H. Stakeholder Comments				
H.1 Description of how stakeholder comments have been invited and compiled				
Has a description of how stakeholder comments have been invited and compiled been provided and has it been undertaken in an open and transparent manner that facilitates comments being received and has the project been described in a manner that allows local stakeholders to understand the project?	2, 37, 40	PRA for the GP members as well as with the whole village community of 30 GPs (of 602GP) and a questionnaire survey with the individual sample households from all 30 GPs were conducted. 30 GPs were randomly selected Half-day workshops were held <u>Clarification Request No 23</u> • Describe the process of PRA in the PDD. • Provide records / results of the PRA	CR	<input checked="" type="checkbox"/>
H.2 Comments received				

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Have stakeholders who made comments been identified and has a summary of the comments been provided?	2, 40	A description of the identified stakeholders is provided in section H.1. <u>Corrective Action Request No 19.</u> Include in this section the summary of the comments received from stakeholders and in sections H.1 describe only the process on how stakeholder comments have been invited and compiled	CAR	<input checked="" type="checkbox"/>
H.3 Report on due account				
Has an explanation on how due account has been taken regarding the received comments from stakeholders been provided?	2	An explanation on the actions to be taken considering the stakeholder's comments is included into the PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Annexes				
Annex 1 Contact information on project participants				
Is contact information on participants of the project complete?	2	All contact details are provided	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Annex 2 Public funding				
Has information been provided from Parties listed in Annex 1 on sources of public funding for the project which affirms that funding does not result in a diversion of official development assistance and is separate from and not counted towards the financial obligations of those Parties?	2, 4, 24	No ODA is diverted, see CAR in A10	CAR	<input checked="" type="checkbox"/>
Annex 3 Baseline information				
Has information additional to that required in Section C or in the approved methodology been provided (or stated as not required)?	2	Data on Baseline study included in Annex 3, see CARs in section C	CAR	<input checked="" type="checkbox"/>
Annex 4 Monitoring plan				
Has the monitoring plan been included as annex 4 and does it allow for all the requirements listed under paragraph 25 of the Modalities and procedures for A/R project activities under	2	A Monitoring Plan is included in Annex 4 of PDD, see CARs in section E	CAR	<input checked="" type="checkbox"/>

Ref. = Reference as included to Information Reference List (Annex 2)



Industrie Service

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
the CDM?				

Table 2: CDM responses to CAR and CR

Draft report clarifications and corrective action requests by validation team	Ref. to PDD	Summary of project owner response	Validation Conclusion
<p><u>Corrective Action Request No 1.</u></p> <p>Provide district-wise maps with all eligible polygons in the PDD with scale, northing, coordinate and datum and include to PDD.</p> <p>Provide digital boundary files (e.g. GIS shape files) of all eligible parcels included in the project.</p>	A.4.2	<p><u>Project team 12 Aug 09</u></p> <p>District wise maps prepared with coordinates (enclosed as Attachment 4) – Will be sent on 22nd August, 2009</p> <p>Digital boundary files prepared and enclosed as Attachment 5 will be sent on 22nd August, 2009</p> <p><u>Audit team 28 Aug 09</u></p> <p>Digital boundary files (shape files) were received, delineating the boundary.</p> <p>The file “sujanpur_polygon.shp” is corrupted and cannot be open.</p> <p>Please clarify the difference between the folder “distwise_parcel” and “shp_files”.</p> <p>Both folders contain shape files, partly of the same area. In both cases the total area differs from each other and from the area mentioned in the PDD. Therefore:</p> <p>Provide <u>one</u> shape file that contains all boundary information, including a defined projection system that can also be used for upload to UNFCCC.</p> <p><u>Project Team Response 11 Nov 09</u></p> <ul style="list-style-type: none"> • Sujanpur Shape file have been rectified & can now be opened. • Validation Protocol (Round -1) 11/05/09 CAR-1 required district-wise maps of eligible parcels where as in the project watershed division is the functional unit. To fulfill the requirements of Validators, a Octarate Distreict-wise folder was created to include district-wise shape files. Now one folder is provided giving Division wise shape files of parcels. In another folder only district and State boundaries have been kept (and not parcel boundaries). Relationship between functional divisions of the Project and district with reference to parcel has been clarified in the folder “Response to CAR_1”. • Areas as given in attribute files of the Parcels have been incorporated in the PDD and all the relevant calculations (TARAM) • Shape files have been created in Arc Info (ver.9.2). Projection system is - Universal Transverse Marcator (UTM). Datum is WGS 84. UTM Zone----43N. <p><u>Audit team 19 Nov 09</u></p>	<p>☑</p>

		The digital boundary delineation of all parcels was submitted to the DOE.	
<p><u>Clarification Request No 1</u></p> <p>Provide information on the percentage of private land out of the total project area. This private land is considered to be not under control. If less than 20% is private land, EB 44 allows to provide evidence on the control over the area at a later stage (see FAR below)</p>	A.4.2	<p><u>Project team 12 Aug 09</u></p> <p>The percentage of private land out of the total project area of 4151 ha is only 549 ha, which is only 13%. This is less than 20% of the total project area and therefore evidence on control over area for some of the parcels will be provided at the time of first verification. However all formalities are complete and the codal formalities are complete to proceed further</p> <p><u>Audit team 28 Aug 09</u></p> <p>Information on private land is provided in the PDD (549 ha =13%). Control has to be shown at verification (Forward Action Request 1)</p>	☑
<p><u>Corrective Action Request No 2.</u></p> <p>During site visits areas have been identified that are not subject to reforestation. Exclude areas that are not subject to reforestation, e.g. due to steep slopes or rocky terrain (e.g. parcel SP006_P1), and provide respective evidence.</p>	A.4.2	<p><u>Project team 12 Aug 09</u></p> <p>All the parcels were revisited to verify land eligibility criteria. Verification was done in the field as well as with remote sensed maps. Areas with steep slopes and rocky terrain, unfit for reforestation have been excluded from the project area and the total current project area is 4151 ha compared to the previous area of 10,000 ha. For example, parcel SP006_P1 and others with similar conditions are no more part of the project area (refer to Annex 6 and Attachment 20)</p> <p><u>Audit team 28 Aug 09</u></p> <p>Parcels were excluded from the project area, the overall project area was reduced from 10'000 ha to now 4125 ha.</p> <p>Provide evidence how it is ensured that all project area is subject to reforestation and all non-plantable areas like steep slopes are excluded from the project area.</p> <p><u>Project Team Response 11 Nov 09</u></p> <p>After on site visit by validator & their comments, detailed field studies were carried out for exclusion of parcels with the following features.</p> <ul style="list-style-type: none"> ➤ If steep unculturable slopes - excluded ➤ If deep gullies - excluded ➤ If tree vegetation qualifying as forests as per Country definition - excluded. ➤ If subjected to agriculture; currently or recently - excluded <p>A format was developed for the same (Attachment 21)</p> <ul style="list-style-type: none"> ➤ Field Teams were given 'hands on' training to do the required Job. ➤ In each watershed division, field teams revisited each & every parcel and 	☑

		<p>filled proforma & marked areas to be excluded on maps (Google maps, where ever available).</p> <p>After Field Visit, these were checked by supervisory staff for quality check. Thus parcels were reduced from 960 to 393 and area reduced from 10000 ha to 4113 ha.</p> <p>Fifteen such forms (Attachment 21) of eligible parcels are enclosed. All forms of all the parcels are available, if needed.</p> <p>The changed area data has been incorporated into the PDD.</p> <p><u>Audit team 19 Nov 09</u></p> <p>The field forms used for delineating only the plantable area was provided. It includes field forms and satellite imagery from Google Earth. Request closed.</p> <p>Final area was adjusted to 4003.07 ha (see CAR 4)</p>	
<p><u>Clarification Request No 2</u></p> <p>Include information on the assessment of endangered species and provide reference for the sources (how the list was developed).</p> <p>Explain if any of the listed rare or endangered species are actually found in the project area.</p>	A.5.2	<p><u>Project team 12 Aug 09</u></p> <p>Reference to source of information on endangered species provided (Attachment 6).</p> <p>There are no endangered species found in the project area and the same incorporated in the PDD, along with references.</p> <p><u>Audit team 28 Aug 09</u></p> <p>Describe in the PDD how it was assessed that no endangered species are present in the project area.</p> <p><u>Project Team Response 11 Nov 09</u></p> <p>Vegetation survey was conducted as part of the baseline study. The vegetation survey included recording of all tree species present in the sample plots. Based on this survey, it can be concluded that there are no endangered flora in the project area as none were encountered (List of species recorded during survey in sample GPs is enclosed as Attachment 22). Further, the Focus/Concentration of endangered species is in the Protected Area Network (Wild Life Sanctuaries & National Parks). None of the project parcels fall within the Protected Area Network.</p> <p><u>Audit team 19 Nov 09</u></p> <p>Describe <i>in the PDD</i> how it was assessed that no endangered species are present in the project area.</p> <p><u>Project Team Response 01 Dec 09</u></p> <p>The details of how presence/absence of endangered species was assessed are included in the PDD, Section A.5.2.</p>	☑

		<p><u>Audit team 04 Dec 09</u></p> <p>Endangered species were assessed during the baseline study.</p>	
<p><u>Corrective Action Request No 3.</u></p> <ul style="list-style-type: none"> Modify and update table A.5.1, identifying the stand models used in the project <p>Provide reference to the book describing the different species which will be planted in the project</p>	A.5.3	<p><u>Project team 12 Aug 09</u></p> <p>Table A.5.1 (BOX A.5.1) updated with stand models (giving complete listing of species) that would be planted in the project</p> <p>Reference for technical description of species provided (Silviculture of Indian Trees, Vol. I to VI compiled by ICFRE Dehra Dun; Fodder trees of India by Sh. R.V. Singh I.F.S (Retd) and Silviculture of hundred useful trees By Lakshman Singh Khanna IFS (Retd))</p> <p><u>Audit team 28 Aug 09</u></p> <p>Table A.5.1 now contains the information on reforestation models and species mix included in each model. A detailed description of the tree species is included in the PDD.</p>	☑
<p><u>Clarification Request No 3</u></p> <ul style="list-style-type: none"> Provide reference to plan in section C4, clarify if the same procedure will be applied for all the species Provide references/documentation regarding the techniques to be applied according to the project site environmental characteristics and species to be used (soil, precipitation, etc) as well as local capacities. 	A.5.4	<p><u>Project team 12 Aug 09</u></p> <p>The silvicultural and management practices adopted for the different mix of species planted under different stand models (in different strata) remains the same.</p> <p>Reference for technical description of species provided (Silviculture of Indian Trees, Vol. I to VI compiled by ICFRE Dehra Dun; Fodder trees of India by Sh. R.V. Singh I.F.S (Retd) and Silviculture of hundred useful trees By Lakshman Singh Khanna IFS (Retd))</p> <p><u>Audit team 28 Aug 09</u></p> <p>Silvicultural techniques are described in the PDD, the reforestation schedule is presented in section C.4.</p> <p>Reference is provided above.</p>	☑
<p><u>Clarification Request No 4</u></p> <p>During onsite visits, small patches of agriculture have been observed in one parcel (SP030_C1). Please indicate in the PDD if agricultural crops and grazing activities are included in the project area. If it is the case, provide more detailed information (hectares under agriculture, number of heads/ha) in section A.5. If not, please exclude these</p>	A.5.6	<p><u>Project team 12 Aug 09</u></p> <p>All the parcels included for A/R CDM under this project are neither under agriculture nor under grazing as explained in Section C.5.1. This has further been verified post-validation in accordance with ESMF of the World Bank. Therefore the parcels currently included in the project have no agriculture or grazing being practiced (Attachment 20).</p> <p><u>Audit team 28 Aug 09</u></p> <p>Parcels were excluded.</p>	☑

<p>areas.</p>		<p>Provide evidence how it is ensured that no agricultural area is included in the current project area. If no independent credible evidence can be provided, an additional on-site visit is required to validate the project.</p> <p><u>Project Team Response 11 Nov 09</u></p> <p>Detailed procedure has been explained in response to CAR-2. Attachment 23 is provided as supportive evidence illustrating 10 sample private abandoned agriculture parcels that have been excluded. Besides, as per safeguard norms of the Parent World Bank Project (MHWDP), conversion of land from agriculture or any other land use is not allowed. Some abandoned agricultural lands were included earlier but they have been excluded now on revisit. About 10% (533.15 ha) of private wastelands which will be covered under tripartite agreement have been included during revisit. Details of all the excluded parcels are available and could be provided on request.</p> <p><u>Audit team 19 Nov 09</u></p> <p>The agricultural area was excluded from the project boundary. Evidence on the exclusion of agricultural area was provided to the DOE.</p>	
<p><u>Corrective Action Request No 4.</u></p> <p>During field visits some parcels contained patches according to the Indian UNFCCC forests definition (e.g. CH008_F7, DS013_P1, CH014_F02, SP030_C1, SP0004_C1).</p> <p>Exclude patches of forest according to the Indian forest definition within the project area.</p>	<p>A.7</p>	<p><u>Project team 12 Aug 09</u></p> <p>Subsequent to validation, a detailed field survey was undertaken by visiting all the parcels to ensure conformity of parcels with Indian UNFCCC forest definition. The current project area of 4151 ha does not include any patches that are forest as per Indian UNFCCC forest definition (Annex 6 and Attachment 20).</p> <p><u>Audit team 28 Aug 09</u></p> <p>Parcels were excluded from the project area, the overall project area was reduced from 10'000 ha to now 4125 ha</p> <p>Provide evidence how it is ensured that no forest is included in the current project area.</p> <p>If no independent credible evidence can be provided, an additional onsite visit is required to validate the project.</p> <p><u>Project Team Response 11 Nov 09</u></p> <p>Detailed procedure has been explained in response to CAR-2. Attachment 21 provides supportive evidence. The change in area has been incorporated into the PDD.</p> <p><u>Audit team 19 Nov 09</u></p> <p>The parcel code KL009_F1 (260 ha) seems to include forest patches inside according to the satellite image in Google Earth. The area of forest shall be excluded and</p>	<p>☑</p>

		<p>the new boundary must be submitted. The area shall also be recalculated and the calculations adopted accordingly.</p> <p><u>Project Team Response 01 Dec 09</u></p> <p>As per physical verification of the area, the growth seen in the satellite image is actually dense growth of fern (less than 2 meter height) spread over large area and is not woody tree growth, So the parcel need not be excluded. A Copy of image is attached (Attachment KL009_F1).</p> <p><u>Audit team 04 Dec 09</u></p> <p>The current shape / kml file do not seem to fit with Google earth images Provide corrected kml file (also see parcel KL004_F1, KL007_F1).</p> <p>The Landsat image of KL009_F1 could also be taken as evidence for eligibility.</p> <p><u>Project team 04 Dec 09</u></p> <p>The area of 260.061 ha of the parcel KL009_F1 has been deducted from the total area of 4113.85. The new area is now 3853.79 ha. This parcel was categorized as high altitude forest land and therefore the total area under high altitude forest land is now reduced to 1081.63 from the previous area of 1344.76 ha.</p> <p>The TARAM calculations have been revised inputting this revised new area and the number changed accordingly in the PDD, wherever relevant. The sample plots for monitoring have also been recalculated considering the revised new area of 3853.79 ha. The entire calculation in the revised PDD confirms to the to the area of 3853.79 ha.</p> <p><u>Audit team 05 Dec 09</u></p> <p>Although the parcel was in most parts eligible, the entire parcel was taken out of the project area. Calculation of GHG net anthropogenic removals were updated accordingly.</p> <p><u>Project Team Response 04 Jan 10</u></p> <p>Of the total area of 260 ha, 111 ha that seemed to have some woody growth, although they were seasonal ferns has been eliminated and an area of 149 ha included. The revised project area is 4003.07 ha.</p> <p>The TARAM calculations have been revised inputting this revised new area and the number changed accordingly in the PDD, wherever relevant. The sample plots for monitoring have also been recalculated considering the revised new area of 4003.07 ha. The entire calculation in the revised PDD confirms to an area of 4003.07 ha.</p> <p><u>Audit team 20 Jan 10</u></p>	
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		<p>Shape files have been updated and submitted.</p> <p>Adapt section A.4.2 accordingly (smallest parcel is 0.2 ha, overall number of parcels 420).</p> <p>Include the final list of parcels with all 420 parcels, its ID (code), area and strata in the annex of the PDD.</p> <p><u>Project Team Response March 2010/ June 2010</u></p> <p>Section A.4.2 revised to reflect the submission of all documentation</p> <p>The total number of parcels is 420 and Annex 5 revised and the same enclosed</p> <p><u>Audit team</u></p> <p>A list of parcels and digital boundary files have been submitted to the audit team. Non-eligible parcels were excluded. Request closed</p>	
<p><u>Corrective Action Request No 5.</u></p> <p>Clarify and include in PDD how to avoid of coincidence of peaks in carbon stocks and verification, according to CDM VVM (paragraph 151).</p>	A.8	<p><u>Project team 12 Aug 09</u></p> <p>The species planted under the different models have varying growth rates and long gestation periods with no harvest during the project period. This will avoid the coincidence of monitoring with peaks in carbon stocks (Refer to Figure A.8.1), Section A.8).</p> <p><u>Audit team 28 Aug 09</u></p> <p>Growth prediction and no clear-cut harvest lead to a steady increase in carbon in the area, thus no peaks are expected that could coincide with verification</p>	<input checked="" type="checkbox"/>
<p><u>Corrective Action Request No 6.</u></p> <p>Include the information of section D and changes in project area, and update the table.</p>	A.9	<p><u>Project team 12 Aug 09</u></p> <p>Section D revised in accordance with change in project area thereby changes in carbon stocks</p> <p><u>Audit team 28 Aug 09</u></p> <p>Table is revised and contains changes implemented based on other CARs.</p>	<input checked="" type="checkbox"/>
<p><u>Clarification Request No 5</u></p> <p>Please provide a confirmation that no public funding comes from Spain</p>	A.10	<p><u>Project team 12 Aug 09</u></p> <p>No ODA money is used for purchasing the carbon credit. LoA from Spain (Attachment 1 – to be sent soon) – the parent MHWD project under which the CDM initiative is proposed does not use ODA money. Besides the World Bank support for the MHWD project is a loan to the Government of HP. It is the Government of HP that is investing the seed capital from the loan amount, and this does not fall under the ODA category.</p> <p><u>Audit team 28 Aug 09</u></p> <p>As the support of the World Bank is a loan, no ODA is diverted in this project, thus a</p>	<input checked="" type="checkbox"/>

		confirmation from Spain is not required.	
<u>Clarification Request No 6</u> Provide the study from the Planning Commission and the National Remote Sensing Agency (NRSA) which describe degraded lands as wastelands See also CR below on soils	C.2	<u>Project team 12 Aug 09</u> http://dolr.nic.in/high_level.htm , please refer to point 8. NRSA report enclosed as Attachment 7, page no. 18 - Section on Description of Wastelands. <u>Audit team 28 Aug 09</u> The use of the tool is not required by the methodology. However, in compliance with the methodology it is shown that the lands /degraded forest lands) are classified as wasteland by the national authority. The wasteland map from 2003 of Himachal Pradesh is provided to DOE.	☑
<u>Clarification Request No 7</u> Include further information on statistical information on soil carbon surveys (standard error, accuracy, precision). Provide information on carbon contents of “non-degraded soils” in the area.	C.2	<u>Project team 12 Aug 09</u> Details of sampling and SOC estimation presented in Annex 3 on Baseline Information. Excel file enclosed with details of sampling – Attachment 8 Standard error values provided in Table C.2.2 Carbon content of non-degraded soils presented in Table C.2.2 <u>Audit team 28 Aug 09</u> Information on carbon content in soils is added to the PDD. The applicability condition of the methodology is met.	☑
<u>Corrective Action Request No 20.</u> Include all applicability criteria of version 02 of the applied methodology (in the PDD version 2 the last criteria was deleted)	C.2	<u>Project Team Response 11 Nov 09</u> The last criteria “The establishment of project shall not decrease availability of fuel-wood” as per the methodology has been included in Section C.2. <u>Audit team 19 Nov 09</u> The footnote 15 leads to version 1 of the methodology and not to version 2. The last applicability criteria included is not part of the applied methodology. <u>Project Team Response 1 Dec 09</u> Footnote 15 changed to lead to version 2 of the methodology Last applicability criteria currently in the PDD deleted and the criteria “Nitrogen-fixing trees used in the A/R CDM project activity account for less than 10% of the total forest crown area, so greenhouse gas emissions from denitrification can therefore be neglected” included.	☑

		<u>Audit team 04 Dec 09</u> All applicability criteria are discussed in the PDD and considered to be met	
<u>Clarification Request No 8</u> <ul style="list-style-type: none"> • Move the information on biomass stock and increment, currently presented in section C.5.2 to this section (C.4). • Provide information on accuracy and precision of the results of study on baseline carbon stocks (AGB, BGB, SOC) and increments. Provide information for each of the nine baseline strata. 	C.3	<u>Project team 12 Aug 09</u> Information in this section moved to Section C.4 Table C.2.2 modified to provide information on standard error. Excel sheets provided with detailed statistical information on baseline stocks and increments (Attachment 9). <u>Audit team 28 Aug 09</u> The results of the calculation and sample plots of the baseline study is provided <ol style="list-style-type: none"> 1. Provide the field data collected in the baseline study, including the location of plots (coordinates and parcel ID of the project area) and the calculation and measurements per plot for trees, shrubs and soil organic carbon. 2. Provide a copy of the results of the soil analysis to the DOE. 3. Please explain if the difference in planting years is / will lead to differentiation in strata. <i>NB: the stepwise approach (step 1-3) as currently presented in the PDD is not defined as such in the methodology, but is nevertheless in compliance with the methodology.</i> <u>Project Team Response 11 Nov 09</u> <ol style="list-style-type: none"> 1. Field data generated during the baseline study including GP-name, altitude, tree name, girth and height – quadrat-wise data for all the 65 baseline sample plots - for the three land categories are provided in Attachment 24 2. GPS coordinates of baseline plots in 30 GPs have not been recorded. Some parcels have been eliminated during the second round of land eligibility test and land parcel selection (Only 65 plots out of the earlier 125 plots are included now). These parcels have been eliminated and biomass of baseline plots recalculated. 3. The parcel ID of the land parcel in which the plots are located is given in Attachment 24. 4. Results of soil analysis provided in Attachment 8. 5. The difference in the planting years may not lead to differentiation in the strata for sampling and monitoring purposes, considering the long rotation of majority of species (50 to 100 years). The rationale being that stand models 	☑

		<p>consist of large number of tree species including slow growing tree species, which may not lead to major changes in CO₂ removals over the initial years. Further, the species composition and density will not vary for the different planting years. Thus, planting in different years will not require differentiation in strata.</p> <p><u>Audit team 19 Nov 09</u></p> <ol style="list-style-type: none"> 1. The baseline study was provided in an excel spreadsheet file containing the gathered data on pre-existing woody vegetation. Provide references for Wood Density, BEF and MAI 2. Provide copies of the laboratory results of the soil analysis determining the carbon content to the DOE. <p>Only one strata is chosen in regards to planting year.</p> <p><u>Project Team 01 Dec 2009:</u></p> <p>The soil organic matter or carbon estimation involved the following steps.</p> <ul style="list-style-type: none"> - Samples collected from the field - Sampled analysed in field research station of Indian Institute of Science. The laboratory results have been transferred to the computerised sheet by the lab and the lab results have been issued in a computerised form, which was submitted as Attachment 8. The records contain sample number, weight of the soil or volume of 0.5 N SAS, solution used for blank titration, volume of 0.5 N SAS used for sample titration, volume of 1 N K₂CR₂O₇ used for oxidation, Using these parameters, the percent soil organic matter is calculated. These samples were analysed at the field research station. Based on the above clarification, we request you to close the CL. <p><u>Audit team 04 Dec 09</u></p> <p>Evidence on the results of the soil analysis of the laboratory is required.</p> <p><u>Project Team Response 04 Dec 09</u></p> <p>The soil samples were collected from the field in phases and the same therefore analysed in phases. A sample of the analysis results and its tabulation sent through an earlier correspondence with validator. In addition, the team leader of the soil analysis team has also certified the result of the soil analysis undertaken in Indian Institute of Science, Laboratory at Bangalore consider as one of the best laboratory in the country and confirms to global standards.</p>	
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<p><u>Corrective Action Request No 7.</u></p> <p>Follow the stepwise approach of the tools, as indicated in the description of the tool (see also C6).</p> <p>Provide copies of data sources used to assess historical land use as indicated in Step 3</p>	C.4	<p><u>Project team 12 Aug 09</u></p> <p>Stepwise approach following the PDD guidelines adopted as suggested.</p> <p>Copies of data sources provided</p> <ul style="list-style-type: none"> • Data source 1: Remote sensing maps; hard copies and CD with maps shared with the validator during validation. The same copy and data available with project proponent and can be provided, if required. • Data source 2: National and state policies on land use and A/R activities implemented on degraded lands – Letter from the forest Secretary cum Addl. Chief secretary, GoHP provided – Attachment 10 • Data source 3: Data from Forest Survey of India on the extent of land under different tree crown density classes at the state and district level; Forest Survey of India – Attachment 11, Pg. 80) • Data source 4: Area brought under A/R over the years - (refer to Table 3; Attachment 12) • Data source 5: Wasteland statistics from the National Remote Sensing Agency (Attachment 7) • Data source 6: Data from vegetation surveys (Table C.2.2) • Data source 7: Data from soil sampling and laboratory analysis (Table C.2.2) <p><u>Audit team 28 Aug 09</u></p> <p>The stepwise approach presented in section C.5 is not required or defined by the methodology. As per applied methodology the combined tool for baseline and additivity shall be used (as applied in section C.6.). The description of the baseline strata (baseline vegetation, baseline carbon stock) should be presented in section C.4.</p> <p><u>Project Team Response 11 Nov 09</u></p> <p>Section C.5 is left blank and all relevant information about baseline vegetation and biomass and carbon stocks has been moved to Section C.4., and the combined tool applied in Section C.6.</p>	☑

		<p><u>Audit team 19 Nov 09</u></p> <p>Section C.5 is left blank following the PDD guidelines intentionally since the combined tool to identify baseline scenario and demonstrate additionally was applied as required by the methodology.</p>	
<p><u>Corrective Action Request No 8.</u></p> <p>Provide evidence for existence of barriers and their prohibitive character (per land ownership). If not sufficient evidence can be provided, exclude the barrier.</p>	C.6	<p><u>Project team 12 Aug 09</u></p> <p>Only those barriers that are prohibitive in nature and those for which evidence is available included</p> <p>Evidence provided in Table C.6.1, Section C.6.</p> <p><u>Audit team 28 Aug 09</u></p> <p>Evidence for the financial barrier is provided, sustaining the barrier.</p> <p><u>Audit team 04 Dec 09</u></p> <p>Clarify the difference of baseline scenario for private land between option 1 (continuation of existing land use or status quo) and option 2 (naturally grown grassland with extreme low productivity). No clear evidence is provided for the exclusion of this alternative; in addition the difference to the baseline scenario is not very clear.</p> <p><u>Project team 12 Aug 09</u></p> <p>Option 2 is not a feasible option as these private lands are traditionally used for livestock grazing and grass harvest. These private abandoned lands are closest to the village settlement. Thus, these private abandoned lands which are closest to settlement are the first preferred choice for grazing due to proximity unlike the forest lands which are away from the settlement along the higher reaches of the hills on the lower reaches of the hills, easily accessible to the livestock for grazing. Thus, these lands will continue to be subjected to grazing, which in other words is identical to option 1, which is continuation of existing land use or status quo.</p> <p>This has been incorporated into the PDD Section C.6.</p> <p><u>Audit team 05 Dec 09</u></p> <p>As the option is called “naturally grown grasslands with <i>extremely low productivity</i>”, there is no barrier preventing the option (only high productivity grassland is prevented by barriers. Therefore the option should either be renamed, or considered to be the same as option1 (“continuation of existing land use or status quo”), as per description in sub-step 1a, the two options are very similar.</p> <p>Table C.6.1 is not coherent: in line 3 (barrier due to technology), an ecological barrier is discussed (see second and third cell). Further in the last line a new barrier is introduced, that was not discussed in sub step 2a on the previous pages.</p>	<input checked="" type="checkbox"/>

		<p><u>Project team response 04 Jan 10</u></p> <p>Options 1 and 2 merged and considered as one single option “Continuation of existing land use or status quo” which is grasslands with low productivity, as opposed to 2 different options.</p> <p>Table C.6.1 revised to be consistent with Sub step 2a and incoherent lines revised,</p> <p><u>Audit team 20 Jan 10</u></p> <p>Two alternative scenarios are considered in step 1.</p> <p>Three barriers are listed in step 2. Table C.6.1. lists a fourth barrier: “local social conditions and lack of organization”. If this is considered to be a barrier, list it also in the previous text as barrier d), or eliminate it from the table.</p> <p><u>Project Team response March 2010</u></p> <p>Table C.6.1 revised; the fourth barrier listed in the table has been deleted</p> <p><u>Audit team</u></p> <p>Three barriers are mentioned and discussed in the PDD: investment, technology and ecological conditions. Evidences are provided in particular for the investment barrier. The reasoning in the section is clear and comprehensive. Request closed.</p>	
<p><u>Clarification Request No 9</u></p> <p>Include information on differences between AR activities carried out by the forest service and the project area.</p>	C.6	<p><u>Project team 12 Aug 09</u></p> <p>The government's priority in the forest sector is primarily the reserve and protected forests. The current budget available from the Government of India and the state government is/will not be adequate even for treating the degraded patches within the priority areas of reserve and protected forests. The A/R CDM project will be implemented on the undemarcated forestlands. Further, the species promoted under traditional A/R programmes include pines, oaks, Acacia catechu, etc. Conversely, the proposed project promotes multi-species forestry, taking into consideration community choice. Also, the proposed project will adopt planting of healthy seedlings, improved land preparation and protection measures that would increase the cost of planting per hectare beyond the norms of the state forest department. Further, in the proposed project, using the CDM revenue, forest plantation maintenance activities will be implemented to increase the biomass growth rate. Such practices are not included in the normal A/R programmes of the state (details presented in Step 4: Common Practice Analysis of Section C.6)</p> <p><u>Audit team 28 Aug 09</u></p> <p>Information on reforestation activities in HP is included in the PDD. Nine differences</p>	<input checked="" type="checkbox"/>

		<p>between other ongoing AR activities and the CDM project are mentioned in the PDD. Provide evidence for the differences between the areas reforested in the region and the AR project activity, in particular the state owned degraded forest areas.</p> <p><u>Project Team Response 11 Nov 09</u></p> <p>The Letter from the Secretary, Government of Himachal Pradesh indicates that the ongoing A/R activities (under various forestry programmes), implemented by the Forest Department is on reserved and demarcated forest lands. The proposed A/R CDM project will be restricted to only undemarcated state owned degraded forest lands as clearly officially stated by the Secretary's letter (Attachment 10).</p> <p><u>Audit team 19 Nov 09</u></p> <p>The official letter from the Chief Secretary of Forests of Himachal Pradesh was provided as evidence. This letter indicates the lack of resources by the local government to implement the CDM project activity in reserve and demarcated forest lands.</p> <p>The letter is considered as sufficient evidence to sustain the differences to other ongoing AR activities in the region.</p>	
<p><u>Clarification Request No 10</u></p> <ul style="list-style-type: none"> • Provide information and reference for the increment data mentioned in the PDD. (The source mentioned does not sustain the figure of annual increment of 0.054 m³/cu = 5.4% annual increment of the growing stock) • During onsite visit no information on baseline calculation were provided. The Excel tables send by emails are not self-explanatory. Provide calculation with respective explanation how the figures for growing stock were calculating (including information on standard error and precision level). <p>See CAR in C3</p> <ul style="list-style-type: none"> • Include the table with the data used for calculation of the ex ante baseline net GHG removals by sinks (see PDD guide- 	C.7	<p><u>Project team 12 Aug 09</u></p> <p>Section modified. Details are as follows:</p> <p>Biomass projections of growing stock are estimated using the gain-loss method. In the absence of literature on biomass growth rate or mean annual increment in degraded forests, the following approach has been adopted to estimate the mean annual increment as a function of total growing stock. The steps in calculation of increment in growing stock are as follows:</p> <p>Area under forests in Himachal Pradesh for which GS data is compiled = 543200 ha</p> <ul style="list-style-type: none"> • Source: Refer to Page 7, Table B, Attachment 13 <p>Total GS in for the area - 543200 ha = 100102000 m³</p> <p>Total annual growth rate (yield) for 543200 ha = 696800 m³</p> <p>Mean annual increment as a function of GS (ratio of total annual yield to total growing stock) = 0.007 m³/ha/yr</p> <p>Per hectare growing stock (100102000m³/543200 ha) = 184.28 m³/ha</p> <p>Per hectare yield or MAI or growth rate (696800/543200 ha) = 1.28 m³/ha</p> <p>Mean annual increment as a function of GS (Per hectare MAI/Per ha GS)</p>	<input checked="" type="checkbox"/>

lines).	<p>= 0.007 m³/ha/yr</p> <p>Reference provided – Attachment 13</p> <p>Stepwise Baseline calculations included</p> <p>Data used for calculation of ex ante baseline net GHG removals by sinks presented in Section C.7.</p> <p><u>Audit team 28 Aug 09</u></p> <p>Reference for baseline information is provided from a publication by the Himachal Pradesh Forest Department (http://hpforest.nic.in/himachalforests2008.pdf). Explanation on the calculation steps are provided in the PDD. The calculations are transparent and complete.</p> <p>Please clarify the low rate of increment (0.013 m³/ha/yr), compared to the average increment of native species in the project scenario of 5.29 t /ha / yr = about 10 m³/yr/ha.</p> <p><i>NB: Even baseline density was only 1% of the project density, the increment would still be 7 times higher, than the value used in the PDD for baseline increment.</i></p> <p>In the light of the above, clarify why/if the baseline increment is considered insignificant</p> <p><u>Project Team Response 11 Nov 09</u></p> <p>MAI Baseline considered in PDD : 0.013m³/ha/yr</p> <p>A/R project MAI considered : 8.09 m³/ha/yr or 4.61 t/ha/yr</p> <p>Total biomass stock (AGB and BGB of tree+non-tree AGB) of baseline = 1.91t/ha from Table C.7.1) (based on revised calculations for baseline where the number of sample plots have changed from 125 to 65, due to elimination of some of the parcels not eligible under A/R CDM).</p> <ul style="list-style-type: none"> - It is important to note that the growing stock of biomass (only trees) is only 1.60 t/ha/yr. (refer to Table C.7.1 in the PDD) - Growing stock of A/R project at 4.61 t/ha/yr for a 50 yr period = 230.5t/ha - Current baseline total AGB of tree+non-trees compared to 50yr growth = 3.27/230.5= 0.014 (this clearly shows that the baseline biomass is only 1.42% of the potential growing stock projected) - However, the current baseline growing stock of only trees compared to 50yr growth = 1.6/230.5 = 0.007 (this clearly shows that the baseline biomass is only 0.69% of the potential growing stock projected)
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		<p>Even when 1.42% of 8.09 m³/ha/yr or 4.61 t/ha/yr of MAI is considered = 0.11 m³/ha/yr or 0.07 t/ha/yr, respectively.</p> <ul style="list-style-type: none"> - However, when only the growing stock of tree biomass is taken, the MAI will be even lower at 0.03 t/ha/yr (4.61 t/ha/yr X 0.69%). - MAI growing stock factor is taken as 0.007, (See explanation below) by taking total biomass (AGB+BGB of trees and AGB of non-tree). If only growing stock of trees is considered, this will be even lower. <p>Explanation:</p> <ol style="list-style-type: none"> 1. MAI factor: The baseline aboveground biomass growing stock in the sample plots ranges from 0.07 to 0.41 t/ha (refer to Table C.2.2. in the PDD). The MAI of the plots with growing stock of 0.07 to 0.41 t/ha is likely to be insignificant, no matter what percentage of growing stock is considered as MAI. The MAI factor is only 0.007 (tonnes or m³ of biomass increment per tonne of growing stock). To obtain the MAI from growing stock, multiply the growing stock by the MAI factor of 0.007. 2. Distribution of tree density per ha across DBH classes: It can be observed from Attachment 25 that the average number of trees per hectare with >10 cm DBH is 4 trees/ha across the three baseline land categories, with a range of 0 to 40 in the baseline plots, compared to 1100 density proposed for the A/R CDM project. This further supports the conclusion that the mean annual increment in the baseline plots is likely to be insignificant and the MAI factor of 0.007, calculated above is a feasible factor for MAI. <ul style="list-style-type: none"> o Degraded forest land – Average 3 trees/ha; ranges from 0 to 20 o Degraded community land – Average 4 trees/ha; ranges from 0 to 40 o Degraded and abandoned private land - Average 7 trees/ha; ranges from 0 to 32 <p><u>Audit team 19 Nov 09</u></p> <p>Considering the low amount of pre-existing biomass, the baseline increment can be considered insignificant. As sources IPCC was quoted for WD and BEF, as well as statistics from Himachal Pradesh for increment.</p> <p>Calculation files are provided and considered adequate.</p>	
<p><u>Clarification Request No 11</u></p> <p>Carbon content in soils in the project area shall be referenced from national districts</p>	C.7	<p><u>Project team 12 Aug 09</u></p> <p>Measurements were made of SOC in the degraded forestland, degraded community land and degraded and abandoned private lands. Estimates from field and laboratory studies (Table C.2.2) show that the SOC status is very low at 26.98 tC/ha to 30.21</p>	☑

		<p>tC/ha. At the Himachal Pradesh state or national level, no literature values are available on the stocks of SOC in degraded land categories.</p> <p><u>Audit team 28 Aug 09</u></p> <p>Provide the field sheets and analysis of the laboratory to proof the data presented to the DOE (same as comment in CR 8).</p> <p><u>Project Team Response 11 Nov 09</u></p> <ul style="list-style-type: none"> - Attachment 8 provides information on depth of soil sampling, bulk density and soil organic matter - Field procedure for soil sampling included recording the parcel number and collection of soil sample in bags for laboratory. - Laboratory analysis was conducted at the soil laboratory situated at the Indian Institute of Science and the results of the same have been tabulated as an excel sheet (enclosed as Attachment 8). Laboratory analysis includes Walkley Black method of estimation of soil organic carbon. The results of the analysis of soil samples are provided in Attachment 8. <p><u>Audit team 19 Nov 09</u></p> <p>The summary of the soil analysis was provided to the DOE as evidence. Copies of laboratory results are still pending as discussed in CR 8.</p>	
<p><u>Clarification Request No 12</u></p> <ul style="list-style-type: none"> • Provide explanation and if required calculations with explanations, why the increment of the baseline is considered insignificant. • Identify which method /carbon gain-loss or stock change) was used for the calculations 	C.7	<p><u>Project team 12 Aug 09</u></p> <p>The baseline biomass carbon growth rate estimated using the new procedure described in Section C.7 shows that the MAI is 0.007 m³/ha/yr or .0042 t/ha/yr, compared to the biomass growth rate of 5.78 t/ha/yr, used for ex ante calculations for reforested plots.</p> <p>Carbon gain-loss method adopted</p> <p><u>Audit team 28 Aug 09</u></p> <p>Information on baseline increment is provided. The carbon gain-loss method was used.</p>	☑
<p><u>Corrective Action Request No 9.</u></p> <ul style="list-style-type: none"> • The BEF was assumed to be zero, since the trees on the project area were assumed to be lobbed. However, during onsite visits not all the trees onsite were observed as lobbed. To have a conser- 	C.7	<p><u>Project team 12 Aug 09</u></p> <p>BEF has been included in the calculations of TARAM spreadsheet.</p> <p>For many of the species for which we have obtained from literature, are expressed as dry tonnes and thus do not require wood density values.</p> <p>References and justification of use of root:shoot, BEF and wood density values for particular species mix is provided in Step 6, Section D.1</p>	☑

vative approach a BEF shall be included in the calculation

- Provide a justification and reference for root-shoot ratio and wood density in the PDD

Audit team 28 Aug 09

Root-shoot factor is taken from IPCC.

Clearly identify which formulas have been used to determine the overall above and belowground increment of biomass in the baseline. (If BEF and WD are already included in the formulae, please provide reference to the formulae in the PDD and provide a copy of the source to the DOE)

Provide calculation (Excel file) of baseline carbon stock and baseline carbon stock changes per strata to DOE for validation.

NB: the provided reference in Attachment 13 does not clearly state if this is only stem wood or total above ground biomass.

Project Team Response 11 Nov 09

- BEF and R:S ratio have been included for baseline increment estimation
- The MAI value does not change with inclusion of BEF and R:S ratio, since it will be included for both the growing stock as well as the yield (e.g. both the numerator as well as denominator)
- The detailed calculation are provided below

Area under forests in Himachal Pradesh for which growing stock data is compiled <i>Source: Refer to Page 7 Table B, Attachment 13</i>	543,200 ha
Total GS in for the area-543200 ha	100,102,000 m ³
Total annual growth rate (yield) for 543200 ha	696,800 m ³
BEF	1.2
Total annual growth rate (yield) of AGB for 543200 ha	836160 m ³
R:S ratio	0.24
Total growth rate (AGB+BGB)	836160 + 200678 = 1036838 m ³
Growth rate per ha of AGB + BGB	1036838 m ³ /5,43,200 ha = 1.91 m ³ /ha/yr
Per hectare growing stock – Aboveground biomass	100,102,000m ³ /543,200 ha = 184.28 m ³ /ha
BEF	1.2
Total aboveground biomass	221.14 m ³ /ha
R:S ratio	0.24
Total biomass (AGB+BGB)	221.14 + 53.07 = 274.21 m ³ /ha
Mean annual increment factor as a function of GS (ratio of total annual yield to total growing	1.91m ³ /ha/yr / 274.21m ³ /ha = 0.007

		<table><tr><td><i>stock per hectare)</i></td><td></td></tr><tr><td>Per hectare yield or MAI or growth rate</td><td>696,800 m³ / 543200 ha = 1.28 m³/ha</td></tr><tr><td>Mean annual increment factor as a function of GS (Per hectare MAI/Per ha GS)</td><td>0.007</td></tr></table> <p><u>Audit team 19 Nov 09</u></p> <p>BEF of 1.2 is taken from IPCC 2006, RS of 0.24 from IPCC GPG 2003, and WD of 0.57 according to Brown 1997.</p> <p>Values are considered adequate, in particular as the standing woody vegetation is negligible.</p>	<i>stock per hectare)</i>		Per hectare yield or MAI or growth rate	696,800 m ³ / 543200 ha = 1.28 m ³ /ha	Mean annual increment factor as a function of GS (Per hectare MAI/Per ha GS)	0.007	
<i>stock per hectare)</i>									
Per hectare yield or MAI or growth rate	696,800 m ³ / 543200 ha = 1.28 m ³ /ha								
Mean annual increment factor as a function of GS (Per hectare MAI/Per ha GS)	0.007								
<p><u>Corrective Action Request No 10.</u></p> <ul style="list-style-type: none">• Provide updated TARAM calculation based on the requests in section A (area), C (baseline) and D (see below).• Ensure that the calculations are in compliance with methodology AR-ACM0001, and provide respective explanation	D.1	<p><u>Project team 12 Aug 09</u></p> <p>TARAM calculations updated taking into consideration the changed area, baseline and other values (Annex 7)</p> <p>Compliance of TARAM calculations with the AR-ACM0001, version 2 methodology is ensured</p> <p><u>Audit team 28 Aug 09</u></p> <p>An updated TARAM version is provided (three excel files)</p> <ul style="list-style-type: none">• In the PDD, ensure consistency with the applied methodology. The stepwise approach of AR-ACM0001 version 02 to determine the actual net GHG removals by sink shall be followed. (<i>steps indicated in the PDD are not in compliance with the methodology</i>)• TARAM indicates methodology version AR-AM0003. Explain and clarify how consistency with the methodology AR-ACM0001 version 02 is ensured• In case the allometric method is used to determine tree biomass (section II.5.1.1 of the meth), present the allometric equation for each species in the PDD, including references, as required by the methodology. In case the BEF method is used, present BEF per species with reference• The values for wood density and must be consistent between PDD and TARAM and shall be sustained with reference.• Provide the Excel file" Species mix, increment and bef_final (Aug).xls" that was used to calculate the input parameter for TARAM• Revise the calculation files and provide an updated file to the DOE. Ensure to up-	<input checked="" type="checkbox"/>						

		<p>date all relevant sections of the PDD.</p> <p><u>Project Team Response 11 Nov 09</u></p> <ul style="list-style-type: none"> - Steps checked and changes made - Consistency with methodology - <i>Equations:</i> No allometric equations are used for baseline and ex-post calculations. MAI has been obtained for baseline from field studies and literature for ex-post used. Species-mix increment files as input parameter for TARAM are provided (refer to Attachment 26) - <i>Wood density in TARAM:</i> In the TARAM spreadsheet, one can enter MAI in cubic meter and the wood density to obtain MAI in t/ha/yr. Alternatively one can directly input MAI in terms of dry tonnes/ha/yr. The calculations in the PDD are based on inputting of MAI in terms of t/ha/yr obtained from literature values and therefore no wood density value is inputted. - Calculations revised excluding soil carbon and baseline increment (considered to be insignificant now) and all relevant sections in the PDD corrected. <p><u>Audit team 19 Nov 09</u></p> <p>The Excel file was updated and indicates now AR-ACM0001 and is in compliance with methodological requirements. Request closed.</p>	
<p><u>Clarification Request No 13</u></p> <ul style="list-style-type: none"> • Provide information in the PDD on the method used. • Provide a summary (main steps / intermediate results) of the calculations in the PDD 	D.1	<p><u>Project team 12 Aug 09</u></p> <p>Method used is Gain-Loss method</p> <p>Step-wise calculations provided in the PDD in Section D.1</p> <p><u>Audit team 28 Aug 09</u></p> <p>As requested please identify the method used to determine tree biomass in compliance with the methodology (the Gain-Loss method is not used in the applied methodology for determining actual net GHG removals by sink)</p> <p>The stepwise approach to determine tree biomass is not identified in the PDD. Ensure consistency with the methodology</p> <p><u>Project Team Response 11 Nov 09</u></p> <ul style="list-style-type: none"> - The MAI used for the calculation are actual net values, incorporating gain and loss. - There are no studies which provide the components of gain and loss equations - In all calculations of biomass growth rate, MAI values (t or m³/ha/yr) are directly 	☑

		<p>taken from literature. This is a common practice for using MAI values published in literature or in IPCC Good Practice Guidance as the net increment in biomass. Thus, the calculation procedure adopted in the PDD also adopts a similar method and directly inputs the MAI data from literature and IPCC, GPG.</p> <p><u>Audit team 19 Nov 09</u></p> <p>The steps as described in the applied methodology are being followed. The BEF method is used to calculate net GHG removals by sink of tree biomass. The stepwise approach is applied in the PDD. Request closed.</p>	
<p><u>Corrective Action Request No 11.</u></p> <p>Neglect soil carbon in the ex-ante calculations, although it will be monitored and included in the ex-post calculation. (As requested by the methodology version 02)</p>	D.1	<p><u>Project team 12 Aug 09</u></p> <p>Soil carbon excluded from ex ante calculations as per AR-ACM0001 methodology</p> <p><u>Audit team 28 Aug 09</u></p> <p>Soil carbon is still included in TARAM. Exclude Soil carbon in ex-ante estimates as required by the applied methodology</p> <p><u>Project Team Response 11 Nov 09</u></p> <p>Soil carbon excluded from TARAM and ex-ante estimates made and numbers revised in the PDD in all the relevant sections.</p> <p><u>Audit team 19 Nov 09</u></p> <p>Soil carbon is removed from ex-ante calculations. As the version of the methodology was updated in 2010, soil carbon was reintroduced in the latest version and calculations of the PDD. In accordance with the methodology an increment in SOC of 0.5 t C per hectare is calculated for 20 years. The value does not need to be monitored. Request closed.</p>	☑
<p><u>Clarification Request No 14</u></p> <p>Include the grouping of species in the PDD and references for the different figures (wood density, MAI, BEF, AGB, RS). Explain how a conservative approach was ensured, when grouping the different species.</p>	D.1	<p><u>Project team 12 Aug 09</u></p> <p>Species mix in different stand models included in Box. A.5.1</p> <p>MAI, Wood density, BEF, AGB - data sources given in Section D.1</p> <p>Attachment 14 provides the mean annual growth rates for different species included in the different stand models. It can be observed from the table that growth rates vary for different species and again for a given species according to different studies. Conservative approach is ensured by selecting a lower growth rate for estimating carbon stocks for a stand model. example, farm forestry, low altitude stratum, 6.39 t/ha/yr is used for calculation even though there are other species in the stand model with higher growth rates.</p> <p><u>Audit team 28 Aug 09</u></p>	☑

		<p>Values for MAI, WD, BEF, and RS are provided in the PDD.</p> <p>Provide reference for growth rate of Salix (not included in attachment 14).</p> <p>Provide full reference for growth rates of Poplar, Cedrus deodora and Syzigium cuminii (including author and a copy to DOE, since documents were not available during onsite visit)</p> <p>Root to shoot ration: page 57 refers to 0.26, while page 61 refers to 0.24, ensure consistency.</p> <p>Provide scientific reference for the wood density for each of the species referenced in the PDD. For some species (Poplar, Salix, Deodar, Syzigium) no WD is presented, please clarify how carbon calculations were carried out for those species (groups).</p> <p>Provide reference/evidence for the conservativeness of grouping of the species (for wood density and BEF)</p> <p><u>Project Team Response 11 Nov 09</u></p> <ol style="list-style-type: none"> 1. The MAI used for different stand models have been revised, considering availability of complete references. For example, Salix has been dropped since we are unable to trace the full reference for the MAI used. Similarly, MAI values used for other stand models have also been revised, wherever we are unable to trace the full reference as well as inability to access the original document – hard or soft copy, particularly for the older references. The MAI values for estimating the net GHG removal are given along with full reference in Attachment 26 and the references scanned and enclosed in Attachment 27. 2. Consistency of root:shoot values throughout the PDD ensured 3. Wood density of species with references provided in Attachment 26. <ul style="list-style-type: none"> • MAI for some species reported directly in dry tonnes. The MAI literature values taken from many of the published journals and books (reference provided in Attachment 27), directly give MAI in terms of dry tonnes per ha per year. Thus wood density and conversion to dry tonnes is not required. It is important to note that IPCC GPG as well as IPCC 2006 guidelines provide direct biomass mean annual increment values in terms of dry tonnes/ha/year for large number of species. • For those species where MAI is reported in cu. m, wood density value of that particular species used to convert to tonnes (refer to Table D.1.1). Further, conservativeness is ensured by taking a lower wood density value wherever a range is reported for a particular species, as in the case of <i>Pinus roxburghii</i>. 4. Conservativeness: As explained above the literature values already incorporate 	
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		<p>the wood density and provide MAI directly in terms of dry tonnes per ha per year. For the species for which MAI is expressed in terms of cu.m/ha/yr., wood density values are used from many reference sources including IPCC GPG.</p> <p>5. Conservatives for wood density and BEF is ensured by taking a lower value from among the literature values available for the species mix in each stand model. Further, whenever MAI is available for a range of years (say, from 5 to 60 years), average across different aged stands was computed and used, which was always lower than the maximum reported MAI (Refer to Attachment 28).</p> <p><u>Audit team 19 Nov 09</u></p> <p>Grouping of species is included in the PDD.</p> <p>Correct error in attachment 26, sheet “fraction_calcu”, farm forestry in high elevation: the ratios of fast, medium and slow growing trees shall be 0.5, 0.25 and 0.25. Update also subsequent calculation connected to these values.</p> <p>Provide clear reference (and provide the document to DOE, if not already provided) for each value listed in attachment 26.</p> <p><u>Project Team Response 11 Nov 09</u></p> <p>The proportion of 0.4, 0.3 and 0.3 considered in the fraction_calcu sheet for farm forestry for the fast, medium and slow growing trees is appropriate and as outlined in the PDD. This was assessed based on the species suitability for respective strata. The proportion of 0.5, 0.25 and 0.25 for fast, medium and slow growing species for high altitude farm forestry is not mentioned anywhere.</p> <p>The references have already been provided.</p> <p><u>Audit team 04 Dec 09</u></p> <p>Attachment 26 is updated (see Ranjan’s email 3 Dec 09)</p> <p>Wood density is required for ex-post calculation and is fixed already at validation for the verification (parameter that does not need to be monitored). Specify and provide reference per species. If you stick with IPCC default value provide information that no local studies were available.</p> <p>Root-to-shoot is required for ex-post calculation and is fixed already at validation for the verification (parameter that does not need to be monitored). If you stick with IPCC default value provide information that no local studies were available.</p> <p>BEF is required for ex-post calculation and is fixed already at validation for the verification (parameter that does not need to be monitored). If you stick with IPCC default value provide information that no local studies were available.</p>	
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		<p>Clearly identify the source (including page number) for each MAI value used in the PDD/attachment 26 and calculation.</p> <p><u>Response Project Team 04 Dec 09</u></p> <p>1. Wood density:</p> <p>a) Poplar; wood density value has been used for conversion of MAI values in m³/ha/yr to t/ha/yr. Given there are no local values available, the wood density value given in http://tenders.gov.in/viewtenddoc.asp?tid=wesb225733&wno=1&td=TD has been used</p> <p>b) Syzygium cuminii; Wood density value of 0.77 given in http://books.google.co.in/books?id=XmQrAAAAYAAJ&pg=PA64&lpg=PA64&dq=wood+specific+gravity+of+jamun+syzygium+cuminii&source=bl&ots=-MayRWShhk&sig=sxQqhngqldMNnkGktx9m-VTD04&hl=en&ei=-m_tSqGwFo76sgPO8tz1Aw&sa=X&oi=book_result&ct=result&resnum=1&ved=0CA0Q6AEwAA#v=onepage&q=specific%20gravity&f=false is used. For this species also, there are no locally available wood density values</p> <p>For the other species such as Aesculus and Poplar, the MAI values are reported in literature directly in tonnes/ha/yr and therefore does not necessitate use of wood density values</p> <p>2. Root to Shoot ratio; IPCC default value of 0.24 is used, given there are no locally generated root:shoot ratio values available.</p> <p>3. BEF; A conservative IPCC default value of 1.2 is used for all the stand models as local studies on BEF of species are not available. Further, every stand model is a mix of species.</p> <p>4. MAI value: Source of data (references)</p> <ul style="list-style-type: none"> - Poplar; Refer to Attachment 27_Poplar, Table 4 - Aesculus; Refer to Attachment 27_Aesculus, Table 2 - Pinus; Refer to Attachment 27_Pinus, Table 2 - Syzygium cuminii; Refer to Attachment 27_Syzygium, Annexure 1, Site quality I <p><u>Audit team 05 Dec 09</u></p> <p>a) As per methodology, the values are for Wood Density are fixed at validation also for verification (no monitoring required). For the ex-pots calculation MAI will not be used, but the data from the sample plots. Therefore Wood Density is required for all species.</p> <p>b) No explanation is provided whether there are local studies for R:S and BEF.</p>	
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		<p>These values will also not be monitored are used also in ex-post calculation. In attachment 27, table 2, values for R:S are provided e.g. for Aesculus).</p> <p>c) MAI: For all species it need to be clearly stated why this exact species was chosen to represent the species group, and why this is conservative.</p> <p>- Poplar; Attachment 27_Poplar, Table 4: Explain how the value of 6.03 Attachment 26_Species mix increment.xls was derived. Note that this are values from polpar plantations, the conditions in the project area can be much less favourable in growth. Please comment if conservativeness is ensured when using these values.</p> <p>As used in Table 2 provides values for total AGB, thus the BEF provided in the study should be used in the calculations. As values for different years are provided, no MAI shall be used, but actual increment of biomass instead (for first 3 years, 3-5, 5-7, 5-9 and thereafter.</p> <p>- Aesculus; Attachment 27_Aesculus, Table 2 is referring to biomass (kg/ha) and not MAI, please clarify</p> <p>- Pinus, Attachment 27_Pinus, Table 2: Explain how the value of MAI of 4.17 was obtained (See Attachment 26_Species mix increment.xls). Instead of average values, actual increment shall be used in TARAM, as it is available and more accurate.</p> <p>- Syzigium cuminii; Attachment 27_Syzygium, Annexure 1, Site quality I: The average would be 3.74 not 3.53 as stated in the excel sheet ("Attachment 26_Species mix increment.xls"). Instead of average values, actual increment shall be used in TARAM, as it is available and more accurate. Explain why site quality I was chosen (as II or III would be more conservative, and as explained the areas are degraded, thus no high production can be expected).</p> <p>Project team response 04 Jan 10</p> <p>a) Wood density of all the species included in the different stand models enclosed in Attachment_wood density_04 Jan</p> <p>c) MAI:</p> <p>The rationale has been incorporated into Section D.1 of the PDD.</p> <p>- Poplar: Values reported in literature are for plantations. However the same have been used for calculations due to the following reasons:</p> <p>- Absence of literature on growth rate of poplar planted on categories of lands</p>	
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		<p>similar to that considered in the project</p> <ul style="list-style-type: none"> - Poplar is just a representative species for the entire stand model which also includes certain species with higher growth rates - BEF; an IPCC default value of 1.2 is considered as each stand model includes a mix of species and considering the BEF of a single species, such as Poplar would under or overestimate. - Averaged growth rates and rather than actual increment is considered as the MAI considered is very conservative given the higher growth rates of many other species in the group. - Aesculus; Please refer to Table 2, page 243 which reports component-wise biomass in terms of $\text{kg ha}^{-1} \text{yr}^{-1}$ - Pinus, The MAI reported for 20 yr Pinus is considered instead of average MAI to ensure conservativeness, given the mix of species in a stand model. Averaged growth rates and rather than actual increment is considered as the MAI considered is very conservative given the higher growth rates of some other species in the group. - Syzigium cuminii; The MAI as given in Attachment 14 and Attachment 26 is 3.53. Averaged growth rates and rather than actual increment is considered as the MAI considered is very conservative given the higher growth rates of some other species in the group. <p><u>Site quality 1</u>: The concept of site quality is relevant in natural forests having intense competition for space, light, nutrients etc. Sites supporting good growth conditions are termed as site quality I. In case of plantations where nursery grown plants are planted with proper spacing, in good sized pits and are tended regularly, site quality is not relevant. Since better growth is expected with communities doing timely and regular tending operations, we can safely use growth rates for site quality I.</p> <p><u>Audit team 20 Jan 10</u></p> <p>a) The references for Wood Density shall be provided to the DOE (digital copies of the relevant page of the document). Although this is mostly not of relevance to the ex-ante calculation (as the increment is provided in t/ha/yr), this parameter is already fixed for ex-post calculations.</p> <p>Include the list values for Wood Density in the PDD, as required per methodology</p> <p>c) Concerning the values of the representative tree species:</p>	
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		<p>Poplar: As requested previously, explain how the value of 6.03 t/ha/yr for MAI was derived, as this value is not quoted in the reference provided. Provide an Excel sheet with the calculations.</p> <p>As requested previously, use actual increment instead of MAI, in order not to overestimate the increment in the first years.</p> <p>BEF: As per methodology (see section II.8, source of data), that no data was available locally, national or for similar species (a-c).</p> <p>Aesculus: Explain how the value of 3.01 t/ha/yr for MAI was derived based on the referenced source, as this value is not quoted in the reference provided. Provide an Excel sheet with the calculations.</p> <p>BEF: As per methodology (see section II.8, source of data), that no data was available locally, national or for similar species (a-c).</p> <p>Pinus: As requested previously, explain how the value of for MAI was derived, as this value is not quoted in the reference provided. Provide an Excel sheet with the calculations. Explain why a different wood density is provided in table D.1.1 in the PDD (0.43) and the document "Attachment_wood density_04 Jan.doc" provided on 03 January 2010 (0.491).</p> <p>As requested previously, use actual increment instead of MAI, in order not to overestimate the increment in the first years.</p> <p>Syzigium cuminii: As requested previously, explain how the value for MAI was derived, as this value is not quoted in the reference provided. Provide an Excel sheet with the calculations.</p> <p>As requested previously, use actual increment instead of MAI, in order not to overestimate the increment in the first years.</p> <p>The increment is too high (3.53 t/ha/yr), if it shall represent the low growing species, since it is higher than the medium growing species (3.01 t/ha/yr). Two different values for wood density for Syzigium cuminii are provided in the PDD table D.1.1 (0.77) and the document "Attachment_wood density_04 Jan.doc" provided on 03 January 2010 (0.647).</p> <p>As the sites are determined as "degraded", the lowest site class shall be applied when determining the increment.</p> <p>All species:</p> <p>The methodology requires to validate the volume equations used to calculate the stem volume ex-post (at verification). Therefore for each species the volume equation must be provided (reference provided to DOE as digital copy, as it was</p>	
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		<p>not available at the onsite visit)</p> <p>d) Evidence / rational shall be provided per species assigned to one group, that it is similar in growth condition and relevant parameters (BEF, WD, CF, RS) as the species chosen to represent group. As the parameters are also needed for ex-post calculation, it shall be shown that no local or national data for the respective tree species was available. (reference provided to DOE as digital copy, as it was not available at the onsite visit).</p> <p><u>Project team response (18th March, 2010) and June 25, 2010</u></p> <p><i>Wood Density</i></p> <p>Wood density values included in the PDD as Annex 9. For the species which we do not have values, we have used the values of species with similar features.</p> <p>The species in the PDD decreased and listing of species in the PDD, annexes and attachment 29 (list of species with growth data and expansion factor parameters) are made consistent.</p> <p>The detailed explanation for the methodology and steps used for calculation of the stand models is described in the Section D1 of the PDD and presented below.</p> <p>The ex ante estimation of carbon stock changes of tree biomass in the project strata is conducted as per the Section 5.1.1 of the methodology. The project adopts BEF method to calculate the carbon stock changes of the aboveground and belowground biomass pools. The data and parameters for calculation of living tree carbon stock in terms of volume equations, growth rate of species (for ex ante estimation), BEF, R, wood density and carbon fraction parameters are summarized in Attachment 29.</p> <p>Step 1: For the purpose of ex ante estimation, an elaborate search of published information relevant to the region, state and India from the scientific journals, books and reports was conducted to compile the growth data of species included in different stand models of the project.</p> <ol style="list-style-type: none"> Restoration forestry on degraded forestland Community forestry on degraded community land Farm forestry on degraded and abandoned private land <p>2. Each land use category is further stratified into three altitude classes</p> <ol style="list-style-type: none"> High – 1400 to 1800 m Medium – 1100 to 1400 m 	
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		<p>c. Low – 600 to 1100 m</p> <p>Within each stand model, species with similar growth patterns are categorized into species groups. This facilitated the identification of species with similar growth characteristics and management regimes and to use the available growth data on some species to represent the growth of other species that have similar growth characteristics but for which published growth data are not available.</p> <p>The volume equations of species included in different stand models was compiled based on published literature and technical discussions with the Himachal Pradesh Forest Department and Forest Research Institute in India.</p> <ul style="list-style-type: none"> • The volume equations of species are compiled from the literature search. The species-wise volume equations are presented in Annex 10. The volume equations are published by the Forest Survey of India (1996) based on the inventories conducted in the region. The volume equations of the species are presented in Attachment 29. • Species for which growth data are not available: Species with similar growth characteristics were grouped into species groups and the data of species with published growth data are adopted for other species on which growth data were not available. For example for the stand model “High altitude_fast growing” - among the species for which growth data is available, the growth rate is in the narrow range of 5.30 to 8.00 t/ha/yr for the age group 11-20 years. Similarly, for the stand model “High altitude_slow growing” – among the species for which growth data is available, the growth rate for the age group 11-20 years is again in the narrow range of 3.59 to 4.69 t/ha/yr. For the remaining species for which growth rates are not available. The grouping of the species is based on expert consultations with the Himachal Pradesh State Forest Department and Forest Research Institute, Dehra Dun. <p>Step 2: The growth data of species reported at the local and national levels was considered for the estimation of stem volume (i.e., if local data on the species are not available, regional and national data were considered).</p> <p>The growth data of species was used to calculate the volume and biomass (taking into account the wood density as per the step 4). The procedure followed for <i>ex ante</i> estimation of growth rates of species is outlined below.</p> <ul style="list-style-type: none"> • Available growth rates (e.g., CAI/MAI) of species were collated from published sources (Attachment 14) and organized as per the age classes (5yrs, 5-10 yrs, 11-20 and >20yrs). For species with reported volume growth rates, they were con- 	
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		<p>verted into biomass (in tonnes/yr/ha) taking into account the wood density of the species. For many of the tree species, growth rates (CAI/MAI) are directly reported in literature as tonnes/ha/year and same values are used.</p> <ul style="list-style-type: none"> • If for species, CAI/MAI values were not available from literature, values of related species from the same genera or species with similar growth characteristics were used. E.g., <i>Populus deltoides</i> for <i>Populus ciliata</i>. • The CAI of species within each age group was calculated and the CAI that is closest to the mean growth of the age group and immediately lower than the mean value for a species and age-class was selected, to ensure conservativeness. <p><i>The CAI/MAI values and references of the literature for the project species are presented in Attachment 14.</i></p> <p><i>Table D 1: Conservative CAI values obtained from literature (see PDD)</i></p> <p>The procedure adopted to select representative growth rates for each stand model is outlined below.</p> <ul style="list-style-type: none"> • Species of a given stand model for which CAI/MAI values are available were organized as per the respective stand models. • For species with CAI data, mean growth rate for the age classes was assessed for each stand model • To ensure conservativeness, the CAI value immediately lower than the mean value for that age class was selected to represent growth rate of that age class for the stand model. • Where CAI values of species were not available, MAI values are adopted. <p>Table D 2: Conservative CAI values obtained from Table D 1 above are summarized below <i>(see PDD)</i></p> <p>Table D 3: The growth data of the stand models were used as input to TARAM for <i>ex ante</i> estimation of carbon stock is presented below. <i>(see PDD)</i></p> <p>Table D 4: MAI values for different stand models (t/ha/yr) (see PDD)</p> <ul style="list-style-type: none"> • The age dependent growth rate of stand models for a given year (Year 1) is added to the next year (Year 2) to obtain the cumulative value for the next year (Year 2), which is added to the next year (Year 3) to obtain the cumula- 	
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		<p>tive value for the next year (Year 3).</p> <ul style="list-style-type: none"> The cumulative growth rates for different stand models and altitude ranges from Year 1-year 20 is given in the table below. <p>Table D5: Biomass growth rates of stand models used in TARAM (<i>see PDD</i>)</p> <p>Step 3: Data on biomass expansion factor (BEF) and root:shoot ratio (R) parameters: The data on BEF and R_j of the project species published and reported at the local, regional and national levels was compiled (i.e., if local data were not available, then regional and national data were considered). For species that did not have published BEF and R parameters, the default BEF parameters (Table 3A.1.10) and R (Table 3A.1.8), Annex A3.1 of IPCC GPG LULUCF were selected.</p> <p>The procedure used for selecting BEF values as an input to TARAM is outlined below.</p> <ul style="list-style-type: none"> Literature search was conducted for obtaining BEF parameters for species included in stand models, which resulted in the collation of BEF parameters for 17 species. BEF parameter values were calculated using different component-wise (commercial biomass, branches, foliage and reproductive parts) biomass values of the species. The values of compiled BEF parameters are presented in Attachment 27. The mean BEF value for the 17 species for which literature values are available is 1.98, and the range of BEF parameters for these species is 1.49-2.90. <p>Considering that the BEF values are not available for all species, to ensure conservativeness in the estimation of biomass, the BEF₂ parameter value of 1.4 reported for (IPCC GPG 2003, Table 3.A.1.10) input to TARAM. The default value is lower than the minimum BEF value reported for 17 project species noted above. The TARAM model uses BEF to convert above ground commercial biomass to total above ground biomass.</p> <p>Step 4: The above ground biomass calculated based on the stem volume, BEF, and wood density, is converted into the aboveground carbon stock using the carbon fraction. Attachment 29 presents growth, BEF, R_j, wood density and carbon fraction (default carbon fraction 0.5 (IPCC, 1997)) data of the species included in the project.</p>	
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		<p>Step 5: The carbon stock in above-ground biomass is converted to the carbon stock in below-ground biomass using the root-shoot ratio (R) parameter of the species. TARAM model converts above ground biomass to belowground biomass using Root-shoot ratio (R:S). For species that did not have published R data, the default IPCC data from IPCC GPG LULUCF Table A3.1.8 of Annex 3A.1 was used.</p> <p>The following procedure was adopted to derive the below-ground biomass as an input to TARAM.</p> <ul style="list-style-type: none"> • Literature search was conducted for obtaining R:S values for the species included in the stand models, which resulted in the collation of R parameter for 13 species from among the species included in the stand models. The R parameter values of the project species are presented in Attachment 29. • As per the published data, the R parameter for the 13 species were in the range of 0.17-0.39. • Considering that the literature values are not available for all the species, to ensure conservativeness, the lower range IPCC default R value of 0.27 (IPCC GPG 2003, Table 3.A.1.8), which is based on the study reported from the state of Uttar Pradesh for species similar to those included in the project, is selected as input to TARAM calculations to estimate actual net GHG removals by sinks. <p>Step 6: The total tree carbon stock per ha (above-ground and below-ground) of the stand models is calculated. The tree carbon stock obtained for each stand model and altitude class for a given year (Year 1.. year 20) was calculated and projected to the stratum level taking into account to account the stratum area.</p> <p>Step 7: The carbon stock of the strata is summed to calculate the carbon stock of the project.</p> <p>Audit team:</p> <p>MAI: Data on MAI/CAI is presented to the audit team. No data is presented for 13 species. But evidence is provided from Professor Ravinranath (Indian Institute of Science) that there is no species specific data available so these species. Thus default data was used for these species.</p> <p>BEF: Data per species is provided by the PP to the audit team. A conservative value of 1.4 is used for ex-ante calculations</p> <p>RS: Data per species is provided by the PP to the audit team. An average value of</p>	
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		0.22 is used for ex-ante calculation. WD: Data per species is provided by the PP to the audit team. The values are not needed in the ex-ante calculation, as the increment is reported in weight per hectare. Copies of the references are provided to the audit team.	
<p><u>Corrective Action Request No 12.</u></p> <p>The list of parameters available at validation as per methodology (section II.8) shall be included to the PDD. Assure to reflect on methodology requirements as specified in regard to source of data and comments. <i>(While it is recognised that mostly corresponding information is already included, this CAR refers to the methodology specific layout and presentation of data and defaults used for validation)</i></p>	D.1	<p><u>Project team 12 Aug 09</u></p> <p>All parameters listed in AR-ACM001 methodology included and methodology specific layout followed as prescribed.</p> <p><u>Audit team 28 Aug 09</u></p> <p>Table D.1.1 lists MAI, and wood density for some species.</p> <p>Provide information on other parameters as required by methodology (see CR 14)</p> <p><u>Project Team Response 11 Nov 09</u></p> <p>Please refer to explanation given for CR14.</p> <p><u>Audit team 19 Nov 09</u></p> <p>Information is provided in the PDD, see CR 14</p>	☑
<p><u>Clarification Request No 15</u></p> <ul style="list-style-type: none"> • Provide reference and explanation on the <u>PRA</u> related to grazing and <u>field study</u> on grass production (<i>Excel sheets provided after onsite visit are not self-explanatory</i>). If needed, values shall be adapted after review of these calculations • Provide reference and explanation on the household survey related to fuel wood collection (<i>Excel sheets provided after onsite visit are not self-explanatory</i>) If needed, values shall be adapted after review of these calculations 	D.2	<p><u>Project team 12 Aug 09</u></p> <p>Baseline studies included PRA as well as HH survey. The sampling procedure for this explained in Annex 3: Baseline information. The steps and procedure adopted for estimating grass production is also detailed in Annex 3. Explanation on PRA and household survey are provided in Attachment 15 and Attachment 16, respectively.</p> <p>Leakage due to displacement of fuelwood collection is set as zero due to the following reasons:</p> <ul style="list-style-type: none"> - HH survey was conducted in 30 gram panchayats covering 300 households. The survey showed that over 50% of households depend on LPG and kerosene for cooking. - Biomass stock and production estimates given in Table C.2.2 showed that the growing biomass stock is extremely low at 0.15 to 3.28 t/ha. Further calculation of mean annual increment (Section D1) showed that per ha MAI is 0.013 t/ha/yr. Thus, the fuelwood availability or supply from the project area is insignificant, leading to no 'displacement of fuelwood collection' and thus leakage due to displacement of fuelwood collection is set as zero. - According to the agreement with the GPs, fuelwood collection is permitted from the A/R CDM project area. The current availability of fuelwood biomass is insignificant as described above. Under the proposed project, the mean biomass in- 	☑

		<p>crement (MAI) is estimated to be in the range of 3.80 to 5.03 t/ha/yr. All the dead and dry and fallen twigs will be permitted to be collected as fuelwood as per the agreement.</p> <p><u>Audit team 28 Aug 09</u></p> <p>Reference to the PRA and household study was provided.</p> <p>Provide reference for the grass/fodder production of 1.3 - 2 dry t/ha</p> <p><u>Project Team Response 11 Nov 09</u></p> <p>Grass/fodder production is estimated based on baseline vegetation studies. The details of field study are provided in Annex 3-Baseline Information</p> <p>The biomass of grass was estimated by the harvest method. All the grass present within the non-tree quadrat of 5x5 m, 5 in number within every tree quadrat were clipped, harvested and weighed to obtain the fresh weight. A known quantity of grass was weighed and dried in the oven to obtain the dry weight. Dry biomass of sample area extrapolated to per hectare.</p> <table><tr><th>Baseline stratum</th><th>Grass production (dry t/ha/yr)</th></tr><tr><td>Degraded forestland</td><td>1.7 (2.5)</td></tr><tr><td>Degraded community land</td><td>1.3 (2.0)</td></tr><tr><td>Degraded and abandoned private land</td><td>2.0 (3.0)</td></tr></table> <p><i>Figures in parenthesis is maximum grass biomass recorded baseline during field studies</i></p> <p>Grass weight recorded in sample plots-GP-wise is given in Attachment 29</p> <p><u>Audit team 19 Nov 09</u></p> <p>A specific study was conducted for analyzing the grass/fodder production according to each stratum. The answer provided by the project team fulfils the requested clarification.</p>	Baseline stratum	Grass production (dry t/ha/yr)	Degraded forestland	1.7 (2.5)	Degraded community land	1.3 (2.0)	Degraded and abandoned private land	2.0 (3.0)	
Baseline stratum	Grass production (dry t/ha/yr)										
Degraded forestland	1.7 (2.5)										
Degraded community land	1.3 (2.0)										
Degraded and abandoned private land	2.0 (3.0)										
<p><u>Corrective Action Request No 13.</u></p> <p>Utilize the tool for “Estimation of GHG emissions related to displacement of grazing activities in the AR CDM activities”.</p>	D.2	<p><u>Project team 12 Aug 09</u></p> <p>Using the tool “Estimation of GHG emissions related to displacement of grazing activities in the AR CDM activities”, it is shown that the project area for A/R CDM is a ‘zero grazing system’. Further justification for setting leakage due to grazing as zero include:</p> <ul style="list-style-type: none">- Current grass productivity low. Productivity is estimated to double under the A/R project conditions (Table D.1.2). Thus the grass availability for livestock would	<input checked="" type="checkbox"/>								

		<p>double.</p> <ul style="list-style-type: none"> - Stall feeding is a traditional practice in this region and there are dedicated measures proposed to further encourage stall feeding (with a budget of about US\$ 5 million under the MHWDP project) <p><u>Audit team 28 Aug 09</u></p> <p>As per the first step of the tool, no displacement of project activities will occur due to the implementation of the project activity. Request closed.</p>	
<p><u>Corrective Action Request No 14.</u></p> <p>Develop QA/QC procedures for project implementation, summarize them in the PDD and provide the documents to the audit team during onsite visit.</p> <p>Refer to annex 4 for SOPs</p>	E.1.3	<p><u>Project team 12 Aug 09</u></p> <p>QA/QC procedures for project implementation summarized in the PDD, with reference to annex 4 for SOPs</p> <p><u>Audit team 28 Aug 09</u></p> <p>QA/QC procedures are included in the PDD</p>	☑
<p><u>Clarification Request No 16</u></p> <p>Include in the PDD the conditions for ex-post strata update.</p>	E.2	<p><u>Project team 12 Aug 09</u></p> <p>Conditions for ex-post strata update provided</p> <p>Ex post stratification could be undertaken in situations where strata defined at the start of the project undergo changes from the influences of human or natural factors.</p> <p>The ex post stratification of the project shall be conducted under the above-mentioned conditions.</p> <p><u>Audit team 28 Aug 09</u></p> <p>The stepwise approach applied in section E.2 is not required by the methodology AR-ACM0001. Please clarify.</p> <p>Conditions for merging of strata are not included explicitly.</p> <p><u>Project Team Response 11 Nov 09</u></p> <ul style="list-style-type: none"> - The step-wise approach adopted has been revised to reflect methodology AR-ACM001 requirements - Conditions for merging strata – Text included in Section E.2 <p><u>Conditions for update of strata</u></p> <p>The sampling strata may not be merged and the sample size estimated in Tables E.2.1 and E.2.2 will be implemented in the field. However, in a scenario of nearly identical mean annual increment of biomass as well as the survival rates of trees, some of the strata may be merged for monitoring. Thus the merging of sampling</p>	☑

		<p>strata will be determined by the mean biomass increment values as well as survival rates.</p> <p><u>Audit team 19 Nov 09</u></p> <p>Section E.2 was amended. Sampling design and stratification are indicated in the PDD according to the methodology.</p>	
<p><u>Corrective Action Request No 15.</u></p> <ul style="list-style-type: none"> • Provide clarification whether the tool used is in compliance with the methodology. • Clarify how the values for standard deviation are derived and adopt the values if needed, • Recalculate the number of sample plots per strata considering the updated input parameter. (<i>provide calculations to DOE</i>) 	E.2	<p><u>Project team 12 Aug 09</u></p> <p>Compliance of tool with the methodology ensured</p> <p>Number of sample plots recalculated in accordance with changed area figures (Annex 8)</p> <p><u>Audit team 28 Aug 09</u></p> <p>The Excel file used is in compliance with the methodology. Number of sample plots is adapted to the updated size of the project area.</p> <ul style="list-style-type: none"> • Clarify how the values for standard deviation are derived used in table E.2.1, <p><u>Project Team Response 11 Nov 09</u></p> <p>Text added in Section E.2. to clarify standard deviation values reported in Table E.2.1.</p> <p>The sample size was calculated using the sampling calculator (Annex 7). The standard deviation used for calculating the sample size was derived using the following procedure.</p> <ul style="list-style-type: none"> - For each land category, a dominant forest type of the region with the dominant species was selected <ul style="list-style-type: none"> o Forest land - <i>Pinus spp.</i> (<i>forests of Himachal are dominated by Pines in the mid-Himalayan region</i>) o Community land – <i>Pinus spp.</i> o Private land – <i>Syzigium cuminii</i> - Literature was reviewed to obtain MAI for the dominant species for the selected forest type - Standard deviation value was calculated for the MAI values of each forest type - This standard deviation value derived for each of the forest type is used in estimating the sample size for forest land, community land and private land. <p><u>Audit team 19 Nov 09</u></p> <p>Numbers of sample plots are calculated per strata, the calculation and standard de-</p>	☑

		viation used is considered adequate.	
<p><u>Clarification Request No 17</u></p> <p>Revisit the sampling approach for SOC. Explain in the PDD how the sampling approach is applied in practice.</p>	E.2	<p><u>Project team 12 Aug 09</u></p> <p>Sampling for SOC as well as AGB revised based on revised area</p> <p>The temporary sample plot approach will be adopted. The estimated number of sample plots will be located in the different strata using the following approach.</p> <ul style="list-style-type: none"> - Plots will be located using the grid approach in each strata - The grids will be randomly selected and the centre point of the sample grid will be sampled for soil carbon - Soil organic carbon shall be measured to a fixed depth (e.g., 30 cm) - The samples shall be collected from five locations within the plot. Soil samples collected are aggregated to reduce the variability and analyzed in the laboratory using the Walkley Black method. <p><u>Audit team 28 Aug 09</u></p> <p>Approach for sampling of soil carbon is explained and in compliance with the methodology.</p> <p><i>NB: Since the methodology version was updated subsequently monitoring of soil carbon is no longer required. The default approach was applied for 20 years.</i></p>	☑
<p><u>Corrective Action Request No 16.</u></p> <ul style="list-style-type: none"> • Update the list of parameters to be monitored according to the methodology, and use the template given in the methodology • Species composition shall be monitored, and included as monitoring parameter • Ownership / contractual relations with private owners and user groups shall be included in monitoring 	E.4	<p><u>Project team 12 Aug 09</u></p> <p>List of parameters for monitoring revised in accordance with methodology.</p> <p>Species composition included as a parameter for monitoring</p> <p>Ownership and contractual relations included as a parameter for monitoring</p> <p><u>Audit team 28 Aug 09</u></p> <p>Species composition is included as a parameter to be monitored</p> <p>Include ownership and contractual relation (control over the project area) as a parameter to be monitored</p> <p>The template of the methodology AR-ACM0001 is not applied. However the relevant information is presented in the PDD.</p> <p><u>Project Team Response 11 Nov 09</u></p> <ul style="list-style-type: none"> - Template applied and section modified. - All parameters included. <p>Monitoring methods along with the indicators for estimating the GHG emissions and</p>	☑

		<p>removals, according to the methodology AR-ACM0001, were described in Section E. The monitoring plan for the proposed A/R CDM project activity involves the following elements:</p> <ol style="list-style-type: none"> 1. Geographic position of the project boundary 2. Monitoring of forest establishment and management 3. Sampling design and stratification with sampling framework <p>The details of methods and indicators to be monitored for assessing forest establishment and management practices are presented in this section. The monitoring methods also aim to ensure that the management practices are implemented in accordance with the PDD.</p> <p>The activities to be monitored for monitoring of forest establishment were described in Section E.1.1. The parameters to be monitored are as follows and the template and the format for recording the data is provided in the Monitoring Plan (Annex 4).</p> <ol style="list-style-type: none"> i. Geographical location of plots – refer to Table 4.1a – Monitoring Plan (Annex 4) ii. Species planted and survival in different stand models refer to Table 4.1b – Monitoring Plan (Annex 4) iii. Species composition refer to Table 4.1c – Monitoring Plan (Annex 4) iv. Total area of all sample plots refer to Table 4.1d – Monitoring Plan (Annex 4) v. Average volume of wood posts refer to Table 4.1e – Monitoring Plan (Annex 4) vi. DBH and height measurements refer to Table 4.1f – Monitoring Plan (Annex 4) vii. Status of contractual agreements refer to Table 4.1g – Monitoring Plan (Annex 4) viii. Soil organic carbon and bulk density estimates refer to Table 4.1h – Monitoring Plan (Annex 4) <p><u>Audit team 19 Nov 09</u></p> <p>Ownership and contractual relation (control over the project area) as a parameter to be monitored is included to the monitoring plan as requested.</p> <p><u>Response Project Team 04 Dec 09</u></p> <p>Ownership and contractual relation (control over project area) has been included as a parameter for monitoring. This has been addressed during the previous round of</p>	
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		<p>comments.</p> <p><u>Audit team 05 Dec 09</u></p> <p>Include monitoring of contractual relation to section E (E.4.1)</p> <p><u>Project team response 04 Jan 10</u></p> <p>Monitoring of contractual relation included in Section E.4.1</p> <p><u>Audit team 20 Jan 10</u></p> <p>Contractual relations is included as monitoring parameter in section E.4</p>	
<p><u>Corrective Action Request No 17.</u></p> <p>Include a statement on non-significance of GHG emissions and their monitoring.</p>	E.4	<p><u>Project team 12 Aug 09</u></p> <p>Statement on non-significance of GHG emissions and their monitoring included</p> <p><u>Audit team 28 Aug 09</u></p> <p>No GHG emissions are expected in the project, PDD is adopted accordingly.</p>	<input checked="" type="checkbox"/>
<p><u>Corrective Action Request No 18.</u></p> <p>Please include the ID number for each data mentioned in the table as required by the PDD guidelines</p>	E.6	<p><u>Project team 12 Aug 09</u></p> <p>ID number included</p> <p><u>Audit team 28 Aug 09</u></p> <p>Not applicable any longer with the update of the PDD, QA/QC is presented now in section E.1.3 of the PDD</p>	<input checked="" type="checkbox"/>
<p><u>Clarification Request No 18</u></p> <p>Include an updated chart and information on the operational and management structure for monitoring the actual net removals and local capacities.</p>	E.7	<p><u>Project team 12 Aug 09</u></p> <p>Updated organizational chart included and O&M structure for monitoring provided</p> <p><u>Audit team 28 Aug 09</u></p> <p>A brief description and an organizational chart is included in the PDD.</p>	<input checked="" type="checkbox"/>
<p><u>Clarification Request No 19</u></p> <p>Indicate the contact details for each of the entities mentioned in this section and clearly indicate that MHWDP is also a project participant listed in Annex 1 of the PDD</p>	E.8	<p><u>Project team 12 Aug 09</u></p> <p>Contact information provided and MHWDP indicated as project participant</p> <p><u>Audit team 28 Aug 09</u></p> <p>Name of entities and persons in charge of monitoring is presented in the PDD</p>	<input checked="" type="checkbox"/>
<p><u>Clarification Request No 20</u></p> <ul style="list-style-type: none"> Describe in this section only the analysis of the environmental impacts (i.e. fuel wood production shall be described in 	F.1	<p><u>Project team 12 Aug 09</u></p> <p>Section revised and only environmental impacts discussed</p> <p>ESG (Attachment 17) and ESMF (Attachment 18) developed under World Bank Safeguard guidelines provided</p>	<input checked="" type="checkbox"/>

section G.1). • Provide the Environmental Social Guidelines (ESG) and Environmental Social Management Framework (ESMF) developed under the MHWDP		<u>Audit team 28 Aug 09</u> Environmental impacts are described in the PDD: ESG and ESMF documents are provided to DOE.	
<u>Clarification Request No 21</u> If no significant negative environmental impacts are expected monitoring is not required. Please clarify/ ensure consistency with section F2.	F.3	<u>Project team 12 Aug 09</u> Section revised to ensure consistency with Section F2 <u>Audit team 28 Aug 09</u> No monitoring of potential negative environmental impacts is required.	☑
<u>Clarification Request No 22</u> If no significant negative socio-economic impacts are expected monitoring is not required. Please clarify / ensure consistency with section G2.	G.3	<u>Project team 12 Aug 09</u> Section revised to ensure consistency with Section G2 <u>Audit team 28 Aug 09</u> No monitoring and remedial measures for potential negative socio-economic impacts are required, as no negative impacts are identified or expected.	☑
<u>Clarification Request No 23</u> • Describe the process of PRA in the PDD • Provide records / results of the PRA	H.1	<u>Project team 12 Aug 09</u> Records/results of PRA enclosed as Attachment 19 <u>Audit team 28 Aug 09</u> Stakeholder process is described in the PDD and single events are listed in details in the document provided by the PP. The results are described in H.2	☑
<u>Corrective Action Request No 19.</u> Include in this section the summary of the comments received from stakeholders and in sections H.1 describe only the process on how stakeholder comments have been invited and compiled	H.2	<u>Project team 12 Aug 09</u> Process of obtaining stakeholder comments explained in Section H.1 and summary of comments presented in Section H.2. <u>Audit team 28 Aug 09</u> A summary of the comments is included in the PDD.	☑

Table 3: Unresolved CAR / CR / FAR

Unresolved
Forward Action Request 1 Provide evidence on control over private land included in the project.



Industrie Service



Annex 2: Information Reference List

IRL	Author/Editor/ Issuer	Title, Type of Document	Date	Additional Information																											
1.		<p><u>Validation Team:</u> Martin Schröder, Sebastian Hetsch, Juan Chang</p> <p><u>Interviewed Persons:</u></p> <table><tr><td></td><td>Name</td><td>Position, Organisation</td></tr><tr><td>1.</td><td>Rama Reddy</td><td>World Bank officer</td></tr><tr><td>2.</td><td>Ranjan Samantaray</td><td>Senior NRM World Bank officer</td></tr><tr><td>3.</td><td>Indu K. Murthy</td><td>Indian Institute of Science</td></tr><tr><td>4.</td><td>Ravindranath</td><td>Indian Institute of Science</td></tr><tr><td>5.</td><td>S.D. Sharma</td><td>HP MHWP</td></tr><tr><td>6.</td><td>R.K. Kapoor</td><td>Chief Project Director HP MHWP</td></tr><tr><td>7.</td><td>Arvind Kumar</td><td>Executive Director HP MHWP</td></tr><tr><td>8.</td><td>Subhash Ashutosh</td><td>Joint Director Forest Survey of India</td></tr></table>		Name	Position, Organisation	1.	Rama Reddy	World Bank officer	2.	Ranjan Samantaray	Senior NRM World Bank officer	3.	Indu K. Murthy	Indian Institute of Science	4.	Ravindranath	Indian Institute of Science	5.	S.D. Sharma	HP MHWP	6.	R.K. Kapoor	Chief Project Director HP MHWP	7.	Arvind Kumar	Executive Director HP MHWP	8.	Subhash Ashutosh	Joint Director Forest Survey of India	08-18 April 2009	
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2.	PP	PDD GSP version and PDD final version: India: Himachal Pradesh Reforestation Project – Improving Livelihoods and Watersheds	GSP version: 26 Jan 2009 Final version: 15 Nov 2010																												
3.	DNA India	Letter of Approval from India	18 Sept 2008	LoA																											

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4.	DNA Spain	Letter of Approval from Spain	2 Dec 2009	LoA
5.		Development Credit Agreement (Himachal Pradesh Mid-Himalayan Watershed Development Project) between INDIA and International Development Association	19 Jan 2006	
6.	Subhash Ashuosh, NFDMC, Forest Survey of India	PowerPoint presentation: Analysing eligibility of lands for reforestation under the CDM Bio-Carbon Sub-project of HP Mid-Himalayan Watershed Development project	13 May 2009	
7.		Satellite imagery of the project: Satellite imagery LANDSAT TM (1989), IRS P6 LISS III and IRS 1D PANCHROMATIC (2004)	1989 and 2004	
8.	Project Participants	Field forms used for eligibility		
9.	Forest Survey of India, Ministry of Environment and forests, Govt. Of India	Analysing eligibility of lands for reforestation under the CDM Bio-Carbon Sub-project of HP Mid-Himalayan Watershed Development project	2009	
10.	SANTEK CONSULTANTS PRIVATE LIMITED	Final Report on Baseline Study for Himachal Pradesh Mid Himalayan Watershed Development Project	2009	
11.	PP	Baseline survey for CDM (species)		
12.		Gram Pachayat Watershed Development Plans		
13.		Environment and Social Management Guidelines (ESG) for the HP Mid-Himalayan Watershed Development Project		
14.		Forest Department record on species		
15.	Directorate of Extension Education, Dr YS Parmar University of Horticulture and Forestry	Package of Practices for Forestry Crops	1985	
16.		Forest Working Plans for different forest divisions		

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17.		Draft Agreement amongst Village Forest Development Society(VFDS),Gram Panchayat(GP), Mid Himalayan Watershed Development Project (MHWDP) and Govt. of H.P. through Forest Department on the collaboration for the improvement of Degraded Forest Lands through Afforestation /		Forwarding of Carbon Rights
18.		Draft Agreement between private land owner and Mid Himalayan Watershed Development Project (MHWDP) and Govt. of H.P through H.P. Forest Department(HPFD) on the collaboration for the improvement of Degraded Private Land through Afforestation/		
19.	Additional Chief Secretary (Forests), Govt of Himachal Pradesh, Department of Forests	Approval of HP Bio-Carbon Reforestation Project-Improving Rural Livelihoods and Watersheds (a sub-project of the Mid-Himalayan Watershed Development Project) in Himachal Pradesh. (Stating approval of the project by the Council of Ministers in the cabinet meeting (7 July 2009), confirming ownership on forest and carbon rights, and confirming lack of resources to address afforestation and land degradation issues)	16 April 2009	
20.		Register of Land Title of the Forest Department		
21.		Draft Agreement between Gram Panchayat (GP), Mid Himalayan Watershed Development Project (MHWDP) and Govt. of H.P. through H.P. Forest Department (HPFD) on the collaboration for the improvement of Degraded Community Land through Afforestation		
22.	PP	Proceedings on discussions about land title for land eligibility		
23.	PP	PRA excel sheets on selected GP		
24.	World Bank	Project Appraisal document on a proposed credit to the republic of India for a Himachal Pradesh Mid-Himalayan Watershed Development Project	14 Nov 2005	Early CDM consideration
25.	Chief Project Director, Mid Himalayan Watershed, Development Project	Annual Plan of Operation of Plantations under HP reforestation (Bio Carbon) Project	15 April 2006	
26.	National Remote Sensing Agency	Wastelands Atlas of India. Dept of Space, Government of India. Ministry of Rural development Department of Land Resources	2005	
27.	PP	Excel sheet on soil analysis		
28.		Project Implementation Plan of the MHWP	Febru-	

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			ary 2006	
29.		Revenue records in private lands		
30.	HP Forest Department	Government records on Budget for reforestation in the area from 1999 to 2005		
31.	Principal Chief Conser- vator of Forests, Hi- machal Pradesh	State Investment in Private Reforestation Activities. Letter stating non availability of funds for afforestation on private lands	Apr 2009	Additionality
32.	PP	Baseline sampling excel sheet		
33.	Forest Survey of India. Ministry of Environment & Forests, Govt. of In- dia	Forest Survey of India (increment of carbon stock)		
34.	PP	Excel sheet of references used for calculations		
35.	PP	Increment models in excel file		
36.		Soil increment reference		
37.	PP	Household survey data format		
38.	PP	Excel file of household survey		
39.	PP	References of BEF for species selected of each stand model		
40.	PP	Communication on meetings with stakeholders		
41.	PP	Table of species arrangement per strata used for determining input parameters in TARAM (In- crement, RS, BEF)		
42.	PP	TARAM Excel sheets (three files)		
43.	PP	Digital boundary file.		
44.	TÜV SÜD	Field Sheets from onsite visit, including notes on eligibility, boundary, baseline and leakage	2009	
45.	Google Earth	Google Earth Satellite images	2010	
46.	Forest Survey of India. Ministry of Environment	Volume Equations For Forests of India, Nepal & Bhutan.	1996	Volume

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	& Forests, Govt. of India			Equation
47.	Pal, R. C. & Sharma, A.	'Afforestation for reclaiming degraded village common land: a case study', Biomass and Bio-energy 21(1), 35—42.	2001	Volume Equation
48.	S.P.Singh, R.C. Jain	Yield of heartwood in Acacia catechu (Khair) for use in khata manufacture, Indian Forester, June	1987	Growth Rates
49.	Adhikari et al.,	Structure and function of high altitude forests of Central Himlaya I. Dry matter dynamics, Annals of botany, 75, 237-248, 1995	1995	Growth Rates
50.	Singh, A. N.; Raghu-banshi, A. S. & Singh, J. S.	'Comparative performance and restoration potential of two Albizia species planted on mine spoil in a dry tropical region, India', Ecological Engineering 22(2), 123--140.		Growth Rates
51.	Luna, R.K.,	Plantation forestry in India		Growth Rates
52.	A.N. Chaturvedi and H.M. Behl	Biomass production trials on sodic site, Indian Forester, June	1996	Growth Rates
53.	R.K.Luna	Plantation forestry in India By, Pg No. 161		Growth Rates
54.	K. Gurumurti and H.C.S. Bhandari	Analysis of biomass production in six fast growing tree species under short rotation system, Journal of Tropical Forestry, Jan.-March, Vol.7(I)	1991	Growth Rates
55.	Rana BS, Parihar AKS and Singh BP	Growth pattern of certain MPTs raised on sodic land, Indian Forester	2002	Growth Rates
56.	Lodhiyal, N. & Lodhiyal, L. S.	'Biomass and net primary productivity of Bhabar Shisham forests in central Himalaya, India', Forest Ecology and Management 176(1-3), 217--235.	2003	Growth Rates
57.	Mohan Kumar,B,Jacob George,S, Jamalud-heen,V&Suresh,TK	Comparison of biomass production, tree allometry & nutrient use efficiency of MPTs grown in woodlot& silvopastoral experiments in Kerala, India, Forest Ecology and Management,112(1-2),145--163.	1998	Growth Rates
58.	Awasthi, A.; Uniyal, S. K.; Rawat, G. S. & Rajvanshi, A.	'Forest resource availability and its use by the migratory villages of Uttarkashi, Garhwal Himalaya (India)', Forest Ecology and Management 174(1-3), 13--24.	2003	Growth Rates

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59.	Mishra VK,Nayak BK,Bhardwaj DR and Verma KS	High density energy plantations:a comparison of growth responses of three species at different planting densities,Ann.For.14(2):206-212	2006	Growth Rates
60.	S.K. Suri	Growth analysis of Chir(Pinus roxburghii, sargent) plantations in Supkhar of Balaghat division of Madhya Pradesh,Indian Forester, May	1984	Growth Rates
61.	Shivanna H, Parasurama J, Balachandra HC and Kyatappanvar S	Potential of Pongamia pinnata in carbon sequestration-an important biodiesel plant, My Forest,Vol42(1):5-11	2006	Growth Rates
62.	Lodhiyal, L. S. & Lodhiyal, N.	'Variation in biomass and net primary productivity in short rotation high density central Himalayan poplar plantations', Forest Ecology and Management 98(2), 167--179.	1997	Growth Rates
63.	O.N. Kaul And K.K. Sharma	Biomass production systems of Poplars and Willows in India, Indian Forester, September	1983	Growth Rates
64.	Ram Prakash	Some favourite Treesby (text book), Pg no. 146		Growth Rates
65.	R.K.Luna	Plantation Trees By, Pg. No. 644		Growth Rates
66.	S.P.Singh	Growth performance of Syzygium cumini, Indian Forester, November	1982	Growth Rates
67.	Rana BS, Parihar AKS and Singh BP	Growth pattern of certain MPTs raised on sodic land, Indian Forester	2002	Growth Rates
68.	M.S. Negi, V.S. Tandon and H.S. Rawat	Biomass and nutrient distribution in young teak(Tectona grandis linn.f) plantations in Tarai region of Uttar Pradesh, Indian Forester, June	1995	Growth Rates
69.	k. Gurumurti and H.C.S. Bhandari	Ananalysis of biomass production in six fast growing tree species ub=nder short rotation system, Journal of Tropical Forestry,Jan.-March, Vol.7(I)	1991	Growth Rates
70.	L.Singh and VP. Singh	Growth performance of selected native and exotic species on coal mine spoil, Journal of tropical forestry, Vol 15, pp:24-33	1999	Growth Rates
71.	Singh, V. & Toky, O.	'Biomass and net primary productivity in Leucaena, Acacia and Eucalyptus, short rotation, high density ([]energy') plantations in arid India', Journal of Arid Environments 31(3), 301--309.	1995	Growth Rates

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72.	V.N. Tandon, M.C. Pande, Lajpat Rai and H.S. Rawat	Biomass production and distribution by Acacia nilotica plantations at five different ages in Haryana, Indian Forester, November	1988	Growth Rates
73.	K.Gurumurthi, H.C.S. Bhandari and M. Dhanwan	Studies of yields, nutrients and energy conversion efficiency in energy plantations of Acacia nilotica, J. Tree Sci, Vol no. 5, no. 1, pp: 36-42	1986	Biomass Expansion Factor
74.	Singh, V. & Toky, O.	'Biomass and net primary productivity in Leucaena, Acacia and Eucalyptus, short rotation, high density ([]energy') plantations in arid India', Journal of Arid Environments 31(3), 301--309.	1995	Biomass Expansion Factor
75.	V.N. Tandon, M.C. Pande, Lajpat Rai and H.S. Rawat	Biomass production and distribution by Acacia nilotica plantations at five different ages in Haryana, Indian Forester, November	1988	Biomass Expansion Factor
76.	Rana BS, Parihar AKS and Singh BP	Growth pattern of certain MPTs raised on sodic land, Indian Forester	2002	Biomass Expansion Factor
77.	K. Gurumurti and H.C.S. Bhandari	Ananalysis of biomass production in six fast growing tree species under short rotation system, Journal of Tropical Forestry, Jan.-March, Vol.7(I)	1991	Biomass Expansion Factor
78.	M.C. Pande, V.N. Tandon, Mridula Negi	Biomass production in plantation ecosystem of Ailanthus excelsa at five different ages in Uttar Pradesh, Indian Forester, June	1988	Biomass Expansion Factor
79.	Arya, R.	'A silvipastoral study combining Cenchrus ciliaris and three species of tree in arid India', Journal of Arid Environments 65(1), 179--191	2006	Biomass Expansion Factor
80.	Rai P, Solanki KR, Singh UP	Survival, growth and production of multipurpose trees under silvipastoral system, Ann.For., 8(2):279-281	2000	Biomass Expansion Factor
81.	Pande PK	Comparative study on biomass accumulation and productivity in village and closed canopy forests of Satpura (Madhya Pradesh), Ann.For, 14(2):194-2005	2006	Biomass Expansion Factor

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82.	Behera, S. K. & Misra, M. K.	'Aboveground tree biomass in a recovering tropical sal (<i>Shorea robusta</i> Gaertn. f.) forest of Eastern Ghats, India', Biomass and Bioenergy 30(6), 509--521.	2006	Biomass Expansion Factor
83.	Hunter, I	AGB& nutrient uptake of 3 tree species (<i>E.camaldulensis</i> , <i>E.grandis</i> & <i>D.sissoo</i>) as affected by irrigation& fertiliser, at 3 years of age, in southern India, Forest Ecology and Management 144(1-3), 189-200	2001	Biomass Expansion Factor
84.	D.C. Sharma, P.L.Taneja and A.P.S. Bisht	Biomass, productivity and nutrient cycling in <i>Dalbergia sissoo</i> plantation, Indian Forester, May	1988	Biomass Expansion Factor
85.	Lodhiyal, N. & Lodhiyal, L. S.	'Biomass and net primary productivity of Bhabar Shisham forests in central Himalaya, India', Forest Ecology and Management 176(1-3), 217--235.	2003	Biomass Expansion Factor
86.	Mohan Kumar,B,Jacob George,S, Jamalud-heen,V&Suresh,TK	Comparison of biomass production, tree allometry & nutrient use efficiency of MPTs grown in woodlot& silvopastoral experiments in Kerala, India, Forest Ecology and Management,112(1-2),145--163.	1998	Biomass Expansion Factor
87.	Behera, S. K. & Misra, M. K.	'Aboveground tree biomass in a recovering tropical sal (<i>Shorea robusta</i> Gaertn. f.) forest of Eastern Ghats, India', Biomass and Bioenergy 30(6), 509--521.	2006	Biomass Expansion Factor
88.	J.K. Rawat, V. N.Tandon	Biomass production and mineral cycling in yung Chir Pine plantations in Himachal Pradesh, Indian Forester, December	1993	Biomass Expansion Factor
89.	R.P Singh, B.S.Rana and OP. Chaturvedi	Biomass estimates, net primary productivity and dynamics of nitrogen and phosphorus in a shorea- <i>Madhuca</i> dry deciduous forest of Varanasi, India, J.Tree Sci Vol 6, no.2, pp: 68-73	1987	Biomass Expansion Factor
90.	B.S. Rana and R.P. Singh	Plant biomass and productivity estimates for Central Himalayan mixed banj Oak- Chir pine forest, Indian Forester, March	1990	Biomass Expansion Factor
91.	O.N. Kaul And K.K. Sharma	Biomass production systems of Poplars and Willows in India, Indian Forester, September	1983	Biomass Expansion Factor

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92.	O.N. Kaul, D.C. Sharma and V.N. Tandon	Biomass distribution and productivity in a Poplar plantation, Indian Forester, November	1983	Biomass Expansion Factor
93.	Lodhiyal, L. S. & Lodhiyal, N.	'Variation in biomass and net primary productivity in short rotation high density central Himalayan poplar plantations', Forest Ecology and Management 98(2), 167--179.	1997	Biomass Expansion Factor
94.	O.N. Kaul And K.K. Sharma	Biomass production systems of Poplars and Willows in India, Indian Forester, September	1983	Biomass Expansion Factor
95.	Raizada Anurag and Srivastava MM	Biomass yield and biomass equations for Populus deltoides Marsh., Ind.J.of For, Vol.12(1):56-61	1989	Biomass Expansion Factor
96.	M.S. Negi, V.S. Tandon and H.S. Rawat	Biomass and nutrient distribution in young teak(Tectona grandis linn.f) plantations in Tarai region of Uttar Pradesh, Indian Forester, June	1995	Biomass Expansion Factor
97.	Kaul ON, Sharma DC, Tandon VN and Srivastava PBL	Organic matter and plant nutrients in a teak (Tectona grandis) plantation, Indian Forester, August	1979	Biomass Expansion Factor
98.	M.S. Negi, V.S. Tandon and H.S. Rawat	Biomass and nutrient distribution in young teak(Tectona grandis linn.f) plantations in Tarai region of Uttar Pradesh, Indian Forester, June	1995	Biomass Expansion Factor
99.	J.D.S. Negi, V.K.Bahuguna, D.C. Sharma	Biomass production and nutrient distribution in 20 year old Teak and Gamar plantation in Tripura, Indian Forester, September	1990	Biomass Expansion Factor
100.	IPCC	IPCC Good Practice Guidance for LULUCF (2003), Table 3A.1.10 of Annex 3A.1, BEF2 value of temperate broadleaf species is adopted as default value	2003	Biomass Expansion Factor
101.	K.Gurumurthi, H.C.S. Bhandari and M. Dhanwan	Studies of yields, nutrients and energy conversion efficiency in energy plantations of Acacia nilotica, J. Tree Sci, Vol no. 5, no. 1, pp: 36-42	1986	Root-to-Shoot-Ratio

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102.	V.N. Tandon, M.C. Pande, Lajpat Rai and H.S. Rawat	Biomass production and distribution by <i>Acacia nilotica</i> plantations at five different ages in Haryana, Indian Forester, November	1988	Root-to-Shoot-Ratio
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105.	Pande PK	Comparative study on biomass accumulation and productivity in village and closed canopy forests of Satpura (Madhya Pradesh), Ann.For,14(2):194-2005	2006	Root-to-Shoot-Ratio
106.	D.C. Sharma, P.L.Taneja and A.P.S. Bisht	Biomass, productivity and nutrient cycling in <i>Dalbergia sissoo</i> plantation, Indian Forester, May	1988	Root-to-Shoot-Ratio
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108.	R.P Singh, B.S.Rana and OP. Chaturvedi	Biomass estimates, net primary productivity and dynamics of nitrogen and phosphorus in a shorea- <i>Madhuca</i> dry deciduous forest of Varanasi, India, J.Tree Sci Vol 6, no.2, pp: 68-73	1987	Root-to-Shoot-Ratio
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115.	J.D.S. Negi, V.K.Bahuguna, D.C. Sharma	Biomass production and nutrient distribution in 20 year old Teak and Gamar plantation in Tri-pura, Indian Forester, September	1990	Root-to-Shoot-Ratio
116.	Rajput S.S., Shukla N.K. and V.K. Gupta	Specific gravity of Indian timbers. Journal of Timber Development Association of India, XXXI(3), 12-41	1985	Wood Density
117.	Satish Kumar	Dimensional stabilization of wood factors influencing shrinkage-swelling behavior. Journal of Timber Development Association of India, XLIV(4), 31-44	1998	Wood Density
118.	Van vigyan	XI (3-4): 17-22	1973	Wood Density
119.	Sanyal S.N., Pandey C.N., V.K. Jain and M.C. Kukreti	Specific gravity of Indian timbers. Journal of Timber Development Association of India Vol.XXVI (2),14-16	1980	Wood Density
120.	Shukla N.K., K R. Singh and R.S. Singh	A note on the physical and mechanical properties of Robinia pseudo-acacia Fraxinus spp. and Ailanthus spp. from Srinagar (J &K) pp 139-148	1986	Wood Density
121.	Santhakumaran L.N.	Comparative natural resistance of eighty two timber species to damage by marine borers at Goa (India), Journal of Timber Development Association of India, XLIII(1),8-30	1997	Wood Density
122.	Forest Department HP	Himachal Forests	2008	
123.	Indian Institute of Science, Bangalore	Participatory Rural Appraisal Format for Information Generation on Land Categories, Project Location, Plantation Models, Emissions and Leakage Related Information for Preparation of Biocarbon/CDM Project Design Document for the Mid-Himalayan Watershed Development Project		
124.	Ministry on Environment and forests, India	Environmental Impact Assessment. Impact Assessment Division, Ministry of Environment and Forests, Government of India http://envfor.nic.in/divisions/iass/eia/Cover.htm	January 2001	
125.	Arun Kumar & Vinod Khanna	Globally Threatened Indian Fauna: Status, Issues and Prospects, Zoological Survey of India, Northern Regional Station, Dehra Dun – 248 195		
126.		NTFP as Livelihood Option; Report of Foundation for Revitalisation of Local Health Traditions, Bangalore (Work done for HPMHWDP (2008) and -Ved, DK, et al 2003; Conservation Assessment& Management Prioritisation for the Medicinal Plants of J &K, Himachal Pradesh & Uttaran-		



Industrie Service

IRL	Author/Editor/ Issuer	Title, Type of Document	Date	Additional Information
		chal: Shimala CAMP Report, FRLHT. Bangalore.		
127.		Conservation Assessment and Management Plan Workshops Report,	1998	
128.	Prof. N.H. Ravin- dranath, Indian Institute of Science	Statement on non-availability of increment data for 13 tree species	Aug 2010	
129.	DNA Spain	Email confirmation on authenticity of the Spanish LoA	Nov 2010	
130.	National CDM Author- ity, Ministry of Environ- ment & Forest, Gov of India	Internet database of approved CDM project: http://www.cdmindia.in/approved_projects.php?n=1	ac- cessed Nov 2010	