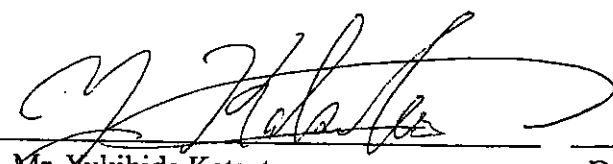


**MINUTES OF JOINT EVALUATION
ON
THE JAPANESE TECHNICAL COOPERATION
FOR
THE DEMONSTRATION STUDY ON CARBON FIXING FOREST MANAGEMENT IN
INDONESIA**

The Japanese Terminal Evaluation Team (hereinafter referred to as “the Japanese Team”) organized by the Japan International Cooperation Agency (hereinafter referred to as “JICA”) and headed by Mr. Yukihide KATSUTA, visited the Republic of Indonesia from September 6 to September 16, 2005 for the purpose of conducting terminal evaluation of the Demonstration Study on Carbon Fixing Forest Management in Indonesia (hereinafter referred to as “the Project”).

This evaluation was conducted by the Joint Evaluation Team, which consist of the Indonesian evaluation team and Japanese evaluation team (hereinafter referred to as “the Team”). As a result of a series of surveys and discussions, the Team agreed forward to respective Governments an Evaluation Report, which is referred to in the attached hereto.

Jakarta, September 16, 2005



Mr. Yukihide Katsuta
Leader

Japanese Terminal Evaluation Team
Japan International Cooperation Agency
Japan



Dr. Hadi S. Pasaribu
Director General
Forestry Research and Development
Agency, Ministry of Forestry
The Republic of Indonesia

**REPORT OF THE JOINT TERMINAL EVALUATION
ON
THE DEMONSTRATION STUDY
ON CARBON FIXING FOREST MANAGEMENT IN INDONESIA**

1. Introduction

1.1 Objectives of the Evaluation

The evaluation activities were performed with the following objectives:

- (1) To verify the accomplishments of the Project compared to those planned;
- (2) To identify obstacles and/or facilitating factors that have affected the implementation process;
- (3) To analyze the Project in terms of the five evaluation criteria (i.e. Relevance, Effectiveness, Efficiency, Impact, and Sustainability); and
- (4) To make recommendations on the Project regarding the measures to be taken for improvement of the Project and after the termination of the Project.

1.2 Members of the Joint Evaluation Team

(1) The Japanese Team

(a) Mr. Yukihide Katsuta

Group Director, Group 1 (Forestry and Nature Environment),
Global Environment Department, JICA

(b) Mr. Tatsuya Watanabe

Technical Officer, National Forest Planning Division, Forestry Agency,
MAFF

(c) Mr. Daisuke Saito

Forest Conservation Team1, Global Environment Dept., JICA

(d) Ms. Yasuyo Hirouch

Permanent Expert, International Development Associate Ltd.

(2) The Indonesian Team

(a) Dr. Krisfianti Ginoga

Researcher, Research and Development Centre for Social Culture and Forestry
Economics, FORDA

(b) Dr. Dody Sukadri

Head of Program Planning and Research Division, Research and Development Centre
for Social Culture and Forestry Economics, FORDA

(c) Dr. M. Bismark

Senior Researcher, Research and Development Centre for Forest and Nature
Conservation, FORDA

(d) Dr. Ernawati

Sub-Head of Report and Evaluation, Research and Development Centre for Forest and Nature Conservation, FORDA

(e) Mr. Ismayadi Samssoedin

Researcher, Research and Development Centre of Forest and Nature Conservation, FORDA

(f) Mr. Chairil Anwar

Senior Researcher, Research and Development Centre of Forest and Nature Conservation, FORDA

(g) Dr. Lilik Prasetyo

Head of Global Environmental Changing Program, Environmental Research Centre, Bogor Agriculture University (PPLG-IPB)

(h) Mr. Andi Sukendro

Lecturer, Silviculture Laboratory, Faculty of Forestry, IPB

1.3 Schedule of the Evaluation Study

After the preparation in Japan, the Japanese evaluation team arrived in Indonesia on September 6, 2005. Both Japanese and Indonesian evaluation team conducted interviews to Japanese experts and Indonesian counterparts from September 7 to 9, and a field survey in Maribaya on September 10. Based on the result of them, the Team prepared a draft report, and elaborated it through a series of discussions among the Team and persons concerned the Project, from September 11 to 15.

2. Outline of the Project

2.1 Background of the Project

The third Conference of the Parties (COP3) to United Nations Framework Convention on Climate Change (UNFCCC) in Kyoto recognized that afforestation and reforestation could be counted as sink and used for achieving green house gases emission reduction commitment in 1997. In this situation the demonstration study, based on the request from Indonesian government in March 2000, was planned to carry out for the purpose of establishing new techniques and methodologies in relation to carbon fixing forest management. In consequence of discussion and field survey by both sides, JICA and FORDA, Ministry of Forestry signed the document in December 2000 to start the new project.

2.2 Summary of the Project

According to the Master Plan of the Record of Discussions (R/D) and the latest JCC report, the Project Purpose is "to establish new techniques and methodologies for carbon fixing forest management, which are expected to promote and to enhance foreign and domestic investments for tree plantations". Furthermore, the Overall Goal of the Project is "to contribute to carbon sequestration and mitigation of global warming through establishment

and management of tree plantation". The items of the Activities are (1) "development of methodologies to estimate carbon fixation benefits of plantation forests", (2) "development of new technology for charcoal-applied plantations to maintain and enhance carbon fixation potential", (3) "development of more effective technology for charcoal production", (4) "estimation of cost and revenue of CDM plantations", and (5) "preparation of manuals for carbon fixing forest management".

3. Methodology of Evaluation

3.1 Preparation of a Project Design Matrix for Evaluation

For a evaluation of a technical cooperation project of JICA, a Project Design Matrix (PDM; a summary table of a project design that describes necessary Inputs, Activities, Outputs, Project Purpose, Overall Goal, Important Assumptions, Objectively Verifiable Indicators, Means of Verification, and the logical relationship between and among them), which is formulated prior to the commencement of the project, is used as one of the essential documents. The PDM for the Project, however, has not been prepared partly. Prior to the start of the evaluation, the Team agreed to prepare a PDM for evaluation (PDMe) as a basis of the evaluation. The PDMe has been prepared based on the R/D and the latest JCC report as well as a consultation with the Project (Annex 1). The Plan of Operation (PO), attached to the latest JCC report, has been modified accordingly (Annex 2). The Team has also agreed to take into a due account that the Project was designed under the JICA's development investment and financing scheme.

3.2 Data Collection Method and Analysis

3.1.1 Data Collection Method

The Team has carried out a field survey in the Project site in Maribaya, and has made interviews with the Indonesian counterparts and the Japanese experts engaged in the Project and other people concerned. The Team has also collected information through questionnaire from the concerned personnel.

3.1.2 Items of Analyses

(1) Accomplishment of the Project

Accomplishment of the Project was measured in terms of the Inputs, the Activities, the Outputs and the Project Purpose in comparison with the Objectively Verifiable Indicators of the PDMe.

(2) Implementation Process

Implementation process of the Project was reviewed to see if the activities have been implemented according to the schedule, and the Project has been managed properly; and to identify obstacles and/or facilitating factors that have affected the implementation process.

(3) Evaluation based on the Five Evaluation Criteria

(a) Relevance

Relevance of the Project was reviewed as the validity of the Project Purpose and the Overall Goal in connection with the needs of the beneficiaries, policies of Indonesia and Japan.

(b) Effectiveness

Effectiveness was assessed by evaluating the extent to which the Project has achieved and contributed to the beneficiaries.

(c) Efficiency

Efficiency of the project implementation was analyzed focusing on the relationship between the output and input in terms of timing, quality, and quantity.

(d) Impacts

Impacts of the Project were identified by referring to direct and indirect, positive and negative impacts caused by the Project.

(e) Sustainability

Sustainability of the Project was forecasted in organizational, financial and technical aspects by examining the extent to which the achievement of the Project would be sustained and/or expanded after the Project is completed.

4. Accomplishment and Implementation Process of the Project

4.1 Accomplishment of the Project

As for the accomplishment of the Project Purpose, the Outputs, and the Inputs, as of 15 September, 2005, please see Annex 3.

4.2 Implementation Process

In general, the Activities have been implemented as planned. It is expected that all of the planned Activities will be completed before the termination. The Project has been monitored periodically through internal quarterly meetings as well as JCC. It has been implemented in close collaboration between the Japanese experts and their counterparts.

Some of the issues are highlighted below:

1. In February 2003, the Project scheme was changed from "development investment and financing" to "technical cooperation".
2. Responding to the above mentioned change, the PO was prepared and approved in July 2003. Since then, the Project has been managed based on the PO in addition to the Master Plan in the R/D.
3. In March 2004, preparation of database was added as a new activity item, taking into account the discussions with the experts and development of the COP negotiations.
4. Target and responsible person(s) of the each activity was not specified enough in the

prepared PO. In addition, a Mid-term evaluation was canceled. These factors have made it difficult for the stake holders to share common understanding of implementation process and issues.

5. In terminal evaluation in 2005, a PDMe was prepared in consultation with the Project for the purpose of evaluating and drawing recommendations and lessons learned.

5. Evaluation based on the Five Evaluation Criteria

5.1 Relevance

The Overall Goal (“Carbon sequestration and mitigation of global warming are enhanced through establishment and management of tree plantations”) is still relevant with the needs of Indonesia. “National Strategic Study on CDM on Forestry Sector” (2003) stresses national interest of Indonesia in terms of the global carbon market and its positive impacts on the development. In March 2005, Forestry Minister, Dr. M. S. Kaban, emphasized importance of AR-CDM as a mechanism for land and forest rehabilitation in Indonesia.

The Project Purpose (“New techniques and methodologies for carbon fixing forest management, which are expected to promote and to enhance foreign and domestic investments for tree plantations, are established”) is still relevant with the needs of the target group (i.e. potential CDM participants). Indonesia has now become eligible for CDM projects. A manual for potential CDM participants, which is defined as “a result of achievements through the Project activities” in the Master Plan of the Project, would be an important manual for the forestry sector in Indonesia.

The Overall Goal and the Project Purpose are still consistent with national policies of Indonesia. MOF has identified the five Forestry Priority Policies for the period between 2005-2009. AR-CDM initiatives are inline with priority No.3 (“Forest rehabilitation and conservation”).

The Overall Goal and the Project Purpose are still consistent with ODA policies of Japan that prioritize “consideration to global warming and environmental problems,” as one of the four priority issues. The latest “JICA Country Programme” (2002) states 1) environmental protection is one of the five priority issues, and 2) forest conservation is an important area for cooperation. (Details are described in Section 1 of Annex 5)

5.2 Effectiveness

The achievement of the Project Purpose is steady. It has been mostly achieved. The Project has established a firm framework for data analyses, while the fundamental data collection and analyses on biomass, soils, and financial aspects are ongoing. The data and AR-CDM manual, which are key outputs of the Project, are expected to be presented through the Project’s web-site that is under development.

It is expected that the Project Purpose will be fully achieved by the end of the Project and provide useful information for potential project participants in a readily available manner.

The contribution of charcoal production and application techniques (i.e. Output 2 and the Output 3) to the Project Purpose is not assessed because one of the Important Assumptions is no longer applicable in this regard. In the modalities of the AR-CDM, the charcoal production from land preparation residue is likely to be regarded as net anthropogenic emission by sources of the greenhouse gas. The positive impacts of the charcoal techniques development are, however, observed and future potential of the impacts are noted. (Details are described in Section 2 of Annex 5)

5.3 Efficiency

In general, the Inputs from the both sides have been appropriate in terms of timing, quality and quantity. Although there were some issues, they were addressed through close collaboration of both sides so that the achievements of the Outputs have not been adversely affected. It is expected that all the Outputs will be achieved fully by the end of the Project. The Project is considered to be mostly efficient. Some of the issues are highlighted below:

Japanese side: In most cases, a period of assignment of short-term expert was no more than two or three weeks. It would have been more efficient if the experts, including the one in the field of database technique, had been assigned for the longer period. Nitrogen-Carbon analyzer (NC-analyzer), one of the major equipment, which is used for analysis of carbon stocks, has become out of order frequently due to voltage fluctuation so that it has not been fully utilized. The counterparts, who were included in a group training course, were not able to utilize the acquired knowledge because it was not directly relevant with their activities.

Indonesian side: Due to budget constraint as well as delay of its disbursement, the Indonesian side has not been able to provide some of the Inputs as planned (i.e. administrative staff, some of the running expenses including travel costs for the counterparts, the sheds at the experimental fields, etc.) : they have been borne by the Japanese side. In addition, the counterpart specialized in database technique has not been assigned yet although preparation of database is among major activities towards the end of the Project. (Details are described in Section 3 of Annex 3)

5.4 Impacts

Impacts at the Overall Goal level: The Overall Goal is found too ambitious: it cannot be achieved in 3-5 years after the termination of the Project. In order to reach the current Overall Goal, the techniques and methodologies developed by the Project should be

disseminated and utilized by potential CDM participants.

Other impacts: Some positive impacts have been already observed. Technical capacity of the counterparts has increased through working with the Japanese experts. Through technical seminars and workshops organized by the Project, technical knowledge and understanding of the participants, including local researchers, have been raised. Charcoal application and production techniques developed/improved under Output 2 and Output 3 have already produced some positive technical and economic impacts, including those on traditional producers near the experimental site in West Java and the projects sites of FORDA in some regions, a local NGO and its beneficiaries in West Kalimantan. In addition, soil carbon measurement techniques developed by the Project have possible or potential impacts on potential CDM participants by making them possible to save time and costs related to monitoring. Negative impacts have not been observed. They are not foreseen, either. (Details are described in Section 4 of Annex 5)

5.5 Sustainability

Institutional aspects: The policy support for the Project is likely to continue. FORDA would be able to manage the relevant activities after the termination of the Project. A plan for the post-project is being developed by FORDA in consultation with the Japanese side.

Financial aspects: The counterpart budget for the Project has been limited so that the Japanese side has covered considerable part of the running costs till now. Unless some measures are taken, it is most likely that FORDA will face financial constraint to continue the relevant activities, including utilization and dissemination of the products of the Project (i.e. database, manuals, and web-site, etc.) , which are crucial for promotion of the AR-CDM. However, for the post-project period, FORDA plans to utilize the budget available under its carbon related research programme, which includes CDM and covers five-year period (2004-2009) .

Technical aspects: Technical level of the counterparts has been raised enough to maintain and to develop the products of the Project. However, FORDA seems to lack of staff with specialized background on database technique to maintain the database, which is most important to secure utmost utilization and dissemination of the products of the Project. The machinery and equipment provided by the Project are expected to be utilized and maintained properly, but the NC-analyzer needs proper maintenance system for full utilization. (Details are described in Section 5 of Annex 5)

6. Conclusion

As described above, the Outputs of the Project are mostly or almost achieved, and the achievement level of the Project Purpose is as planned. Therefore, by January 7, 2006, the date

of the project termination, it is expected that the Project will fully accomplish its purpose.

As for the five evaluation criteria: 1) the relevance of the Project is endorsed by the Indonesian national policy, growing awareness of AR-CDM in Indonesia, and the Japanese ODA policy; 2) the effectiveness is assured by the steady achievement of the Project Purpose as well as the contribution of the Outputs to the Project Purpose; 3) the Project is considered to be mostly efficient as the Project overcame the constraints of the Inputs; 4) some direct positive impacts have been already observed without any observed or foreseeable negative impacts; and 5) the forecasted sustainability, which is a key for this output-rich Project, is fair.

7. Recommendations and Lessons Learnt

7.1 Recommendations

The Project will terminate on January 7, 2006, according to the schedule as described in the R/D, and will be handed over to the Indonesian side. FORDA, on behalf of the Government of Indonesia, will take a whole responsibility for maintenance and continuation of the Project.

7.1.1 Measures to be taken by the Termination of the Project

(1) Completion of the Remaining Activities

The Project is required to complete the whole activities, which were planned and still remain, by the date of the termination of the Project. Although the evaluation team foresees that Project would achieve its purpose, continuous effort of both Japanese experts and Indonesian counterparts as well as effectual support from JICA and the Indonesian authorities for that are necessary. Especially, 1) the measurement and analysis of soil carbon, 2) the preparation of the database, 3) the preparation of the AR-CDM manual, and 4) preparation of scientific and research papers need to be paid careful attention.

(2) Securing Enough Budget for the Project Running

Financial sustainability of the Project is one of the main concerns of this evaluation. Even though the Japanese side will cover some local budget during the project cooperation period, FORDA is necessary to try its best to secure the budget that has been allocated for the implementation of the Project. This effort will be one of the exit strategies for smooth handing over of the Project to the Indonesian side.

(3) Assignment of a Counterpart with Specialized Background on Database Technique

The construction of the database for potential CDM participants is among the major activities towards the end of the Project; and its maintenance is one of the key issues concerning utilization and dissemination of the products of the Project. A counterpart with specialized background on database technique has been nominated but has not

been assigned yet. It is recommended that FORDA expedite the administrative procedure of assigning the counterpart so that he could start by the time for the third dispatch of the short-term expert on database technique from the end of September to the middle of October 2005.

(4) Maintenance and Provision of Proper Management System for the NC-analyzer

The NC-analyzer has a potential to become an income source for the project continuation of FORDA by getting orders of analyses from other organizations. The NC-analyzer, which has become out of order frequently, should be maintained properly. The Project has imported a stock of consumable spare parts for the NC-analyzer. The maintenance work is hoped to be done by the Project using local engineering contractors, so as to provide proper maintenance system after the termination of the Project. The NC-analyzer should be in good condition at the time of the handing-over.

(5) Preparation of the Institutional and Financial Arrangements for the Post-Project

For the sake of smooth handing-over of the Project to the Indonesian side, it is required for them, in consultation with the Japanese side, to start and to complete preparation of the necessary institutional and financial arrangements during the cooperation period of the Project. A plan for the post-project, which is under development, should be finalized and authorized by FORDA before the end of the Project. Especially, a plan for securing the necessary budget from the Indonesian government and /or other financial sources for the post-project is essential.

(6) Modification of the Overall Goal

Although the current Overall Goal of the Project is relevant with the needs of Indonesia, it was found too ambitious to be achieved in three to five years after the termination of the Project. It should be treated as a goal for the longer period, and an appropriate Overall Goal should be set. In view of the above, it is recommended that the Super Goal be created, to which the present Overall Goal is transferred: and that new Overall Goal be "The techniques and methodologies developed by the Project are utilized by potential CDM participants". (Please see Annex 6)

(7) Project Management using the PDM

It is recommended that the PDM be used as a management tool for the Project for the remaining period. The draft PDM has been prepared for consideration by JCC based on the PDMe as well as the recommendation item (6) above. (Please see Annex 6 for the draft PDM)

7.1.2 Measures to be taken after the Termination of the Project

(1) Proper Management of the Experimental Sites

The experimental sites established by the Project are necessary to be maintained properly after the cooperation period because further data collection and analysis from them are very useful for the maintenance of the data and the development of the products of the Project.

(2) Continuation of the Measurement and Analysis of Carbon Stock

In order to fully utilize the data for carbon estimation obtained by the Project, the measurement and analysis of carbon stock are necessary to be continued as the plantations and the secondary forests grow.

(3) Maintenance and Renewal of Data and Database

The data newly obtained and the results of the analysis of them are required to be kept in order. These are also necessary to be stored in the database for references.

(4) Provision of the Information to Potential CDM Participants

The techniques and methodologies developed by the Project will not become valuable until potential CDM participants utilize them, so utilization and dissemination of them are one of the key issues for the post-project. FORDA, with close cooperation with other governmental or private organizations, is required to provide information to potential CDM participants through any channels. It is necessary to update the manuals and maintain the web-site after the completion of the Project. In addition, holding dissemination seminars for interested CDM stakeholders is suggested.

(5) Provision of the Institutional and Financial Arrangement for the above mentioned Measures

The arrangement for the post-project described in the recommendation item (5) of 7.1.1 is necessary to be continued or strengthened after the termination of the Project in order to carry out the measures mentioned above.

(6) Use of the Project's Products by the Government of Japan

With the permission of the Government of Indonesia, the Government of Japan could use the products of the Project.

7.2 Lessons Learnt

(1) Ownership of Project and Mutual Consultation

As quoted from the Record of Discussions of this project; "The Government of the Republic of Indonesia will implement the Demonstration Study on Carbon Fixing Forest Management in cooperation with the Government of Japan", the ownership of the Project

has been in the Indonesian side since the Project started. As respecting this basic principle, Japanese experts and Indonesian counterparts, however, have consulted each other about realistic implementation measures for the accomplishment of the Project Purpose. Such flexible measures contributed success of the Project, and the basic principle leads the fact that Indonesian side started to consider the post-project measures by their ownership. Respecting a basic principle and adopting flexible measures through mutual consultation are essential for the management.

(2) Contribution of other Organizations to the Project

The Project has been implemented in collaboration with local research institute, universities, and NGOs, and these resources injected in the Project contributed to the achievement of the Project Purpose. To seek resources from such broad area is effective for project implementation.

(3) Proper Project Management

As described in 4.2 "Implementation Process" and others, proper project management is found very important, and it influences on achievement of the Outputs. Through the experience of the Project, the following issues are considered essential;

- proper monitoring system within project,
- proper monitoring by JICA,
- utilization of management tool properly, such as PDM and PO,
- information sharing among stakeholders (JICA headquarters, JICA overseas office, project, recipient countries' government, etc),
- mutual communication between Japanese experts and counterparts,
- proper timing and period of dispatch of expert, and,
- selection of proper equipment, especially from the view point of maintenance and local availability of spare-parts.

Attachment

- Annex 1 PDM for Evaluation (PDMe)
- Annex 2 Modified PO with activity chart
- Annex 3 Accomplishment of the Project
- Annex 4 Implementation Process of the Project
- Annex 5 Evaluation based on the Five Evaluation Criteria
- Annex 6 Draft PDM

- Appendix A Record of Outputs
- Appendix B Record of Inputs
- Appendix C List of Abbreviation

Annex 1. Project Design Matrix for Evaluation (PDMe)

1. Project Title: Demonstration Study on Carbon Fixing Forest Management in Indonesia. 2. Project Period: 5 Years from Jan. 2001
 3. Executing Agency: Forestry Research and Development Agency (FORDA), Ministry of Forestry

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p>Overall Goal</p> <p>Carbon sequestration and mitigation of global warming are enhanced through establishment and management of tree plantation¹.</p>	<p>Tree plantations for carbon sequestration and mitigation of global warming, established and managed based on the techniques and/or methodologies developed by the Project, increased in Indonesia.</p>	<p>1. Review of the relevant statistics, interview with relevant organizations including the DNA (Designated National Authority) of Indonesia, the DOEa (Designated Operational Entities) and review of the UNFCCC web-site.</p>	<p>1. There are no drastic changes in the modalities of AR-CDM 2. There are no major changes in CDM Policy in Indonesia 3. The Carbon-market where I-CERS (Temporary Certified Emission Reductions) and I-CERS (long-term CERs) circulate at sufficient quantity and substantial price will stand and work.</p>
<p>Project Purpose</p> <p>New techniques and methodologies for carbon fixing forest management² which are expected to promote and to enhance foreign and domestic investments for tree plantations, are established.</p>	<p>Techniques and methodologies provided in a readily available manner for potential CDM participants, and able to be judged useful for (or likely to be used by) them, in view of the following items: (1) Setting of project boundary; (2) Determination of baseline scenario; (3) Demonstration and assessment of additionality (including financial analysis & barriers check); (4) Feasibility analysis (in "Tool for Demonstration and Assessment of Additionality" of UNFCCC); (5) Design of Monitoring Plan on Carbon Stock Change (including carbon stock estimation); (6) Leakage Estimation and design of its monitoring plan; (7) Selection of carbon pools for carbon accounting; (8) Policy & Regulations on forestry investments in Indonesia; (9) Procedure and criteria of National Designated Authority (DNA) to certify contribution of the AR-CDM projects to the Sustainable Development of Indonesia; (10) Policy and regulations on analysis and assessment of Socio-Economic Impacts of AR projects in Indonesia; (11) Policy and regulations on analysis and assessment of Environmental Impacts of AR projects in Indonesia; (12) Possible risk of AR projects and its Management; (13) Formulation of Project Design Document (PDD); (14) Validation of PDD by Designated Operational Entity (DOE); and (15) Verification of Net Anthropogenic Greenhouse Gas Removals. (Criteria (1) to (13) are major topics that project participants shall describe in the Project Design Document format of UNFCCC)</p>	<p>1. Interview with the J/E (Japanese experts) and CIP (Indonesian counterpart personnel) and review of the documents produced by the Project.</p>	<p>1. The modalities of AR-CDM encourage utilization of the methodologies and/or the techniques developed by the Project. 2. There are no major changes in CDM Policy in Indonesia 3. An emergence of the Carbon-market where I-CERS and I-CERS circulate at sufficient quantity and substantial price are foreseen.</p>
<p>Outputs</p> <p>1. Methodologies to estimate carbon fixation benefits of plantation forests are developed.</p>	<p>1.1 Research papers on biomass and soil carbon stocks prepared and/or presented at scientific meetings, workshops, etc. 1.2 Parameters for carbon estimation of biomass and soil (BEF, R, D, allometric equation, and so on) obtained. 1.3 Manuals for survey and analysis methodologies for the potential CDM participants prepared 1.4 Scientific papers on biomass and soil carbon stocks accepted by the relevant societies. 1.5 Database on biomass and soil for the potential CDM participants prepared</p>	<p>1.1-1.5 Interview with J/E and CIP, questionnaire, review of the project monitoring reports and technical reports. In addition, 1.4 Review of the manuals</p>	<p>1. CIP remain with FORDA 2. The modalities of AR-CDM encourage utilization of the methodologies and/or the techniques developed by the Project.</p>
<p>2. New technology for charcoal-applied plantations to maintain and enhance carbon fixation potential is developed.</p>	<p>2.1 Research papers on charcoal application technique prepared and/or presented at scientific meetings, workshops, etc 2.2 Scientific papers on charcoal application technique accepted by the relevant societies</p>	<p>2.1-2.3 Interview with J/E and CIP, questionnaire, review of the project monitoring reports and technical reports.</p>	
<p>3. More effective technology for charcoal production is developed.</p>	<p>3.1 Research papers on charcoal production prepared and/or presented at scientific meetings, workshops, etc</p>	<p>3.1-3.2 Interview with J/E and CIP, questionnaire, review of the project monitoring reports and technical reports.</p>	
<p>4. Cost and revenue of CDM plantations are estimated</p>	<p>4.1 Research papers on cost and revenue analysis prepared and/or presented at scientific meetings, workshops, etc. 4.2 A manual for cost and revenue analysis of the CDM plantations for the potential CDM participants prepared. 4.3 Scientific papers on cost and revenue analysis for AR-CDM projects accepted by the relevant societies 4.4 A tool package for cost and revenue analysis for the potential CDM participants prepared.</p>	<p>4.1-4.2 Interview with J/E and CIP, questionnaire, review of the project monitoring reports and technical reports.</p>	
<p>5. Data and information necessary for potential CDM participants are made available</p>	<p>5.1 An overall manual for carbon-fixing plantation prepared. 5.2 A web-site on AR-CDM in Indonesia prepared 5.3 Related literatures for a library of FORDA collected 5.4 Technical seminars and workshops organized</p>	<p>5.1-5.4 Interview with J/E and CIP, questionnaire, review of the project monitoring reports and technical reports.</p>	

¹ "Management of tree plantation" means management of carbon-fixing tree plantation, i.e. afforestation and reforestation, as defined in the Marrakech Accords under the Article 12 of Kyoto Protocol.
² "Carbon-fixing forest management" means management of carbon-fixing tree plantations, i.e. afforestation and reforestation as defined in the Marrakech Accords under the Article 12 of Kyoto Protocol.

Annex 1. Project Design Matrix for Evaluation (PDMe)

Activities	Inputs	Important Assumptions
1-a. Measurement and analysis of the carbon contents in biomass and soil in newly established plantations 1-b. Measurement and analysis of the carbon contents in biomass and soil in existing plantations 1-c. Measurement and analysis of the carbon contents in biomass and soil in control plots (i.e. baseline) 1-d. Data collection and development of methodologies to estimate carbon contents in various land use types 1-e. Preparation of manuals for survey and analysis methodologies 1-f. Preparation of scientific and research papers 1-g. Prepare a database on soil and biomass for the potential CDM participants, using the data collected through surveys and analyses	<p><u>Inputs</u></p> <p><Japanese Side> (1) Long-Term experts (4) 1. Chief Advisor 2. Silviculture 3. Forest Management 4. Coordinator</p> <p>(2) Short - Term Experts Dispatched as needed.</p> <p>(3) Training of Indonesian personnel in Japan Training opportunities for the Indonesian personnel in Japan will be provided.</p> <p>(4) Machinery and Equipment Vehicles, items for silviculture, experiment, investigation, and other necessary items will be provided.</p>	<p><u>Pre-conditions</u></p>
2-a. Measurement of effects of charcoal input into newly established plantations 2-b. Experiment of effects of charcoal input into pot seedling 2-c. Preparation of scientific and research papers	<p><Indonesian Side> (1) Staff allocation 1. Project Director 2. Project Manager 3. Project Coordinator 4. Field Managers 5. Counterpart personnel in the fields of (a) Forest Management, (b) Silviculture, (c) Charcoal Production 6. Administrative Personnel: (a) Clerical and service employees, (b) Drivers and Labors, (c) Other necessary supporting staff, (d) Secretaries for Japanese Experts</p>	
3-a. Development of cost effective technology for charcoal production 3-b. Quantification of charcoal production upon land preparation 3-c. Preparation of research papers 4-a. Study and data collection on CDM related plantations 4-b. Development of CDM plantation model 4-c. Data analysis and estimation of cost and revenue of carbon fixing plantation 4-d. Preparation of a manual for cost-revenue analysis for the potential CDM participants 4-e. Preparation of scientific and research papers 4-f. Preparation of a tool package for the cost and revenue analysis for the potential CDM participants	<p>(2) Land, buildings and facilities 1. Land for (a) Experimental Plantation, (b) Project office and related facilities, (c) Access roads 2. Buildings and facilities: (a) Project office, (b) Spaces for machinery and equipment, (c) Storehouse for forestry materials, (d) Workshop and Garage, (e) Sheds in the plantation field, (f) Others 3. Natural and Planted forests</p>	
5.a. Preparation of a manual for carbon fixing plantations for the potential CDM participants 5.b. Preparation of a web-site on AR-CDM in Indonesia 5.c. Collection of relevant literatures for a library of FORDA 5.d. Organization of technical seminars and workshops		

Annex 2: Modified PO with Activity Chart - (1/9)

Activities	Expected results/indicators	Schedule (Japanese FY)				Person in charge	Other Major Inputs		Progress	Remarks
		2001	2002	2003	2004		2005	Indonesian side		
<p><1) Methodologies for estimation of carbon fixation benefits of plantation forests developed></p>										
1.a Measurement and analysis of carbon content in newly established plantation						JE<Silviculture> > Kato			A	
1) Establishment of plantation in West Java	Plantations for experimental plots are established.					-do-	<ul style="list-style-type: none"> • CP < Silviculture > • Facilities • Field 	<ul style="list-style-type: none"> • SE < Biomass survey method > • Equipments: Equipments for establishing the plantations • CP training 	A	In total, three plantations (i.e. experimental plots for biomass and soil measurement) were established by the end of FY 2002: one for <i>Acacia mangium</i> in Maribaya, one for <i>Shorea leprosula</i> in Ngasuh, and the other one for <i>Pinus merkusii</i> in Cianjen.
2) Measurement of carbon contents in West Java						-do-				
2)-a Biomass	a) Carbon stocks in tree biomass and its changes are measured. b) Data regarding parameters and equations for estimating biomass are obtained.					-do-	<ul style="list-style-type: none"> • CP < Silviculture > • Facilities • Field 	<ul style="list-style-type: none"> • SE < Biomass survey method, Biomass measurement method > • Equipments: NC analyzer, Oven etc. • CP training 	A	To clarify carbon stocks and its annual changes in newly established plantations, field measurements have been carried out every year. The methodology was transferred to CP and technicians. Parameters for predicting biomass were collected based on GPG. Allometric equations were derived for biomass estimates for specific sites.
2)-b Soil and litter	a) Carbon stocks in soil and litter, and its changes are measured. b) Field methodology are developed.					-do-	<ul style="list-style-type: none"> • CP < Silviculture > • Facilities • Field 	<ul style="list-style-type: none"> • SE < Forest soil, Forest soil data analysis > • Equipments: NC analyzer, Oven etc. • CP training 	A	Soil/litter samplings have been carried out in newly established plantations every year. The methodology was transferred to CP and technicians. Some valuable results for monitoring soil carbon stocks were obtained: variability and the required number of soil samples in three major soil types in tropics. Annual changes of carbon stocks after planting will be revealed by November 2005.
1-b Measurement and analysis of carbon content in existing plantations						JE<Silviculture> > Kato			A	
1) Java						-do-				Existing plantations with different tree species and ages have been selected as survey sites for estimation biomass. <i>Acacia mangium</i> in Maribaya, <i>Shorea leprosula</i> in Leuwiliang, <i>Pinus merkusii</i> in G. Blundar/Cianjen, <i>Tectona grandis</i> in Madiun. The measurement have been carried out in a plot of Maribaya site every year.

Progress : A=already completed, B1=on schedule/expected to be completed by end of the Project, B2=behind the schedule but expected to be completed, C=not expected to be completed, D=not able to start

Annex 2: Modified PO with Activity Chart - (2/9)

Activities	Expected results/indicators	Schedule (Japanese FY)					Person in charge	Other Major Inputs		Prog. res.	Remarks
		2001	2002	2003	2004	2005		Indonesian side	Japanese side		
1)-a Biomass	a) Carbon stocks in tree biomass and its changes are measured. b) Data regarding parameters and equations for estimating biomass are obtained.	←	←	←	←	←	-do-	<ul style="list-style-type: none"> CP < Silviculture > Facilities Field 	<ul style="list-style-type: none"> SE < Biomass survey method, Biomass measurement > Equipments: NC analyzer, Oven etc. CP training Local consultant 	A	To clarify carbon stocks and its annual changes in newly established plantations, field measurements were transferred to CP and technicians. Parameters for predicting biomass were collected based on GPG. Allometric equations were derived for biomass estimates at specific sites.
1)-b Soil and litter	a) Carbon stocks in soil and litter, and its changes are measured. b) Field methodology are developed.	←	←	←	←	←	-do-	<ul style="list-style-type: none"> GP < Silviculture > Facilities Field 	<ul style="list-style-type: none"> SE < Forest soil, Forest soil data analysis > Equipments: NC analyzer, Oven etc. CP training Local consultant 	A	Soil/litter samplings have been carried out in existing plantations every year. The methodology was transferred to CP and technicians. Some valuable results for monitoring soil carbon stocks were obtained: variability and the required number of soil samples in three major soil types in tropics. Annual changes of carbon stocks after planting will be revealed by November 2005.
2) Sumatra							-do-				Existing plantations with different ages has been selected as a survey site in South Sumatra.
2)-a Biomass	a) Carbon stocks in tree biomass are measured. b) Data regarding parameters and equations for estimating biomass are obtained.	←	←	←	←	←	-do-	<ul style="list-style-type: none"> CP < Silviculture > Facilities Field 	<ul style="list-style-type: none"> SE < Biomass survey method, Biomass measurement > Equipments: NC analyzer, Oven etc. CP training 	A	Parameters for predicting biomass were collected based on GPG. Allometric equations were derived for biomass estimates for specific sites.
2)-b Soil and litter	Carbon stocks in soil and litter are measured.	←	←	←	←	←	-do-	<ul style="list-style-type: none"> CP < Silviculture > Facilities Field 	<ul style="list-style-type: none"> CP training Local consultant 	A	Data concerning soil carbon stocks and litter were collected.
1-c Measurement and analysis of carbon content in controlled plots (i.e. baseline)							JE < Silviculture > > Kato			A	
1) Java							-do-				Secondary forests have been selected as survey sites in Maribaya, Ngasuh and Cianjen.
a Biomass	a) Carbon stocks in tree biomass and its changes are measured. b) Data regarding parameters and equations for estimating biomass are obtained.	←	←	←	←	←	-do-	<ul style="list-style-type: none"> CP < Silviculture > Facilities Field 	<ul style="list-style-type: none"> SE < Biomass survey method, Biomass measurement > Equipments: NC analyzer, Oven etc. CP training 	A	To clarify carbon stocks and its annual changes in baseline vegetations, field measurements have been carried out every year. The methodology was transferred to CP and technicians. Parameters for predicting biomass were collected based on GPG. Allometric equations were derived for biomass estimates at specific sites.

Annex 2: Modified PO with Activity Chart - (3/9)

Activities	Expected results/indicators	Schedule (Japanese FY)					Person in charge	Other Major Inputs		Remarks
		2001	2002	2003	2004	2005		Indonesian site	Japanese site	
									Prog ress	
b) Soil and litter	a) Carbon stocks in soil and litter are measured. b) Field methodology are developed.	←	↔	↔	↔	↔	-do-	<ul style="list-style-type: none"> SE < Forest soil, Forest soil data analysis > Equipments: NC analyzer, Oven etc. CP training 	Soil/litter samplings have been carried out in secondary forests every year. The methodology was transferred to CP and technicians. Some valuable results for monitoring soil carbon stocks were obtained: variability and the required number of soil samples in three major soil types in tropics. Annual changes of carbon stocks after planting will be revealed by November 2005.	
								A		
2)	Sumatra						-do-		Secondary forests, agro-forests and jungle rubber forests have been selected as survey sites in South Sumatra, Jambi and Lampung.	
a) Biomass	a) Carbon stocks in tree biomass are measured. b) Data regarding parameters and equations for estimating biomass are obtained.	↔	↔	↔	↔	↔	-do-	<ul style="list-style-type: none"> SE < Biomass survey methods, Biomass measurement methods, Biomass measurement > CP training Local consultant 	Carbon stocks of above- and below-ground biomass were summarized for different land-use types. Parameters for predicting biomass were collected based on GPG. Allometric equations were derived for biomass estimates for specific sites.	
								A		
b) Soil and litter	a) Carbon stocks in soil and litter are measured.	↔	↔	↔	↔	↔	-do-	<ul style="list-style-type: none"> CP training Local consultant 	Carbon stocks of soil and litter were summarized for different land-use types.	
								A		
3)	Kalimantan						-do-		Secondary forests and peat swamp forests have been selected as survey sites in West and Central Kalimantan.	
a) Biomass	a) Carbon stocks in tree biomass are measured. b) Data regarding parameters and equations for estimating biomass are obtained.	↔	↔	↔	↔	↔	-do-	<ul style="list-style-type: none"> CP training Local consultant 	Carbon stocks of above- and below-ground biomass were summarized for different land-use types. Parameters for predicting biomass were collected based on GPG. Allometric equations were derived for biomass estimates for specific sites.	
								A		
b) Soil and litter	a) Carbon stocks in soil and litter are measured.	↔	↔	↔	↔	↔	-do-	<ul style="list-style-type: none"> CP training Local consultant 	Carbon stocks of soil and litter were summarized for different land-use types.	
								A		
1-d	Preparation of database on biomass and soil using the data collected through the surveys and analyses						JE < Silviculture > > Kato	<ul style="list-style-type: none"> SE < Database technique > Equipments: Software, Networking equipments 	Structure of database was constructed in September 2005. The data obtained from the surveys and analyses have been entered and will be continued to update until the end of the Project.	

Progress: A=already completed, B1=on schedule/expected to be completed by end of the Project, B2=behind the schedule but expected to be completed, C=not expected to be completed, D=not able to start.

Annex 2: Modified PO with Activity Chart - (4/9)

Activities	Expected results/indicators	Schedule (Japanese FY)					Person in charge	Other Major Inputs		Remarks		
		2001		2002		2003		2004	2005		Indonesian side	Japanese side
		2001	2002	2001	2002							
1-e Development of methodologies to estimate carbon contents in various land-use types	Parameters and allometric equations are obtained						-do-	<ul style="list-style-type: none"> SE<Database technique, Biomass measurement method, Biomass measurement> Equipments :Software, Networking equipments 	<ul style="list-style-type: none"> SE<Database technique, Biomass measurement method, Biomass measurement> Equipments :Software, Networking equipments 	Parameters for estimating biomass based on GPG, and allometric equations were summarized for various land-use types. All relevant information not only on parameters and equations but also on sites, soil types and climates were compiled into the database.		
1-f Preparation of manuals for survey and analysis methodologies	Manuals are prepared.						JE<Silviculture > Kato	<ul style="list-style-type: none"> SE<Biomass survey method, Biomass measurement method, Biomass measurement> CP training 	<ul style="list-style-type: none"> SE<Biomass survey method, Biomass measurement method, Biomass measurement> CP training 	Two manuals have been produced: one is "Measurement of carbon storage in soil" (in Feb. 2002) and the other "Measurement of biomass in forests (in May 2002). In addition to these two, the Project has decided to prepare two manuals which ensure reliable estimation for carbon stocks in tree biomass and soils based on GPG and statistics.		
1-g Preparation of scientific and research papers	a)Scientific papers are submitted to journals b)Research papers are prepared and/or presented at the scientific meetings, etc.						JE<Silviculture > Kato	<ul style="list-style-type: none"> SE<Biomass survey method, Biomass measurement method, Biomass measurement, Forest soil, Forest soil data analysis> Equipments :Software CP training 	<ul style="list-style-type: none"> SE<Biomass survey method, Biomass measurement method, Biomass measurement, Forest soil, Forest soil data analysis> Equipments :Software CP training 	In total, six scientific papers are planned in the fields of Biomass and Soil, of which three papers have been submitted to the journals and one paper accepted by the Journal of Forest Planning. It is expected that three more papers will be prepared and submitted to journals by the end of the Project.		
<2>New technology for charcoal application in plantation to maintain and enhance carbon fixation potentials is adopted												
2-a Measurement of effects of charcoal input into newly established plantations							JE<Forest Management> Nakama					
1) West Java							-do-					
1)-a Establishment of experimental plots	Experimental plots are established.						-do-	<ul style="list-style-type: none"> SE<Charcoal application technique> Equipments: Equipments for establishing plantations CP training 	<ul style="list-style-type: none"> SE<Charcoal application technique> Equipments: Equipments for establishing plantations CP training 	Three experimental plots were established at the newly established plantation sites in West Java by the end of FY 2001. One for <i>Acacia mangium</i> in Matibaya, one for <i>Shorea leprosula</i> in Ngasuh, and the other one for <i>Pinus merkusii</i> in Cianjen.		
1)-b Measurement of effects of charcoal input	Effects of charcoal input are measured.						-do-	<ul style="list-style-type: none"> SE<Charcoal application technique, Charcoal production and application technique> Equipments CP training 	<ul style="list-style-type: none"> SE<Charcoal application technique, Charcoal production and application technique> Equipments CP training 	Charcoal application effects were measured on growth of the planted trees and the soil components during March 2002-February 2005 at the 3 experimental plots in West Java.		

Progress : A=already completed, B1=on schedule/expected to be completed by end of the Project, B2=behind the schedule but expected to be completed, C=not expected to be completed D=not able to start

Annex 2: Modified PO with Activity Chart - (5/9)

Activities	Expected results/indicators	Schedule (Japanese FY)					Person in charge	Other Major Inputs		Prog. res.	Remarks
		2001	2002	2003	2004	2005		Indonesian side	Japanese side		
1)-c Data analysis and development of techniques for charcoal applied plantation	Data of techniques for charcoal applied plantation are analyzed and developed.		←		→		-do.-	<ul style="list-style-type: none"> CP <Forest management> Facilities Field 	<ul style="list-style-type: none"> SE <Charcoal application technique, Charcoal production and application technique> Equipments CP training 	B1	It was observed that growth of the <i>Acacia mangium</i> of 26 months was improved significantly by 10% charcoal application. Technique of charcoal application was developed.
2)	Kalimantan						-do.-				
2)-a Establishment of experimental plots	Experimental plots are established.		↔				-do.-	<ul style="list-style-type: none"> CP <Forest management> Facilities Field 	<ul style="list-style-type: none"> SE <Charcoal application technique> Equipments CP training Local consultant 	A	One experimental plot at the newly established plantation site of <i>Shorea leprosula</i> and <i>Shorea macrophylla</i> was established in West Kalimantan in November 2002.
2)-b Measurement of effects of charcoal input	Effects of charcoal input are measured.		●	●	●		-do.-	<ul style="list-style-type: none"> CP <Forest management> Facilities Field 	<ul style="list-style-type: none"> SE <Charcoal application technique, Charcoal production and application technique> Equipments CP training Local consultants 	A	Charcoal application effects were measured on growth of the planted trees and the soil components between December 2002-January 2005 at the experimental plot in West Kalimantan.
2)-c Data analysis and development of techniques for charcoal applied plantation	Data of techniques for charcoal applied plantation are analyzed and developed.		←		→		-do.-	<ul style="list-style-type: none"> CP <Forest management> Facilities Field 	<ul style="list-style-type: none"> SE <Charcoal application technique, Charcoal production and application technique> Equipments CP training 	B1	It was observed that growth of the <i>Shorea macrophylla</i> of 25 months was improved by charcoal application but not significantly.
2-b Experiment on effects of charcoal input into pot seedling							-do.-			A	
1)	Design of experiment and measurement on effects of charcoal input into pot seedling		↔	↔	↔		-do.-	<ul style="list-style-type: none"> CP <Forest management> Facilities Nursery 	<ul style="list-style-type: none"> SE <Charcoal application technique, Charcoal production and application technique> Equipments, Oven CP training 	A	In total, four experiments were designed and carried out at the nursery in Bogor. Charcoal application effects were measured on growth and the soil components of the pot seedlings. Tree species are <i>Acacia mangium</i> , <i>Shorea leprosula</i> , <i>Pinus merkusii</i> and <i>Michelia montana</i>
2)	Data analysis and development of techniques for charcoal input into pot seedling		←		→		-do.-	<ul style="list-style-type: none"> CP <Forest management> Facilities Nursery 	<ul style="list-style-type: none"> SE <Charcoal application technique, Charcoal production and application technique> Equipments, Oven CP training 	A	It was observed that growth of the <i>Acacia mangium</i> seedling of 6 months was improved significantly by 10% charcoal application. Technique of charcoal application was developed.
2-c Preparation of scientific and research papers	Research papers are prepared and/or presented at scientific meetings, etc.		←		→		-do.-	<ul style="list-style-type: none"> CP <Forest management> Facilities 	<ul style="list-style-type: none"> SE <Charcoal application technique, Charcoal production and application technique> Equipments CP training 	B1	<ul style="list-style-type: none"> It is expected that one scientific paper will be prepared and submitted to journal by the end of the Project in the field of charcoal application. So far, 6 research papers were presented at the scientific meetings, seminars and workshops. It is expected that 3 more presentations will be made by the end of the Project.

Annex 2: Modified PO with Activity Chart - (6/9)

Activities	Expected results/indicators	Schedule (Japanese FY)					Person in charge	Other Major Inputs		Progress	Remarks
		2001	2002	2003	2004	2005		Indonesian side	Japanese side		
<p><S> More effective technology for charcoal production developed</p>											
3-a	Development of cost effective technology for charcoal production						J/E: <Forest Management> Nakama			A	
1)	Experiments on types of kiln		↕				-do.-	<ul style="list-style-type: none"> •CP <Charcoal production> •Facilities •Field 	<ul style="list-style-type: none"> •SE <Charcoal production and application technique> •Equipments •CP training 	A	Four kinds of techniques (i.e. 6 types of kilns) were experimented. That are Nonpermanent kiln (Earth pit kiln, Modified earth pit kiln and Sawdust mound kiln), Movable kiln (Drum kiln), Permanent kiln and Flat kiln for sawdust.
2)	Data collection and analysis for development of cost-effective technology		↕				-do.-	<ul style="list-style-type: none"> •CP <Charcoal production> •Facilities •Field 	<ul style="list-style-type: none"> •SE <Charcoal production and application technique> •Equipments: Desticator, Charcoal hardness meter, Tensiometer etc. •CP training 	A	Data on the productivity and efficiency of the kilns were collected and analyzed. Most cost-effective kiln was the earth pit kiln. The technologies were developed.
3-b	Quantification of charcoal production upon land preparation						-do.-			A	
1)	Data collection and analysis on amount of the produced charcoal with the remaining wood materials in the process of land preparation		↕				-do.-	<ul style="list-style-type: none"> •CP <Charcoal production> •Facilities •Field 	<ul style="list-style-type: none"> •SE <Charcoal production and application technique> •Equipments: •CP training 	A	Data on amount of the produced charcoal with the remaining wood materials in the process of land preparation were collected and analyzed. Around 16%-32% of carbon of remaining wood materials were sequestered in charcoal.
3-c	Preparation of research papers						-do.-	<ul style="list-style-type: none"> •CP <Charcoal production> •Facilities 	<ul style="list-style-type: none"> •SE <Charcoal production and application technique> •Equipments •CP training 	B1	So far, 4 research papers have been presented at the scientific meetings, seminars and workshops. In addition, one more research paper will be submitted to the International Symposium (IAWPS2005) in November 2005.

Progress : A=ready completed, B1=on schedule/expected to be completed by end of the Project, B2=behind the schedule but expected to be completed, C=not expected to be completed D=not able to start

Annex 2: Modified PO with Activity Chart - (7/9)

Activities	Expected results/indicators	Schedule (Japanese FY)					Person in charge	Other Major Inputs		Remarks
		2001	2002	2003	2004	2005		Indonesian side	Japanese side	
4-a	Study and data collection on CDM related plantations Studies on CDM related plantations are carried out and the data are collected.						J/E <Forest Management> Nakama	<ul style="list-style-type: none"> CP <Forest management> Facilities Field 	<ul style="list-style-type: none"> SE <Financial analysis, Forest management analysis, Clean Development Mechanism in forest sector, CDM plantation and community, CDM related cost and validation analysis> CP training Local consultants 	As many as 8 surveys have been carried out on cost and revenue of the tree plantation activities for AR-CDM projects. That are Industrial tree plantation (1), Environmental tree plantation (1), Participatory tree plantation management by State Forest cooperation (1), Agro-forestry by small stakeholders (2), socio-economic survey (2) and silvicultural techniques & plantation promoting policies (1).
4-b	Development of CDM plantation models are developed.					-do-	<ul style="list-style-type: none"> CP <Forest management> Facilities Field 	<ul style="list-style-type: none"> SE <Financial analysis, Forest management analysis, Clean Development Mechanism in forest sector, CDM plantation and community, CDM related cost and validation analysis> Equipments: Computer etc. CP training 	Four tree plantation models for AR-CDM in Indonesia have been developed based on the studies (4-b). That are Industrial tree plantation, Environmental tree plantation, Participatory tree plantation management by State Forest cooperation and Agro-forestry by small stakeholders.	
4-c	Data analysis and estimation on cost and revenue of carbon fixing plantation Data of the above plantations are analyzed and cost and revenue of carbon fixing plantation are estimated.					-do-	<ul style="list-style-type: none"> CP <Forest management> Facilities 	<ul style="list-style-type: none"> SE <Forest management analysis, Clean Development Mechanism in forest sector, CDM plantation and community, CDM related cost and validation analysis> Equipments: Computer, GIS software etc. CP training 	The data collected in 4-b were analyzed and estimation on cost and revenue of the 4 plantation models under AR-CDM scheme are on-going. It is expected that it will be completed and contributed to the Manual by the end of October 2005 and will be presented at the workshop held on November 2005.	
4-d	Preparation of scientific and research papers a) Scientific papers are submitted to journals b) Research papers are prepared and/or presented at the scientific meetings, etc.					-do-	<ul style="list-style-type: none"> CP <Forest management> Facilities 	<ul style="list-style-type: none"> SE <Forest management analysis, Clean Development Mechanism in forest sector, CDM plantation and community, CDM related cost and validation analysis> Equipments: Computer Local consultant 	<ul style="list-style-type: none"> So far, 9 research papers have been prepared and presented at the scientific meetings, seminars and workshops on cost and revenue analysis for AR-CDM projects. It is expected that 3 more papers will be made and presented by the end of the Project. In addition, one scientific paper has been submitted to scientific journal ("Forest Policy and Economics") and will be accepted by the end of the project in the field of cost and revenue analysis, which would contribute to AR-CDM projects 	
4-e	Preparation of a manual for cost-revenue analysis of the tree plantation modis Organization of the data obtained from the surveys and analyses are on-going. It is expected that it will be completed and contributed to the Manual by the end of October 2005 and will be presented at the workshop held on November 2005.					-do-	<ul style="list-style-type: none"> CP <Forest management> Facilities 	<ul style="list-style-type: none"> SE <Forest management analysis, Clean Development Mechanism in forest sector, CDM plantation and community, CDM related cost and validation analysis> Equipments CP training 	Organization of the data obtained from the surveys and analyses are on-going. It is expected that it will be completed and contributed to the Manual by the end of October 2005 and will be presented at the workshop held on November 2005.	

Progress: A=already completed, B1=on schedule/expected to be completed but expected to be completed, B2=behind the schedule but expected to be completed, C=not expected to be completed, D=not able to start

Annex 2: Modified PO with Activity Chart - (8/9)

Activities	Expected results/Indicators	Schedule (Japanese FY)					Person in charge	Other Major Inputs		Prog. res.	Remarks
		2001	2002	2003	2004	2005		Indonesian side	Japanese side		
4-f Preparation of a tool package for the cost and revenue analysis for the potential CDM participants	A tool package prepared				↔	↔	-do-	-do-	B1	Preparation of a tool package for the cost and revenue analysis of CDM plantations (for personal computers on MS-Excel basis) is ongoing. It is expected that it will be completed and will be uploaded on the web-site prepared under Output 5.	
<5-Data and information necessary for potential CDM participants made available>											
5-a Development of a manual for carbon fixing forest management					↔	↔	J/E <Chief Advisor> Ando	•CP <Coordinator> •Facilities	B1	•SE <Clean Development Mechanism in forest sector> •Equipments: Computer etc.	
1) Development of the structure of the manual	The structure developed.				↔	↔	-do-	•CP <Coordinator> •Facilities	A	The structure of the manual ("Manual for the Implementation of AR-CDM project activities in Indonesia") was determined by August 2004.	
2) Writing of the manual, utilizing the data and information collected through the Project activities.	The manual written in English by October 2005				↔	↔	J/E <Chief Advisor>	•CP <Coordinator> •Facilities	B1	•SE <Clean Development Mechanism in forest sector> •Equipments: Computer etc.	
3) Publish the manual both offline and on the web	a) At least 100 copies of the manual in English printed and distributed by November 2005. b) The manual uploaded on the Project website (5-b) by December 2005.				↔	↔	-do-	•CP <Coordinator> •Facilities	B1	•SE <Clean Development Mechanism in forest sector> •Equipments: Computer etc.	
5-b Preparation of a web-site on AR-CDM in Indonesia	A web-site opened and maintained.				↔	↔	-do-	•CP <Coordinator> •Facilities	B1	•SE <Database technology> •Equipments: Computer etc.	
5-c Collection of relevant literatures for a library of FORDA	Indonesian and English literatures collected				↔	↔	-do-	•CP <Coordinator> •Facilities	B1	•SE <Database technology> •Equipments: Computer etc.	

Progress : A=already completed, B1=on schedule/expected to be completed by end of the Project, B2=behind the schedule but expected to be completed, C=not expected to be completed, D=not able to start

Annex 2: Modified PO with Activity Chart - (9/9)

Activities	Expected results/indicators	Schedule (Japanese FY)				Person in charge	Other Major Inputs		Prog ress	Remarks
		2001	2002	2003	2004		2005	Indonesian side		
5-d) Organization of technical seminars and workshops	Technical seminars and workshops organized.						<ul style="list-style-type: none"> • CP < Coordination > • Facilities 	<ul style="list-style-type: none"> • Equipments: Computer etc. 	B1	<p>Since the Japanese fiscal year 2002, sixteen short-term experts have conducted technical seminars during their assignment periods, which were attended by 20-30 people, but also other researchers of J/E, C/P and local staff including not only the Project staff (J/E, C/P and local staff) but also other researchers of FORDA, MOF headquarters, Bogor Agriculture Institute (IPB), etc. and researchers of foreign and international institutes.</p> <p>Two workshops have been organized so far: one in December 2002 and the other in January 2005. The third and the final workshop is planned to be organized in November 2005</p>

Annex 3: Accomplishment Grid

PDM code	Indicators as per PDME	Source/ Method	Results (as of 15 September, 2005)
<p><u>Overall Goal</u> Carbon sequestration and mitigation of global warming are enhanced through establishment and management of tree plantations.</p>	<p>Tree plantations for carbon sequestration and mitigation of global warming, established and managed based on the techniques and methodologies developed by the Project, increased in Indonesia.</p>		
<p><u>Project Purpose</u> Appropriate New techniques and methodologies to carbon fixing forest management, which will promote and enhance foreign and domestic investment for tree plantations, are established.</p>	<p>Techniques and methodologies provided in a readily available manner for potential CDM participants, and able to be judged useful for (or likely to be used by) them, in view of the following items: (1) Setting of project boundary; (2) Determination of baseline scenario; (3) Demonstration and assessment of additionality (including financial analysis & barriers check); (4) Feasibility analysis (in "Tool for Demonstration and Assessment of Additionality" of UNFCCC); (5) Design of Monitoring Plan on Carbon Stock Change (including carbon stock estimation); (6) Leakage Estimation and design of its monitoring plan; (7) Selection of carbon pools for carbon accounting; (8) Policy & Regulations on forestry investments in Indonesia; (9) Procedure and criteria of National Designated Authority (DNA) to certify contribution of the AR-CDM projects to the Sustainable Development of Indonesia; (10) Policy and regulations on assessment of Socio-Economic Impacts of AR projects in Indonesia; (11) Policy and regulations and assessment of Environmental Impacts of AR projects in Indonesia; (12) Possible risk of AR projects and its Management; (13) Formulation of Project Design Document (PDD); (14) Validation of PDD by Designated Operational Entity (DOE); and (15) Verification of Net Anthropogenic Greenhouse Gas Removals.</p>	<p>Interview with Japanese experts (J/E) and Counterpart personnel (C/P), review of the technical reports, project reports,</p>	<p>Techniques and methodologies under development by the Project are as follows:</p> <ul style="list-style-type: none"> (a) Database of the parameters for carbon estimation and monitoring; (b) Parameters for carbon estimation and monitoring; (c) Manuals for surveys and analyses on biomass and soils; (d) A manual for cost and revenue analysis of the plantation models; (e) A tool package for the cost and revenue analysis; (f) An overall manual for AR-CDM project; (g) Web site on AR-CDM project; and (h) Collection of related literature. <p>These techniques and methodologies for AR-CDM are 1) provided in a readily available manner for potential CDM participants, and 2) able to be judged useful for (and likely used by) them, in view of at least one of the items listed in :</p> <p>The methodologies to estimate carbon fixation benefits of plantation forests are developed and materialised in the framework design of the database of the parameters for carbon estimation and monitoring. The Project assumes that users of the database are familiar with default parameters in LULUCF-GPG of IPCC and visit the database for exploring more localised and/or specific parameters and data for their projects. This concept of the database is recognized by the Project and is reflected to the design of the database.</p> <p>The parameters are essential information for potential CDM participants in the process of formulating AR-CDM projects, in particular for carbon estimation and monitoring that are fundamental component for items (1) to (8) and (15) listed above. The methodologies are also explained in the manuals for surveys and analyses on biomass and soils.</p> <p>The manual for cost and revenue analysis of the plantation models is almost completed and its essence is concentrated in a down-loadable tool package (for personal computers on MS-Excel basis) that is easily and flexibly used for analyzing the additionality of the AR-CDM project. The manual together with the program package compliment methodologies for carbon estimation and monitoring, in particular item (4) in the Indicator.</p> <p>The overall manual for AR-CDM is designed to be useful for items (8) to (14) listed in the Indicator and consolidates the methodologies for carbon estimation and monitoring ((1)-(7), (15)) as well. The web site ensures open access to the information accumulated by the Project, including the overall manual. The collection of the related literature utilized by the Project is invaluable resource for further in-depth study and will be secured in the FORDA library.</p>

Annex 3: Accomplishment Grid

Output 1	1.1 Research papers on biomass and soil carbon stocks prepared and/or presented at scientific meetings, workshops, etc.	-do-	<Relations among indicators of Output 1.> Indicator 1.1 (Research Papers) serves as supporting material for Indicator 1.2 (Parameters for carbon estimation) that is a primary output of the Output 1. Indicator 1.3 (Manuals for survey and analysis methodologies on biomass and soils) works as supporting material to ensure transparency and credibility of Indicator 1.2. Indicator 1.4 (Scientific Papers that are accepted by scientific journals) is an evidence of credibility for 1.2. Indicator 1.5 (Database on biomass), though its construction is in progress, is a medium to distribute Output 1.2. Indicator 1.5 Database is designed to be consolidated to the Indicator 5.2 (Project's Web Site) and to ensure open access.																																									
<p>Methodologies to estimate carbon fixation benefits of plantation forests are developed.</p>	<p>1.2 Parameters for carbon estimation including BEF (Biomass E Factors), R(Root to Shoot,) D (Basic Wood Density), allometric equation, etc. obtained.</p>		<p>1.1 Soil carbon stocks of the target three species (<i>Acacia mangium</i>, <i>Pinus merkusii</i>, and <i>Shorea leprosula</i>) have been continuously measured at existing and newly established plantation sites as well as secondary forests in West Java. Other vegetation types in other regions were also surveyed. As many as 14 research papers on biomass and soil carbon stocks have been prepared as technical reports and proceedings of the scientific meetings, seminars and workshops. Comparisons of biomass estimation techniques were presented on research papers. Biomass changes resulting from different land-use histories were clearly revealed in Central Kalimantan, West Kalimantan, and Jambi.</p>																																									
	<p>1.3 Manuals for survey and analysis methodologies for the potential CDM participants prepared</p>		<p>Table a: Number of research papers on carbon stocks in biomass and soil prepared and presented</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Topic</th> <th colspan="2">No. of papers prepared and presented</th> </tr> <tr> <th>As of Sep. 2005</th> <th>By the Project end*</th> </tr> </thead> <tbody> <tr> <td>1 Biomass</td> <td>10</td> <td>0</td> </tr> <tr> <td>2 Soil</td> <td>4</td> <td>0</td> </tr> <tr> <td>3 General Info.</td> <td>0</td> <td>1</td> </tr> </tbody> </table> <p>(For details, please see Appendix A)</p>	Topic	No. of papers prepared and presented		As of Sep. 2005	By the Project end*	1 Biomass	10	0	2 Soil	4	0	3 General Info.	0	1																											
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	1 Biomass	10	0																																									
2 Soil	4	0																																										
3 General Info.	0	1																																										
<p>1.4 Scientific papers on biomass and soil carbon stocks accepted by the relevant societies.</p>		<p>1.2: Through analyses of the collected data, parameters for carbon estimation (Merchantable Volume (V), BEF2, R, and D), by which users can predict carbon stocks based on GPG (Good Practice Guidance) (IPCC, 2003), have been obtained. The number of sampling trees for parameters was more than 1700. In addition, four allometric equations for <i>A. mangium</i>, <i>P. merkusii</i>, <i>S. leprosula</i>, and <i>Tectona grandis</i> were derived to estimate biomass.</p>																																										
<p>1.5 Database on biomass and soil for the potential CDM participants prepared</p>		<p>1.3: A manual for biomass survey methodology as well as a manual for soil survey methodology has been prepared already. Preparation of manuals for analysis methodology is ongoing and is expected to be completed by November 2005. (These manuals will be attached to the overall manual prepared under Output 5).</p>																																										
			<p>1.4 As many as 6 scientific papers are planned in the fields of biomass and soil carbon stocks, of which three papers have been submitted to the journals and one accepted by the Journal of Forest Planning. Three more papers will be prepared and submitted to journals by the end of the Project.</p>																																									
			<p>Table b. Number of scientific papers in the field of biomass carbon stocks</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Topic</th> <th colspan="2">No. of papers prepared</th> <th colspan="2">No. of papers submitted</th> <th colspan="2">No. of papers accepted</th> </tr> <tr> <th>As of Sep. 2005</th> <th>By the Project end*</th> <th>As of Sep. 2005</th> <th>By the Project end*</th> <th>As of Sep. 2005</th> <th>By the Project end*</th> </tr> </thead> <tbody> <tr> <td>1 <i>Acacia mangium</i> (West Java)</td> <td>1</td> <td>0</td> <td>1</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>2 <i>Pinus merkusii</i> (West Java)</td> <td>1</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>NA</td> </tr> <tr> <td>3 <i>Tectona grandis</i> (East Java)</td> <td>0</td> <td>(1)</td> <td>0</td> <td>(1)</td> <td>0</td> <td>NA</td> </tr> <tr> <td>4 <i>Acacia mangium</i> (South Sumatra)</td> <td>1</td> <td>0</td> <td>0</td> <td>(1)</td> <td>0</td> <td>NA</td> </tr> </tbody> </table> <p>* ()=expected number</p>	Topic	No. of papers prepared		No. of papers submitted		No. of papers accepted		As of Sep. 2005	By the Project end*	As of Sep. 2005	By the Project end*	As of Sep. 2005	By the Project end*	1 <i>Acacia mangium</i> (West Java)	1	0	1	0	1	0	2 <i>Pinus merkusii</i> (West Java)	1	0	1	0	0	NA	3 <i>Tectona grandis</i> (East Java)	0	(1)	0	(1)	0	NA	4 <i>Acacia mangium</i> (South Sumatra)	1	0	0	(1)	0	NA
Topic	No. of papers prepared		No. of papers submitted		No. of papers accepted																																							
	As of Sep. 2005	By the Project end*	As of Sep. 2005	By the Project end*	As of Sep. 2005	By the Project end*																																						
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3 <i>Tectona grandis</i> (East Java)	0	(1)	0	(1)	0	NA																																						
4 <i>Acacia mangium</i> (South Sumatra)	1	0	0	(1)	0	NA																																						

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			<p>Table c.: Number of scientific papers in the field of soil carbon stocks</p> <table border="1"> <thead> <tr> <th rowspan="2"></th> <th rowspan="2">Topic</th> <th colspan="2">No. of papers prepared</th> <th colspan="2">No. of papers submitted</th> <th colspan="2">No. of papers accepted</th> </tr> <tr> <th>As of Sep. 2005</th> <th>By the Project end*</th> <th>As of Sep. 2005</th> <th>By the Project end*</th> <th>As of Sep. 2005</th> <th>By the Project end*</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Carbon stocks and its variation</td> <td>1</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>NA</td> </tr> <tr> <td>2</td> <td>Changes of soil carbon stocks</td> <td>0</td> <td>(1)</td> <td>0</td> <td>(1)</td> <td>0</td> <td>NA</td> </tr> </tbody> </table> <p>* ()=expected number</p> <p>(For details, please see Appendix A)</p> <p>1.5: Framework of the database was constricted in September 2005 in order to provide parameters for GPG and allometric equations to the potential CDM participants for accurate estimation of biomass and carbon stocks. The number of records of parameters and allometric equations entered is shown in Table d.</p> <p>Table d: Number of records of prepared</p> <table border="1"> <thead> <tr> <th>Outputs</th> <th>Target</th> <th>No. of records</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Parameter for GPG</td> <td>Individual tree level</td> <td>1700 +</td> </tr> <tr> <td>Stand level</td> <td>17 (~46)</td> </tr> <tr> <td rowspan="2">Allometric equations</td> <td>Planted species</td> <td>4</td> </tr> <tr> <td>Other tree species</td> <td>16 +</td> </tr> </tbody> </table> <p>In addition, preparation of information on carbon stocks of five carbon pools (i.e. above ground biomass, below ground biomass, litter, deadwood, and soil) in forest stands with different measurements, species, and land-use is ongoing. It is expected to be completed by the end of the Project.</p>		Topic	No. of papers prepared		No. of papers submitted		No. of papers accepted		As of Sep. 2005	By the Project end*	As of Sep. 2005	By the Project end*	As of Sep. 2005	By the Project end*	1	Carbon stocks and its variation	1	0	1	0	0	NA	2	Changes of soil carbon stocks	0	(1)	0	(1)	0	NA	Outputs	Target	No. of records	Parameter for GPG	Individual tree level	1700 +	Stand level	17 (~46)	Allometric equations	Planted species	4	Other tree species	16 +
	Topic	No. of papers prepared				No. of papers submitted		No. of papers accepted																																						
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<p><u>Output 2.</u> New technology for charcoal-applied plantations to maintain and enhance carbon fixation potential is developed.</p>	<p>2.1 Research papers on charcoal application technique prepared and/or presented at scientific meetings, workshops, etc</p>	<p>Interview with J/E and C/P, review of the technical reports, project reports,</p>	<p>2.1 Experiments of charcoal application on the growth of the planted trees and the soil components at newly established plantation sites (West Java: 3 sites and West Kalimantan: 1 site) have been carried out four times. It was observed that growth of <i>A. mangium</i> of 26 months was improved significantly by 10 % charcoal application in West Java. The growth of <i>S. macrophylla</i> of 25 months was improved in West Kalimantan. In addition, experiments of charcoal application on the growth of the tree pot seedlings and the soil components were carried out four times at the nursery of FORDA in Bogor. It was observed that growth of <i>A. mangium</i> seedling of 6 months was improved significantly by 10 % charcoal application.</p> <p>Based on the analyses of the experiments, 6 research papers have been released as technical reports and proceedings of the scientific meetings, seminars and workshops. It is expected that 3 more papers will be prepared by the end of the Project. In addition, 6 presentations have been carried out at the scientific meetings, seminars and workshops. It is expected that 3 more presentations will be carried out by the end of the Project.</p> <p>Table e: Number of research papers on charcoal application prepared and presented</p> <table border="1"> <thead> <tr> <th rowspan="2"></th> <th rowspan="2">Topic</th> <th colspan="2">No. of papers prepared and presented</th> </tr> <tr> <th>As of Sep. 2005</th> <th>By the Project end*</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Newly established tree plantations</td> <td>4</td> <td>(2)</td> </tr> <tr> <td>2</td> <td>Tree pot seedlings in nursery</td> <td>2</td> <td>(1)</td> </tr> </tbody> </table> <p>* ()=expected number</p> <p>(For details, please see Appendix A)</p> <p>2.2: One scientific paper is being prepared based on the analysis of the experiments in the tree pot seedlings. It is planned to be submitted to journal by the end of the Project (For details, please see Appendix A)</p>		Topic	No. of papers prepared and presented		As of Sep. 2005	By the Project end*	1	Newly established tree plantations	4	(2)	2	Tree pot seedlings in nursery	2	(1)																													
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<p><u>Output 3.</u> More effective technology for charcoal production is</p>	<p>3.1 Research papers on charcoal production</p>		<p>3.1: Experiments on charcoal production were carried out at newly established plantation sites in West Java (3 sites) and West Kalimantan (1 site). A survey on locally developed techniques was carried out in seven regions of Indonesia (East Java, Central Java, Yogyakarta, South Sumatra, East</p>																																											

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developed.	prepared and/or presented at scientific meetings, workshops, etc		<p>Kalimantan, West Kalimantan, and East Nusa Tenggara), which was entrusted to Daun Dan Akar. As many as 4 kinds of techniques for charcoal production (i.e. 6 types of kilns) were developed and compared in the terms of productivity and efficiency. Earth pit kiln was found most effective. Dram kiln was also found effective for quality of charcoal.</p> <p>So far, 4 research paper have been released as technical reports and proceedings of the scientific meetings, seminars and workshops. Based on the research papers, six presentations have been made at the scientific meetings, seminars and workshops, so far. It is expected that two more papers will be prepared & presented by the end of the Project.</p> <p>Table f: Number of research papers on charcoal production prepared and presented</p> <table border="1"> <thead> <tr> <th rowspan="2">Topic</th> <th colspan="2">No. of papers prepared and presented</th> </tr> <tr> <th>As of Sep. 2005</th> <th>By the Project end*</th> </tr> </thead> <tbody> <tr> <td>1 Charcoal production techniques</td> <td>4</td> <td>(2)</td> </tr> </tbody> </table> <p>* ()=expected number (For details, please see Appendix A)</p>	Topic	No. of papers prepared and presented		As of Sep. 2005	By the Project end*	1 Charcoal production techniques	4	(2)						
Topic	No. of papers prepared and presented																
	As of Sep. 2005	By the Project end*															
1 Charcoal production techniques	4	(2)															
Output 4: Cost and revenue of CDM plantations are estimated	<p>4.1 Research papers on cost and revenue analysis prepared and/or presented at scientific meetings, workshops, etc.</p> <p>4.2 A manual for cost-revenue analysis of the tree plantation models prepared</p> <p>4.3 Scientific papers on cost and revenue analysis for AR-CDM projects accepted by the relevant societies</p> <p>4.4 A tool package for the cost and revenue analysis for the potential CDM participants prepared</p>	-do-	<p>4.1: As many as 8 surveys were carried out on cost and revenue of the tree plantation activities for AR-CDM projects, all of which were entrusted to IPB, UGM, etc. The data were analyzed and, so far, 9 papers have been released as technical reports and proceedings of the scientific meetings, seminars and workshops. It is planned that 3 more papers will be prepared and presented by the end of the Project.</p> <p>Table g: Number of research papers on cost and revenue of CDM plantations prepared and presented</p> <table border="1"> <thead> <tr> <th rowspan="2">Topic</th> <th colspan="2">No. of papers prepared and presented</th> </tr> <tr> <th>As of Sep. 2005</th> <th>By the Project end*</th> </tr> </thead> <tbody> <tr> <td>1 Cost revenue analysis</td> <td>2</td> <td>(1)</td> </tr> <tr> <td>2 Perspective of AR-CDM</td> <td>3</td> <td>(1)</td> </tr> <tr> <td>3 Participation of local community</td> <td>4</td> <td>(1)</td> </tr> </tbody> </table> <p>* ()=expected number (For details, please see Appendix A)</p> <p>4.2:Based on the analyses of the survey results, four tree plantation models for AR-CDM in Indonesia have been developed: (1) Industrial plantation; (2) Industrial plantation with local people involved; (3) Environmental plantation; and (4) Agroforestry by local people. A manual for cost and revenue analysis of these four models is under preparation and is expected to be completed by the end of October 2005. (This manual will be attached to the overall manual prepared under Output 5).</p> <p>4.3:One scientific paper on economic analysis of the agroforestry model has been submitted to the journal. (For details, please see Appendix A)</p> <p>4.4: Preparation of a tool package for the cost and revenue analysis of CDM plantations (for personal computers on MS-Excel basis) is ongoing. It is expected that it will be completed and will be uploaded on the web-site prepared under Output 5.</p>	Topic	No. of papers prepared and presented		As of Sep. 2005	By the Project end*	1 Cost revenue analysis	2	(1)	2 Perspective of AR-CDM	3	(1)	3 Participation of local community	4	(1)
Topic	No. of papers prepared and presented																
	As of Sep. 2005	By the Project end*															
1 Cost revenue analysis	2	(1)															
2 Perspective of AR-CDM	3	(1)															
3 Participation of local community	4	(1)															
Output 5: Date and information necessary for potential CDM participants are made available	<p>5.1 A manual for carbon-fixing plantation prepared.</p> <p>5.2 A web-site on AR-CDM in Indonesia</p>	-do-	<p>5.1:Preparation of "an overall manual for the preparation and implementation of AR-CDM project activities in Indonesia", targeting the potential AR-CDM participants in Indonesia and Japan, are ongoing (Chapter I and II almost completed). An attached manual on estimating and monitoring carbon stock, consisting of the manuals prepared/ to be prepared under Output 1 & Output 4, is also ongoing. They are written in English. It is expected that they will be completed by the end of October 2005. At least 100 copies of the Manual will be printed in color and distributed to as many as people showing the interest in AR-CDM. Power-point presentation material is also considered as a summary of manuals. The time of distribution will come on December 2005. Upload on the web-site will be in November or December 2005.</p> <p>5.2:The Project launched its homepage in February 2005 (http://www.cffmp.org), contents of which include The pages are written in</p>														

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	<p>prepared</p> <p>5.3 Related literatures for a library of FORDA collected</p> <p>5.4 Technical seminars and workshops organized</p>	<p>English, Indonesian, and Japanese. web-site has been launched</p> <p>5.3: So far, as many as 902 documents (books, articles, journals, reports, thesis, etc.) on allometry, article, biomass and soil, carbon and carbon sequestration, carbon sequestration, charcoal, charcoal application, charcoal production, computer programme, cost and revenue analysis of CDM plantations, forest fire, forest management, land use, logging, etc. have been collected.</p> <p>5.4: So far, 16 short-term experts have conducted technical seminars during their assignment periods, which were attended by 20-30 people, including not only the Project staff (J/E, C/P, and local staff) but also other researchers of FORDA, MOF headquarters, IPB, etc. and researchers of foreign and international institutes.</p> <p>Two workshops have been organized so far: one in December 2002 and the other in January 2005. The third and the final workshop is planned to be organized in November 2005.</p>
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Items	Plan as per PDMe	Sources/Methods	Results (as of 12 September, 2005)																																				
Input	<p>Japanese side</p> <p>1. Experts (1) Long-Term experts 1. Chief Advisor 2. Silviculture 3. Forest Management 4. Coordinator (2) Short-Term Experts Dispatched as needed.</p> <p>2. Training of Indonesian personnel in Japan Training opportunities for the Indonesian personnel in Japan</p> <p>3. Machinery and Equipment Vehicles, items for silviculture, experiment, investigation, and other necessary items</p> <p>4. Administrative cost</p>	<p>Review of the Project reports</p> <p>-do-</p> <p>-do-</p> <p>-do-</p>	<p>(1) Long-term experts: Since January 2001, nine experts in the field of Chief Advisor, Silviculture, Forest Management, and Coordinator have been dispatched.</p> <p>(2) Short-term experts: So far 30 experts in total have been dispatched in eleven fields. The fields and the number of the experts dispatched are as follows: (a) biomass measurement -6; (b) forest soil-1; (c) forest soil data analysis -3; (d) forest soil analysis-1; (e) charcoal production techniques -2; charcoal application techniques-2; (f) charcoal production/application techniques-3; (g) forest management analysis -5; (h) CDM plantation -2; (i) CDM plantation & community-1; (j) CDM cost and validation analysis-1; and (k) database techniques -3.</p> <p>Four more short-term experts in the fields of forest soil data analysis, database technique, forest management analysis and charcoal production/application techniques are planned to be dispatched by the end of the Project.</p> <p>Table h: Dispatch of short-term experts by the Japanese fiscal year (April-March)</p> <table border="1" data-bbox="556 1299 1074 1366"> <thead> <tr> <th>Fiscal Year</th> <th>2001</th> <th>2002</th> <th>2003</th> <th>2004</th> <th>2005</th> </tr> </thead> <tbody> <tr> <td>Persons</td> <td>4</td> <td>6</td> <td>6</td> <td>10</td> <td>4 (4)*</td> </tr> </tbody> </table> <p>(*)=plan Note: Even if one expert is dispatched twice in the same fiscal year in the same field, this is counted as two dispatches (For details, see Appendix B-1)</p> <p>in total, 11 counterparts have been trained in Japan in the following courses: CDM research (1 person); forest project group training (3 persons); charcoal production/ application techniques (1 person); CDM plantation research (4 persons); and Forest management analysis (2 persons)</p> <p>Table i: C/P training by the Japanese fiscal year (April-March)</p> <table border="1" data-bbox="556 1635 1074 1702"> <thead> <tr> <th>Fiscal Year</th> <th>2001</th> <th>2002</th> <th>2003</th> <th>2004</th> <th>2005</th> </tr> </thead> <tbody> <tr> <td>Persons</td> <td>1</td> <td>3</td> <td>3</td> <td>3</td> <td>1</td> </tr> </tbody> </table> <p>(For details, see Appendix B-2)</p> <p>in total, approximately US\$ 258,679 has been disbursed for procurement of the equipment and machinery. Major equipment include 4WD Car, Nitrogen Carbon analyzer (NC-analyzer), photocopy machine, desktop PC, printer, oven, equipment for plantation, projector, software, electric balance, consumable for NC-analyzer, color laser printer, GIS software, and so on.</p> <p>Table j: Disbursement related to the equipment and machinery by the Japanese fiscal year (April-March) Unit=US dollars</p> <table border="1" data-bbox="556 1971 1411 2049"> <thead> <tr> <th>Fiscal Year</th> <th>Jan. 2001-Mar. 2002</th> <th>Apr. 2002-Mar. 2003</th> <th>Apr. 2003-Mar. 2004</th> <th>Apr. 2004-Mar. 2005</th> <th>Mar. 2005-Jan. 2006</th> </tr> </thead> <tbody> <tr> <td>Amount</td> <td>447,420</td> <td>135,270</td> <td>49,806</td> <td>29,183</td> <td>75,700 (proposed)</td> </tr> </tbody> </table> <p>(For details, see Appendix B-3)</p> <p>Approximately Rp6,218million which is equivalent to approximately 74,505 thousand Japanese Yen, has been disbursed as running expenses.</p>	Fiscal Year	2001	2002	2003	2004	2005	Persons	4	6	6	10	4 (4)*	Fiscal Year	2001	2002	2003	2004	2005	Persons	1	3	3	3	1	Fiscal Year	Jan. 2001-Mar. 2002	Apr. 2002-Mar. 2003	Apr. 2003-Mar. 2004	Apr. 2004-Mar. 2005	Mar. 2005-Jan. 2006	Amount	447,420	135,270	49,806	29,183	75,700 (proposed)
Fiscal Year	2001	2002	2003	2004	2005																																		
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Fiscal Year	2001	2002	2003	2004	2005																																		
Persons	1	3	3	3	1																																		
Fiscal Year	Jan. 2001-Mar. 2002	Apr. 2002-Mar. 2003	Apr. 2003-Mar. 2004	Apr. 2004-Mar. 2005	Mar. 2005-Jan. 2006																																		
Amount	447,420	135,270	49,806	29,183	75,700 (proposed)																																		

Annex 3: Accomplishment Grid

			<p>Note:</p> <ol style="list-style-type: none"> Since administrative staff have not been assigned to the Project by the Indonesian side, the Japanese side have employed the following staff: (a) Secretary- 1 ; (b) Driver- 1; (c) Janitor - 1; (d) Clerk-1; (e) Guards for the experimental sites in West Java -6 ; and (f) Soil analysis workers- 6. Travel costs for the C/Ps have been borne by the Japanese side often. An access road to each experimental site in West Java are constructed and maintained by the Japanese side (Maribaya- 800 m, Ngasuh- 1200 m, Cianter- 900m). Cottages for the guards at all of the experimental sites and a watch tower in Maribaya site has been constructed by the Japanese side. <p>Table k: Disbursement of administrative cost by the Japanese fiscal year (April-March) Unit= million Rp</p> <table border="1"> <thead> <tr> <th>Fiscal Year</th> <th>Jan. 2001- Mar 2002</th> <th>Apr 2002- Mar 2003</th> <th>Apr.2003- Mar. 2004</th> <th>Apr. 2004- Mar. 2005</th> <th>Mar. 2005- Jan. 2006</th> </tr> </thead> <tbody> <tr> <td>Amount</td> <td>1,253</td> <td>879</td> <td>2,014</td> <td>1,955</td> <td>967 (proposed)</td> </tr> </tbody> </table> <p>(For details, see Appendix C-4)</p>	Fiscal Year	Jan. 2001- Mar 2002	Apr 2002- Mar 2003	Apr.2003- Mar. 2004	Apr. 2004- Mar. 2005	Mar. 2005- Jan. 2006	Amount	1,253	879	2,014	1,955	967 (proposed)																																																	
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	<p>Indonesian side</p> <p>(1) Staff allocation</p> <ol style="list-style-type: none"> Project Director Project Manager Project Coordinator Field Managers Counterpart personnel in the fields of (a) Forest Management, (b)Silviculture, (c)Charcoal Production Administrative Personnel: (a)Clerical and service employees, (b)Drivers and Labors, (c)Other necessary supporting staff, (d)Secretaries for Japanese Experts <p>(2) Land, buildings and facilities</p> <ol style="list-style-type: none"> Land for (a)Experimental Plantation, (b)Project office and related facilities, (c)Access roads Buildings and facilities:(a)Project office, (b)Spaces for machinery and equipment, (c)Storehouse for forestry materials, (d)Workshop and Garage, (e)Sheds in the plantation field, (f)Others Natural and Planted forests <p>3. Running expenses</p>	<p>Review of the Project reports</p> <p>-do-</p> <p>-do-</p>	<p>Staff for project management as well as technical C/P have been assigned as shown in Table m and l. None of the administrative staff have been assigned.</p> <p>Table l: Assignment of Staff for Project Management</p> <table border="1"> <thead> <tr> <th></th> <th>Title</th> <th>Name</th> <th>Assignment period</th> </tr> </thead> <tbody> <tr> <td rowspan="3">1</td> <td rowspan="3">Project Director</td> <td>Dr. U. Islandar</td> <td>Jan-Apr 2001</td> </tr> <tr> <td>Mr. A. Fatah</td> <td>Apr-Jun 2002</td> </tr> <tr> <td>Dr. H. Pasaribu</td> <td>Jun 2002-present</td> </tr> <tr> <td rowspan="5">2</td> <td rowspan="5">Project Manager</td> <td>Dr. Sunaryo</td> <td>Jan.2001-Jan 2003</td> </tr> <tr> <td>Mr. Suyono</td> <td>Jan - Nov 2002</td> </tr> <tr> <td>Dr. F. Mas'ud</td> <td>Nov2002- May 2004</td> </tr> <tr> <td>Dr. S. R. Gadas</td> <td>May-Jun 2005</td> </tr> <tr> <td>Mr. Anwar</td> <td>Jun 2005-present</td> </tr> <tr> <td>3</td> <td>Coordinator</td> <td>Dr. Siregar</td> <td>Jan 2001- present</td> </tr> <tr> <td>4</td> <td>Field Manager</td> <td>Mr. H. H. Siringoringo</td> <td>Jan 2001- present</td> </tr> </tbody> </table> <p>Table m: Assignment of Technical C/P</p> <table border="1"> <thead> <tr> <th></th> <th>Technical Field</th> <th>Name of the C/P assigned</th> <th>Responsible Outputs of PDM</th> <th>Assignment Period</th> </tr> </thead> <tbody> <tr> <td rowspan="3">1</td> <td rowspan="3">Forest management</td> <td>Mr. N.M. Herianto</td> <td>Output 1 (Biomass)</td> <td>Jan 2001 -present</td> </tr> <tr> <td>Mr. Haris</td> <td>Output 1 (Soil)</td> <td>Jan. 2001-present</td> </tr> <tr> <td>Dr. Taulana Sukandi</td> <td>Output 4 (Cost-revenue analysis)</td> <td>May 2004- present</td> </tr> <tr> <td rowspan="2">2</td> <td rowspan="2">Silviculture</td> <td>Mr. Ika Heriansyah</td> <td>Output 1 (Biomass and soil)</td> <td>Jan 2001-Apr. 2004</td> </tr> <tr> <td>Mr. R. Immanudin</td> <td>Output 2, 4 (Charcoal application & Cost-revenue analysis)</td> <td>Apr 2004-present</td> </tr> <tr> <td>3</td> <td>Charcoal production</td> <td>Mr. Gustan Pari</td> <td>Output 2, 3 (Charcoal application & production)</td> <td>Jan 2001 -present</td> </tr> </tbody> </table> <p>1. Land for</p> <ol style="list-style-type: none"> Experimental plantation: The land for three sites with 15 ha for each have been made available for the Project experiments by the PT. Perm Perhutani in West Java (Maribaya, Ngasuh, and Cianter). Project office and related facilities: The land has been provided in the compound of R & D Center for Forest & Nature Conservation (Gunung Batu, Bogor) , FORDA. Access roads: The land for access roads has been provided. (The roads to the sites in West Java, however, have been constructed by the Japanese side). <p>2. Buildings and facilities</p> <ol style="list-style-type: none"> Project office and related facilities: The office with three rooms (two expert rooms and one computer room), two storages and one toilet has been provided. One soil laboratory has been provided for soil processing and analyzing with NC-analyzer as well Spaces for machinery and equipment: Enough space has been provided. Storehouse for machinery and equipment: Workshop and garage: The garage for the Project cars was constructed by FORDA in 2004. The space is wide enough for two cars Sheds in the plantation field: The sheds have not been provided by the Indonesian side: Cottages for guards have been constructed by the Japanese side <p>3. Natural and planted forests have been made available for the Project.</p> <p>(The amount of disbursement was not available.)</p>		Title	Name	Assignment period	1	Project Director	Dr. U. Islandar	Jan-Apr 2001	Mr. A. Fatah	Apr-Jun 2002	Dr. H. Pasaribu	Jun 2002-present	2	Project Manager	Dr. Sunaryo	Jan.2001-Jan 2003	Mr. Suyono	Jan - Nov 2002	Dr. F. Mas'ud	Nov2002- May 2004	Dr. S. R. Gadas	May-Jun 2005	Mr. Anwar	Jun 2005-present	3	Coordinator	Dr. Siregar	Jan 2001- present	4	Field Manager	Mr. H. H. Siringoringo	Jan 2001- present		Technical Field	Name of the C/P assigned	Responsible Outputs of PDM	Assignment Period	1	Forest management	Mr. N.M. Herianto	Output 1 (Biomass)	Jan 2001 -present	Mr. Haris	Output 1 (Soil)	Jan. 2001-present	Dr. Taulana Sukandi	Output 4 (Cost-revenue analysis)	May 2004- present	2	Silviculture	Mr. Ika Heriansyah	Output 1 (Biomass and soil)	Jan 2001-Apr. 2004	Mr. R. Immanudin	Output 2, 4 (Charcoal application & Cost-revenue analysis)	Apr 2004-present	3	Charcoal production	Mr. Gustan Pari	Output 2, 3 (Charcoal application & production)	Jan 2001 -present
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Annex 4: Implementation Process

Abbreviation: C/P-Counterparts J/E-Japanese expert

Item	Source/ Methods	Evaluation
1 Progress of Activities		Overall: Most of the Activities have been implemented as planned. Although some activities delayed in implementation process, all activities are expected to be finished before the Project termination. Major issues for the Activities under each Output are highlighted in the rows below.
(1) Activities under Output 1	Review of the activity chart and progress & JCC reports, interview with C/P & J/E,	<p>(1) Activities 1-a., 1-b, 1-c: Measurement and analysis of soil carbon delayed because NC analyzer developed trouble frequently. The cause of the trouble is attributed to fluctuation of voltage. Currently, measurement and analysis of soil carbon are contracted out to a private company, which are expected to be finished by the end of the Project.</p> <p>(2) Activity 1-d: "Preparation of database on soil and biomass" was not planned in the Master Plan of the RD. This activity item was adopted by the Project in April 2004. Additionally, in March 2005, the Project decided the provision of the open access to the database taking into account advice from short-term experts and development of COP negotiations. In this connection, the data has been and will be continuously refined until the end of the Project. The database will be completed and uploaded on the Project's web-site before the end of the Project.</p>
(2) Activities under Output 2	-do-	<p>(1) In COP9 in December 2003, the modalities of AR-CDM were agreed by the Parties to the UNFCCC. In the modalities of AR-CDM, charcoal production from land preparation residue is likely regarded as net anthropogenic emission by sources of the Greenhouse Gas, even though the growth enhancement by charcoal application may offset the emission in long term.</p> <p>(2) Responding to the agreement of modalities and advice from short-term experts, JCC in April 2004 approved a plan to terminate substantial activities for charcoal application (under Output 2) within Japanese FY 2004 (up until March 2005).</p> <p>(3) The substantial activity for charcoal application was terminated by March 2005. Some sporadic measurement and data analysis are ongoing.</p>
(3) Activities under Output 3	-do-	<p>(1) Taking into account of the development of discussions up to COP8, November 2002, and advice from short-term experts, JCC in April 2003 approved a plan that terminates substantial activities for charcoal production (under Output 3) within Japanese FY 2003 (up until March 2004).</p> <p>(2) The substantial activity for charcoal production was terminated by March 2004. Some scientific and research papers have been prepared based on this study.</p>
(4) Activities under Output 4	-do-	<p>(2) The C/Ps for the second long-term expert in Forest Management specialized in Cost and Revenue Analysis, who arrived in January 2003, had not been assigned until April-May 2004. Although a C/P in other technical field assisted the expert during the absence of the C/Ps in Cost and Revenue Analysis, field surveys had to be contracted out to the local institutes and analyses were carried out by the expert alone. In this situation, the activities under the Output 4 delayed to some extent. Since the C/Ps specialized in cost and revenue analysis were assigned, the implementation of the activities has been promoted.</p>
(5) Activities under Output 5	-do-	<p>(1) Based on the discussion for data provision in JCC in April 2004, the Project newly added activities such as "preparation of a web-site on AR-CDM in Indonesia" and "collection of relevant literatures for a library of FORDA". These activities are expected to be finished by the end of the Project though they were not originally designed in the Master Plan of the R/D.</p>
2 Decision Making & Monitoring	Review of Progress reports & JCC	<p>I. Monitoring system within the Project The Project has been monitored periodically through internal quarterly meetings as well as JCC. Some of the issues are described below:</p>

Annex 4: Implementation Process

<p style="text-align: center;">Process</p>	<p>reports, interview with C/P, J/E</p>	<p>(1) A quarterly meeting was held three times, from October 2003 to July 2004, based on the decision of the 2nd JCC. In the meetings, the Project reviewed its progress and activity plan. The meetings contributed to management of the project progress. Thereafter, because of the difficulty on schedule arrangement, the Project decided to circulate the quarterly progress report instead of holding the meeting;</p> <p>(2) Steering Committee, which functioned as JCC, met in May 2001. There was no meeting in 2002. Since April 2003, JCC has met every year. JCC has played a primary role in the project monitoring;</p> <p>(3) As for Output 2 and 3, the Project finished the substantial part of the activities earlier than planned, because satisfactory results were obtained and influence of agreed modalities of CDM was considered: and</p> <p>(4) Preparation of database was added as a new Activity item under Output 1 in March 2004, taking account of the discussions with a short-term expert and development of the negotiations of COP.</p> <p><u>II. Monitoring by JICA</u></p> <p>(1) In 2002, responding to the request from the Project, JICA formulated an advisory committee to support the Project from the view point of technical aspects;</p> <p>(2) The Project started as a demonstration study under the scheme of "development investment and financing" in January 2001. However, the scheme was decided to be abolished in October 2003, so the Project was changed to be carried out under the scheme of "technical cooperation" in February 2003. Responding to the change mentioned above, the Plan of Operation (PO) was prepared and approved in JCC in July 2003. Since then, the Project has been implemented and managed based on the PO in addition to the Master Plan of the R/D. The PDM was not prepared. The PO, however, was not specific enough. For example, the C/P(s) in charge of each activity was not identified; and expected results and indicators were not defined for each activity. According to the R/D, joint evaluation of the Project was planned at the middle and during the last six months of the cooperation period. The mid-term evaluation, which was scheduled in July 2003, however, was canceled. It seems that, at that time, sending the short-term experts was considered more important than carrying out the evaluation for efficient implementation of the Project within the limited budget of JICA. These factors have made it difficult for the stake holders to share common understanding of implementation process and issues: and</p> <p>(3) In September 2005, the terminal evaluation team prepared the PDM for evaluation (PDMe) in consultation with the Project.</p>
<p>3 Communication</p>	<p style="text-align: center;">-do-</p>	<p>Communication between J/Es and C/Ps has been very close: they have cooperated in planning, implementation, and monitoring of the activities.</p>

Annex 5: Evaluation by Five Criteria

Abbreviation: C/P-Counterpart J/E-Japanese expert

1. RELEVANCE:

Item	Sources/ Method	Evaluation
1.1 Necessity		
(1) Relevance with the needs of Indonesia	Review of documents related to AR-CDM in Indonesia, questionnaire, interviews with C/P, J/E	<p>The Overall Goal ("Carbon sequestration and mitigation of global warming are enhanced through establishment and management of tree plantations") is still relevant with the needs of Indonesia.</p> <ul style="list-style-type: none"> • According to " National Strategic Study on CDM on Forestry Sector" (2003), CDM and non-Kyoto carbon markets are of keen interest to Indonesia: By increasing capacity of Indonesian to absorb global carbon market through the mechanism, it is expected that it would have positive impact on the national development. • As Forestry Minister, Dr. M.S. Kaban has emphasized in his speech at CDM workshop in March 2005, AR-CDM is an important mechanism for land and forest rehabilitation in Indonesia. ("In order to combat the environmental degradation, government has started National Forest and Land Rehabilitation Program (GERHAN). I understand that many efforts and programme have been done by government is not sufficient to recover our environmental condition into a better stage. Government programme covers only 5 % from total area that need to be rehabilitated. AR-CDM is one mechanism which enable them to develop land and forest rehabilitation, which could attract enterprises to invest on land rehabilitation. Therefore we can achieve higher benefits from selling CER").
(2) Relevance with the needs of target group	-do-	<p>The Project Purpose ("New techniques and methodologies for carbon fixing forest management, which are expected to promote and to enhance foreign and domestic investments for tree plantations, are established") is still relevant with the needs of the target group (i.e. potential CDM participants). Indonesia ratified Kyoto Protocol in 2004 and established its DNA (National Commission on CDM-Komnas MPB), which is a national authority to give national approval to CDM projects, by the Ministerial Decree in 2005. Indonesia has now become eligible for CDM projects. A manual for potential CDM participants, which are defined as "a result of achievements through the Project activities" in the Master Plan of the Project, would be an important manual for the forestry sector in Indonesia. The needs of the potential CDM participants for new techniques and methodologies</p>
1.2 Priority		
(1) Relevance with national policies of Indonesia	C/P, J/E, policy documents	<p>The Overall Goal and the Project Purpose are still consistent with national policies of Indonesia. MOF has identified the five Forestry Priority Policies for the period between 2005-2009. AR-CDM initiatives are in line with the priority No.3 ("Forest rehabilitation and conservation").</p>
(2) Relevance with ODA policies of Japan	ODA policy documents	<p>The Overall Goal and the Project Purpose are still consistent with ODA policies of Japan.</p> <ul style="list-style-type: none"> • According to the "Official Development Assistance Charter" prepared by the Government of Japan, "consideration to global warming and environmental problems," is one of the four priority issues. • According to the latest "JICA Country Programme"(2002), environmental protection is one of the five priority issues. Forest conservation is listed as one of the important areas for cooperation.

Annex 5: Evaluation by Five Criteria

2. EFFECTIVENESS :

Items	Sources/ Method	Evaluation
2.1 Achievement level of the Project Purpose	Review of accomplishment grid, technical reports, progress reports, JCC reports, questionnaires, Interviews C/P, J/E	The achievement of the Project Purpose is steady. It has been mostly achieved. The Project has established a firm framework for data analyses, while the fundamental data collection and analyses on biomass, soils, and financial aspects are ongoing. The data and AR-CDM manual, which are key products of the Project, are expected to be presented through the Project's web-site that is under development. It is expected that, subject to the completion of the ongoing works, the Project provides useful information for potential project participants in a readily available manner by the end of the Project. It is expected that the Project Purpose will be fully achieved by the end of the Project.
2.2 Contribution of the Outputs to the Project Purpose	-do-	Outputs 1, 4, and 5 directly contribute to the achievement of the Project Purpose as they provide open access to necessary and useful information for the potential CDM participants. The contribution of Output 2 and 3 to the Project Purposes are not assessed because of the influence of the Important Assumptions. The positive impacts brought by the Output 2 and 3, however, have been already observed (as described in Section 4 "Impacts") and future potential of the impacts are noted
2.3 Important Assumptions	-do-	One of the Important Assumptions has not been satisfied. The modalities of AR-CDM, which was agreed by the COP9 of the UNFCCC in December 2003 on the basis of COP7 decisions in November 2001, discourage the utilization of new technologies developed by the Project for charcoal making and application to plantations. In the modalities of the AR-CDM, the charcoal production from land preparation residue is regarded as net anthropogenic emission by sources of the Greenhouse Gas even though the growth enhancement by charcoal application may offset the emission in long term.

3. EFFICIENCY:

Items	Sources/ Method	Evaluation
3.1 Achievement level of Outputs	Accomplishment grid, progress reports, C/P, J/E	Overall: All the Outputs are mostly or almost achieved. The achievement levels are considered appropriate in view of the Inputs provided and the Activities conducted. It is expected that the Outputs will be achieved fully by the end of the Project.
3.2 Inputs		
(1) Japanese side		
(a) Long-term expert	Accomplishment grid, progress reports, C/P, J/E	<ul style="list-style-type: none"> • Timing: All of the first batch of the long-term experts but Coordinator (i.e. Chief Advisor and two experts in Forest Management and Silviculture) left office at the same time on January 14, 2003. In addition, their successors arrived on January 5, 2003. The time for takeover was hardly sufficient. It would have been more efficient if the timing of leaving and arrival the first and second batch of the experts had been arranged in a way that they could have sufficient time for takeover. • Quality: The experts with relevant technical level and experiences have been dispatched. Although they sometimes had to cover the activities that were not directly related to their technical background, they were able to manage in close collaboration with C/Ps and with support of short-term experts. • Quantity: The number of the experts has been sufficient.
(b) Short-term expert	-do-	<ul style="list-style-type: none"> • Timing: Timing of most of dispatch has been adequate. • Quality: The experts with relevant technical level and experiences have been dispatched. • Quantity: Most of the short-term experts have been dispatched for two-three weeks. In order to make up for this, in some technical fields, the same experts have been dispatched twice within a year. "Preparation of database on soil and biomass", which is one of the major activities towards the end of the Project, was not envisaged in the original plan and was included in the Project in April 2004. Furthermore, it was decided to open the database in April 2005. The work related to organization of the

Annex 5: Evaluation by Five Criteria

		<p>data for open-access has been added. Although the short-term expert in database techniques have been dispatched in 2004 and 2005, the period of each dispatch was less than one month. Most of the related activities have fell on the long-term expert in Silviculture, who is originally responsible for the activities related to measurement of biomass and soil carbon contents, as an additional task. It would have been more efficient if they had been sent for the longer period.</p>
(c) C/P training	-do-	<ul style="list-style-type: none"> • <u>Timing</u>: Appropriate. • <u>Quality</u>: The quality of the training has been appropriate. For two of the C/Ps, who were included in a group training course, however, the contents and fields were general and/or were not relevant with their needs. • <u>Quantity</u>: Appropriate. Especially, in a case of the C/P in Charcoal Production, training period was as many as four months so that he had enough time to learn various techniques and methodologies. • <u>Utilization</u>: Some C/Ps have been able to utilize the techniques and knowledge acquired through the training. Others, who were included in a group training course, have not learned any techniques that could be applied to their activities. The contribution level of the C/P training to the Outputs is considered to be middle.
(d) Equipment	-do-	<ul style="list-style-type: none"> • <u>Timing</u>: Timing of provision of the equipment has been appropriate. • <u>Quality</u>: In general, the items, specifications and the quality of the provided equipment are appropriate. However, an NC-analyzer, which is used for analysis of carbon stocks under Output 1, has become out of order frequently due to voltage fluctuation. For the carbon analysis in the Japanese fiscal year 2005, the Project had to put out their work. • <u>Quantity</u>: Appropriate. • <u>Utilization & management</u> : The provided equipment is essential for the Project activities and has been fully utilized except for the NC-analyzer. In order to prevent the damage to the provided equipment, especially precision instruments, from the frequent blackouts, UPS was purchased in 2002 and replaced in 2005.
(e) Administrative cost	-do-	<ul style="list-style-type: none"> • <u>Timing, Quantity, Utilization</u>: Appropriate. • <u>Others</u> : Due to budget constraints, the Indonesian side have not been able to provide some of the Inputs as planned, including administrative staff, travel costs for the C/P, the sheds at the experimental fields, etc.: the related costs have been borne by the Japanese side.
(2) Indonesian side		
(a) C/P personnel	Accomplishment grid, progress reports, C/P, JE	<ul style="list-style-type: none"> • <u>Timing</u>: All the necessary C/Ps, including staff for the project management, were assigned at the start of the Project. When one left the office, the successor was appointed without a delay. However, C/Ps for the second long-term expert in Forest Management specialized in Cost and Revenue Analysis, who arrived in January 2003, had not been assigned until April-May 2004. Although a C/P in other technical field assisted the expert during the absence of the C/Ps in Cost and Revenue Analysis, field surveys had to be contracted out to the local institutes and analyses were carried out by the expert alone. The C/Ps missed opportunities to conduct surveys and analyses with the expert, too. • <u>Quality & Quantity</u>: All of the technical C/Ps are researchers with relevant technical background. The number of the technical C/Ps has been sufficient. The C/Ps, however, have not been able to engage in the Project activities on full-time basis as they have other engagements, including research projects of FORDA related to CDM. Furthermore, when preparation of database was included in the Project activities in 2004, the Japanese side requested FORDA to appoint a C/P specialized in database technique. Since FORDA was not able to find a staff with relevant technical background immediately, it appointed three of the existing C/Ps for the time being. The related activities, however, have been mostly undertaken by the long-term expert in Silviculture assisted by local research assistants employed by the Japanese side. Although the C/P specialized in database technique has been nominated lately, he has not been assigned yet. In addition, the Project Manager has been changed four times since the beginning of the Project.

Annex 5: Evaluation by Five Criteria

(b) Administrative staff	-do-	Administrative staff have not been provided by the Indonesian side.
(c) Land, building, and other facilities	-do-	<ul style="list-style-type: none"> • <u>Timing, Quantity, Quality</u> : Timing of provision was generally appropriate. A garage for the Project vehicles was not built until April 2004. Quality has been generally adequate. As for the Project Office, due to unstable electric supply, blackouts occur frequently. Since there is no generator equipped with the Office, some of the activities, including carbon analysis using NC-analyzer, had to be suspended during the blackouts. • <u>Utilization & management</u>: Generally appropriate. Patrol of the experimental fields of Perhutani is not very sufficient because it is entrusted to local guards employed by the Project. (Their wage is paid by the Japanese side).
(d) Others (Running expenses)	-do-	<ul style="list-style-type: none"> • <u>Timing</u>: Disbursement of the allocated budget for the Project activities has been delayed due to a delay of disbursement of the overall government budget. • <u>Quantity</u>: Hardly sufficient. Only a part of the amount proposed by the C/P has been disbursed due to budget constraint and the delay of the disbursement. For example, travel costs for the C/Ps have not been provided. Although the Japanese side bore the costs on special cases, the C/Ps were not able to conduct the field surveys very often. To make up for that, the Japanese side contracted out most of the surveys. Furthermore, the C/Ps missed the opportunities to conduct the surveys.
3.3 Important Assumptions	C/P, J/E,	
3.4 Coordination with other relevant projects	Progress reports, J/E	<ul style="list-style-type: none"> • <u>JICA Project</u>: The Project on "Small-Scale Forest Plantation Using Fast-Growing Tree Species Identified in Phase I and II in Malaysia" provided the data regarding S. Leprosula stands planted in 1992 and 1995 to the Project in 2002 upon request. The Project has exchanged information with the following JICA project in Indonesia: (1) "The Forest Tree Improvement Project Phase 2" ; (2) "The Forest Fire Prevention Management Project Phase II "; and (3) "Gunung Halimun Salak national park management project". • <u>Other Project</u>: The Project has exchanged information with two of the international Projects on CDM : (1) ADB 's "Carbon Sequestration through CDM"); and (2) Australian Center for International Agriculture Research (ACIAR)'s "Economic Potential of Land-Use Change and Forestry for Carbon Sequestration Poverty Programme"
3.5 Other promoting /hampering factors	Accomplishment grid, progress reports, C/P, J/E	<ol style="list-style-type: none"> (1) For charcoal production (Output 3) , a technique developed by a local NGO, which has been proven locally adaptable was utilized. (2) Some of the field surveys were entrusted to local research institutes, such as Bogor Agriculture University (IPB) and Gadjah Mada University (UGM), which are familiar with local conditions. (3) At the technical seminars and workshops organized by the Project as well as the scientific meetings, workshops, etc. attended by the J/E and/or C/P, valuable information and views were obtained through discussions with researchers from local and oversea institutes, universities, NGOs, etc.

4. IMPACT:

Items	Source/ Methods	Evaluation
4.1 Impact at the Overall Goal level		
(1) Expected achievement level of the Overall Goal	Interview with C/P, J/E	The Overall Goal of the Project was found too ambitious. It cannot be achieved 3-5 years after the completion of the Project. In order to reach the Overall Goal, the techniques and methodologies developed by the Project are utilized by potential CDM participants first.
(2) Important Assumption	-do-	The first and second assumptions ("There are no drastic changes in the modalities of AR-CDM" and "There are no major changes in CDM Policy in Indonesia") are likely to be satisfied. As for the third one ("An emergence of the Carbon-market where t-CERs and l-CERs circulate at sufficient quantity and substantial price is foreseen"), it is uncertain whether or not this will be satisfied.

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<p>4.2 Other impacts</p>	<p>Review of the progress reports, JCC reports, & technical reports, interview with C/P, J/E</p>	<p>I. Positive Impacts</p> <p>Although four months are left before termination of the Project, some impacts have been already observed. There are some possible and potential impacts as well.</p> <p>(1) Impacts already observed</p> <p><u>(a) General</u></p> <ol style="list-style-type: none"> 1. Although technical transfer is not a primary objective of the Project, which started as a development study, technical capacity of the C/Ps has increased through working with long-term and short-term experts as well as training in Japan. 2. Through the Project, including training in Japan, some C/Ps have established good contacts with Japanese researchers, which would be useful for their research activities in future. 3. Through technical seminars organized by short-term experts on their respective specialized subjects, technical knowledge and understanding of the participants, including researchers from outside institutes have been raised. 4. Through the scientific papers accepted by scientific journals as well as the presentation made at scientific meetings, workshops, etc, knowledge and interests of the researchers specialized in the related fields on the methodologies and techniques for AR-CDM have been raised. 5. The former C/P in Biomass has been studying at a graduate school of Kobe University in Japan since April 2004 supported by a scholarship scheme under the Ministry of Education, Culture, Sports, Science and Technology of the Government of Japan, upon a recommendation of JICA. He is writing a master's thesis using the results of the surveys and analyses of the Project. <p><u>(b) Charcoal Application and Production Techniques</u></p> <p>Although charcoal application and production techniques developed/improved under Output 2 and Output 3 have become irrelevant with the Project Purpose due to an influence of the Important Assumptions, they have produced the following positive impacts:</p> <ol style="list-style-type: none"> 1. <u>Impact on traditional producers near the Project site in West Java:</u> About 6~8months in 2001, the Project entrusted approximately 20 local traditional charcoal producers living near the experiment site in Jasinga, West Java, with charcoal production utilizing (i) Earth-Pit Kiln refined by the Project and (ii) Dram Kiln developed by the Project. The producers have learned improved / new techniques. In addition, the Project paid 5,000 rp for one sack. On average, a group of four people produced 15 – 20 sacks of charcoals a day: one was able to earn 18,000~25,000 rp. a day. 2. <u>Impact on a local NGO and its beneficiaries in West Kalimantan:</u> In 2002, the Project entrusted a survey in West Kalimantan to a local NGO called <u>Yeyasan Dian Tama (YDT)</u>, which also engages in activities related to charcoal production with assistance from a Japanese NGO. In the same year, the Project introduced Permanent Kiln developed by YDT and through discussions refined it. YDT has applied the refined techniques for its activities. 3. <u>Impact on local charcoal producers through FORDA's projects:</u> In 2001, the Project introduced and refined Semi-continuous Kiln developed by the FORDA/JIFPRO project (2001~2004), which produces charcoal from saw-dusts. Since the same year, the C/P has disseminated the refined Kiln in the project sites of FORDA/JIFPRO in Jambi, West Java, and North Sumatra. The Project has developed a technique for production of charcoal composts from saw-dust, which can be applied in agriculture and forestry. They have been disseminated in the above the project sites of FORDA/JIFPRO. A technique briquette charcoal using saw-dusts developed by the Project has been disseminated to a group of approximately 20 model farmers in Sukabumi by FORDA. 4. At the World Congress of International Union of Forest Research Organizations (IUFRO) in August 2005, "Effect of charcoal application on growth of <i>A. mangium</i>" was presented by the Project Coordinator. The presentation attracted a great interest from its participants. An editor of an American scientific journal ("Communication in Soil Science") has
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		<p>even invited a contribution.</p> <p>(2) Possible and Potential Impacts (a) Soil Carbon Measurement Techniques <u>Possible Impacts</u></p> <ol style="list-style-type: none"> 1. Since the soil types studied by the Project cover three representative ones of the tropics, the results can be utilized in other tropical countries under similar conditions. 2. Through the Project, the sampling intensity necessary for estimation of carbon stocks of the major soil types have been clarified. If the necessary sampling specification in the scientific paper on the subject is secured, this will be considered as statically viable. Potential CDM participants can save time and cost related to collection and analysis of soil samples. 3. The Project demonstrated in scientific papers that carbon stocks in acid soils have not decreased immediately after planting of the target tree species in the survey. By referring to the scientific paper on the subject, potential CDM participants could continue validators/verifiers of the CDM projects that the compulsory monitoring of soil carbon pool can be omitted according to the AR-CDM modalities. They could save time and cost related to monitoring. 4. Only 10 organizations/institutes possess NC-analyzers in Indonesia. With the NC-analyzer provided by the Project and the C/P whose capacity has been raised, it is expected FORDA would play an important role in analysis of carbon contents in Indonesia in future. <p><u>Potential Impacts</u></p> <ol style="list-style-type: none"> 1. If it is made clear in a transparent and verifiable manner that soil carbon stocks do not decrease over the years after planting (if the scientific paper on the subject is accepted), potential CDM participants could save time and costs related to monitoring. 2. Although soil carbon pool is an important component of the total carbon stocks in forest ecosystem, a systematic study on annual change of soil carbon stocks is scarce not only in Indonesia but also in the whole tropical regions. <p>II. Negative Impacts Negative impacts have not been observed so far. They are not foreseen, either.</p>
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5. SUSTAINABILITY:

Items	Source/Methods	Evaluation
5.1 Institutional Aspects		
(1) Policy support	Review of the policy document, questionnaire, interview with C/P	Carbon sequestration and mitigation of global warming is a national commitment of Indonesia. The policy support for the activities relevant to the Project is likely to continue.
(2) Position of C/P	-do-	<p>The C/Ps are permanent employees of FORDA, whose employment is guaranteed. All of them are researchers and it is most likely that they continue to be involved in their respective research fields. Most of the C/Ps are eager to continue their activities under the present framework after the termination of the Project. Carbon related research, including CDM, is one of the 42 topics under the research programme of FORDA for the period 2004-2009. The Project Coordinator, who is responsible for the topic, has submitted a research plan for 2006. As for the other C/Ps, whether or not they will be continuously involved in CDM related research is uncertain, though there is a possibility to join the CDM related research as a team with the Coordinator.</p> <p>After the termination of the Project, FORDA will take a whole responsibility of maintenance and continuation of the Project. Within FORDA, Research</p>

Annex 5: Evaluation by Five Criteria

		and Development Centre of Forest and Nature Conservation, to which most of the C/P belong, will be responsible for the time being; but the Centre that is to be ultimately responsible has not been determined yet. Whether or not the C/Ps will be involved in maintenance and continuation of the Project is uncertain.
(3) Management capacity of FORDA	-do-	FORDA has managed the Project in collaboration with the J/E s without any serious problems. In addition, FORDA has managed various research projects by themselves. It is expected that FORDA will be able to manage the relevant activities by themselves after termination of the Project.
(4) Coordination with other relevant organizations	-do-	Through the Project as well as its own activities, FORDA has established a good network with local and international organizations relevant to CDM, including IPB, UGM, International Centre for Research in Agroforestry (ICRAF), Centre for International Forestry Research (CIFOR), Conservation International (CI), etc.. FORDA plans to explore the possibilities in further developing the relationship with them. In addition, the Project Coordinator is a member of the National Secretariat for Carbon Sequestration of MOF that is responsible for coordination and information dissemination of the matters related to AR-CDM.
5.2 Financial Aspects	Review of the progress reports, records of inputs questionnaire, interview with C/P and J/E	Budget for the utilization and dissemination of the Project outputs, such as database, manuals, and web-site, is crucial not only for continuation of the relevant activities but also for promotion of the AR-CDM in Indonesia. As described in "Efficiency" of this Annex, the Japanese side has covered considerable part of the running costs for the Project. Unless FORDA, as an organization, takes some measures to secure the necessary budget from the Indonesian government and/or other financial sources, it is most likely that FORDA will face financial constraint to continue the relevant activities by themselves. FORDA, however, plans to utilize the budget available under its carbon related research programme (2004-2009), which includes CDM. In the meantime, at the level of the C/Ps, they seem to have strong intention to obtain some research funds from the government and/or possible donors. For example, Waseda University in Japan has already pledged to implement a joint research for the cost and revenue analysis with one of the C/Ps. Another C/P is preparing a research proposal through FORDA to the Ministry of Forestry in Indonesia, which has a policy on promoting AR-CDM activities.
5.3 Technological Aspects		
(1) Technical capacity of the C/P	Review of the progress and technical reports, questionnaire, interview with C/P and J/E	Through working together with Japanese experts in planning and implementing, and problem solving, technical level of the C/Ps has been raised enough to maintain and develop the Project outputs by themselves. Especially, they have confidence in continuing the activities such as measuring data in the field. While some are able to write scientific papers by themselves, others need to further improve their capacity in this regard.
(2) Utilization and dissemination of the developed technologies	-do-	<p>Technically, it is possible that the developed technologies will be utilized and be disseminated properly, because the C/Ps have enough knowledge and technique for that, and manuals and database for CDM participants and web-site for dissemination have been prepared by the Project.</p> <p>In order to secure utmost utilization and dissemination of the Project products, the construction and proper maintenance of the database is most important. However, the C/P with specialization in database techniques has not been assigned yet. The periodical measurement in the experimental sites after the termination of the Project is necessary in order to extend the applicability and accuracy of growth curves, in particular for longer rotation species, in the database. The C/Ps recognized and emphasized that importance of periodical measurement. Up-dating of the database becomes necessary when the periodical measurement is conducted.</p> <p>The sustainability of the utilization and dissemination of the accumulated information and developed techniques is uncertain unless a post-project plan being prepared by the Indonesian authorities be finalized and maintained to address these issues.</p>
(3) Utilization of the provided machinery and	-do-	It is expected that the machinery and equipment provided by the Project will be utilized and maintained properly by the Indonesian side after the termination of the Project, because the counterparts are managing them

Annex 5: Evaluation by Five Criteria

equipment		well at present. But the NC-analyzer is not in good condition, and such delicate equipment needs elaborate maintenance. The NC-analyzer might be able to become an income source for the post-project activities by getting orders of analyses from other organizations, if it is repaired completely and the Indonesian side provides proper maintenance system. Apart from the NC-analyzer, since the quantity and varieties of the provided equipment are substantial, at the time of hand-over, the equipment may require management by a person(s) in charge who is also responsible for the Project activities.
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Annex 6. Draft Project Design Matrix
1. Project Title: Demonstration Study on Carbon Fixing Forest Management in Indonesia **2. Project Period: 5 Years from Jan. 2001**
3. Executing Agency: Forestry Research and Development Agency (FORDA), Ministry of Forestry

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p>Super Goal Carbon sequestration and mitigation of global warming are enhanced through establishment and management of tree plantation¹.</p>	<p>Tree plantations for carbon sequestration and mitigation of global warming, established and managed based on the techniques and/or methodologies developed by the Project, increased in Indonesia.</p>	<p>Review of the relevant statistics, interview with relevant organizations including the DNA (Designated National Authority) of Indonesia, the DOE's (Designated Operational Entities) and review of the UNFCCC web-site.</p>	<p>1. There are no drastic changes in the modalities of AR-CDM Policy in Indonesia 2. There are no major changes in CDM Policy in Indonesia 3. The Carbon-market where t-CERs (temporary Certified Emission Reductions) and t-CERs (long-term CERs) circulate at sufficient quantity and substantial price will stand and work.</p>
<p>Overall Goal The techniques and methodologies developed by the Project are utilized by potential CDM participants.</p>	<p>Proposals for AR- CDM projects, utilizing the techniques and methodologies developed by the Project, submitted to the Designated National Authority (DNA) of Indonesia by the potential CDM participants.</p>		<p>1. There are no drastic changes in the modalities of AR-CDM Policy in Indonesia 2. There are no major changes in CDM Policy in Indonesia 3. The Carbon-market where t-CERs (temporary Certified Emission Reductions) and t-CERs (long-term CERs) circulate at sufficient quantity and substantial price will stand and work.</p>
<p>Project Purpose New techniques and methodologies for carbon fixing forest management² which are expected to promote and to enhance foreign and domestic investments for tree plantations, are established.</p>	<p>Techniques and methodologies provided in a readily available manner for potential CDM participants, and able to be judged useful for (or likely to be used by) them, in view of the following items: (1) Setting of project boundary; (2) Determination of baseline scenario; (3) Demonstration and assessment of additionality (including financial analysis & barriers check); (4) Feasibility analysis (in "Tool for Demonstration and Assessment of Additionality" of UNFCCC); (5) Design of Monitoring Plan on Carbon Stock Change (including carbon stock estimation); (6) Leakage Estimation and design of its monitoring plan; (7) Selection of carbon pools for carbon accounting; (8) Policy & Regulations on forestry investments in Indonesia; (9) Procedure and criteria of National Designated Authority (DNA) to certify contribution of the AR-CDM projects to the Sustainable Development of Indonesia; (10) Policy and regulations on analysis and assessment of Socio-Economic Impacts of AR projects in Indonesia; (11) Policy and regulations on analysis and assessment of Environmental Impacts of AR projects in Indonesia; (12) Possible risk of AR projects and its Management; (13) Formulation of Project Design Document (PDD); (14) Validation of PDD by Designated Operational Entity (DOE); and (15) Verification of Net Anthropogenic Greenhouse Gas Removals. (Criteria (1) to (13) are major topics that project participants shall describe in the Project Design Document format of UNFCCC)</p>	<p>Interview with the J/E (Japanese expert) and CIP (Indonesian counterpart personnel) and review of the documents produced by the Project.</p>	<p>1. The modalities of AR-CDM encourage utilization of the methodologies and/or the techniques developed by the Project. 2. There are no major changes in CDM Policy in Indonesia 3. An emergence of the Carbon-market where t-CERs and t-CERs circulate at sufficient quantity and substantial price are foreseen.</p>
<p>Outputs 1. Methodologies to estimate carbon fixation benefits of plantation forests are developed. 2. New technology for charcoal-applied plantations to maintain and enhance carbon fixation potential is developed.</p>	<p>1.1 Research papers on biomass and soil carbon stocks prepared and/or presented at scientific meetings, workshops, etc. 1.2 Parameters for carbon estimation of biomass and soil (BEF, R, D, allometric equation, and so on) obtained. 1.3 Manuals for survey and analysis methodologies for the potential CDM participants prepared 1.4 Scientific papers on biomass and soil carbon stocks accepted by the relevant societies. 1.5 Database on biomass and soil for the potential CDM participants prepared 2.1 Research papers on charcoal application technique prepared and/or presented at scientific meetings, workshops, etc. 2.2 Scientific papers on charcoal application technique accepted by the relevant societies</p>	<p>1.1-1.5 Interview with J/E and CIP, questionnaire, review of the project monitoring reports and technical reports. In addition, 1.4 Review of the manuals 2.1-2.3 Interview with J/E and CIP, questionnaire, review of the project monitoring reports and technical reports.</p>	<p>1. C/P remain with FORDA 2. The modalities of AR-CDM encourage utilization of the methodologies and/or the techniques developed by the Project.</p>
<p>3. More effective technology for charcoal production is developed.</p>	<p>3.1 Research papers on charcoal production prepared and/or presented at scientific meetings, workshops, etc</p>	<p>3.1-3.2 Interview with J/E and CIP, questionnaire, review of the project monitoring reports and technical reports</p>	
<p>4. Cost and revenue of CDM plantations are estimated</p>	<p>4.1 Research papers on cost and revenue analysis prepared and/or presented at scientific meetings, workshops, etc. 4.2 A manual for cost and revenue analysis of the CDM plantations for the potential CDM participants prepared. 4.3 Scientific papers on cost and revenue analysis for AR-CDM projects accepted by the relevant societies 4.4 A tool package for cost and revenue analysis for the potential CDM participants prepared.</p>	<p>4.1-4.2 Interview with J/E and CIP, questionnaire, review of the project monitoring reports and technical reports.</p>	
<p>5. Data and information necessary for potential CDM participants are made available</p>	<p>5.1 An overall manual for carbon-fixing plantation prepared. 5.2 A web-site on AR-CDM in Indonesia prepared 5.3 Related literatures for a library of FORDA collected 5.4 Technical seminars and workshops organized</p>	<p>5.1-5.4 Interview with J/E and CIP, questionnaire, review of the project monitoring reports and technical reports.</p>	

¹ "(Management of tree plantation" means management of carbon-fixing tree plantation, i.e. afforestation and reforestation as defined in the Marrakech Accords under the Article 12 of Kyoto Protocol.
² "(Carbon-fixing forest management" means management of carbon-fixing tree plantations, i.e. afforestation and reforestation as defined in the Marrakech Accords under the Article 12 of Kyoto Protocol.

Annex 6. Draft Project Design Matrix

Activities	Inputs	Important Assumptions
<p>1-a. Measurement and analysis of the carbon contents in biomass and soil in newly established plantations</p> <p>1-b. Measurement and analysis of the carbon contents in biomass and soil in existing plantations</p> <p>1-c. Measurement and analysis of the carbon contents in biomass and soil in control plots (i.e baseline)</p> <p>1-d. Data collection and development of methodologies to estimate carbon contents in various land use types</p> <p>1-e. Preparation of manuals for survey and analysis methodologies</p> <p>1-f. Preparation of scientific and research papers</p> <p>1-g. Prepare a database on soil and biomass for the potential CDM participants, using the data collected through surveys and analyses</p>	<p><Japanese Side></p> <p>(1) Long-Term experts (4)</p> <p>1. Chief Advisor</p> <p>2. Silviculture</p> <p>3. Forest Management</p> <p>4. Coordinator</p> <p>(2) Short -Term Experts Dispatched as needed.</p> <p>(3) Training of Indonesian personnel in Japan Training opportunities for the Indonesian personnel in Japan will be provided.</p> <p>(4) Machinery and Equipment Vehicles, items for silviculture, experiment, investigation, and other necessary items will be provided.</p>	<p>1. C/P will remain with FORDA</p> <p>2. Major natural disasters or severe climate conditions will not occur in the survey sites.</p>
<p>2-a. Measurement of effects of charcoal input into newly established plantations</p> <p>2-b. Experiment of effects of charcoal input into pot seedling</p> <p>2-c. Preparation of scientific and research papers</p>	<p><Indonesian Side></p> <p>(1) Staff allocation</p> <p>1. Project Director</p> <p>2. Project Manager</p> <p>3. Project Coordinator</p> <p>4. Field Managers</p> <p>5. Counterpart personnel in the fields of (a) Forest Management, (b)Silviculture, (c)Charcoal Production</p> <p>6. Administrative Personnel, (a)Clerical and service employees, (b)Drivers and Labors, (c)Other necessary supporting staff, (d)Secretaries for Japanese Experts</p>	<p><u>Pre-conditions</u></p>
<p>3-a. Development of cost effective technology for charcoal production</p> <p>3-b. Quantification of charcoal production upon land preparation</p> <p>3-c. Preparation of research papers</p>	<p>(2) Land, buildings and facilities</p> <p>1. Land for (a)Experimental Plantation, (b)Project office and related facilities, (c)Access roads</p> <p>2. Buildings and facilities:(e)Project office, (b)Spaces for machinery and equipment, (c)Storehouse for forestry materials, (d)Workshop and Garage, (e)Sheds in the plantation field, (f)Others</p> <p>3. Natural and Planted forests</p>	
<p>4-a. Study and data collection on CDM related plantations</p> <p>4-b. Development of CDM plantation model</p> <p>4-c. Data analysis and estimation of cost and revenue of carbon fixing plantation</p> <p>4-d. Preparation of a manual for cost-revenue analysis for the potential CDM participants</p> <p>4-e. Preparation of scientific and research papers</p> <p>4-f. Preparation of a tool package for the cost and revenue analysis for the potential CDM participants</p> <p>5.a. Preparation of a manual for carbon fixing plantations</p> <p>5.b. Preparation of a web-site on AR-CDM in Indonesia</p> <p>5.c. Collection of relevant literatures for a library of FORDA</p> <p>5.d. Organization of technical seminars and workshops</p>		

Appendix A: Record of Output
-Scientific papers, research papers and presentation-

1. Scientific papers (already accepted, submitted or for submitting to scientific journal)

(Output 1: Biomass and soil)

- 01 Allometric biomass equations, biomass expansion factors and root-to-shoot ratios of planted *Acacia mangium* Willd. forests in West Java Indonesia (Dr. Miyakuni, Journal of forest planning, 2004 .9 accepted)
- 02 Allometric equations and other parameters for estimating the biomass of planted *Pinus merkusii* Jungh Et. de Vr. (Dr. Miyakuni, submitted to the Journal of Forest Environment, 2004.11)
- 03 Soil carbon storage and its variation among three major soil types under tree plantations, West Java (Mr. Kato, submitted to the Forest Ecology and Management, 2005.4)
- 04 Estimation of biomass and sequestered carbon of young teak plantation with participatory forest management in East Java (Mr. Kato, plan to submit to a journal)
- 05 Changes in soil carbon stocks in plantation forests, West Java (Kato, under consideration)
- 06 Comparative study on growth characteristics and allometric equations of *Acacia mangium* Wild. under different conditions in Indonesia. (Mr. Ika, plan to submit to a journal)

(Output 2 Charcoal application)

- 07 Effect of charcoal application on growth of *Acacia mangium* (Dr. Chairil, plan to submit to a journal)

(Output 4: Cost and revenue analysis of CDM plantations)

- 08 Economics analysis of sengon (*Paraserianthes falcataria*) community forest plantation, a fast growing species in East Java (Dr. Ulfah, submitted to the Forest Policy and Economics, 2005.7)

2. Research Papers:

(Output 1: Biomass and soil)

- 01 Estimating carbon fixing potential of plantation forests: Case study on *Acacia mangium* plantations (Mr. Ika, 1st Workshop Proceedings, 2003)

- 02 Analysis of soil carbon stock of *Acacia mangium* plantation in Maribaya, West Java (Mr. Harris, 1st Workshop Proceedings, 2003)
- 03 Analysis of soil carbon accumulation of *Shorea leprosula* plantation in Ngasuh, West Java (Dr. Chairil, 1st Workshop Proceedings, 2003)
- 04 Analysis of soil carbon accumulation of *Pinus merkusii* plantation in Cianten, West Java (Mr. Harris, 1st Workshop Proceedings, 2003)
- 05 Carbon stock estimates for *Acacia mangium*, *Pinus merkusii* and *Shorea leprosula* plantations in West Java, Indonesia. (Mr. Ika, BIO-REFOR Proceedings, 2004)
- 06 Allometric equation and other parameters for estimating biomass of young *Shorea leprosula* (Dr. Miyakuni, internal information)
- 07 Estimation of biomass and carbon stock in some potential land-uses for forest carbon project in Bungo-Tebo area, Jambi (Dr. Suryo, 2nd Workshop Proceedings, 2005)
- 08 Estimation of biomass and soil carbon in Bungo-Tebo, Jambi (Dr. Agus, 2nd Workshop Proceedings, 2005)
- 09 Allometric patterns of young teak trees managed with different silviculture systems in Madiun, Indonesia (Mr. Kato, 2nd Workshop Proceedings, 2005)
- 10 Allometric equations and other parameters for estimating the amount of biomass *Pinus merkusii* forests (Mr. Heriyanto, 2nd Workshop Proceedings, 2005)
- 11 Allometric equations of other tree species in secondary vegetations (*Puspa*, *Schima wallicii*) (Dr. Kiyono, internal information)
- 12 Estimation of biomass and sequestered carbon of young teak plantation with participatory forest management in East Java (Mr. Kato, IUFRO, The international forestry review, 2005)
- 13 Comparative method of carbon biomass estimation in tropical peat swampy forest, Central Kalimantan (Dr. Chairil, IUFRO, The international forestry review, 2005)
- 14 Impact of land-use changes and wild fire on carbon stock of tropical peat swampy forest in Central Kalimantan (Dr. Ulfah, IUFRO, The international forestry review, 2005)
- 15 (tentative title) Methodology and estimation of biomass and soil carbon stocks in West Java (Mr. Kato, plan to submit to Nettai Ringyo on November 2005)

(Output2: Charcoal application)

- 16 Early growth of *Acacia mangium*, *Pinus merkusii* and *Shorea leprosula* plantation as affected by charcoal application (Dr. Chairil, 1st Workshop Proceedings, 2003)
- 17 Preliminary study on the effect of charcoal application on the early growth of *Acacia mangium*, *Pinus merkusii* and *Shorea leprosula* (Dr. Chairil, 1st Workshop Proceedings, 2003)
- 18 Effect of charcoal application on early growth stage of *Acacia mangium* and *Miichelia*

- montana* (Dr. Chairil, 2nd Workshop Proceedings, 2005)
- 19 Growth of *Acacia mangium*, *Pinus merkusii* and *Shorea leprosula* plantation as affected by charcoal application in West Java (Dr. Chairil, 2nd Workshop Proceedings, 2005)
 - 20 Growth of *Shorea leprosula* and *S. macrophylla* plantation as affected by charcoal application in West Kalimantan (Mr. Rinaldi, 2nd Workshop Proceedings, 2005)
 - 21 Effect of charcoal application on growth of *Acacia mangium* (Dr. Chairil, IUFRO, The international forestry review, 2005)

(Output 3: Charcoal production)

- 22 Method of charcoal production to enhance carbon sequestration (Dr. Gustan, 1st Workshop Proceedings, 2003)
- 23 Trials on some of charcoal production methods for carbon sequestration in Indonesia (Mr. Ando, International Symposium at University of Georgia, 2004.6)
- 24 Charcoal production for carbon sequestration (Dr. Miyakuni, Final internal report, 2004)
- 25 Trials on some of charcoal production methods for carbon sequestration in Indonesia (Dr. Gustan, 2nd Workshop Proceedings, 2005)

(Output 4: Cost and revenue analysis of CDM plantations)

- 26 Cost and benefit analysis of AR-CDM projects: case study in Indonesia (Mr. Ando, IUFRO International Conference on SFM – FORCOM Proceedings, 2004)
- 27 Potency of clean development mechanism as tools to develop collaborative management of conservation area in Indonesia: Towards a better live quality for future generation (Dr. Agus, IUFRO International Conference on SFM – FORCOM Proceedings, 2004)
- 28 Participation of the people on optimum forest teak management in Madiun, East Java, Indonesia (Silvi Nur Oktalina, IUFRO International Conference on SFM – FORCOM Proceedings, 2004)
- 29 Perspective on forest management model in A/R-CDM project (Dr. Matsumura, 2nd Workshop Proceedings, 2005)
- 30 Implementation of agroforestry system for SS AR-CDM scheme: potential limitation and strategy (Dr. Taulana, 2nd Workshop Proceedings, 2005)
- 31 Soico-economic engineering on the optimum teak management model in Madiun (Mr. Wiyono, 2nd Workshop Proceedings, 2005)
- 32 Local's participation to new tumpangsari system in Madiun, East Java, Indonesia (Mr. Yokota, JASTE 15 Proceedings, 2005, Kyoto)

- 33 Paradigm shift of tumpangsari system towards local involvement in Madiun, East Java, Indonesia (Mr. Yokota, IUFRO, The international forestry review, 2005)
- 34 Economics analysis of sengon (*Paraserianthes falcataria*) community forest plantation, a fast growing species in East Java (Dr. Ulfah, The international forestry review, 2005)

(General introduction)

- 35 Introduction of the project activities (Mr. Ando, CEISIA Communication news, 2003)
- 36 Demonstration study on carbon fixing forest management in Indonesia (Mr. Ando, Nettare Ringyo, 2004)

3. Presentations

(Output1: Biomass and soil)

- 01 Estimating carbon fixing potential of plantation forests: Case study on *Acacia mangium* plantations (Mr. Ika, 1st Workshop, 2002, Bogor)
- 02 Analysis of soil carbon stock of *Acacia mangium* plantation in Maribaya, West Java (Mr. Harris, 1st Workshop, 2002, Bogor)
- 03 Analysis of soil carbon accumulation of *Shorea leprosula* plantation in Ngasuh, West Java (Dr. Chairil, 1st Workshop, 2002, Bogor)
- 04 Analysis of soil carbon accumulation of *Pinus merkusii* plantation in Cianten, West Java (Mr. Harris, 1st Workshop, 2002, Bogor)
- 05 Carbon stock estimates for *Acacia mangium*, *Pinus merkusii* and *Shorea leprosula* plantations in West Java, Indonesia. (Mr. Ika, BIO-REFOR, 2003, Yogyakarta)
- 06 Estimation of biomass and carbon stock in some potential land-uses for forest carbon project in Bungo-Tebo area, Jambi (Dr. Suryo, 2nd Workshop, 2005, Bogor)
- 07 Estimation of biomass and soil carbon in Bungo-Tebo, Jambi (Dr. Agus, 2nd Workshop, 2005, Bogor)
- 08 Allometric patterns of young teak trees managed with different silviculture systems in Madiun, Indonesia (Mr. Kato, 2nd Workshop, 2005, Bogor)
- 09 Allometric equations and other parameters for estimating the amount of biomass *Pinus merkusii* forests (Mr. Heriyanto, 2nd Workshop, 2005, Bogor)
- 10 An estimation of above ground biomass and carbon of a heath forest stand in a Danau Sentarum National Park, West Kalimantan (Dr. Cecep, 2nd Workshop, 2005, Bogor)
- 11 Estimates of above-ground tree biomass of vegetated landuses of surrounding Sentarum Lake National Park, West Kalimantan, Indonesia (Dr. Cecep, JASTE, 2005, Kyoto)
- 12 Estimation of biomass and sequestered carbon of young teak plantation with

- participatory forest management in East Java (Mr. Kato, IUFRO, 2005, Brisbane)
- 13 Comparative method of carbon biomass estimation in tropical peat swampy forest, Central Kalimantan (Dr. Chairil, IUFRO, 2005, Brisbane)
 - 14 Impact of land-use changes and wild fire on carbon stock of tropical peat swampy forest in Central Kalimantan (Dr. Ulfah, IUFRO, 2005, Brisbane)

(Output2: Charcoal application)

- 15 Early growth of *Acacia mangium*, *Pinus merkusii* and *Shorea leprosula* plantation as affected by charcoal application (Dr. Chairil, 1st Workshop, 2002, Bogor)
- 16 Preliminary study on the effect of charcoal application on the early growth of *Acacia mangium*, *Pinus merkusii* and *Shorea leprosula* (Dr. Chairil, 1st Workshop, 2002, Bogor)
- 17 Effect of charcoal application on early growth stage of *Acacia mangium* and *Miichelia montana* (Dr. Chairil, 2nd Workshop, 2005, Bogor)
- 18 Growth of *Acacia mangium*, *Pinus merkusii* and *Shorea leprosula* plantation as affected by charcoal application in West Java (Dr. Chairil, 2nd Workshop, 2005, Bogor)
- 19 Growth of *Shorea leprosula* and *S. macrophylla* plantation as affected by charcoal application in West Kalimantan (Mr. Rinaldi, 2nd Workshop, 2005, Bogor)
- 20 Effect of charcoal application on growth of *Acacia mangium* (Dr. Chairil, IUFRO, 2005, Brisbane)

(Ourpu3: Charcoal production)

- 21 Method of charcoal production to enhance carbon sequestration (Dr. Gustan, 1st Workshop, 2002, Bogor)
- 22 Trials on some of charcoal production methods for carbon sequestration in Indonesia (Mr. Ando, International Symposium at University of Georgia, 2004.6)
- 23 Charcoal production for carbon sequestration (Dr. Miyakuni, JIFPRO international workshop, Bogor, 2004)
- 24 Trials on some of charcoal production methods for carbon sequestration in Indonesia (Dr. Gustan, 2nd Workshop, 2005, Bogor)

(Output 4: Cost and revenue analysis of CDM plantations)

- 25 Cost and benefit analysis of AR-CDM projects: case study in Indonesia (Mr. Ando, IUFRO International Conference on SFM – FORCOM Utsunomiya, 2004)
- 26 Potency of clean development mechanism as tools to develop collaborative management of conservation area in Indonesia: Towards a better live quality for future generation (Dr. Agus, IUFRO International Conference on SFM – FORCOM, Utsunomiya, 2004)

- 27 Participation of the people on optimum forest teak management in Madiun, East Java, Indonesia (Silvi Nur Oktalina, IUFRO International Conference on SFM – FORCOM, Utsunomiya, 2004)
- 28 Perspective on forest management model in A/R-CDM project (Dr. Matsumura, 2nd Workshop, 2005, Bogor)
- 29 Implementation of agroforestry system for SS AR-CDM scheme: potential limitation and strategy (Dr. Taulana, 2nd Workshop, 2005, Bogor)
- 30 Socio-economic engineering on the optimum teak management model in Madiun (Mr. Wiyono, 2nd Workshop, 2005, Bogor)
- 31 Local's participation to new tumpangsari system in Madiun, East Java, Indonesia (Mr. Yokota, JASTE 15, 2005, Kyoto)
- 32 Paradigm shift of tumpangsari system towards local involvement in Madiun, East Java, Indonesia (Mr. Yokota, IUFRO, 2005, Brisbane)
- 33 Economics analysis of sengon (*Paraserianthes falcataria*) community forest plantation, a fast growing species in East Java (Dr. Ulfah, IUFRO, 2005, Brisbane)

Appendix B: Input of the Project

1. Long-term Expert

Name	Title	Period	In charge
Mr. Satoru Shimazaki	Chief advisor	2001. Jan. 15 - 2003. Jan. 14	Management of Output 1-4
Mr. Hiroki Hatori	Silviculture	2001. Jan. 15 - 2003. Jan. 14	Output 1
Mr. Kiyoshi Miyakuni	Forest management	2001. Jan. 15 - 2003. Jan. 14	Output 1, 2, 3, 4
Mr. Ichiro Taniguchi	Coordinator	2001. Jan. 8 - 2004. Jan. 7	Coordination
Mr. Kazuya Ando	Chief advisor	2003. Jan. 5 - 2006. Jan. 7	Output 5 Management of Output 1-5
Mr. Tsuyoshi Kato	Silviculture	2003. Jan. 5 - 2006. Jan. 7	Output 1
Mr. Nobuo Ishibashi	Forest management	2003. Jan. 5 - 2005. Jan. 4	Output 2, 3, 4
Ms. Satomi Tanaka	Coordinator	2003. Dec. 10 - 2006. Jan. 7	Coordination Output 5 (Web)
Mr. Eichiro Nakama	Forest management	2003. Dec. 12 - 2006. Jan. 7	Output 2, 3, 4

2. Short-term Expert

Name	Title	Period	In PO
Dr. Yoshiyuki Kiyono	Biomass survey method	2001. Jun. 18-Jul. 6	1-a, b, c
Dr. Seiichi Ota	Forest soil	2001. Aug. 29-Sep. 14	1-a, b, c
Mr. Takayuki Furumoto	Charcoal production methods	2001. Sep. 2-14	3-a, b
Dr. Makoto Ogawa	Charcoal application technique	2001. Oct. 21-26	2-a, b
Dr. Yoshiyuki Kiyono	Biomass measurement method	2002. Jun. 6-29	1-a, b, c
Mr. Takayuki Furumoto	Charcoal production methods	2002. Sep. 12-21	3-a, b
Dr. Seiichi Ota	Forest soil data analysis	2002. Sep. 18-Oct. 11	1-a, b, c
Dr. Makoto Ogawa	Charcoal application technique	2002. Dec. 15-21	2-a, b
Dr. Masahiro Amano	Clean development mechanism in forest sector	2002. Dec. 15-21	1-a, b, c 4, 5

Dr. Naoto Matsumura	Financial analysis	2003.Feb.9-22	4
Dr. Kiyoshi Miyakuni	Charcoal application technique	2003.May.20-Jun.17	2-a,b
Dr. Yoshiyuki Kiyono	Biomass measurement	2003.Jul.24-Aug.16	1-a,b,c
Dr. Naoto Matsumura	Forest management analysis	2003.Oct.9-29	4
Dr. Kiyoshi Miyakuni	Charcoal application technique	2004.Feb.29-Apr.20	2-a,b
Dr. Masahiro Amano	Clean development mechanism in forest sector	2004.Mar.1-6	1-a,b,c,d 4, 5
Dr. Seiichi Ota	Forest soil data analysis	2004.Mar.10-19	1-a,b,c
Dr. Naoto Matsumura	Forest management analysis	2004.Jun.15-Jul.3	4
Dr. Iwao Noda	Database technique	2004.Jun.30-Jul.23	1-d
Dr. Kiyoshi Miyakuni	Biomass measurement	2004.Jul.12-Sep.16	1-a,b,c
Dr. Kazuhiro Harada	CDM plantation and community	2004.Jul.21-Aug.28	4-2)
Dr. Yoshiyuki Kiyono	Biomass measurement	2004.Aug.18-09.1	1-a,b,c
Dr. Seiichi Ota	Forest soil data analysis	2004.Dec.5-18	1-a,b,c
Dr. Naoto Matsumura	Forest management analysis	2005.Jan.9-15	4
Dr. Makoto Ogawa	Charcoal production and application technique	2005.Jan.10-15	2-a,b 3-a,b
Dr. Iwao Noda	Database technique	2005.Mar.16-Apr.6	1-d
Dr. Masahiro Amano	Clean development mechanism in forest sector	2005.Mar.27-Apr.2	1-a,b,c,d, 4, 5
Dr. Yoshiyuki Kiyono	Biomass measurement	2005.Jun.1-9	1-a,b,c
Dr. Naoto Matsumura	Forest management analysis	2005.Jun.16-30	4
Mr. Yasuhiro Yokota	CDM plantation and community	2005.Jun.26-Jul.15	4-2)
Mr. Masaru Ishikawa	CDM related cost and validation analysis	2005.Aug.8-21	4-3)
Dr. Seiichi Ota	Forest soil data analysis	2005.Sep.18-10.5	1-a,b,c
Dr. Iwao Noda	Database technique	2005.Sep.19-Oct.12	1-d
Dr. Naoto Matsumura	Forest management analysis	2005.Nov	4
Not confirmed	Charcoal production and application technique	2005.Nov.	2-a,b 3

3. C/P training

No.	Name	Subject of training	Duration	Output
1	Dr. Sunaryo	Research on CDM	2001.10.22-11.1	Research on CDM
2	Mr. Harris Herman Siringoringo	Forest and forestry project C/Ps training course	2002.8.13-9.28	Forest soil
3	Mr. Nur Muhammad Heriyanto	Forest and forestry project C/Ps training course	2002.8.13-9.28	Forest management
4	Mr. Ika Heriansyah	Forest and forestry project C/Ps training course	2002.8.13-9.28	Silviculture
5	Dr. Gustan Pari	Application technology for charring and charcoal	2003.8.18-12.17	Application technology for charring and charcoal
6	Dr. Ahmad Fauzi Mas'ud	Research for afforestation CDM	2003.9.1-10	Research for afforestation CDM
7	Dr. Chairil Anwar Siregar	Research for afforestation CDM	2003.9.1-10	Research for afforestation CDM
8	Mr. Basoeki Karyaatmadja	CDM research on forest sector	2004.7.20-29	CDM research on forest sector
9	Dr. Sukandi Taulana	Techniques of forest management analysis	2004.9.27-10.24	Techniques of forest management analysis
10	Mr. Imanuddin Rinaldi	Techniques of forest management analysis	2004.9.27-10.24	Techniques of forest management analysis
11	Mr. Anwar Purwoto	CDM research on forestry sector	2005.7.25-8.2	CDM research on forestry sector

4. Equipment

4.1 Main equipment for the Project

No.	Item	Qt	Amount
1	NC Analyzer sith Transfer	1	121,451.50 (US\$)
2	Vehicle (Land Cruiser 4WD turbo)	1	55,600.00 (US\$)
3	Atomic Absorption Spectrophotometer	1	45,814.29 (US\$)
4	Atomic Absorption Spectrophotometer	1	35,100.00 (US\$)
5	Vehicle (F70 GTL)	1	27,717.00 (US\$)
6	Vehicle (F70 GTL)	1	27,250.00 (US\$)
7	High Speed Vibrating Sample Mill	1	18,779.22 (US\$)
8	Plant Canopy Analyzer	1	15,538.00 (US\$)
9	High Speed Vibrating Sample Mill	1	15,420.00 (US\$)
10	Constant Temp. Oven	1	14,526.02 (US\$)
11	Plant Canopy Analyzer	1	14,371.43 (US\$)
12	Copy Machine	1	13,639.20 (US\$)
13	LCD Data Projector	1	10,696.00 (US\$)
14	Laser Distance Measurer	1	9,504.00 (US\$)
15	Laser Distance Measurer	1	9,251.43 (US\$)

4.2 Main Local procurement

16	Computer Peripherals	1	36,490,300 (Rp)
17	Notebook PC	1	16,361,050 (Rp)
18	LSD Projector	1	14,350,000 (Rp)
19	Computer	1	12,874,000 (Rp)
20	Computer	1	10,505,000 (Rp)

4.3 Main Equipment for experts

21	PERSONAL COMPUTER	1	485,000(Yen)
22	DATA PROJECTOR	1	420,000(Yen)
23	NOTEBOOK-TYPE COMPUTER IBM THINKPAD	1	368,000(Yen)
24	Software	1	235,000(Yen)
25	NOTEBOOK-TYPE COMPUTER IBM THINKPAD	1	231,000(Yen)
26	BLANCES,PRECISION ELECTRONIC	1	212,000(Yen)

Appendix C: List of Abbreviation

ACIAR:	Australian Center for International Agriculture Research
ADB:	Asia Development Bank
AR:	Afforestation and Reforestation
BEF:	Biomass Expansion Factor
C/P:	Indonesian counterpart personnel
CDM:	Clean Development Mechanism
CER:	Certified Emission Reduction
CI:	Conservation International
CIFOR:	Center for International Forestry Research
COP:	Conference on Parties
D:	Basic Wood Density
DNA:	Designated National Authority
DOE:	Designated Operational Entity
FORDA:	Forestry Research and Development Agency
GERHAN:	National Forest and Land Rehabilitation Program
GPG:	Good Practice Guidance
IAWPS:	International Conference on effective utilization of plantation
ICRAF:	International Center for Research in Agreforestation
IPB:	Bogor Agriculture University
IPCC:	Intergovernmental Panel on Climate Change
IUFRO:	International Union of Forest Research Organization
J/E:	Japanese experts
JCC:	Joint Coordinating Committee
JICA:	Japan International Cooperation Agency
JIFPRO:	Japan International Forestry Promotion and Cooperation Center
l-CER:	Long-term CER
LULUCF:	Land Use, Land Use Change, and Forestry
MAFF:	Ministry of Agriculture, Forestry and Fisheries
MOF:	Ministry of Forestry
PDD:	Project Design Document
PDM:	Project Design Matrix
PDMe:	Project Design Matrix for evaluation
PO:	Plan of Operation
PPLG-IPB:	Peatland Development Project - Bogor Agriculture University
R/D:	Record of Discussion
R:	Root to shoot ratio
SE:	Short-Term Expert
t-CER:	Temporary CER
UGM:	Gadjah Mada University
UNFCCC:	United Nations Framework Convention on Climate Change
YDT:	Yayasan Dian Tama
V:	Merchantable Volume