

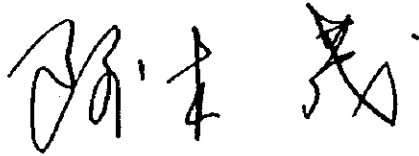
3 合同評価報告書

MINUTES OF DISCUSSION
FOR
THE JOINT EVALUATION
OF THE BRAZILIAN AMAZON FOREST RESEARCH PROJECT

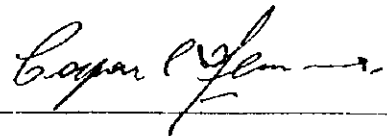
The Japanese Evaluation Team (hereinafter referred to as "the Team"), organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Aki, visited the Federative Republic of Brazil from December 9 to 22, 1997 for the purpose of evaluating the achievement of the Japanese Technical Cooperation for the Brazilian Amazon Forest Research Project (hereinafter referred to as "the Project") jointly with the Brazilian Evaluation Team headed by Mr. Stemmer, Secretary of Scientific Development, Ministry of Science and Technology of the Federative Republic of Brazil.

As a result of a series of discussions, both the Japanese and Brazilian Teams agreed to forward to respective Governments a report of the evaluation which is referred to in the document attached hereto.

December 19, 1997



Mr. Shigeru Aki
Leader
Japanese Evaluation Team



Mr. Caspar Erich Stemmer
Leader
Brazilian Evaluation Team



1. INTRODUCTION

Based upon the Record of Discussions (hereinafter referred to as "The R/D") signed on 18th April, 1995, the Government of Japan and the Government of the Federative Republic of Brazil have been implementing the Project since 1st June, 1995.

The Project is scheduled to be implemented for three (3) years and is to be completed on 31st May, 1998.

According to the R/D, the objectives of the Project are as follows:

- (1) Overall Goal : To contribute to establishment of a natural forest management model for the purpose of developing forest management technologies which can harmonize the environmental conservation and sustainable development of the Amazonian tropical rainforest.
- (2) Project Purpose: To develop basic scientific research at INPA, for forest management of the Amazonian tropical rainforest.

In order to conduct evaluation precisely and efficiently, both Teams have developed Project Design Matrix (hereinafter referred to as "PDM") as shown in Annex 1. The project purpose elaborated and redefined in PDM is as follows:

" Basic conditions and research/study methodologies necessary for INPA to develop technologies useful for the environmental conservation and sustainable development of the Brazil-Amazonian tropical rainforest are established in INPA. "

The Project has been carried out in the Central Amazonia in the form of joint study between the Japanese and Brazilian researchers in the following fields;

- a. Remote sensing
- b. Management of natural forest
- c. Rehabilitation of degraded areas

2. EVALUATORS

2-1. Japanese Side

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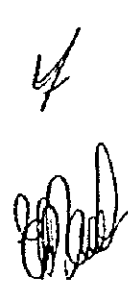
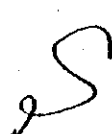
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3. OBJECTIVES OF THE EVALUATION

Objectives of the evaluation of the Project are as follows:

- (1) To execute a comprehensive evaluation of the achievement in accordance with the original plan described in the R/D, Tentative Schedule of Implementation (TSI), and PDM.
- (2) To make recommendations and suggestions concerning the measures to be taken for the rest of the Project period and after the termination of the Project period to the authorities of the respective Governments.

4. METHODOLOGY OF EVALUATION

4-1. Survey

The Project was evaluated jointly by the Japanese and Brazilian sides. The Team visited project sites and had a series of hearings from Japanese long-term experts, Brazilian counterpart researchers and important parties related to the Project.

4-2. Items of the Evaluation

4-2-1. Accomplishment of the Project

Accomplishment of the Project was measured in terms of inputs, activities, outputs and project purpose, all of which accord with the R/D, TSI and PDM.

4-2-2. Analysis on Evaluation Issues

(1) Effectiveness

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Effectiveness was assessed by evaluating the extent to which the Project has achieved the project purpose and the causes why the purpose was achieved to such a degree in terms of the relationship among the project purpose, outputs, activities and assumptions.

(2) Impact

Impact of the Project activities was forecasted as positive and negative changes produced by the Project mainly in the aspect of unexpected changes.

(3) Efficiency

Efficiency of the project implementation was analyzed with the emphasis on the relationship between outputs and inputs in terms of timing, quality and quantity.

(4) Rationale of the Plan

Rationale of the Project plan was reviewed as the validity of project purpose and overall goal in connection with the development policy of the Government of Brazil and needs of the beneficiaries and also the logicity of the project plan.

(5) Sustainability

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

5. RESULTS OF EVALUATION

5-1. Accomplishment of the Project

5-1-1. Inputs

(1) Measures taken by the Government of the Federative Republic of Brazil

1) Provision of Land, Building and Facilities

Necessary facilities as follows have been provided for the Project.

Land : Campus Aleixo, Campus V-8, Forest Reserve A. Ducke (10,000 ha), EEST-Station (Experimental Station for Tropical Silviculture) and ZF-2 Experimental Station for Forest Management (together 21,000 ha).

Buildings : Offices of INPA's researchers, Offices for Japanese Experts, Library, Laboratories (02 labs. for Seed Technology, 01 lab. for Ecophysiology, 01 lab. for Forest Management, 01 lab. for Sample Preparation, 02 labs. for Soil and Plant Nutrition), Canteen, Dormitories and Canteen in the Field Stations and Forest Reserve.

Facilities : Refurbishment of EEST, ZF-2 and R. Ducke Stations, Refurbishment of laboratories, Vehicles, D6-tractor.

2) Assignment of Counterpart Researchers and Other Staff

During the cooperation period, 14 researchers have participated in the Project and approximately 38 administrative staff members also supported the activities of the Project.

In addition, 6 other researchers and 3 students have participated in the research activities. They are supported by research grants and scholarships from The Ministry of Science and Technology and National Council for Scientific and Technological Development.

3) Allocation of Special Budget

R\$100,000. (equivalent of 11 million Japanese yen*) have been allocated annually for the implementation of the Project.

* Foreign exchange rate : 1R\$ = 110 Japanese yen is applied.

(2) Cooperation by the Government of Japan

1) Dispatch of Experts

a. Long-term Experts

Five (5) experts such as Team Leader, Liaison Officer, Researchers on management of natural forest, rehabilitation of degraded area with different working period, one to three years term have been dispatched.

b. Short-term Experts

A total of nine (9) researchers in the fields of remote sensing, management of natural forest, rehabilitation of degraded were dispatched. (A total of 12 missions were dispatched.) And two (2) more researchers are scheduled to be dispatched during Japanese fiscal year 1997.

2) Provision of Machinery and Equipment

The machinery and equipment worth approximate 99 million Japanese yen (equivalent of R\$900,000.) were provided for the Project.

3) Study Tour and Training of Counterpart Researchers in Japan

Seven (7) Brazilian researchers were invited for training and study tour in Japan.

4) Special Measures

For effective implementation of the Project, a total amount of approximate 54 million Japanese yen (equivalent of R\$491,000.) has been provided to supplement a portion of local expenditures, as cost for field work related to foreseen reforestation mainly in the component of Rehabilitation of Degraded Area.

5-1-2. Activities

(1) Research related activities (to establish research conditions and to conduct researches)

Necessary activities to realize Outputs and Project Purpose were identified as a set of actions (Activity 1 and 2) in PDM and undertaken in each concrete subject as follows;

RESEARCH AREA 1. REMOTE SENSING

1-a. Forest type mapping

1-a-(1) Classification of forest types of INPA Experimental Forests

1-b. Forest change mapping

1-b-(1) A study on information systems for detection of forest type changes

RESEARCH AREA 2: MANAGEMENT OF NATURAL FOREST

2-a. Forest inventory

2-a-(1) Structural analysis of natural forests

2-a-(2) A study of sampling methods and data management

2-b. Faunistic inventory

2-b-(1) Preparation of the list of mammals in natural forests

2-b-(2) A study of techniques for analyzing faunistic diversity

RESEARCH AREA 3: REHABILITATION OF DEGRADED AREAS

3-a. Ecological characteristics of major tree species

3-a-(1) Ecological and physiological properties of tree species

3-a-(2) Ecophysiological properties for seed management

3-a-(3) A study on soil characteristics

3-b. Seedling production for reforestation technologies

3-b-(1) Ecophysiological properties for seedling management

3-b-(2) Establishment of gene conservation technologies

(2) Other activities (also identified in PDM as Activity 3.)

1) Administrative management

Activities such as financial management of the Japanese team's operation cost, the budget of Special Measures and the procurement of equipment and also other administrative work related to the procurement of equipment have been carried out.

2) Monitoring of the Project

Monitoring of the project has been undertaken by the use of the variety of means such as 1) to hold the Joint Coordination Committee, 2) to hold the Joint Executing Committee, 3) Interim workshop including the presentation by researchers and 4) to make a progress report

and monitoring report (both in Japanese). There is, however, room for improvement in this aspect, because monitoring tools including plan of operations have not been in use sufficiently and some of the tools were not shared by both Japanese and Brazilian sides.

5-1-3. Outputs

Outputs are the concrete accomplishment of the Project achieved by the end of the Project period. Outputs of the project are also defined in PDM as follows:

- (1) Concrete research results and research methods are acquired/established in each of 11 small subjects of three fields such as remote sensing, management of natural forest and rehabilitation of degraded area.
- (2) Facilities, equipment and machinery related to researches are established/installed in each research field.

Results of these Outputs in each research subject are as follows;

RESEARCH AREA 1. REMOTE SENSING

1-a. Forest type mapping

1-a-(1) Classification of forest types of INPA Experimental Forests

A new laboratory of remote sensing including 3 work stations, 3 PCs, software of remote sensing and GIS was established by May, 1997. Common software TNT mips were finally installed in early December, which completed the scheduled installment of the equipment.

Classification of types of forest of Amazon area including ZF-2 site is going on by utilizing the satellite image currently. Achievement has not reached the originally expected level and further effort towards making of reports is expected.

1-b. Forest change mapping

1-b-(1) A study on information systems for detection of forest type changes

Observation has been undertaken by the use of periodic photographing equipment installed on the observation tower of 40m height at ZF-2 site in order to clarify the phenology of trees, which is an important factor of analysis in remote sensing data. Positioning of forest at the site was confirmed, its relationship with the photographic image was checked and a method of data analysis is under development.

Progress is a little late for the original plan but a certain achievement is expected by the continuous research.

RESEARCH AREA 2: MANAGEMENT OF NATURAL FOREST

2-a. Forest inventory

2-a-(1) Structural analysis of natural forests

Two transects (2,500 m X 20 m) were set up in the area of ZF-2 and local names and all trees bigger than 10cm DBH were recorded, tagged and measured. In natural regeneration studies, a total of four sub-plots were set up in each transect and all trees of less than 10cm DBH and more than 1.5m height were recorded. The above research reveals stand structure of natural forest and species composition in the transects and the result is expected to be reported in the academic conference of the next year. Thus, this subject has been smoothly proceeding along with the original plan.

2-a-(2) A study of sampling methods and data management

Considerable volume of data concerning species, size, spatial positioning, and geography collected at a site set-up in ZF-2 was analyzed and sampling methods were discussed. These results are expected to be reported in an academic conference of the next year.

Progress is a little late for the original plan in this subject.

2-b. Faunistic inventory

2-b-(1) Preparation of the list of mammals in natural forests

By recording the species and behavior of mammals living in the area of ZF-2 and EEST, the relationship between mammals and plants, particularly the dispersal of fallen fruits of trees by mammals has been clarified.

The result has been reported in academic conferences including international ones and also published in the form of paper. Thus, this subject has proceeded well.

2-b-(2) A study of techniques for analyzing faunistic diversity

Automatic photographing instrument was developed by the use of infrared rays sensor and the field research technology was studied in order to analyze the faunistic diversity quantitatively.

The result was reported in various academic conferences including international ones. The research method was recognized internationally as a kind of pioneer, which is important not only for the Amazon area research but also for tropical forest studies in the world. Accordingly, the result seems to have exceeded the originally expected level and to be very good.

RESEARCH AREA 3: REHABILITATION OF DEGRADED AREAS

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EEST

3-a. Ecological characteristics of major tree species

3-a(1) Ecological and physiological properties of tree species

Examinations such as 1) light and water stress in nurseries, 2) seedling survival in enrichment plantation and 3) ecophysiology in seedling grown in logged over forest area have been conducted. Nurseries and experimental forest are maintained properly and the reports will be made later on.

The progress is a little behind of the plan, because of the delay of the installment of facilities and equipment.

3-a(2) Ecophysiological properties for seed management

Examinations such as 1) biometric studies, 2) characteristics of seed germination and 3) seed storage study and management of seeds collection have been conducted. Establishment of seeds stock rooms, installment of equipment such as germination chamber have been properly undertaken.

Part of results were reported in academic conferences and further reporting is scheduled. This subject has been proceeding well.

3-a(3) A study on soil characteristics

Physical and chemical relationship between topography of transects set-up in the research forest and soil was analyzed and features of soil of plantation forest was also analyzed.

Experimental forest is properly managed but there is some problem about the equipment affecting the research activities. The research results will be summarized after the completion of surveys.

3-b. Seedling production for reforestation technologies

3-b(1) Ecophysiological properties for seedling management

Examinations such as 1) light condition study, 2) fertilizer condition study, and 3) cutting production study have been conducted. Nurseries are properly managed and equipment such as tractor is also properly utilized. Results were exchanged among researchers and analyzed comprehensively and papers and reports are expected to be made later on.

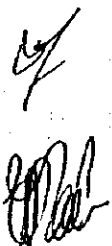
This subject has been proceeding well but there is some delay of experiment (cutting).

3-b(2) Establishment of gene conservation technologies

Germplasma bank has been studied and seed orchard is to be established. Experimental forest for the seed collection and equipment for forest research are properly managed.

Although data on mother tree has been accumulated, the progress is behind of the plan. Results such as reports, however, are expected to be made.

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5-1-4. Accomplishment of Project Purpose

Project Purpose is redefined as :

"Basic conditions and research/study methodologies necessary for INPA to develop technologies useful for the environmental conservation and sustainable development of the Brazil-Amazonian tropical rainforest are established in INPA."

In this Project, the relationship between Project Purpose and Outputs is that the latter is the summary situation of the former. Accordingly, based on the findings shown above, it can be concluded as follows:

1) In terms of research conditions, situation is good and 2) in terms of research results such as reports or manuals, there is some weak achievement in subjects including remote sensing, although certain achievement was observed.

5-1-5. Prospect of Overall Goal

Overall Goal is the long-term objective which Project Purpose will contribute to with the time frame such as 3 - 5 years after the end of a project period. Overall Goal of the project is stated in R/D as follows;

"To contribute to establishment of a natural forest management model for the purpose of developing forest management technologies which can harmonize the environmental conservation and sustainable development of the Amazonian tropical rainforest."

As we have seen in the evaluation of Outputs and Project Purpose, there are certain achievements in both aspects of research circumstance and results. Accordingly, these achievements' contribution to the above stated goal will be substantial in the long run. Particularly, INPA's strong will and capability to utilize the developed skills in the real setting with the cooperation of private sector is noteworthy and endorses such prospect.

Finally, technically speaking, the present form of the statement of Overall Goal is beyond the above mentioned time frame and is even longer term oriented as objective. Therefore, also considering the time consuming feature of forestry itself, the original Overall Goal stated in the R/D could be redefined into Super Goal of time frame of around 10 years and more and Overall Goal as shown in PDM.

5-2. Analysis on Evaluation Issues

5-2-1. Effectiveness

In remote sensing, delay of procurement of equipment caused by many reasons including external factors definitely affected the activities, which resulted in incomplete results. In natural forest management, good cooperative activities smoothly led to good results. In rehabilitation of degraded area, outputs of some subjects were affected by the

delay of procurement of equipment and shortage of staff. In other subjects particularly those in which thorough discussion was held in the planning stage among the research group, activities led to the good results.

5-2-2. Impact

As stated in the part of the prospect of Overall Goal, the Project is expected to contribute to the sustainable development of the forest through the formulation of multiple forest management model in the long run. In addition, the following unexpected impact is expected from the Project.

It is expected that achievement of the project will not be limited to the inside of INPA or to the Amazon area but be extended to the surrounding Amazonian nations by the researchers' communication through international scheme such as UNAMAZ, which was not expected at the time of project planning. Moreover, the Project is expected to be approved as the PPG7 (G7-Pilot Program), in which case the result of the Project can be shared by other projects through many opportunities such as fora or conferences.

Second, by transferring the effective way of the rehabilitation of degraded area to the private sector, some economic benefit can be expected.

Third, in some fields of the project, associate researchers supported by the Ministry of Science and Technology with special scholarship have some part of responsibility to project activities. Such activities not only contribute to the activation of the project but also to the development of human resource related to forestry research.

5-2-3. Efficiency

(1) Timing of most of equipment was not problematic but delay of installment of some equipment particularly in remote sensing negatively affected the related subjects.

(2) Quality of most of provided equipment is satisfactory and in good use but some equipment is not fully utilized at the moment by the reasons such as lack of proper manuals.

5-2-4. Rationale of the Plan

(1) Brazilian government has put the strong priority on the environmental issue, particularly on the conservation of the Amazon Tropical Rainforest. Because of the continuous decrease of forest resources, Government has introduced a series of policies and regulations such as *Integrated National Policy for the Legal Amazon - Brazil* (1995), Law 9393 (1996, new law for the taxation for rural land) and Temporary Measure 1511 (1996, for the land development limit). The project has strong relations with these policies and regulations either directly and indirectly. Accordingly, necessity and importance of the Project remain very strong.

(2) PDM, which was introduced for the proper evaluation this time, clarifies the basic framework of the project and it is observed that there is a meaningful linkage between each

level of narrative summary (objectives and activities) .

(3) More detailed planning, however, seems to have been late and weak for both sides and monitoring activities have room for improvement accordingly.

5-2-5. Sustainability

(1) Organizational aspect

INPA is a well established full fledged institute of international reputation. And according to the Ministry of Science and Technology, to which INPA belongs to, it is expected to be maintained in the present form in the future. Therefore, organizational basis of INPA and its component related to the Project seems to be firm.

(2) Financial aspect

INPA has been supported strongly by the Brazilian government, which is evidenced by the significant increase of budget it has received recently. The Project has also been supported with special assistance spent for the research facilities and also by the special budget used for the associate researchers's recruitment. At the same time, however, the Team has an impression that the Project's budget for running cost is not necessarily abundant. As a whole, it may be concluded that financial sustainability of the Project itself could be strengthened.

(3) Human resources and technological aspect

Researchers participating in the Project are qualified staff and it is unlikely that these personnel will not remain in INPA. Accordingly, sustainability from the human resources aspect is not low in the short term, although it is observed that researchers of younger generation of regular staff are not many in the project or INPA.

Technologically speaking, the basis of research towards the future objectives stated in Overall Goal seems to be well formulated. Maintenance system of equipment and facilities, however, needs to be strengthened in terms of repair and parts supply.

6. CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

Overall evaluation is summarized as follows.

With regard to the *Project Achievement*, situation is good in terms of research conditions and some subjects reached very good level but others show some weakness or delay in terms of research results. In *Efficiency* aspect, delay of procurement of some equipment had negative effect, although provided equipment was of proper quality and in good use in general. *Rationale* of the Project seems to be strong in general, although detailed

planning and monitoring need to be improved. With regard to *Impact*, some unexpected positive aspect such as the prospect of internationally spreading research results is observed in addition to the originally expected aspect. *Sustainability* seems to be not weak but factors of the Project such as the human resources development and finance need to be strengthened.

The Japanese Team would like to supplement the evaluation by the following comment on the Project.

There had been several difficulties in this project since the beginning. One aspect is that the Project has been undertaken not simply as technological transfer from the Japanese side to the Brazilian side like other many technical cooperation organized by JICA but the Project has had some feature of joint research program between two countries. Accordingly, particularly in the early stage of the Project, there were some difficulties to coordinate the various activities, which was also affected by the difference of cultural background of researchers. Another is the environmental difficulties such as occasional shortage of electricity supply and the weather conditions to affect the visits to the fields. Much effort was needed to overcome these difficulties.

Considering these challenges which do not necessarily come to the surface of the evaluation to be noticed, the Team would like to pay strong respect to the Project staff and related parties.

6-2. Recommendations

(1) Short term recommendations for the remaining project period

1) Improvement of planning activities : More detailed planning, which is the annual plan including the concrete targets and activity items, should be undertaken for the purpose of effective project implementation. Thorough discussion such as Project Cycle Management (PCM) workshop among researchers is also very effective at the time of project design for the future phase. (This item is important in the long term as well.)

2) Improvement of monitoring activities : Monitoring method should be improved by the use of PCM method and also such exercise should be shared by both the Brazilian and the Japanese sides, which is expected to contribute to the formulation of stronger coordination among researchers. (This item is important in the long term as well.)

3) Accumulation of know-how related to the procurement of the equipment : Experiences related to the procurement of equipment should be kept in the form of precise records and a simple manual as valuable lesson.

4) Effective utilization of provided equipment : Provided research equipment should be fully utilized by the proper procurement based on the precise planning and also the system of good

maintenance needs to be introduced.

5) Authorization of the project as INPA's Institutional Research Project (PPI) : Considering the importance of the Project and its achievement, both Teams believe that the Project is worth considering as PPI.

(2) Long term recommendations concerning the future orientation of the Project

1) Strengthening of human resources development : Researchers of younger generation of regular staff are definitely in short and they are expected to be increased by some measures taken by INPA with governmental support, if necessary.

2) Strengthening of financial basis : Financial basis of the project related to running cost had better be strengthened towards the increase of sustainability in the future.

Finally, a request for the Phase II, which will contribute to the improvement of forest management technology useful for the recovery of degraded area, was submitted by the Brazilian Government. Considering the achievement of the Project, the Evaluation Teams consider it is worth undertaking the Phase II. In order that the next phase can be undertaken effectively, however, it is recommended that the new phase be started at the time when the situation is ready by undertaking follow-up activities particularly in the fields which have relatively bigger room for improvement. It is also important that INPA conducts necessary activities during the follow-up period even in the fields which showed considerable achievement.

In conducting follow-up activities based on the result of report, it is recommended that related organizations of both countries should take necessary procedures such as the signature of R/D and TSI for the follow-up cooperation and the preparation of A1 form for the request of dispatch of Japanese experts as smoothly as possible.

The Evaluation Teams believe that conservation of forest resources in Amazon is an extremely important objective and thus the Project is conducting a very valuable task. The Evaluation Teams hope to see the project further develops by considering and adopting the above stated recommendations and eventually realize the above objective.

Annex 1: The Brazilian Amazon Forest Research Project: PDM 1. Period of Cooperation: 3 Years (June 1, 1995 to May 31, 1998) 2. Methodology: This PDM was completed by revising the draft of PDM prepared by the Japanese Experts, based on the discussion between the evaluation team and the project team. 3. Japanese Implementing Agency: JICA 4. The Beneficiary Country's Implementing Agency: INPA. 5. Project Area: Same as 1. (ed. on Dec 12)

Narrative Summary	Indicator	Means of Verification	Assumption
Super Goal Forest management is undertaken harmonizing the environmental conservation and sustainable development of the forest resources in the tropical rainforest of Amazon area.	By the year around 2010. 1 Activities of the education of and the transfer of skills to local residents for sustainable development of forest resources are carried out in a broad area of Brazil Amazon. 2 A considerable number of staff conduct such training and educational activities in Brazil Amazon (Note)	Records of training and educational activities. Text and teaching material in use (Note)	1 Brazilian government's forestry and environment related policies do not change considerably. 2 Human factors negatively influencing forest environment do not worsen. (Note)
Overall Goal Multiple forest management technology model for sustainable management of forest resources including the rehabilitation of degraded area is formulated.	By the year around 2003. 1 Practical administrative guidelines including concrete operation manuals are formulated. 2 Situation of Amazonian forest including degraded area is properly monitored. 3 Experimental planting forests are properly managed by the use of research achievement of INPA. (Note)	1 Administrative guidelines 2 Basic information such as vegetation maps, topography maps and soil maps of Amazon region based on remote sensing data 3 Record of experimental planting forest management (Note)	1 Organizations and system to extend skills developed in INPA are well established by the government, (e.g. "System of delivery of information on forest management technology model") 2 There is good cooperation among governmental organizations related to Amazonian forest environment (Note)
Project Purpose Basic conditions and research/study methods necessary for advancing researches on the development of technology of environmental conservation and sustainable management of forest resources are established in INPA.	By the end of the project period, research results and methods necessary for effective and continuous researches are acquired/established and research environment is established towards the realization of the Overall Goal in INPA.	the same as those at Output level	1 Personnel and budget necessary for conducting researches continuously are maintained in INPA. 2 There is good coordination among related research departments in INPA. 3 Brazilian researchers remain in INPA.
Outputs 1 Concrete research results and research methods are acquired/established in each of 11 small subjects of three fields such as remote sensing, management of natural forest and rehabilitation of degraded area (see the attached supplementary sheet). 2 Facilities, equipment and machinery related to researches are established/installed in each research field.	(The relevant items among the following ones are applied to each of 11 small subjects, see the attached supplementary sheet) In INPA, by the end of the project period 1 Research results contributing to the realization of Overall Goal are summarized in the form of thesis, publication or database. 2 Research methods contributing to the realization of Overall Goal are summarized and standardized in the form of manuals. 2 1 Nurseries and seeds stock rooms are properly managed. 2 2 Experimental forest is properly managed. 2 3 Research equipment is effectively utilized.	1 1 Publications including thesis and articles 1 2 Records (publication) of presentations in seminars conducted in INPA 1 3 A list of expected publications of INPA 1 4 Presentations in academic conferences 1 5 Seminars held outside of INPA 1 6 Database of research results 1 7 Manuals to standardize research procedures 2 1 Record of management of nurseries and seeds stock rooms 2 2 Record of management of experimental forest 2 3 Lists of existing equipment, equipment management charts, and other records of the operation and maintenance of equipment	
Activities 1 In three fields of remote sensing management of natural forest and rehabilitation of degraded area (11 small subjects). 1 1 To plan and design examinations. 1 2 To formulate examination schedules. 1 3 To conduct examinations. 1 4 To collect and analyze data. 1 5 To verify the viability of the research result. 1 6 To produce report, thesis or manuals. 1 7 To report in academic conferences. 1 8 To conduct C/P study in Japan. 2 1 To identify experimental forest and research equipment necessary for conducting researches. 2 2 To prepare/install new nurseries and research equipment according to necessity. 2 3 To manage or maintain nurseries and research equipment. 3 1 To conduct administrative management including financial management for the entire project. 3 2 To undertake monitoring of the entire project.	Inputs Japan 1 Dispatch of experts Long term experts: several persons/year (Team leader, Management of natural forest, Rehabilitation of degraded area and Liaison Officer) Short term experts, according to necessity (Remote sensing, Management of natural forest and Rehabilitation of degraded area) 2 Receiving of researchers 2 persons/year 3 Provision of Equipment 1) Equipment for remote sensing 2) Equipment for forest research/study 3) Vehicles and tractors 4 Special budget for afforestation 1) Establishment and management of nurseries 2) Construction of forest road Brazil 1 Assignment of personnel Around 17 counterpart researchers and administrative staff of several people 2 Provision of land, buildings and furniture 3 Running cost of INPA (including public utility charges)		1 Procedure of customs clearance of equipment is undertaken smoothly. 2 Brazilian researchers can allocate enough time for project activities. Pre condition 1 There are research sites and land for nurseries of enough space. 2 Qualified researchers are available for the project.

Note 1. Details of the content of Super Goal and Overall Goal were not discussed at the time of planning. Accordingly, indicators, means of verification and assumptions stated are examples.

The Brazilian Amazon Forest Research Project : PDM Supplementary Sheet (1/2)

: Relationship between small subjects and Output indicators

Small Subjects	Output Indicators				
	1-1. Papers, thesis, reports database	1-2. Manuals	2-1. Nurseries and seeds stock rooms	2-2. Experimental Forest	2-3. Research equipment
<p>1-a(1) Classification of forest types of INPA Experimental Forests: To develop the methodology on classification and mapping of forest types around INPA Experimental Forests using multi stage remote sensing data and ground survey for the purpose of creating vegetation data sets of the Experimental Forests.</p> <p>1-b(1) A study on information systems for detection of forest type changes To establish the methodology on detection of forest land changes, and to develop database system using GIS (Geographic Information System) and remote sensing technologies for long term monitoring of forest environment and rehabilitated areas.</p>	<input type="radio"/>			<input type="radio"/>	<input type="radio"/>
<p>2-a(1) Structural analysis of natural forests To analyze stand structure and floristic composition of the natural forests for future evaluation of dynamics and diversity of plant communities and development of sound natural forest management.</p>	<input type="radio"/>			<input type="radio"/>	
<p>2-a(2) A study of sampling methods and data management To develop the methodology on sampling design and data management for the evaluation of the existing natural regeneration and adult tree species within the limits of INPA's experimental station.</p>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	
<p>2-b(1) Preparation of the list of mammals in natural forests To prepare the taxonomical inventory of mammals in natural forests for future evaluation of interactions between plants and animals.</p>	<input type="radio"/>			<input type="radio"/>	<input type="radio"/>
<p>2-b(2) A study of techniques for analyzing faunistic diversity To establish field research techniques through modification or combination of various existing techniques for future quantitative analysis of faunistic diversity.</p>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>

The Brazilian Amazon Forest Research Project: PDM Supplementary Sheet(2/2)

: Relationship between small subjects and Output indicators

Small Subjects	Output Indicators				
	1-1. Papers, thesis, reports, database	1-2. Manuals	2-1. Nurseries and seeds stock rooms	2-2. Experimental Forest	2-3. Research equipment
3-a(1) Ecological and physiological properties of tree species To collect preliminary information on ecological and physiological characteristics to understand initial establishment of selected trees under natural conditions for complementation of silviculture technologies.	○	○	○	○	○
3-a(2) Ecophysiological properties for seed management To identify the ecophysiological properties of seeds such as germination pattern, dormancy, desiccation tolerance, temperature tolerance, chemical composition and others, if possible.	○	○	○	○	○
3-a(3) A study on soil characteristics To characterize the soils of natural forests (specific geographical areas in accordance with item 3-a(1) and degraded lands.	○	○	○	○	○
3-b(1) Ecophysiological properties for seedling management To identify the ecophysiological properties of seedlings in nursery in relation to light condition, nutritional conditions and various stresses for making guidelines of seedling production suitable for the Amazonous region.	○	○	○	○	○
3-b(2) Establishment of gene conservation technologies To collect basic information of selected trees to establish seed orchards and germplasm bank 'in situ' for gene conservation of Amazonous tree species.	○	○	○	○	○

THE RECORD OF DISCUSSIONS
ON THE JAPANESE TECHNICAL COOPERATION PROGRAM
BETWEEN THE JAPAN INTERNATIONAL COOPERATION AGENCY
AND THE NATIONAL INSTITUTE OF AMAZONIAN RESEARCH
FOR
THE BRAZILIAN AMAZON FOREST RESEARCH PROJECT

The Implementation Survey Team (hereinafter referred to as "the Team") of the Japan International Cooperation Agency (hereinafter referred to as "JICA"), headed by Mr. Junichi Konuma, Former Deputy Director, Forestry and Forest Products Research Institute, Ministry of Agriculture, Forestry and Fisheries visited the Federative Republic of Brazil from April 9th to April 20th, 1995, and had a series of discussions with the Brazilian Cooperation Agency (hereinafter referred to as "ABC"), the legal intervenient agency on behalf of the Government of the Federative Republic of Brazil, headed by Mr. Sergio Arruda, Director, and with the National Institute of Amazonian Research (hereinafter referred to as "INPA"), headed by Mr. Ozorio Jose de Menezes Fonseca, Director, and Ministry of Science and Technology (hereinafter referred to as "MCT"), represented by Mr. Lindolpho de Carvalho Dias, Executive Secretary, to work out the details of the technical cooperation program for the Brazilian Amazon Forest Research Project (hereinafter referred to as "the Project").

As a result of the discussions, the JICA Team, ABC, MCT and INPA agreed to recommend to their respective governments the matters which follow hereafter, in accordance with the Basic Agreement on technical Cooperation between the Government of Japan and the Government of the Federative Republic of Brazil, signed in Brasilia on September 22nd, 1970 (hereinafter referred to as "the Basic Agreement").

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I. COOPERATION BETWEEN BOTH GOVERNMENTS

1. The Government of Japan and the Government of the Federative Republic of Brazil will cooperate mutually in implementing the Project for the purpose of contributing to the establishment of natural forest management model for the purpose of developing the forest management technologies which can harmonize the environmental conservation and sustainable development of the Amazonian tropical rainforest.
2. The Government of the Federative Republic of Brazil, through ABC, will designate the MCT/INPA as the executing institution for the implementation of the Project.
3. The Project will be implemented in accordance with the Master Plan of the Project as stipulated in ANNEX I.

II. DISPATCH OF JAPANESE EXPERTS

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures, through JICA, which is the executing agency for the technical cooperation by the Government of Japan, to provide, at its own expense, the services of Japanese experts as listed in ANNEX II, through the normal procedures under the technical cooperation scheme of the Government of Japan.
2. In accordance with the laws and regulation in force in Brazil, the provisions of the Article IV (1), V (1)(iii) and (2), VI VII and VIII of the Basic Agreement, will apply to the Japanese experts referred to in 1., above, and to their families, to the extent that the latter may be relevant.

III. PROVISION OF EQUIPMENT, MACHINERY AND MATERIALS BY THE GOVERNMENT OF JAPAN

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures, through JICA, to provide, at its own expense, the

equipment, machinery and materials required for the implementation of the Project through the normal procedures under the technical cooperation scheme of the Government of Japan.

2. The list of the equipment, machinery and materials required will be agreed upon between the authorities concerned of the two Governments within the scope those stipulated in ANNEX III.

3. The provisions of the Article IX of the Basic Agreement will apply to the equipment, machinery and materials referred to in 1. and 2. above.

4. In accordance with the laws and regulations in force in Brazil, the Government of the Federative Republic of Brazil, through MCT and INPA, will meet the expenses necessary for installation, operation and maintenance of the equipment, machinery and materials referred to in 1. and 2. above.

IV. TRAINING OF BRAZILIAN COUNTERPART PERSONNEL IN JAPAN

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures, through JICA, to receive, at its own expense, Brazilian counterpart personnel involved in the Project for technical training and/or a study tour in Japan, through the normal procedures under the technical cooperation scheme of the Government of Japan.

2. The provisions of Article IV(2) of the Basic Agreement will apply to the techniques and knowledge acquired by the counterpart personnel mentioned in 1., above.

V. MEASURES TO BE TAKEN BY THE GOVERNMENT OF THE FEDERATIVE REPUBLIC OF BRAZIL

1. In accordance with the laws and regulations in force in Brazil, the Government of the Federative Republic of Brazil, through MCT and INPA, will take necessary measures to provide, at its own expense:

Handwritten signatures and initials: M, SP, DM, JK

- (1) The services of Brazilian counterpart personnel and administrative staff, necessary for the implementation of the Project, as listed in ANNEX IV ;
 - (2) The land, buildings and facilities necessary for the implementation of the Project, as listed in ANNEX V.
 - (3) The supply or replacement of equipment, machinery, vehicles, instruments, tools, spare parts and other materials necessary for the implementation of the Project, other than those provided by the Government of Japan under III.1., above.
2. In accordance with the laws and regulations in force in Brazil, the Government of the Federative Republic of Brazil, through MCT and INPA, will take necessary measures to meet current expenses of the Project.
3. In accordance with the laws and regulations in force in Brazil, the Government of the Federative Republic of Brazil, through MCT and INPA, will take necessary measures to ensure that the self-reliant operation of the Project will be sustained during and after the period of Japanese technical cooperation, through the full and active involvement in the Project by all related authorities, beneficiary groups and institutions.

VI. SPECIAL MEASURES TO BE TAKEN BY THE GOVERNMENT OF JAPAN

In case the Government of the Federative Republic of Brazil decides on the implementation of a special plantation and survey programs for the rehabilitation of the degraded land and management of natural forest, as components of the Project and considers partially supporting its expenditures, the Government of Japan will also consider to supplement the cost of the above-mentioned special programs.

VII. PROJECT MANAGEMENT

1. The Secretary of Programs Coordination of MCT, as the Project Director, will have overall responsibility for the Implementation of the Project.



2. The Director of INPA, as the Head of the Project, will be responsible for the administrative and managerial aspects of the Project.
3. The researcher designated by Director of INPA as the Project Coordinator, will be responsible for the issues on the research works and the management.
4. The Japanese Team Leader will provide the necessary recommendations and advice on technical and administrative matters concerning the implementation of the Project to the Project Coordinator, and, if necessary, to the Project Director.
5. The Japanese experts will provide the necessary guidance and advice on the technical matters concerning the implementation of the Project to the Brazilian counterpart personnel.
6. For the effective and successful implementation of the Project, a Joint Coordinating Committee will be established on the Project, composed of the members listed in ANNEX VI, and will meet at least annually. The Committee will formulate the details of the Master Plan referred to in I. 3. above and an Annual Work Plan of the Project to be submitted for approval to the authorities concerned of the two Governments.

VIII. JOINT EVALUATION

Evaluation of the Project will be conducted jointly by the two Governments, through ABC, MCT, JICA, and INPA, at the middle and during the last six (6) months of the cooperation term in order to examine the level of achievement.

IX. MUTUAL CONSULTATIONS

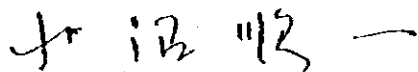
The two Governments will consult mutually in respect of any matter that may arise from, or in connection with this Record of Discussions.

Handwritten signatures and initials:
A large handwritten signature, possibly "LOR".
A smaller handwritten signature, possibly "S.M.". 
A circled handwritten signature, possibly "JK". 

X. TERM OF COOPERATION

The duration of the technical cooperation for the Project under this Record of Discussions will be three (3) years from June 1st, 1995.

Brasilia, April 18, 1995



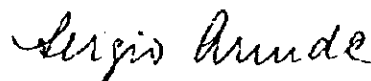
Mr. Junichi Konuma
Team Leader
Japanese Implementation Survey Team
Japan International Cooperation Agency
Japan



Mr. Ozorio Jose de Menezes Fonseca
Director
National Institute of Amazonian Research
Federative Republic of Brazil



Mr. Lindolpho de Carvalho Dias
Executive Secretary
Ministry of Science and Technology
Federative Republic of Brazil



Mr. Sergio Arruda
Director
Brazilian Cooperation Agency
Federative Republic of Brazil

ANNEX - I MASTER PLAN

1. OBJECTIVES OF THE PROJECT

(1) OVERALL GOAL

To contribute to establishment of a natural forest management model for the purpose of developing a forest management technologies which can harmonize the environmental conservation and sustainable development of the Amazonian tropical rainforest.

(2) PROJECT PURPOSE

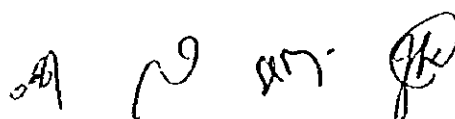
To develop basic scientific research at INPA, for forest management of the Amazonian tropical rainforest.

2. OUTPUTS OF THE PROJECT

- (1) To develop basic remote sensing techniques to be applied to the understanding and monitoring of forest change in the Amazonian tropical rainforest.
- (2) To collect scientific basic data for management of natural forest.
- (3) To develop basic knowledge and techniques in the evaluation of selected forest tree species for rehabilitation of degraded areas.
- (4) To establish basic requirements for research activities in the study areas.

3. ACTIVITIES OF THE PROJECT

- (1) Remote sensing
 - a. Forest type mapping
 - b. Forest change mapping
- (2) Management of natural forest
 - a. Forest inventory
 - b. Faunistic inventory
- (3) Rehabilitation of degraded areas
 - a. Ecological characteristics of major tree species
 - b. Seedling production for reforestation techniques



4. PROJECT SITES

- (1) INPA headquarters in the city of Manaus
- (2) EEST experimental forest of INPA
- (3) Ducke experimental forest of INPA

NA AM (GR) SA

ANNEX - II LIST OF JAPANESE EXPERTS

- (1) Team Leader ;
- (2) Liaison Officer ;
- (3) Experts in the following fields :
 - a. Management of natural forest
 - b. Rehabilitation of degraded areas

The Team Leader may serve concurrently as one of these experts, if necessary.

- (4) Short-term experts in related fields will be dispatched when necessity arises.

NA AMI (JK) AB

ANNEX—III LIST OF MACHINERY AND EQUIPMENT

1. Machinery and equipment for ;
 - a. Remote sensing
 - b. Management of natural forest
 - c. Rehabilitation of degraded areas

2. Machinery and equipment in other related fields mutually agreed upon as necessary

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ANNEX-IV LIST OF BRAZILIAN COUNTERPART AND
ADMINISTRATIVE PERSONNEL

1. Project Director
2. Project Coordinator
3. Counterpart personnel in the following fields :
 - a. Remote sensing
 - b. Management of natural forest
 - c. Rehabilitation of degraded areas
4. Administrative personnel
 - a. Secretaries
 - b. Clerks
 - c. Typists
 - d. Drivers
 - e. Other supporting staff mutually agreed upon as necessary

N *SM* *(JK)* *SB*

ANNEX - V LIST OF LAND, BUILDINGS AND FACILITIES

1. Land
2. Buildings and Facilities
 - a. Sufficient facilities for the implementation of the Project
 - b. Offices and other necessary facilities for the Japanese expert
 - c. Facilities such as electricity, gas and water supply, sewage systems, telephone and furniture necessary for the Project's activities
 - d. Transportation facilities for the implementation of the Project
 - e. Other facilities mutually agreed upon as necessary

Handwritten initials and signatures: "NR", "AM", a circled "NR", and a signature.

ANNEX – VI JOINT COORDINATING COMMITTEE

1. Functions

The Joint Coordinating Committee will meet at least once a year and whenever necessity arises, and work

- (1) To formulate and approve the annual work plan for the Project under the framework of this Record of Discussions.
- (2) To review the overall progress of the technical cooperation program as well as the achievements of the above mentioned annual work plan.
- (3) To review and discuss major issues arising from or related to the technical cooperation program.
- (4) To discuss any matters to be mutually agreed upon as necessary concerning the Project.

2. Composition

(1) Chairman : Project Director

(2) Members :

a. Japanese Side:

- a) Team Leader
- b) Liaison Officer
- c) Other Japanese experts
- d) Resident representative of JICA Brazil Office
- e) Personnel concerned to be dispatched by JICA, if necessary.
- f) Other personnel designated by the Team Leader, if necessary.

b. Brazilian Side:

- a) Head of the Project
- b) Project Coordinator
- c) Representative of ABC
- d) International Cooperation Officer of MCT
- e) International Cooperation Officer of INPA
- f) Other personnel designated by Head of the Project, if necessary.

(3) Observers

The following representatives may attend the Joint Coordinating Committee meeting as observers:

- a. Official(s) of the Embassy of Japan and the Consulate General of Japan in Manaus.
- b. Personnel designated by the chairman of the Joint Coordinating Committee.

THE MINUTES OF DISCUSSION
ON
TENTATIVE SCHEDULE OF IMPLEMENTATION
FOR
THE BRAZILIAN AMAZON FOREST RESEARCH PROJECT

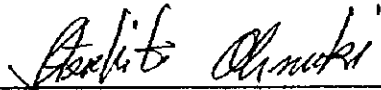
The Japanese Consultation Survey Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (JICA) and headed by Mr. Itsuhito Ohnuki, Deputy Director General, Forestry and Forest Products Research Institute, Ministry of Agriculture, Forestry and Fisheries, visited the Federal Republic of Brazil for consultation of The Brazilian Amazon Forest Research Project (hereinafter referred to as "the Project").

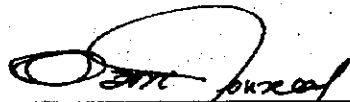
The team held a series of discussions and exchanged views with authorities concerned of the Government of the Federal Republic of Brazil and conducted a field survey to the Project sites. As the result of the discussions and the survey, both sides agreed to formulate the Tentative Schedule of Implementation (TSI), attached herewith.


This TSI has been formulated in accordance with the Record of Discussions signed on April 18, 1995 between the Japan International Cooperation Agency and Brazilian Authorities concerned on the conditions that necessary budget will be allocated for the implementation of the Project.

Research activities of the Project written on TSI should be monitored and reviewed every year at the occasion of the Joint Coordinating Committee during the Project term. This TSI can be modified by the Joint Coordinating Committee if necessary.

December 5, 1995


Mr. Itsuhito Ohnuki
Leader of Consultation Survey Team
Japan International
Cooperation Agency
Japan


Mr. Ozório José de Menezes Fonseca
Director of National Institute of
Amazonian Research
Federal Republic of Brazil


Mr. Caspar Erich Stemmer
Secretary of Programs Coordination
Ministry of Science and Technology
Federal Republic of Brazil

TENTATIVE SCHEDULE OF IMPLEMENTATION

OBJECTIVES OF THE PROJECT

I. OVERALL GOAL

To contribute to establishment of sound forest management model for the purpose of developing a forest management technologies which can harmonize the environmental conservation and sustainable development of Amazonian tropical rainforest.

II. PROJECT PURPOSE

To develop basic scientific research at INPA, for forest management of the Amazonian tropical rainforest.

RESEARCH SUBJECTS IN EACH RESEARCH AREA

The research subjects will be developed through cooperation between Brazilian and Japanese scientists.

RESEARCH AREA 1: REMOTE SENSING

1-a. Forest type mapping

1-a-(1) Classification of forest types of INPA Experimental Forests

To develop the methodology on classification and mapping of forest types around INPA Experimental Forests using multi stage remote sensing data and ground survey for the purpose of creating vegetation data sets of the Experimental Forests.

1-b. Forest change mapping

1-b-(1) A study on information systems for detection of forest type changes

To establish the methodology on detection of forest land changes, and to develop database system using GIS(Geographic Information System) and remote sensing technologies for long term monitoring of forest environment.

RESEARCH AREA 2: MANAGEMENT OF NATURAL FOREST

2-a. Forest inventory

2-a-(1) Structural analysis of natural forests

To analyze stand structure and floristic composition of the natural forests for future evaluation of dynamics and diversity of plant communities and development of sound natural forest management.

2-a-(2) A study of sampling methods and data management

To develop the methodology on sampling design and data management for the evaluation of the existing natural regeneration and adult tree species within the limits of INPA's experimental station.

2-b. Faunistic inventory

2-b-(1) Preparation of the list of mammals in natural forests

To prepare the taxonomical inventory of mammals in natural forests for future evaluation of interactions between plants and animals.

2-b-(2) A study of techniques for analyzing faunistic diversity

To establish field research techniques through modification or combination of various existing techniques for future quantitative analysis of faunistic diversity.

RESEARCH AREA 3: REHABILITATION OF DEGRADED AREAS

3-a. Ecological characteristics of major tree species

3-a-(1) Ecological and physiological properties of tree species.

To collect preliminary information on ecological and physiological characteristics to understand initial establishment of selected trees under natural conditions for complementation of silvicultural technologies.

3-a-(2) Ecophysiological properties for seed management

To identify the ecophysiological properties of seeds such as germination pattern, dormancy, desiccation tolerance, temperature tolerance, chemical composition and others, if possible.

3-a-(3) A study on soil characteristics

To characterize the soils of natural forests (specific geographical areas in accordance with item 3-a-(1)) and degraded lands.

3-b. Seedling production for reforestation technologies

3-b-(1) Ecophysiological properties for seedling management

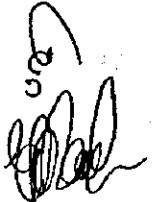
To identify the ecophysiological properties of seedlings in nursery in relation to light condition, nutritional conditions and various stresses for making guidelines of seedling production suitable for the Amazonous region.

3-b-(2) Establishment of gene conservation technologies

To collect basic information of selected trees to establish seed orchards and germplasm bank 'in situ' for gene conservation of Amazonous tree species.

RESEARCH TERM

All research subjects described above will be undertaken until the end of the project, May 1998.

E.O. 

6 日本側およびブラジル側投入実績一覧表

6) 日本側/相手国側投入実績一覧表

細目	平成9年度第3四半期現在				
	平成7年度 4 5 6 7 8 9 10 11 12 1 2 3	平成8年度 4 5 6 7 8 9 10 11 12 1 2 3	平成9年度 4 5 6 7 8 9 10 11 12	平成9年度 4 5 6 7 8 9 10 11 12	平成9年度 4 5 6 7 8 9 10 11 12
6) - 1 専門家派遣および機材供与	予算年月				
長期専門家	給木皓史リーター兼専門家(天然林管理) 97.05.19~98.05.31				
	梶野なつみ業務調整 95.06.21 ~ 98.05.31				
短期専門家	内田敏博専門家(荒地地回復) 95.08.02 ~ 98.05.31				
	矢部恒晶専門家(天然林管理) 95.10.04 ~ 97.03.31				
専門家派遣	— 中北 理専門家(リモセン) 96.04.08 ~ 04.28				
	— 桜井尚武専門家(天然林管理) 96.04.08 ~ 04.28				
短期専門家	— 太田誠一専門家(荒地地回復) 96.05.23 ~ 06.19				
	— 石塚森吉専門家(天然林管理) 96.09.26 ~ 10.24				
短期専門家	— 酒井 武専門家(天然林管理) 96.09.26 ~ 11.14				
	— 山辺武征専門家(機材据付) 96.11.17 ~ 11.30				
短期専門家	— 太田誠一専門家(荒地地回復) 97.04.07 ~ 97.05.01				
	— 中北 理専門家(リモセン) 97.04.10 ~ 97.05.01				
短期専門家	— 三浦横香専門家(天然林管理・動物) 97.07.31 ~ 8.20				
	田中信行専門家(天然林管理) 97.10.13 ~ 11.30				
短期専門家	菅藤 哲専門家(天然林管理) 97.10.13 ~ 11.30				
	中北 理専門家(リモセン) 97.11.24 ~ 12.21				
機材	供与	○ 10,226 千円	△ 11,659 千円	○ 3,224 千円	カラ-複製システム
	機材	△ 32,800 千円	△ 10,775 千円	△ 5,963 千円	光合成システム外
機材	機材	△ 22,738 千円	△ 7,207 千円		
	機材	○ 5,739 千円	○ 854 千円	○ 1,279 千円	バンコン周辺機器外
機材	機材	△ 529 千円	△ 144 千円		
	機材				

○本邦購送分、△現地調達分

6) 日本側/相手国側投入実績一覧表

平成9年度第3四半期現在

6) - 2 研修員受入、現地活動経費、相手国側投入実績、その他

細目	平成7年度 (1995年度)		平成8年度 (1996年度)		平成9年度 (1997年度)	
	4	5	6	7	8	9
C/P 日本研修	Antenor Pereira Barbosa (荒廃地回復C/P研修) 95.10.22 ~ 95.11.23					
	Antonio Donato Nobre (リモセンC/P研修) 95.10.22 ~ 95.11.21					
	— Isolde Kossmann Ferraz (荒廃地回復C/P研修) 96.07.04 ~ 96.08.04					
	— Niro Higuchi (天然林管理C/P研修) 96.08.21 ~ 96.09.14					
	— Joaquim dos Santos (天然林管理C/P研修) 96.08.21 ~ 96.09.14					
	— Moacir A. A. Campos (リモセン集合研修) 96.10.22 ~ 96.12.04					
	Gil Vieira (荒廃地回復C/P研修) 97.07.30 ~ 08.28					
	Joao Ferraz (荒廃地回復C/P研修) 97.08.20 ~ 10.10					
現地活動経費	一般現地業務費 4,800千円		一般現地業務費 6,767千円		一般現地業務費 4,218千円	
	造林推進対策費 31,737千円		造林推進対策費 14,919千円		造林推進対策費 8,981千円	
相手国側 投入実績	科技省予算 R\$ 100,000		科技省予算 R\$ 100,000		科技省予算 R\$ 100,000	
	リモセン室インフラ整備費		リモセン室インフラ整備費		リモセン機材S I費	
調査団	— TSI 調査団 95.11.25 ~ 12.10					
	— 終了時評価調査団 97.12.08 ~ 12.25					
	— 農林水産プロジェクト・リーダー会議 96.02.01 ~ 08					
	— 伯内プロジェクト・リーダー会議 96.03.11					
	— 農林水産プロジェクト・リーダー会議 97.02.17 ~ 21					
	— 伯内プロジェクト・リーダー会議 97.03.10					
リーダー会議	— 伯内プロジェクト調整員会議 96.07.18 ~ 19					
	— 農林水産プロジェクト調整員会議 96.10.14 ~ 18					
調整員会議	— 伯内プロジェクト調整員会議 97.08.18					
国内委員会等	— 終了時評価調査団国内委員会 97.10.03					

7 カウンターパート配置一覧表

7) C/P 配置一覧表

平成9年度第3四半期現在

分野	C/P名	予算年 月	配 置 状 況				本 邦 研 修		備 考
			平成7年度 4 7 10 1	平成8年度 4 7 10 1	平成9年度 4 7 10 1	平成10年度 4 7 10 1	年度	主な研修先	
リ モ ン セ ン	Antonio D. Nobre, PhD		⇔				7	森林総合研究所	リモセン分野リーダー
	Francisca D. de A. Matos								
	Moacir A. Assis Campos *			⇔		8	RESTEC		
天 然 林 管 理	Niro Higuchi, PhD			⇔			8	森林総合研究所	天然林管理分野リーダー 初代コーディネーター
	Gil Vieira, PhD *								
	Joaquim dos Santos, PhD						8	森林総合研究所	現サブ・コーディネーター
	Luciano J. Minete, PhD								
	Ralph Ribeiro								
荒 廃 地 回 復	Antenor P. Barbosa, PhD		⇔				7	森林総合研究所	荒廃地回復分野リーダー 2代目コーディネーター
	Isolde D. K. Ferraz, PhD			⇔			8	森林総合研究所	
	Joao B. S. Ferraz, PhD						9	森林総合研究所	現コーディネーター
	Jurandyr C. Alencar, PhD								
	Gil Vieira, PhD *			⇔			9	森林総合研究所	
	Paulo T. B. Sampaio, PhD								
Moacir A. Assis Campos *									
Vania Palmeira Varela									

*複数分野兼務、 | 配置実績、 ⇔ 本邦研修

8 機材の配備状況表

8) 機材の配備状況表
(160万円以上の機材)

平成9年度(1997年度)度第3四半期現在

供与年度	番号	機材名(メーカー名・型式)	価格	数量	利用/保管場所	備考/特記事項
1995		車両 TOYOTA HILUX SW4 四輪駆動、ジープ型	R\$ 51,061	1	INPA - CPST 熱帯林業研究部	平7 供与・現地
1995		車両 TOYOTA HILUX Cabine Dupla 4X4、 四輪駆動、ピックアップ型	R\$ 41,200	1	同上	平7 供与・現地
1995		ドラフト・チャンバー DN-101P, AC220V 60Hz	¥1,860,000	1式	同上	平7 供与・本邦短専による 据付。一部必要な部品がな いたため今後調達する
1995		ワークステーション Silicon Graphics Indigo2	US\$ 40,385	1式	INPA 本館内 リモセン・ラボ	平7 供与・現地
1995		ワークステーション Silicon Graphics Indy	US\$ 23,006	1式	同上	平7 供与・現地
1996		ワークステーション Silicon Graphics O2	US\$ 18,100	1式	同上	平8 供与・現地
1996		GPS/GIS・データ収集システム Trimble GPS 12ch Pro XR TDC2	US\$ 13,350	1式	同上	平8 供与・現地

平成9年度(1997年度)第3四半期現在

(10万円以上160万円未満の機材)

供与年度	番号	機材名(メーカー・規格・能力)	供与数	処分数	現有数	処理由由・備考
1995		コピー機 GESTETNER 2321	1	0	1	平7 携行・現地
1995		デスクトップ型パソコン COMPAQ Prolinea 575/5	1	0	1	平7 携行・本邦
1995		ノートブック型パソコン COMPAQ Contura 410C	1	0	1	平7 携行・本邦
1995		ノートブック型パソコン COMPAQ Contura 420C	1	0	1	平7 同時携行・本邦
1995		林分材積測定器(シェーゲルレラスコープ)	1	0	1	平7 携行・本邦
1995		ノートブック型パソコン APPLE Mac PowerBook 550C	1	0	1	平7 携行・本邦
1995		ノートブック型パソコン FUJITSU FMV57N	1	0	1	平7 同時携行・本邦
1996		ノートブック型パソコン APPLE Mac PowerBook 5300	1	0	1	平8 同時携行・本邦
1996		ノートブック型パソコン TOSHIBA Satellite 200CS	1	0	1	平8 同時携行・本邦
1996		カメラ NIKON F3 HP. レンズ AI Fisheye NIKKOR 8mm F2.85	1	0	1	平8 同時携行・本邦
1996		データ・コレクタ HANDY-CARD PRO	1	0	1	平8 同時携行・本邦
1996		統計ソフトウェア STATSOFT STATISTICA for Windows	1	0	1	平8 携行・本邦

(10万円以上160万円未満の機材)

平成9年度(1997年度)第3四半期現在

供与年度	番号	機材名(メーカー・規格・能力)	供与数	処分数	現有数	処理由・備考
1995		カメラ NIKON F3, Macro & Zoom Lens, etc.	1	0	1	平7供与・本邦
1995		送風定温乾燥器、東洋製作所 FV-630, AC220V	1	0	1	平7供与・本邦
1995		送風装置、機器、東洋製作所 FV-830, AC220V	1	0	1	平7供与・本邦
1995		種子選別機 SEEDBURO 98-SS	1	0	1	平7供与・現地
1995		精密電子天秤 SARTORIUS BP110S	2	0	2	平7供与・現地
1995		精密電子天秤 SARTORIUS BP2100S	1	0	1	平7供与・現地
1995		精密電子天秤 SARTORIUS BP310S	2	0	2	平7供与・現地
1995		植物能力解析装置 ELE 470-040	1	0	1	平7供与・現地
1995		天秤 15Kg. ELE, w/Flat Pan	1	0	1	平7供与・現地
1995		葉面積測定装置 LI-COR, LI-3000A	1	0	1	平7供与・現地
1995		Transparent Belt Accessory, LI-COR, LI-3050A/4	1	0	1	平7供与・現地
1995		データロガー LI-COR, 32K memory, LI-1000-32	1	0	1	平7供与・現地
1995		放射計 LI-COR, LI-191SA, 10 Cable	2	0	2	平7供与・現地
1995		気孔伝達度.. 蒸散計 LI-COR, LI-1600M	1	0	1	平7供与・現地
1995		樹冠分析機 LI-COR LAI-2000, LAI-2050	2	0	2	平7供与・現地

(10万円以上 160万円未満の機材)

平成9年度 (1997年度) 第3四半期現在

供与年度	番号	機材名 (メーカー・規格・能力)	供与数	処分数	現有数	処分理由・備考
1995		水分測定天秤 OHAUS MB200	1	0	1	平7 供与・現地
1995		天秤 OHAUS, Heavy Duty Mech. Solution	1	0	1	平7 供与・現地
1995		粉碎機 FRITSCH Pulverisette 15	1	0	1	平7 供与・現地
1995		オーブン FISHER Isotmp. Pre Mech., 240V	1	0	1	平7 供与・現地
1995		オーブン FISHER Isotmp. Pre Gravity, 120V	1	0	1	平7 供与・現地
1995		蒸留器 FISHER 4 ltr/hr Glass 60Hz, 240V	1	0	1	平7 供与・現地
1995		蒸留器 FISHER 4 ltr/hr Glass 60Hz 240V	1	0	1	平7 供与・現地
1995		発芽試験器 FANEM 347CDG	5	0	5	平7 供与・現地
1995		水ストレス測定器 PMS Mod. 1000	1	0	1	平7 供与・現地
1995		トラクター YANMAR TC-11 Super	1	0	1	平7 供与・現地
1995		パソコン PC-AT 486DX-4	3	0	3	平7 供与・現地
1995		パソコン Pentium 482CDT	1	0	1	平7 供与・現地
1995		ソフトウェア MS Office	1	0	1	平7 供与・現地
1996		パソコン APPLE Performa 6320/120 16/1.2GB	1	0	1	平8 供与・現地
1996		分光光度計 ELE Spectrophotometer UV EA485-031	1式	0	1	平8 供与・現地
1996		脂肪抽出装置 ELE Soxhlet apparatus EA525-400	1式	0	1	平8 供与・現地
1996		気象観測ステーション ELE Environmental Monitoring Station EE507-200	1式	0	1	平8 供与・現地

(10万円以上 160万円未満の機材)

平成9年度(1997年度)第3四半期現在

供与年度	番号	機材名(メーカー・規格・能力)	供与数	処分数	現有数	処分理由・備考
1996		蒸留水製造装置 FISHER Still MP-1	1	0	1	平8供与・現地
1996		遠心分離器 FISHER Centrifuge Marathon 22KBR	1式	0	1式	平8供与・現地
1996		赤外線プロテイン消化装置 MARCONI MA-4003	1	0	1	平8供与・現地

(10万円以上160万円未満の機材)

平成9年度(1997年度)第3四半期現在

供与年度	番号	機材名(メーカー・規格・能力)	供与数	処分数	現有数	処分理由・備考
1995		野外計算機 Husky-Hunter PC5L, Forestry Suppliers	2	0	2	平7供与・現地
1995		高度計 Forestry Suppliers	1	0	1	平7供与・現地
1996		パソコン Ships.t Pentium 150MHz INTEL	1	0	1	平8供与・現地
1996		電波受信機 TELONICS TR-2 164-166MHz	1	0	1	平8供与・現地

(10万円以上160万円未満の機材)

供与年度	番号	機材名(メーカー・規格・能力)	供与数	処分数	現存数	処分理由・備考
1995		EWS 画像処理ソフトウェア ERDAS Imagine	1	0	1	平7 供与・現地
1995		Direct GPS - PCMCIA カード TRIMBLE	1	0	1	平7 供与・現地
1995		PC用モニタ NANAOT2-17TS	3	0	3	平7 供与・現地
1995		EWS用統計ソフト STATSCI S-PLUS V.3.4	1	0	1	平7 供与・現地
1995		無停電電源装置 DELTEC 2086CT-2	1	0	1	平7 供与・現地
1995		スライド・スキャナ NIKON LS-1000	1	0	1	平7 供与・現地
1995		オート・スライド・フイーダ NIKON SF-100	1	0	1	平7 供与・現地
1995		LANリンクスイッチ 3COM 100012 RJ45	1	0	1	平7 供与・現地
1995		LANリンクビルダ 3COM FMS100 F.E. Hub	1	0	1	平7 供与・現地
1995		ダイジタイジング・ボード	1	0	1	平7 供与・現地
1995		CALCOMP 34482H2	1	0	1	平7 供与・現地
1995		スライド/フィルム・レコーダ	1	0	1	平7 供与・現地
1995		Personal LFR Plus	1	0	1	平7 供与・現地
1995		プリンタ TEKTRONIX Phaser 480X	1	0	1	平7 供与・現地
1995		レーザープリンタ TEKTRONIX Phaser 550	1	0	1	平7 供与・現地
1995		ネットワーク・ファイル・システム・ソフト	1	0	1	平7 供与・現地
1995		CHAMELEON NSF v.4.6	1	0	1	平7 供与・現地
1995		EWS SIGソフトウェア ESRI ARC-INFO ラボ・キット	1	0	1	平7 供与・現地

(10万円以上160万円未満の機材)

平成9年度(1997年度)第3四半期現在

供与年度	番号	機材名(メーカー・規格・能力)	供与数	処分数	現有数	処分理由・備考
1995		レーザープリンタ HP LaserJet 4MV Printer	1	0	1	平7供与・現地
1995		プリンタ HP DesignJet 755CM Color InkJet Printer	1	0	1	平7供与・現地
1995		スキャナ HP ScanJet 4C Scanner, IBM PC/AT	1	0	1	平7供与・現地
1995		ハードディスク SEAGATE HD ST15150WD	3	0	3	平7供与・現地
1996		MOドライブ, Pinnacle Apex 4.6GB Optical	3	0	3	平8供与・現地
1996		統計ソフト, Statsoft "Statistica" for Windows	1	0	1	平8供与・現地
1996		ノートブック型パソコン, Toshiba Tecra 740CDT	1	0	1	平8供与・現地
1996		衛生データ LANDSAT TM in 8mm Exabyte tape	6	0	6	平8供与・現地

9 活動実績一覧表

活動項目	平成7年度第3四半期				平成7年度第4四半期				平成8年度第1四半期				平成8年度第2四半期				平成8年度第3四半期				平成8年度第4四半期				
	4	7	10	1	4	7	10	1	4	7	10	1	4	7	10	1	4	7	10	1	4	7	10	1	
調査活動 (リモートセンシング)									インターバル・カメラによる天然林樹木のフェノロジー(季節変化)調査を開始し、パソコンによるデジタル画像処理および解析法指導	インターバル・カメラによる天然林樹木の季節変化調査	インターバル・カメラによる天然林樹木の季節変化調査	インターバル・カメラによる天然林樹木の季節変化調査	インターバル・カメラによる天然林樹木の季節変化調査	インターバル・カメラによる天然林樹木の季節変化調査	インターバル・カメラによる天然林樹木の季節変化調査	インターバル・カメラによる天然林樹木の季節変化調査	インターバル・カメラによる天然林樹木の季節変化調査	インターバル・カメラによる天然林樹木の季節変化調査	インターバル・カメラによる天然林樹木の季節変化調査	インターバル・カメラによる天然林樹木の季節変化調査	インターバル・カメラによる天然林樹木の季節変化調査	インターバル・カメラによる天然林樹木の季節変化調査	インターバル・カメラによる天然林樹木の季節変化調査	インターバル・カメラによる天然林樹木の季節変化調査	
調査活動 (天然林管理-植生)					アマゾン天然林の現状に関する文献収集				アマゾン天然林の構造解析のための調査法を決定し、試験地内に南北方向トランセクトの設定を開始	アマゾン天然林の構造解析の南北方向トランセクト2500mを決定し、植生データを収集	アマゾン天然林の構造解析の南北方向トランセクト2500mのトランセクトを設定し、同1000m区間の植生データを収集	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ		
調査活動 (天然林管理-動物)					自動撮影装置を用いた動物調査を開始。アマゾン天然林に生息する動物に関する文献の収集				種子を捕食する動物を自動撮影装置により把握し、調査対象樹種および個体を特定	自動撮影調査を継続し、動物種別に採訪頻度に異なる傾向があることを確認	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ	アマゾン地上林における哺乳類相の種子捕食状況に関する調査データをとりまとめ		
調査活動 (荒地地回復)					試験用種子のうち5種類の結実状況を確認。苗畑試験計画を作成				対象樹種20種の種子を採集し、一部種子の冷蔵保存および発芽試験を実施。天然林および苗畑周辺の土壌プロファイル調査を実施	種子の抽出法、休眠覚醒法の試験、発芽率および発芽特性を確認し、苗畑の光環境、施肥成分と苗木成長との関係性を調査	種子の発芽率、発芽特性に関する試験方法を取りまとめ、光環境、施肥成分と苗木成長との試験を行い、データを収集	種子の発芽率、発芽特性に関する試験方法を取りまとめ、光環境、施肥成分と苗木成長との試験を行い、データを収集	種子の発芽率、発芽特性に関する試験方法を取りまとめ、光環境、施肥成分と苗木成長との試験を行い、データを収集	種子の発芽率、発芽特性に関する試験方法を取りまとめ、光環境、施肥成分と苗木成長との試験を行い、データを収集	種子の発芽率、発芽特性に関する試験方法を取りまとめ、光環境、施肥成分と苗木成長との試験を行い、データを収集	種子の発芽率、発芽特性に関する試験方法を取りまとめ、光環境、施肥成分と苗木成長との試験を行い、データを収集	種子の発芽率、発芽特性に関する試験方法を取りまとめ、光環境、施肥成分と苗木成長との試験を行い、データを収集	種子の発芽率、発芽特性に関する試験方法を取りまとめ、光環境、施肥成分と苗木成長との試験を行い、データを収集	種子の発芽率、発芽特性に関する試験方法を取りまとめ、光環境、施肥成分と苗木成長との試験を行い、データを収集	種子の発芽率、発芽特性に関する試験方法を取りまとめ、光環境、施肥成分と苗木成長との試験を行い、データを収集	種子の発芽率、発芽特性に関する試験方法を取りまとめ、光環境、施肥成分と苗木成長との試験を行い、データを収集	種子の発芽率、発芽特性に関する試験方法を取りまとめ、光環境、施肥成分と苗木成長との試験を行い、データを収集	種子の発芽率、発芽特性に関する試験方法を取りまとめ、光環境、施肥成分と苗木成長との試験を行い、データを収集	種子の発芽率、発芽特性に関する試験方法を取りまとめ、光環境、施肥成分と苗木成長との試験を行い、データを収集	種子の発芽率、発芽特性に関する試験方法を取りまとめ、光環境、施肥成分と苗木成長との試験を行い、データを収集
造林推進対策事業					試験苗畑送電線工事完了				試験苗畑ならびに関連工事が終了し、5月13日に落成式を実施(平成7年度事業)	試験苗畑作業継続	試験苗畑作業継続	試験苗畑作業継続	試験苗畑作業継続	試験苗畑作業継続	試験苗畑作業継続	試験苗畑作業継続	試験苗畑作業継続	試験苗畑作業継続	試験苗畑作業継続	試験苗畑作業継続	試験苗畑作業継続	試験苗畑作業継続	試験苗畑作業継続		

9) 活動実績一覧表

平成9年度第3四半期現在

活動項目	平成8年度第4四半期				平成9年度第1四半期				平成9年度第2四半期				平成9年度第3四半期			
	4	7	10	1	4	7	10	1	4	7	10	1	4	7	10	1
予算年月																
調査活動 (リモートセンシング)	リモートセンシング装置の機械部品の納入はほぼ完了。				リモートセンシング装置のシステムインテグレーションが終了し、5月23日にリモセン研究室の落成式を行い、TS11-a-(1)分野の研究準備開始。				当四半期に到着したEWSにシステム・インテグレーションを行った。C/Pによるフェノロジー調査を継続。				定点カメラによる撮影データの解析等、短期専門家によるフェノロジー研究協力を行った。			
調査活動 (天然林管理一植生)	試験林内東西方向トランセクタの残り1500Mにつき植生データを収集。				南北・東西両方向トランセクタの調査データを分析し、試験林の森林構成の一部を明らかにした。				引き続き、両トランセクタ内の植生データと土壌データとの関連について検討を加えた。				短専2名とC/Pにより、両トランセクタにおいてDBH 10cm以下の植生データの収集と分析を実施した。			
調査活動 (天然林管理一動物)	INPA択伐試験区内に自動撮影装置を新しく設置し、雨期における哺乳類相の調査データを収集。				択伐試験林内の各処理区における哺乳類相の調査を継続し、テレメトリ調査の準備を開始。				ミナオボッサムの行動圏をテレメトリ法により調査。択伐試験林内の各処理区における哺乳類の調査を継続し、データ収集を終了した。				択伐試験林内の微小生息環境調査、東西方向トランセクタにおける自動撮影により地形毎の哺乳類相調査を行った。			
調査活動 (荒廃地回復)	試験苗畑において主要樹種の発芽試験および苗木生長試験を実施し、光環境や施肥効果、根切り効果等に関するデータを得た。				主要樹種の苗木生長試験(光環境、施肥反応等)を継続し、データを把握するとともに、挿し木試験を開始。				主要樹種の苗木生長試験(光、施肥、スベーシング等)及び挿し木試験を継続するとともに、データの分析を開始。				主要樹種の苗木生長試験(光、施肥、スベーシング等)及び挿し木試験を継続し、データの分析・取りまとめを開始。			
造林推進対策事業	種子保管庫の建設の40%が工事終了。挿木用ガラス室の建設、宿舍補修、林道補修等の各工事を終了。				種子保管庫が完成。苗畑育苗作業の継続実施				苗畑育苗作業の継続実施と、採種林(5ha)の火入れ・地植え作業、作業道補修を実施				苗畑育苗作業および採種林の地植え作業の継続、作業道補修の継続および同作業用機材の保守を実施。			

10 全体活動計画 (進捗状況)

PLAN of OPERATION with PERFORMANCE

TSI items and individual themes	Responsibilities	Input	Target
1-a Forest Type Mapping			
1-a-1) Classification of forest types of INPA Experimental Forests			
Theme 1: Development of the methodology on classification and mapping of forest types around INPA Experimental Forests	Nozoe, Nozaki, Alexandre, Hiroslav, Nakahira, Hirata	1) Laboratory equipment, acquisition: 3 UNIX EMS; 3PC NT EPS; Network; Mass Storage; Input & Output Peripherals; Software. 2) Field equipment acquisition; Notebook PC; Direct GPS for navigation; ArcView bundle; Differential GPS; Software. 3) Laboratory assemblage 4) Hardware installation 5) Software installation	1) Methodology development 2) TM image enhancement and classification for natural vegetation. 3) Field verification
Theme 2: Development of a forest type map for area of INPA Experimental Forests	Nozoe, Alexandre, Hiroslav, Hirata	6) System logic implementation 7) Laboratory operationalization 8) Trial runs and tests 9) Remote Sensing Data acquisition: Recent LANDSAT TM satellite image; Photogrammetric pictures.	4) Classification improvement 5) Final map development
1-b Forest change mapping			
1-b-1) A study on information systems for detection of forest type changes			
Theme 1: Establishment of the methodology on detection of forest land changes	Nozoe, Alexandre, Hiroslav, Nakahira, Hirata	1) Laboratory hardware and software established for the study of item 1-a. 2) Remote sensing data acquisition: Multitemporal series of LANDSAT TM satellite images.	1) TM image enhancement and classification for land cover change 2) Field verification 3) Classification improvement 4) Final map development. 5) Development of GIS base from land cover classification
Theme 2: Development of a database system using GIS and remote sensing	Nozoe, Hiroslav, Nakahira		

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35	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12
1-a Forest Type Mapping																																														
1-a-1) Classification of forest types of INPA Experimental Forests																																														
1-b Forest change mapping																																														
1-b-1) A study on information systems for detection of forest type changes																																														
1-b-2) Development of a database system using GIS and remote sensing																																														

7S/2 Management of Natural Forest

7S/2-1 Themes and individual chapters	Respons- ibility	Input	Target
2-a. Forest inventory			
2-a-(1) Structure analysis of natural forests			
Theme: Analysis on structure of the natural forest	Nirol Gill Joachim Sakurai Ishizuka Sakai Rehlin	Transsect N-S Forest Inventory (200m x 2500m) 300P x 10cm Trans. N-S Forest Canopy Pictures Trans. W-E Forest Inventory (200m x 2500m) 300P x 10cm	
Theme: Analysis on floristic composition of the natural forest	Nirol Gill Joachim Sakurai Ishizuka Sakai Rehlin	Transsect N-S Forest Inventory (200m x 2500m) 300P x 10cm Trans. N-S Forest Canopy Pictures Trans. W-E Forest Inventory (200m x 2500m) 300P x 10cm	
2-a-(2) A study of sampling methods and data management			
Theme: Development of a methodology on sampling design and data management	Nirol Joachim Sakurai Leizhida Shah	Guidelines for Field Data Collection and Data Management of Forest Inventory	
2-b. Faunistic inventory			
2-b-(1) Preparation of the list of animals in natural forests			
Theme: Inventory of animals in natural forests for the evaluation of interactions between plants and animals.	Nirol Yabe Mura	1. Recording of seed predator or carrier animals (for 50 tree species) 2. Recording of animals in natural forest on Terra Firme and Igarape area (Transsect plots, each month in dry and wet season) 3. Recording of animals in experimental blocks of selective cutting in natural forest (2P-2, each 3months in dry and wet season) 4. Recording of animals in forest edge and degraded area (each month in dry and wet season)	
2-b-(2) A study of techniques for analyzing faunistic diversity			
Theme: Establishment of the field research techniques for the quantitative analysis of faunistic diversity	Nirol Yabe Mura	1. Application of automatic photography for faunistic inventory on the ground and on the tree, each 2weeks in dry and wet season 2. Application of radio tracking for investigation on habitat use by animals (2 species, each 3months in dry and wet season) 3. Application of radio tracking for investigation on seed dispersal by animals (2 species)	

7S/2-1 Themes and individual chapters	Respons- ibility	Input	Target	7S/2-2 Present (%)	7S/2-3 10-12	7S/2-4 1-3	7S/2-5 4-5	7S/2-6 7-9	7S/2-7 10-12	7S/2-8 13-15
2-a. Forest inventory										
2-a-(1) Structure analysis of natural forests										
		50 %	50 %							100 %
			50 %	50 %						100 %
			50 %	50 %						100 %
			50 %	50 %						100 %
				50 %	50 %					100 %
				50 %	50 %					100 %
2-a-(2) A study of sampling methods and data management										
										0 %
2-b. Faunistic inventory										
2-b-(1) Preparation of the list of animals in natural forests										
		1 SP (2%)	4 SP (8%)	1 SP (2%)	1 SP (2%)	1 SP (2%)	1 W (12.5%)			4 SP (8%)
							2 W (25%)			3 W (37.5%)
							6 W (75%)			4 W (50%)
							2 W (25%)			2 W (25%)
2-b-(2) A study of techniques for analyzing faunistic diversity										
		2 W	12 W	12 W	12 W	12 W	12 W	8 W		2 W (25%)
										5 W (12.5%)
										1 SP (25%)
										1 SP (25%)

TSP-3 Rehabilitation of Degraded Areas

Theme (Topic)	Inputs	Target
3-a Ecological characteristics of major tree species		
3-a(1) Ecological and physiological properties of tree species		
Theme 1: Ecophysiology in Viçosa G. Labor species seedling in Ferraz I. Amazonia		6 species
3-a(2) Ecophysiological properties of seed management		
Theme 1: Biometric study of 230 species of seed germination	Varela V. Ferraz I.	40 species
Theme 2: Characteristics of seed germination	Varela V. Ferraz I.	20 species
Theme 3: Seed storage study	Varela V. Ferraz I.	5 species
Theme 4: Determination of accumulation on various condition (temperature, water potential, etc.)	Varela V. Ferraz I.	5 species
Theme 5: Illustration of steps on seed treatment	Varela V. Ferraz I.	25 species
Theme 6: Determination of seed viability under natural conditions	Varela V. Ferraz I. Leiteana A.	4 species seed bank study
3-a(3) A study on soil characteristics		
Theme 1: Soil distribution characteristic of natural forest	Equipment Ferraz J. acquisition Ohita S. Installation	1. Soil collection X-5 Transect 2. Soil profile description 3. Determination of physical properties (color, texture, etc.) 4. Chemical analysis of soil 5. Soil collection Y-5 transect 6. Soil profile description 7. Determination of physical properties (color, texture, etc.) 8. Chemical analysis of soil
Theme 2: Soil distribution characteristic of plantation areas	Ferraz J. Ohita	1. Soil profile description 2. Determination of physical properties 3. Chemical analysis of soil
Theme 3: Comparison of soil chemical and physical condition in natural forest, plantation and degraded areas	Ferraz J. Ohita	

90-99	10-12	1-5	4-5	7-9	10-17	7	4-6	7-9	Present-EI (Ecophysiology)	10-17	90-99
3-a Ecological characteristics of major tree species											
3-a(1)											
									50%	25%	25%
3-a(2) Ecophysiological properties of seed management											
*****	*****	*****	*****	*****	*****	*****	*****	*****	80%		
*****	*****	*****	*****	*****	*****	*****	*****	*****	95%		
*****	*****	*****	*****	*****	*****	*****	*****	*****	40%		
									100%		
*****	*****	*****	*****	*****	*****	*****	*****	*****	50%		
									80%		
3-a(3) A study on soil characteristics											
			50%	50%					100%		
			100%						100%		
			100%						100%		
				40%	60%				100%		
				80%	20%				100%		
								80%	100%		
								100%	100%		
							20%	80%	100%		
			100%						100%		
			100%						100%		
							80%	20%	100%		
									100%		
									100%		
							80%	20%	100%		

TS-3 Rehabilitation of Degraded Areas

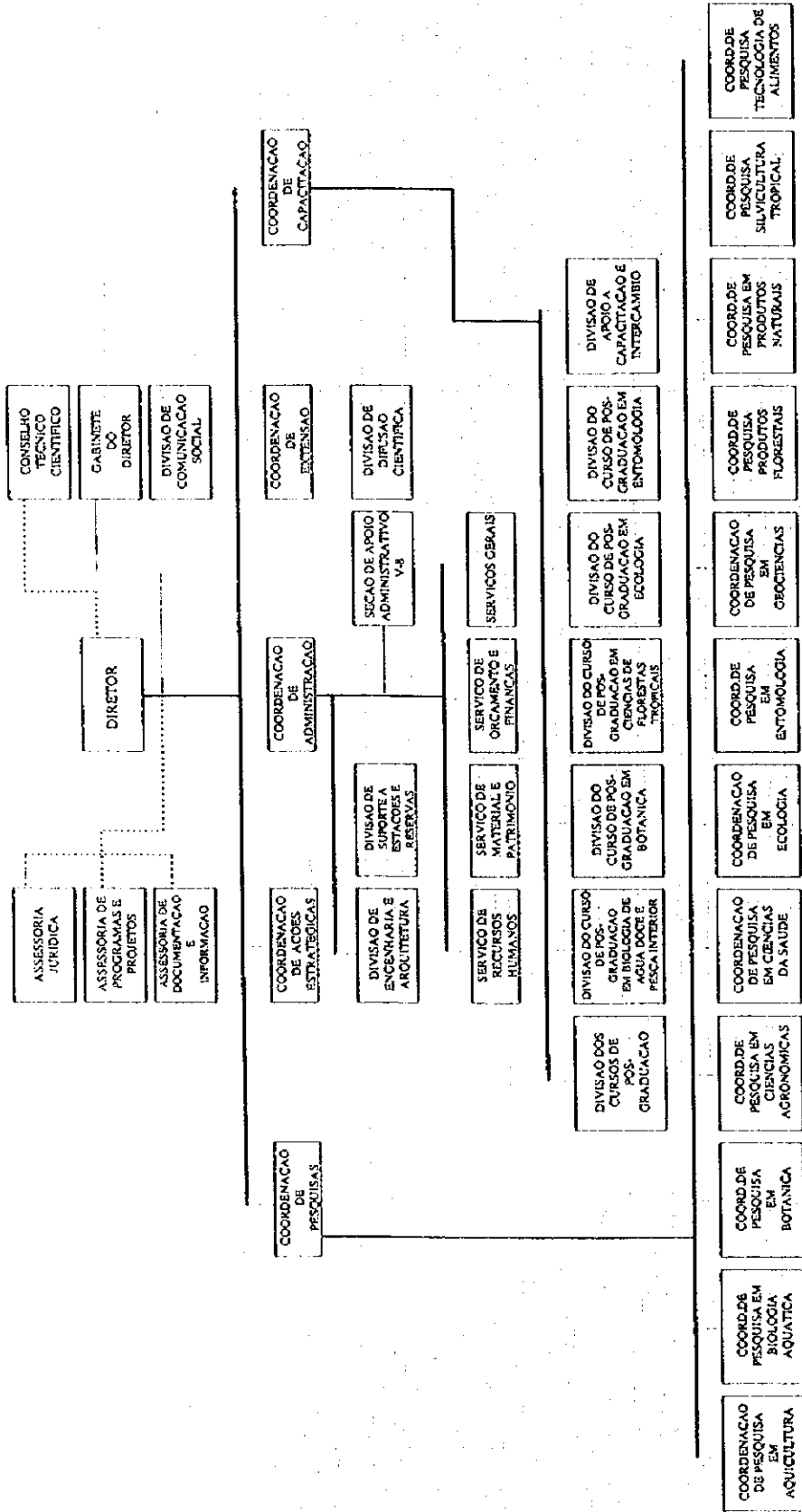
TS-3 6-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-5
3-b Seedling production for reforestation technologies										
3-b-(1) Ecophysiological properties for seedling technologies										
<p>1. Equipment: tractor, sprayer, leaf area meter, germination cabinet, printer, tinometer, etc.</p> <p>2. Others: Workers, Assistant, consumary goods</p>										
3-b-(2) Establishment of gene conservation technologies										
<p>1. Equipment: tractor, sprayer, leaf area meter, germination cabinet, printer, tinometer, etc.</p> <p>2. Others: Workers, Assistant, consumary goods</p>										

3-5 6-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-5
3-b Seedling production for reforestation technologies										
3-b-(1) Ecophysiological properties for seedling technologies										
<p>1. Equipment: tractor, sprayer, leaf area meter, germination cabinet, printer, tinometer, etc.</p> <p>2. Others: Workers, Assistant, consumary goods</p>										
3-b-(2) Establishment of gene conservation technologies										
<p>1. Equipment: tractor, sprayer, leaf area meter, germination cabinet, printer, tinometer, etc.</p> <p>2. Others: Workers, Assistant, consumary goods</p>										

11 組織図

Instituto Nacional de Pesquisas da Amazonia

ORGANORAMA



INPA / MCT - JICA
 JACARANDA PROJECT
 "THE BRAZILIAN AMAZON FOREST RESEARCH PROJECT"

PARTICIPANT'S DEGREES

FUNCTION	DEGREE	QUANTITY
INPA's Researcher	Ph.D.	9
INPA's Researcher	M.Sc.	2
INPA's Researcher	M.Sc.	1
INPA's Researcher	B.Sc.	2
INPA'S Technician-Tec. School Level		5
SUB-TOTAL		19
Researcher with Grant (CNPq)	Ph.D.	1
Researcher with Grant (CNPq)	M.Sc.	2
Researcher with Grant (CNPq)	B.Sc.	2
Researcher (Special Measure)	B.Sc.	1
Trainees (Students)		3
SUB-TOTAL		9
TOTAL		28

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 JACARANDA PROJECT
 "THE BRAZILIAN AMAZON FOREST RESEARCH PROJECT"

version: 12.12.97

PARTICIPANTS LIST

AREA	THEME	INPA'S COUNTERPARTS	JICA'S COUNTERPARTS	
TSI-1 REMOTE SENSING	1-a Forest Type Mapping	Antônio Nobre Mozair Campos	Ph.D. Researcher INPA M.Sc. Researcher INPA	Osamu Nakakita Yasumasa Hirata
	1-b Forest change mapping	Miroslav Hozak* Alexandre Kemeles*	Ph.D. Researcher CNPq-Grant B.Sc. Researcher PCI-Grant	
TSI-2 MANAGEMENT OF NATURAL FOREST	2-a Forest inventory	Niro Higuchi	Ph.D. Researcher INPA	Teruobu Suzuki** Teuneki Yabe Shobu Sakurai Monyoshi Ishizuka Takeshi Sakai Shingo Miura Nobuyuki Tanaka Satoshi Saito Junichi Konuma***
	2-a-(1) Structure analysis of natural forests	Joaquim dos Santos	Ph.D. Researcher INPA	
	2-a-(2) A study of sampling methods and data management	Gil Vieira	Ph.D. Researcher INPA	
	2-b Faunistic inventory	Ralph Ribeiro	M.Sc. Technician INPA - University Degree	
	2-b-(1) Preparation of the list of mammals in natural forests	Carlos Ritt†	B.Sc. Researcher CNPq-Grant	
	2-b-(2) A study of techniques for analyzing faunistic diversity	Gilson Santos*	B.Sc. Researcher PCI-Grant	
TSI-3 REHABILITATION OF DEGRADED AREAS	3-a Ecological characteristics of major tree species 3-a-(1) Ecological and physiological properties of tree species 3-a-(2) Ecophysiological properties of the seed management 3-a-(3) A study on soil characteristics 3-b Seeding production for reforestation technologies 3-b-(1) Ecophysiological properties for seedling technologies 3-b-(2) Establishment of gene conservation technologies	Antenor Barbosa	Ph.D. Researcher INPA	Toshihiro Uchida Seiichi Ohta
		Gil Vieira	Ph.D. Researcher INPA	
		Isolde Ferraz	Ph.D. Researcher INPA	
		João Ferraz	Ph.D. Researcher INPA	
		Jurandyr Alencar	Ph.D. Researcher INPA	
		Mozair Campos	M.Sc. Researcher INPA	
		Paulo Sampaio	Ph.D. Researcher INPA	
		Vânia Varela	M.Sc. Researcher INPA	
		Angélica Cortés	B.Sc. Technician INPA - University Degree	
		Mary Jane Almeida	B.Sc. Technician INPA - Tec.School Degree	
		Bertran da Silva	Technician INPA - Tec.School Degree	
		Johnny Vargas	Technician INPA - Tec.School Degree	
		José Maria da Paz	Technician INPA - Tec.School Degree	
		Lúcio Batalha	Technician INPA - Tec.School Degree	
		Valda Nogueira	(B.Sc.) Technician INPA - Tec.School Degree	
Aníbal Marques	B.Sc. Researcher (Special Measure)			
José Luiz Camargo*	M.Sc. Researcher CNPq-Grant			
Patrícia de Sales*	M.Sc. Researcher PCI-Grant			
Ângela Imakawa** (see 5.97)	M.Sc. Researcher CNPq-Grant			
Claudia Blair	Trainee CNPq/PBIC			
Márcia dos Santos*	Trainee CNPq/PBIC			
Mª Mariene da Silva*	Trainee IEL			

* Human Resources Capacitation within the Project Areas

** Japanese Team Leader (since 5.97)

*** Japanese Team Leader (7.95 - 5.97)

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13 アマゾン森林研究計画参加研究者の方への質問票

(原文は英語)

:このアンケートの結果は、プロジェクトの評価および今後の改善に活用されます。
ご協力に感謝します。

記入日 (月 日)

1. 貴方のこのプロジェクトでの担当分野と課題につき、お書き下さい。()
2. 貴方は、このプロジェクト(特に自分の関わった部分)の成果についてどう感じていますか? もし、プロジェクトを評価するならば、5段階評価(5-「極めて良好」、4-「良好」、3-「ふつう、まずまず」、2-「やや不十分」、1-「全く不十分」)のうち何ですか? また、その理由についてもお書き下さい。

5分の()理由 : ()
3. 日本人専門家(指導/研究の姿勢、方法、レベル等々)についての印象をお聞かせ下さい。
4. 今後貴方は、このプロジェクトでの共同研究の経験をどう生かしますか?(三者択一)
 - 1) 「同じ職場にとどまって研究を続けたい」
 - 2) 「かならずしも同じ職場にとどまらず、他の分野/地域で経験を生かしたい」
 - 3) その他: ()
5. 上記の2. および3. 以外にこのプロジェクトについて良かった点、あるいは、改良すべき点があれば、お書き下さい。
6. 今後の活動への提案があれば、お書き下さい。
7. (もしあなたが、日本での研修を受けていらっしゃる場合には、次の質問のお答え下さい)
 - 1). 研修は、現在の研究に役立っていますか?(三者択一)
 - 「おおいに役立っている」
 - 「ある程度役に立っている」
 - 「あまり役に立っていない」
 - 2) 1) の回答が「おおいに」以外の場合、問題点は何ですか? できるだけ具体的に教えて下さい。

14 カウンターパートに対する質問票への回答結果のまとめ

本調査では、プロジェクトに関するブラジル側（特にカウンターパート）の評価を確認するために、調査団のマナウス滞在中に前ページのような質問票を用いたアンケートを実施した。質問票の配付先は、本プロジェクトに参加しているブラジル人研究者全員（厳密な意味でのC/P以外の研究参加者も含む）である。計9人より質問票を回収した。分野は、「荒廃地回復」に集中しているが、設問毎の回答状況は、以下のとおりである。

1. プロジェクトでの担当分野と研究課題

リモートセンシング：0 天然林管理：2名 荒廃地回復：7名

2. プロジェクト（特に自分の関わった部分）の成果についての自己評価（基準：5－「極めて良好」、4－「良好」、3－「ふつう、まずまず」、2－「やや不十分」、1－「全く不十分」）

5分の5：1名、5分の4：8名と全体的に評価は高い。（理由としては、個々の分野での具体的な実績が述べられている。ただし、訳語として用いた第4段階を示す英単語「satisfactory」はブラジル人の感覚では、必ずしも強い表現ではないことに注意したい。）

3. 日本人専門家（指導／研究の姿勢、方法等）についての印象

全般的に、専門家の姿勢は「協力的」と評され、研究の水準・方法に関しても高い評価が与えられている。

4. プロジェクトでの経験の今後の生かし方

学生を除く全員が、「INPAにとどまって研究を続けたい」と回答している。

5. 上記の2. および3. で述べたこと以外のこのプロジェクトについて良かった点、あるいは、反省／改良すべき点

6. その他のこのプロジェクトに関連した重要な事柄

これらの項目については、各分野毎に様々な具体的提案がなされている。一般的な事柄としては、学生（博士課程）の研究への参加を勧める声が比較的多い。

7. （日本でのカウンターパート研修参加者に対する設問：該当者は3名）

研修の有用度に関しては、「おおいに役立っている」：1名、「ある程度役に立っている」：2名という結果である。「おおいに役に立っている」を選択しなかった者のコメントには、「3週間という期間が短かすぎる」、「内容的にブラジルで行われていることとの類似性が高い」などがある。

JICA