

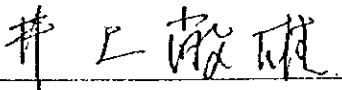
JOINT EVALUATION
OF
THE FOREST AND ENVIRONMENT CONSERVATION RESEARCH PROJECT
IN THE STATE OF SAO PAULO

The Japanese Evaluation Team (hereinafter referred to as "the Team"), organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Dr. Takao Inoue, visited the Federative Republic of Brazil from December 2 to 15, 1997 for the purpose of evaluating jointly with the Brazilian Evaluation Team headed by Mr. Oswaldo Poffo Ferreira, General Director of the Forestry Institute, Environmental Secretariat of the State of São Paulo, Federative Republic of Brazil (hereinafter referred to as "IF") the achievement of the Japanese technical cooperation for the Forest and Environment Conservation Research Project in the State of São Paulo (hereinafter referred to as "the Project").

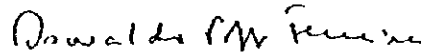
During the stay in Brazil, the Team conducted field surveys jointly with Brazilian Team in the project sites and also had discussion with concerned Brazilian authorities. Finally both teams had a series of discussion in the joint meeting for the above mentioned purpose.

As a result of series of discussions, both teams agreed to forward to respective Governments a report of the evaluation which is referred to in the documents attached hereto.

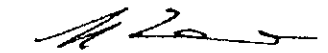
São Paulo, December 12, 1997



Dr. Takao Inoue
Leader
Japanese Evaluation Team



Mr. Oswaldo Poffo Ferreira
Leader
Brazilian Evaluation Team



Mr. Fabio Feldmann
Secretary

Secretariat of the Environment of the State of São Paulo
Federative Republic of Brazil

**REPORT OF THE JOINT EVALUATION
OF THE FOREST AND ENVIRONMENT CONSERVATION RESEARCH PROJECT
IN THE STATE OF SAO PAULO**

1. INTRODUCTION

Based upon the Record of Discussions (hereinafter referred to as "the R/D") signed on November 30, 1992, the Government of Japan and the Government of the Federative Republic of Brazil have been implementing the Project since February 1, 1993.

The Project is scheduled to be implemented for five (5) years and is to be completed on January 31, 1998.

According to the R/D, the purpose of the Project is:

"to promote the research activities on the restoration of the forest vegetation and the prevention of soil erosion in the degraded areas, thus contributing to the conservation of environment".

In order to conduct evaluation more precisely, both teams have developed Project Design Matrix (hereinafter referred to as "PDM") as shown in Annex 1.

The project purpose in PDM is as follows:

"The Forestry Institute of the State of São Paulo upgrades its research ability in conducting the researches on the soil erosion control and the forest restoration in the degraded lands of São Paulo State."

The Project has been carried out mainly at Assis and Paraguaçu Paulista.

2. EVALUATORS

2-1. Japanese Side

Dr. Takao INOUE
Leader

Deputy Director General,
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Ministry of Agriculture, Forestry and Fishery (MAFF)

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Cooperation Evaluation

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Section Director,
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Mr. Ikuo TAKEUCHI Silviculture/Forest Ecology	Chief, Vegetation Control Laboratory, Silvicultural Section, Forestry Technology Division, FFPRI, MAFF
Mr. Katsuya TAKI Planning Evaluation	Project Officer, Forestry Cooperation Division, Forestry and Fishery Development Cooperation Department, Japan International Cooperation Agency (JICA)
Mr. Wataru TAKADA Evaluation Analysis	Senior Principal Consultant, Consulting Department I CRC Overseas Cooperation Inc.

2-2. Brazilian side

Mr. Oswaldo Poffo Ferreira Leader	General Director, Forestry Institute Secretariat of Environment
Dra. Vera Lúcia Ramos Bononi	Coordinator Coordination Office for Technical Information, Documentation and Environmental Research Secretariat of Environment
Mr. Marco Antonio de Oliveira Garrido	Director, Forest and Experimental Station Division Forestry Institute
Mr. Guenji Yamazoe	Chief, Silviculture Section, Forestry Institute
Dr. Joao Batista Baitello	Director, Dasonomy Division, Forestry Institute

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Dra. Giselda Durigan

Chief,
Assis Forest and Experimental Station Section,
Forestry Institute

Mr. Sebastião Fonseca Cesar

Coordinator,
Erosion Control Group,
Forestry Institute

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, Annual Work Plan and PDM.
- (2) To make recommendations and suggestions concerning the measures to be taken after the termination of the cooperation period of the Project to the authorities of the respective Governments.

4. METHODOLOGY OF EVALUATION

4-1. Survey

The Project was evaluated jointly by the Japanese and Brazilian side. The Team visited two project sites and had a series of hearings from Japanese long-term experts, Brazilian counterpart personnel.

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

Effectiveness was assessed by evaluating the extent to which the Project has achieved outputs and project purpose.

(2) Impact

Impact of the Project activities was identified as positive and negative changes produced by the Project directly and indirectly (including unexpected changes).

(3) Efficiency

Efficiency of the Project implementation was analyzed focusing on the relationship between outputs and inputs in terms of timing, quantity, and on linkage with other cooperation scheme of JICA and other organizations.

(4) Rationale

Rationale of the Project 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.

(5) Sustainability

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

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5. RESULTS OF EVALUATION

5-1. Accomplishment of the Project as of December 12, 1997

5-1-1. Accomplishment of Input

(1) Measures taken by the Government of Brazil

1) Provision of Land, Building and Facilities

(a) Project Offices

(b) Laboratories

(c) Experimental Fields

(d) Nurseries

(e) Machinery and Vehicles

(f) Lodging

2) Allocation of Counterparts and Other Personnel

During the cooperation period, twenty two (22) counterpart personnel were allocated, including two (2) resigned.

3) Allocation of Local Cost

A total of approximately US\$ 620 thousand was allocated for the Project as a part of the afforestation promotion program.

(2) Cooperation by the Government of Japan

1) Dispatch of Experts

(a) Long-term Experts

Nine (9) long-term experts in four (4) fields were dispatched.

(b) Short-term Experts

Twenty (20) short-term experts in three (3) fields were dispatched.

2) Provision of Machinery and Equipment

The machinery and equipment worth approximately 217 million yen (equivalent to approx. US\$ 1.7 million) were provided for the Project.

3) Training of Brazilian Counterpart Personnel in Japan

Eleven (11) Brazilian counterpart personnel were trained in Japan.

4) Other Financial Support

For effective implementation of the Project, a total amount of 138 million yen (equivalent to approx. US\$ 1.1 million) has been provided to supplement a portion of the cost of afforestation promotion program.

5-1-2. Accomplishment of Activities

(1) Research works on prevention of soil erosion

1) Actual condition and mechanism of soil erosion

In surrounding area of Assis and Paraguaçu Paulista, the actual condition of erosion such as type, scale and distribution, as well as their change was investigated by aerial photograph and field survey in order to clear their characteristics. Also, their relations with basic factors such as topography, soil nature and vegetation, as for mechanism to generate soil erosion, and with inducements including rainfall and land use type were examined.

2) Effect of the forests on soil erosion control

a) Plot experimental test on soil erosion and surface runoff on different land use type

Six experiment plots were constructed in different land use type at Assis area in which comparative experiments were conducted for verifying the effectiveness of the forests on soil erosion control. In the experimental plots, soil erosion, surface runoff, suspended soil in surface runoff and soil moisture are observed comparing the difference among data of each plot. Also, in order to clarify the effectiveness of reforestation in degraded area, field hydraulic test were conducted on different land use type.

b) Comparative survey of runoff and transported sediment before and after soil and water conservation works

In Agua da Cachoeira basin (Paraguaçu Paulista area), the comparative survey of transported sediment, water quality and runoff was planned, using two weir newly constructed for the Project in two degraded watershed (A&B) in order to clarify the effect of erosion control works such as stream work and hillside works as well as planting of trees.

In the watershed A, an observation of calibration period before the treatment of erosion control works was conducted using the constructed weir. After that, however, the observation of treated period has not started due to delay in treatment works. In the watershed B, with delay in construction of the weir, data collection and analysis are now being conducted.

3) Development of soil conservation technology

Various practical works of soil erosion control suitable to local degraded situation were studied at the watershed A. Those works were experimented utilizing materials obtainable locally by counterparts trained in Japan. Also, seedlings of native species were planted along Agua da Cachoeira River.

(2) Research works on restoration of the forest vegetation

1) Development of restoration technology

For the selection of native species and development of restoration technology suitable to reforestation in degraded area and river banks in the western region of São Paulo State, many different surveys and experiments were carried out in the area around Assis and Paraguaçu Paulista. Also, in the remaining forests and Cerrado, site condition, species composition and succession were

surveyed and the survey on geological structure and soil was conducted in sites for planting trials. The characteristics of seeds of native species selected for reforestation were examined and various planting trials using planting stock produced in the nursery of Assis and Paraguaçu Paulista were carried out, thus reforestation method suitable to site condition was discussed.

2) Effect of the forests on the environmental conservation

For clarifying the effect of forests on the environmental conservation, meteorological condition and change of soil were investigated in newly planted forest and remaining forests with different type of forest vegetation.

(3) Maintenance and utilization of equipment and facilities

In the soil erosion control area, 2 weirs, 6 experimental plots for soil erosion and surface runoff and laboratories were installed in both experimental sites and equipment for meteorological observation, runoff measuring and so on were provided in each experimental site and experimental watershed. In the forests restoration area, nursery facilities and equipment such as sprinkler, tractor, low temperature seed storage and so on were prepared for the production of nursery stock and also meteorological observatory equipment for forest environment survey were set up in some types of forests.

Inventory file, management label for each equipment and driving record of vehicles were prepared.

5-1-3. Accomplishment of Outputs

(1) Soil erosion control area

Many surveys and researches were carried out widely related to actual condition and mechanism of soil erosion and the characteristics of erosion such as type, scale and distribution, and relation with land use as well as mechanism of erosion including basic factors like soil nature and topography and inducement like relation with characteristics of rainfall were clarified.

Also, as the results of six plot tests, the effect of vegetation on reduction of soil erosion and surface runoff was confirmed.

However, in relation to the clarification of the effect of forests on soil erosion control, because of the delay in construction of observatory facilities due to interruption of works caused by extraordinary heavy rain out of season and various soil erosion control works and reforestation as treatment of experimental watershed which are now being undertaken behind the schedule, it became difficult to obtain the observation data to verify the effect of various erosion control works and reforestation by the end of the cooperation period.

As for the development of soil erosion control technology, various soil control by stream works and hillside works suitable to degradation of the site using materials locally available are developed and executed by counterparts trained in Japan.

In connection to the works in the watershed A, it is expected for the IF to supervise the execution

and completion of the works and planting and to collect the data for assessment of the effect and then to proceed the analysis and judgment of the effect of the soil erosion control works and the reforestation based on the transferred analysis technology.

(2) Forest restoration area

Appropriate species for each site conditions were listed up. The seed germination characteristics of native species were clarified and nursing method of cutting and potted seedling were developed. These results were published as "Seedlings of Tropical Trees". In the planting trials, ground clearance method which is effective for survival and growth of planting stock was developed. And also methods such as planting spacing, mixed planting and ground treatment which is effective for inducing natural regeneration, were obtained. Thus, forest restoration methods with native species were developed.

Also it was clarified, by meteorological observation inside and outside forests and by measuring depth, hardness and pH of soil, that both of climate condition and soil condition become stable and forests produce good environment.

(3) Maintenance and utilization of equipment and facilities

Constructed facilities and provided equipment in both of the soil erosion control area and the forest restoration area were well maintained and fully utilized.

5-1-4. Accomplishment of the Project Purpose

The results of researches in both area of the soil erosion control and the forest restoration were prepared for publishing. The activities to publish and to disseminate research results were extensively performed through releasing in academic meetings, symposia and so on. The equipment and facilities for researches were well maintained and properly used. Thus, the research ability of the IF is considered to have been remarkably upgraded.

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5-2. Analysis on Evaluation Issues

5-2-1. Effectiveness

The outputs have been effectively secured by performing planned activities and appropriate technology was transferred to the counterparts. Owing to the research activities conducted in the Project and the provision of equipment and facilities for researches, the researching staffs of the IF have improved its ability and has expanded widely the extent of its activities, thus the project purpose was considered accomplished.

It is expected that the IF will contribute in disseminating the results of researches.

5-2-2. Impact

In both areas of the soil erosion control and the forest restoration, the organization in the IF to promote research has been improved and the methodologies of research, survey and analysis owned by researching staffs of the IF have been upgraded.

The results obtained in the project are being utilized in environment education to local communities. The counterpart researchers are contributing in dissemination by publishing the results of researches in the Third County Training Program, academic meetings, symposia and so on.

As an example of contribution of the Project, it is found that the municipal governments in the vicinity of the project site have started, with financial cooperation of the World Bank, the Paranapanema Basin Environment Control Project in which riparian forest restoration is being promoted. This project was modeled after the Project.

5-2-3 Efficiency

The timing of inputs such as dispatch of experts, provision of equipment and expenditure of local costs was appropriate in general.

In the forest restoration area, expected outputs were obtained efficiently on good balance with inputs.

However, in the soil erosion control area, most of counterpart researchers assigned in both site of Assis and Paraguaçu Paulista were temporary contracted personnel and very few staff members of the IF with guaranteed status were allocated. Moreover, some of temporary contracted counterparts were dismissed because of the change of employment policy of the State Government. Also, the delay in the works related to construction of weir is observed. These factors inhibited efficient implementation of a part of the Project.

5-2-4 Rationale of the Plan

In the State of São Paulo, degradation and decrease of forests have been advanced rapidly mainly by development of agriculture and livestock farming. The importance of soil conservation by erosion control against extensive land use is increasing. This situation remains unchanged since the beginning of the Project. To promote the researches on the soil erosion control and the forest restoration is considered critical in order to develop the practical technologies in those areas, offering scientific knowledge. The IF

is the organization in charge of such researches. In the above view point, the overall goal and the project purpose are considered timely and appropriate. The inputs, activities and outputs as well as these linkages are adequately designed.

5-2-5 Sustainability

The researches conducted in the Project meet the administrative needs under the situation that social interests in environmental conservation are increasing and the soil erosion control and forest resources preservation and restoration are required in the domestic environmental policy.

It is observed that the counterpart personnel have acquired the technologies transferred during the cooperation period on researching methodology, and operation and maintenance of researching equipment. And, with those counterparts who acquired technology transfer, the IF will be able to develop practical technologies based on the results of researches which are expected to be disseminated in all over the State of São Paulo.

It is also noted that counterparts are publishing and disseminating the results of researches in the Third Country Training Program, academic meetings, symposia and so on. As such, the results of researches in the IF are expected to be disseminated not only in Brazil but also in surrounding countries.

It is concerned, however, whether the actual research activity will be able to be continued or not in the field even after the termination of the cooperation period, as the agreement period of using private lands which was the precondition of the Project is same 5 years as the cooperation period.

In the soil erosion control area, appropriate counterpart was not assigned in both site of Assis and Paraguaçu Paulista throughout the cooperation period, as stated before, and there is no prospect to be assigned in future. In order to secure the succession of the obtained results of researches and methodologies from one to another, it is required to allocate the staff members of IF or to continue the contract with actual temporary personnel after the termination of the cooperation period.

During the Project period, IF has given the best effort in the difficult financial situation in sharing a portion of the afforestation promotion program and expending for the various constructions. It is expected that IF will continue to secure the necessary budget for its planned activities.

Most of observatory equipment provided in the experiment fields are made in Japan. They may be necessary to be gradually replaced with other products which are available in Brazil, considering maintenance and spare parts.

6 CONCLUSION AND RECOMMENDATIONS

6-1. Conclusion

The Project, which has been conducting researches in the area of the soil erosion control and the forest restoration, presented a great contribution to the environmental conservation in Brazil. And also it is noted that both side of Brazil and Japan could share many useful information being needed to promote tropical forest conservation obtained through cooperative research activity in the Project.

In the forest restoration area, the project activity was executed without remarkable problems and produced satisfactory results. In the soil erosion control area, the basic and pioneering results such as a grasp of the mechanism of soil erosion has been obtained, although some research activities at the last part of the project period has not reached the level expected at the planning stage due to certain delay in the construction of observatory facility and other works in connection and also to a lack of stable counterpart assignment. It is observed, however, that the Brazilian researchers have been already improved, throughout the cooperation period, on the research technologies such as for planning, designing and implementing of experiments, for collection and analysis of data, and for maintenance and operation of equipment.

Accordingly, it is reasonably considered to terminate the cooperation of the Project in the end of January, 1998 as scheduled. It must be added that the continuous data collection and data analysis, as well as publishing and dissemination of the research results in both cooperation areas are important.

6-2 Recommendations

For the promotion of environmental policy of the country, it is important that the IF will make the best use of the results of the Project and will continue to develop the researches on the soil erosion control and the forest restoration.

For developing further the results of the Project and securing the sustainability of the researches on both cooperation areas, it is required for the IF to prepare an action plan for at least several years, in which the IF shall design clearly the research activities to be developed independently by itself and to conduct the researches systematically according to the plan. In case that the necessity of Japanese cooperation is recognized in implementing the action plan, according to the results of monitoring on its progress for several years, it is desired for both Governments to consider the possibility of additional cooperation such as an after care program by JICA based on request by Brazilian Government. By such a reason, the IF is requested to submit annual reports on the progress of the action plan to JICA São Paulo Office.

Furthermore, it is required, for continuing the researches on the both cooperation areas, to reinforce the organizations, allocating permanent researchers in each station of the soil erosion control, to assure the existing experimental sites by renewing the agreement, and to secure necessary budget according to the research plan.

Also it is recommended for the IF to keep close relations with other research institutions and extension organizations in order to promote efficiently the research activities and to disseminate the research results.

Project Design Matrix (PDM) on the Japanese Technical Cooperation for the Forest and Environment Conservation Research Project

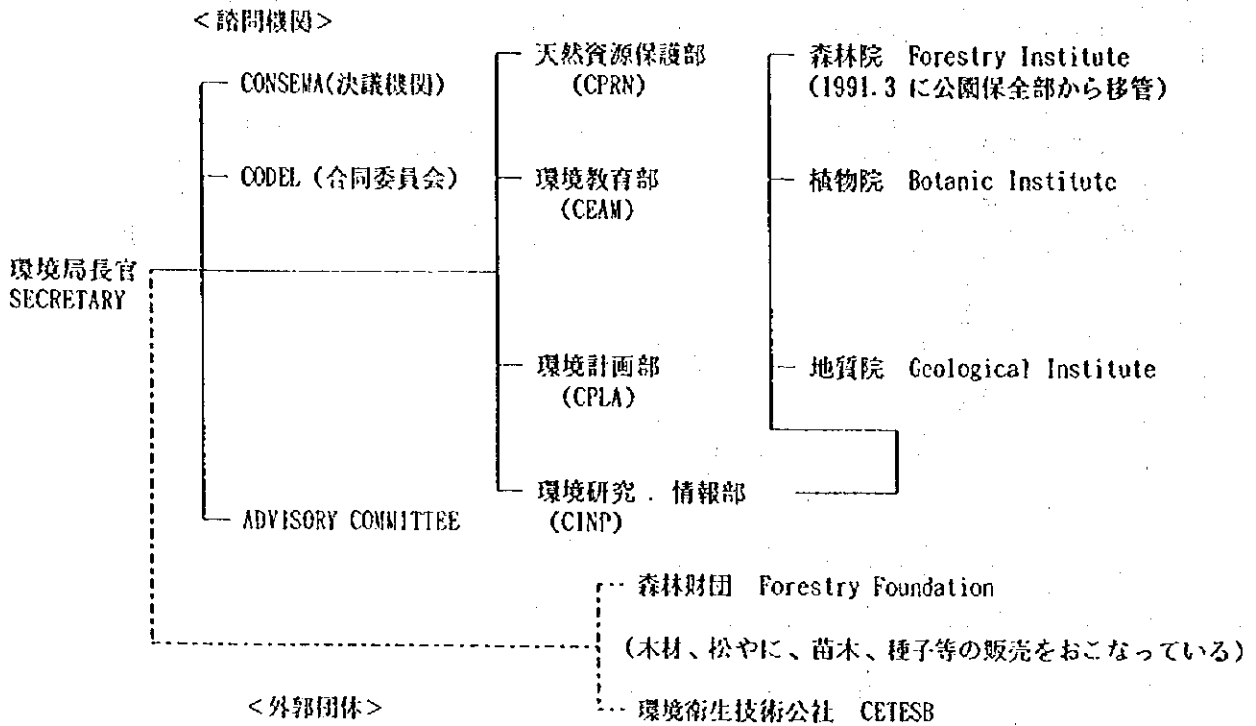
Annex 1

Summary of the project	Verifiable Indicators	Means of Verification	Important Assumption
<p><u>Overall Goal</u> The products of researches by the Forestry Institute of the State of São Paulo on the soil erosion control and the forest restoration are utilized for developing practical technology.</p>	<p>- Examples of utilization of the products of researches by the Forestry Institute on the soil erosion control and the forest restoration</p>	<p>• Interview to implementing agency and authorities concerned</p>	<p>(1) The present environmental policies are maintained. (2) Technology developed based on outcomes of research activities by the Forestry Institute is accepted by the local society.</p>
<p><u>Project Purpose</u> The Forestry Institute of the State of São Paulo upgrades its research ability in conducting independently the researches on the soil erosion control and the forest restoration in the degraded lands of São Paulo State.</p>	<p>(1) Status of coordinating outputs of researches (2) Status of maintenance control and use of equipment and facilities (3) Degree of upgrading research ability of researchers who acquired technology transfer</p>	<p>(1) Documents of the Forestry Institute (2) Activity report of the Project (3) Interview to JICA Experts and Brazilian Counterparts (4) Record of participation in seminars and academic symposium etc.</p>	<p>(1) The counterparts remains as researcher and the structure of research is maintained. (2) The research activities are spontaneously and continuously developed. (3) Financial support to soil erosion control and forest restoration continues.</p>
<p><u>Result/Outputs</u> 1. As results of research works on prevention of soil erosion: (a) Actual condition and mechanism of soil erosion are clarified. (b) Effect of the forest on soil erosion control are clarified. (c) Soil conservation technology is developed. 2. As results of research works on restoration of the forest vegetation: (a) Restoration technology is developed. (b) Effect of the forests on environmental conservation is studied. 3. Equipment and facilities necessary for research works are well maintained and utilized for research works.</p>	<p>1. In research area of Prevention of Soil Erosion: (a) Status of clarification on actual condition and mechanism of soil erosion (b) Status of clarification on effect of the forest on soil erosion control (c) Status of development of soil conservation technology 2. In research area of Restoration of the Forest Vegetation: (a) Status of development of restoration technology (b) Extent of study on effect of the forests on environmental conservation 3. Status of maintenance and utilization of equipment and facilities</p>	<p>(1) Research papers and technical reports on - Actual condition and mechanism of soil erosion - Soil erosion control function of forests - Soil conservation technology - Forest restoration technology - Effect of forests on environmental conservation (2) Interview to JICA Experts and Brazilian Counterparts (3) Equipment inventory and completion reports of constructions (4) Field survey...</p>	
<p><u>Activities</u> 1. In the above research areas (2 areas with 5 themes), following activities are conducted: 1-1 planning and designing of experiments 1-2 execution of experiments 1-3 data collection and analysis 1-4 preparation of research papers and technical report 1-5 publishing in seminars and symposium 2. To build the structure for maintenance and utilization of equipment and facilities necessary for research works</p>	<p><u>Inputs by Japanese Side (As of December, 1997)</u> 1. Dispatch of experts : long term 9, short term 20 2. Brazilian counterpart training in Japan : 11 counterparts 3. Provided equipment equivalent to : approx. 217 million yen 4. Other Expenditure : Afforestation Promotion Program approx. 138 million yen</p> <p><u>Inputs by Brazilian Side</u> 1. Staff assigned : Counterparts: 22 assigned (2 resigned) 2. Lands, buildings and facilities 3. Local cost of Afforestation Promotion Program : approx. US\$ 620 thousand</p>	<p>• The counterparts continue to engage themselves in the research activity.</p> <p>(Pre-conditions) (1) Local cost is secured. (2) Researchers with basic research capabilities are assigned as counterparts. (3) Project sites are acquired with land owners' cooperation.</p>	

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4 サンパウロ州環境局組織図



5 サンパウロ州森林院組織図

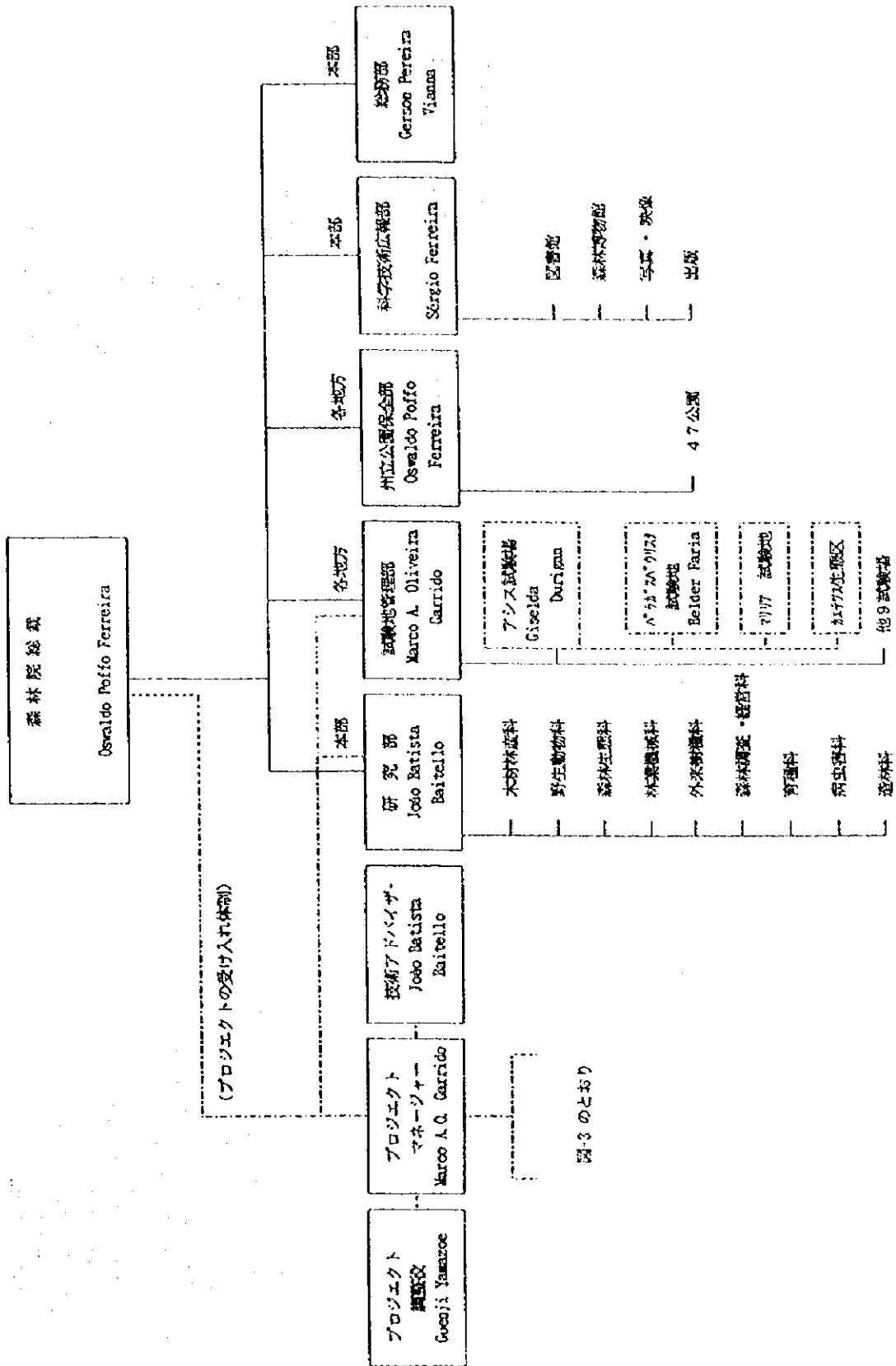


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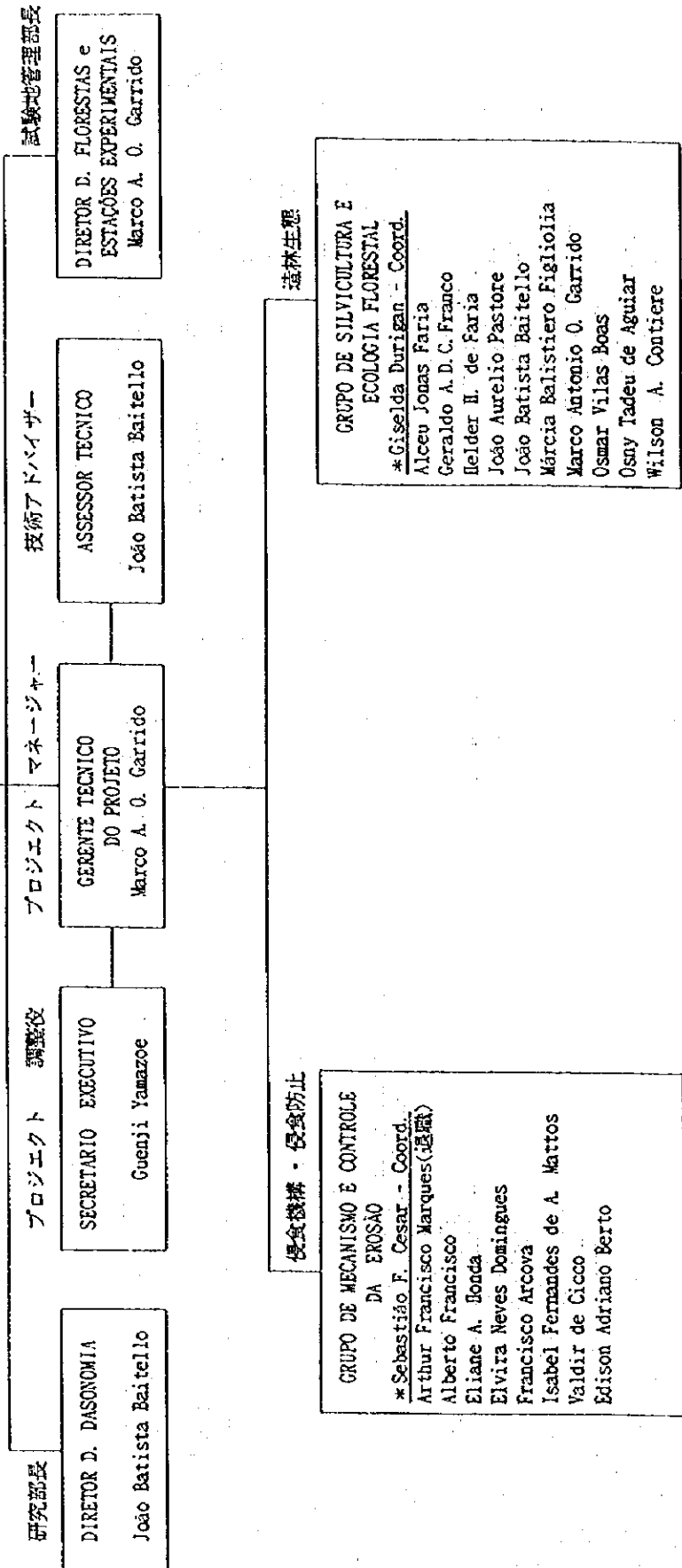
6 プロジェクト実施体制

森林院でのプロジェクトの受け入れ体制

PROJETO DE PESQUISA EM CONSERVAÇÃO DE FLORESTAS E DO MEIO AMBIENTE

森林院総裁

DIRETOR GERAL
DIRETOR DO PROJETO
Oswaldo Poffo Ferreira



優先機構・侵食防止

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造林生態

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Marco Antonio O. Garrido
Osmar Vilas Boas
Osny Tadeu de Aguiar
Wilson A. Contiere

註1) * は 各分野の調整役

7 カウンターパートの配置

研究課題と C/P の 配置

1997. 10. 01

大課題	中課題	小課題	C/P 担当者名	勤務地	所属・身分
I. 侵食防止の研究	1. 侵食地の実態及びメカニズムの解明	(1)侵食地の実態解析	1. Arthur Marques	パラガス	森林財団 (研究員)
			2. Elvira Domingues	サンパウロ	IF-研究部 (研究員)
		3. Isabel F. Mattos	サンパウロ	森林財団 (研究員)	
	2. 森林の侵食防止効果の解明	(1)土地利用別流出水土量のプロット試験	1. Isabel F. Mattos	サンパウロ	森林財団 (研究員)
2. Edison A. Berto			アシス	IF-試験地管理部 (研究員)	
	(2)荒廃流域における治山施工前・後の流出水土量流域試験	①Sebastião F. Cesar	サンパウロ	IF-研究部 (研究員)	
2. Alberto Francisco		パラガス	森林財団 (研究員)		
3. Eliane Bonda		サンパウロ	IF-研究部 (研究員)		
4. Francisco Arcova		サンパウロ	IF-研究部 (研究員)		
5. Maria E. Martins		パラガス	森林財団 (研究員)		
6. Valdir de Cicco		サンパウロ	IF-研究部 (研究員)		
	3. 侵食防止の開発	(1)侵食防止法の開発と侵食防止林の配置	①Sebastião F. Cesar	サンパウロ	IF-研究部 (研究員)
II. 森林回復の研究	1. 森林造成法の開発	(1)残存植生及び立地条件の調査	1. Geraldo Franco	サンパウロ	IF-研究部 (研究員)
			2. Giselda Durigan	アシス	IF-試験地管理部 (研究員)
			3. João A. Pastore	サンパウロ	IF-研究部 (研究員)
			4. João B. Baitello	サンパウロ	IF-研究部 (研究員)
			5. Márcia Figliolia	サンパウロ	IF-研究部 (研究員)
			6. Osny de Aguiar	サンパウロ	IF-研究部 (研究員)
		(2)郷土樹種育苗技術の開発	1. Márcia Figliolia	サンパウロ	IF-研究部 (研究員)
	2. Osmar Vilas Boas		アシス	IF-試験地管理部 (研究員)	
		(3)森林造成技術の開発	1. Giselda Durigan	アシス	IF-試験地管理部 (研究員)
	2. Marco A. Garrido		アシス	IF-試験地管理部 (研究員)	
3. Wilson Contiere	アシス		IF-試験地管理部 (研究員)		
4. Helder R. de Faria	パラガス		IF-試験地管理部 (研究員)		
	2. 環境保全効果の検討	(1)造成した森林における環境要因の調査	①Giselda Durigan	アシス	IF-試験地管理部 (研究員)
2. Alceu Faria			サンパウロ	IF-研究部 (研究員)	
3. Geraldo Franco			サンパウロ	IF-研究部 (研究員)	
4. João Pastore			サンパウロ	IF-研究部 (研究員)	
5. Márcia Figliolia			サンパウロ	IF-研究部 (研究員)	
6. Osny de Aguiar			サンパウロ	IF-研究部 (研究員)	

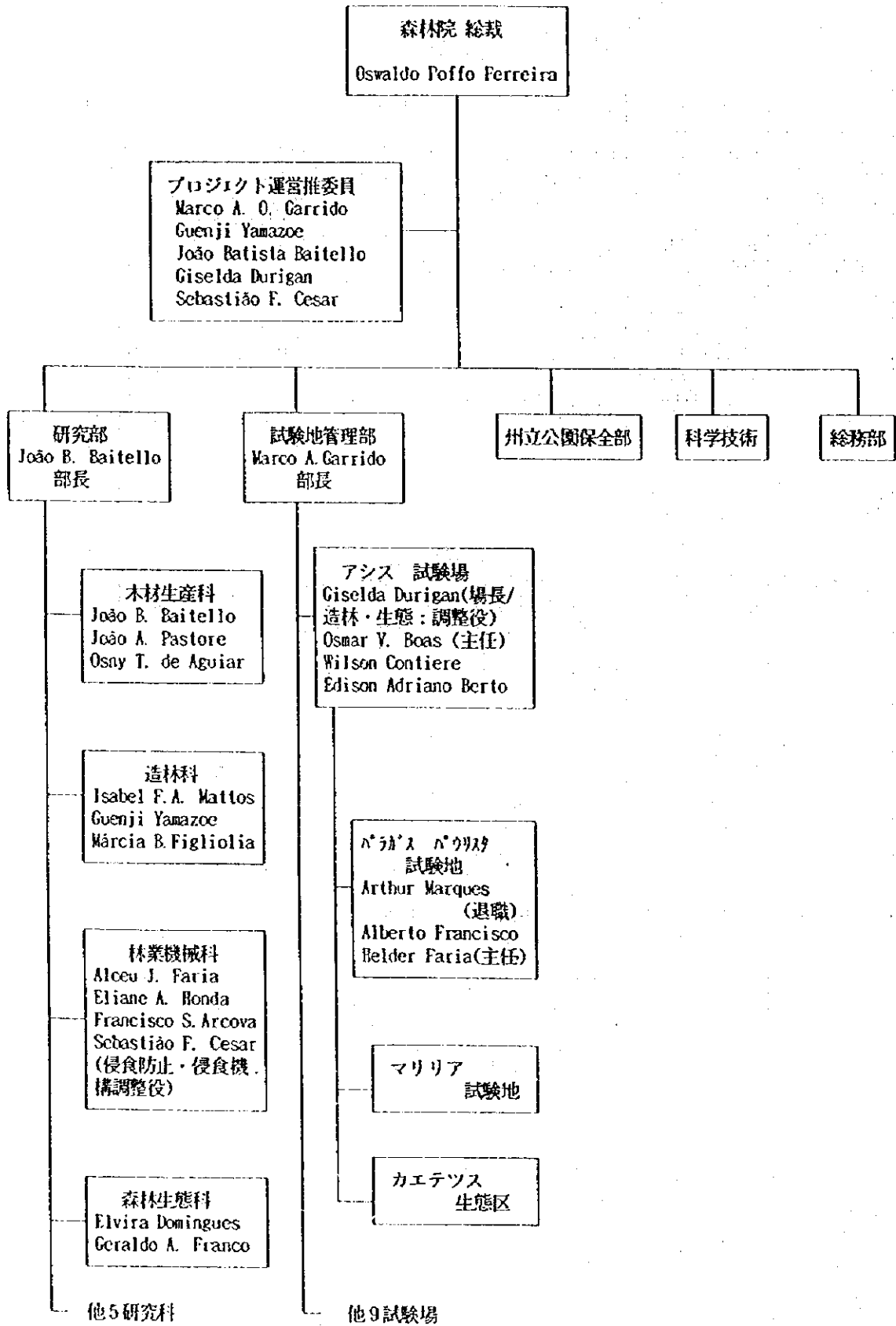
1997. 6. 30付解雇

1997年3月退職

①の研究員が各小課題の調整役

森林院内のC/P所属配置図

97.10.01



C/P 配設

分野	C/P名	予算年 月	配 置 状 況						本邦研修		備 考 (研究科目)	
			1992年 4.7.10.1	1993年 4.7.10.1	1994年 4.7.10.1	1995年 4.7.10.1	1996年 4.7.10.1	1997年 4.7.10.1	年度	主な研修先		
研究	Mr. Alberto Francisco											
研究	Mr. Alceu Faria								84	林野庁 森林総研	気候学	
財団	Mr. Arthur Marques								95	林野庁 林業土木コンパル	侵食防止	
研究	Ms. Eliane Akiko Honda								97	林野庁 森林総研	侵食対策	
研究	Ms. Elvira Domingues											
研究	Mr. Francisco Arcova											
研究	Mr. Geraldo Franco								95	林野庁 森林総研	造林	
管理	Ms. Giselda Durigan								95	林野庁 森林総研	造林	
研究	Mr. Helder E. de Faria								98/1 予定	林野庁 森林総研	造林	
財団	Ms. Isabel F. A. Mattos								94	林野庁 林業土木コンパル	侵食防止	
研究	Mr. João A. Pastore											
研究	Mr. João B. Baitello								92	林野庁 森林総研	造林	

C/P 配況

分野	予算年 C/P名 月	配 置 状 況						本邦研修		備 考 (研修科目)
		1992年 4.7.10.1	1993年 4.7.10.1	1994年 4.7.10.1	1995年 4.7.10.1	1996年 4.7.10.1	1997年 4.7.10.1	年度	主 公 研 修 先	
研究	Mr. José Timoni							93	林野庁 森林総研	管理
研究	Ms. Marcia B. Figliolia							94	林野庁 森林総研	造林
研究	Ms. Maria E. Martins									
財団	Mr. Marco Nalon									
管理	Mr. Marco A. Garrido							93	林野庁 森林総研	管理
管理	Mr. Osmar V. Boas									
研究	Mr. Osny de Aguiar									
研究	Mr. Sebastião Cesar									
財団	Mr. Sérgio de Campos									
研究	Mr. Valdir de Cicco							84 91	林野庁 森林総研	流域管理 森林水文
研究	Mr. Wilson A. Contiere							97	林野庁 森林総研	造林

8 専門家派遣実績

専門分野	氏名	年											
		1993	1994	1995	1996	1997	98						
長期													
プロジェクトリーダー	工藤 哲也 梁瀬 秀雄												
業務調整	佐藤 徹次 松田 潤治郎												
侵食機構	阿部 和時 阿部 実博 落合 博貴												
侵食防止	工藤 哲也 梁瀬 秀雄												
造林 生態	中田 博 川畑 充郎												
短期													
植生/造林生態	高橋 昌宏 佐藤 明真 佐野 真												
土壌	金子 真司												
侵食機構	阿部 和時 北原 隆 志水 俊夫 大倉 陽一												
侵食防止	北田 正憲 品川 正義 橋田 健司 嘉藤 昭吉 大野 輝広												
森林気象	森澤 猛												

9 プロジェクト終了後の研究活動計画

(1) 侵食防止分野

最低限必要な観測業務内容

1) 樹木の生長に伴う「降雨-流出 反応特性」の把握 (植栽広葉樹プロット)

植栽広葉樹、裸地の2プロットにおける観測は、本プロジェクトの中で特に重要であり、以下のように行うことが必要である。

試験項目	観測項目	観測点数
プロット試験		
裸地 (対象区)	流出水量	2
	堆積物量	2
植栽広葉樹	浮遊固形物	2
	土壤水分	32
	降水量	1
合計		39

観測期間： できるだけ長く (5年が目安)

保守管理の頻度

流出水量、浮遊固形物量：降雨イベントごと

堆積物量： 状況に応じて適時

降水量： 月に1回

水補給： 週に1回 (雨期)

(土壤水分計、水位計) 3-4日に1回 (乾期)

群落構造： 年に1回

(土壤表面を含む)

その他

- ・裸地プロットは、広葉樹植栽プロットの対象プロットとして観測を行う。

2) 植生別の「降雨一流出特性」の把握

サトウキビ、草地、マツ林、セハードの4プロットにおける観測は、以下のように行うことが望ましい。

試験項目	観測項目	観測点数
プロット試験		
サトウキビ	流出水量	4
草地	堆積物量	4
マツ林	浮遊土砂量	4
セハード	土壌水分	64
	降水量	1
合計		77

観測期間： 最低で約 15 降雨イベント

保守管理頻度

流出水量、浮遊固形物量：降雨イベントごと

堆積物量： 状況に応じて適時

降水量： 月に1回

水補給： 週に1回 (雨期)

(土壌水分計、水位計) 3-4日に1回 (乾期)

その他

- ・本試験の観測システムは壊れやすい。観測システムの故障などにより、全6プロットでの測定が不可能となり、観測を中止するプロットを選定しなければならない場合には、草地プロットないしはマツ林プロットが望ましい。草地プロットを選んだ理由は、すでにある程度のデータ蓄積がなされているためである。マツ林プロットを選んだ理由は以下の通りである。マツ林プロットとセハードプロットは共に森林プロットであり、お互いに保管するプロットといえる。したがっていずれか一方の観測を中止することは、本プロジェクト全体に及ぼす影響は比較的少ない。セハードプロットは、広葉樹植栽プロットと関連したプロットであり、マツ林プロットより重要性は高い。そのため、マツ林プロットを選択した。

3) A、B流域の流出観測

A、B流域における観測は、以下のように行うことが望ましい。

試験項目	測定項目	観測点数
流域試験		
A、B流域	流出水量	2
	堆積物量	2
	浮遊固形物量	2
	降水量	2
	気温	2
	濁度	2
	水温	2
	溶存酸素量	2
	pH	2
合計		18

観測期間： 最低で約20降雨イベント程度

保守管理頻度

堆積物量を除く全項目： 週に1回または降雨イベントの直後

堆積物量： 状況に応じて適時

その他

- ・これらの観測項目のうち、流出水量、堆積物量、浮遊固形物量、降水量は特に重要である。
- ・保守管理時に、毎回流速を測定し、水位計による測定値と比較する必要がある。
- ・A、B両流域で、十分な注意を払った観測が行えないような場合には、両流域で漫然とした観測を行うよりも、いずれか一方の観測を集約的に行う方が極めて有効である。
プロット試験の結果に基づいて構築したモデルの検証を行うためには、B流域に集約することが望ましい。B流域は、サトウキビ、草地と複数の土地利用が存在するためこと、集水域がA流域よりも明瞭であり、かつ土地利用形態の変化、緑化工事の影響が排除できるため、モデルの検証が比較的容易と考えられるためである。
- ・A流域の水量観測水路の下端が、土砂の堆積により水の落差が確保できなくなっている。そのため、A流域における観測を正確に行うことができない状況にある。A流域における観測を再開する場合には、水路下端付近を浚渫し、水の落差高をおおよそ1m程度確保する必要がある。

4) アグアダカシヨイエラ流域における気象観測

アグアダカシヨイエラ流域における気象観測は現在順調に行われており、必要となる労働力も比較的少ない。したがって現在と同様に今後も観測を行うことが望ましい。その内容は以下の通りである。

試験項目	観測項目	観測点数
気象観測	日射量	1
	気温	1
	湿度	1
	風向	1
	風速	1
	降水量	6
合計		11

観測期間： できるだけ長く

保守管理頻度： 月に1回

その他

・これらの観測項目のうち、降水量は比較的重要である。

9 プロジェクト終了後の研究活動計画

(2) 森林回復分野

NUMERO	TITULO	タイトル	AREA	PLANTIO	LUGAR	方針	研究計画(案)
1	Florística	種の同定			Est. Exp. ASSIS	継続 ◎	アシス試験地を中心に更に植物標本の採集を進める。
2	Fitosociologia	植物群落構造調査			Est. Exp. ASSIS	継続 ◎	ガリア内の永久プロット内の5cm以下について1999年に測定する。
3	Teste de espécies para plantio área de cerrado	セラードにおける造林樹種試験(I)	0.43ha 720本	2/94	Est. Exp. ASSIS	継続 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano
4	Teste de espécies para plantio área encharcada	湿地における造林樹種試験	1.22ha 2,040本	3/94	Est. Exp. ASSIS	継続 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano
5	Plantio de enriquecimento	エンリッチメント試験(セラード林内)	17.78ha 1,800本	4/94	Est. Exp. ASSIS	継続 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano
6	Indução da regeneração natural em área de cerrado	天然更新の誘導試験(地表処理別)	1.93ha	1/95	Est. Exp. ASSIS	継続 ◎	出現個体の動向を1年に1回測定する。 Medição 1 vez por ano
7	Regeneração natural do cerrado sob diferentes tipos de florestas	天然更新の誘導試験(上層樹種別)	1.44ha 1,350本	3/95	Est. Exp. ASSIS	継続 ◎	出現個体の動向を1年に1回測定する。 Medição 1 vez por ano
8	Regeneração natural da mata ciliar sob floresta plantada de pinus em diferentes densidades	天然更新の誘導試験(上層木植栽密度別)	0.35ha 342本	4/95	Est. Exp. ASSIS	継続 ◎	出現個体の動向を1年に1回測定する。 Medição 1 vez por ano
9	Plantio de enriquecimento com 10 espécies	エンリッチメント試験(深群林内)	2.00ha 220本	1/95	Agua da Cachoeira	継続 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano
10	Conservação de sementes de essências nativas	郷土樹種の種子保存		11/95	IF Sao paulo	継続 ◎	遠く多くの樹種について実験を継続する。 Continuar outras espécies
11	Técnicas de preparo de solo para reflorestamento com espécies nativas em área de cerrado	地植え技術試験(セラード林地)	3.46ha 2,590本	1/96	Est. Exp. ASSIS	継続 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano
12	Teste de espécies	セラードにおける造林樹種試験(II)	1.26ha 1,400本	2/96	Est. Exp. ASSIS	継続 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano
13	Plantio misto de essências nativas testando diferentes combinações de 7 espécies	遠く組み合わせによる郷土樹種(7種)の混植試験	1.00ha 2,194本	1/96	Agua da Cachoeira	継続 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano

NÚMERO	TÍTULO	タイトル	AREA	PLANTIO	LUGAR	方針	研究計画(案)
1 4	Plantio misto de 4 espécies com diferentes combinações com mudas de duas idades	2つの異齡苗(4種)の混植試験	2.00ha 1.152本	1/96	Agua da Cachoeira	継続 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano
1 5	Plantio misto de essências nativas testando diferentes espacamentos	郷土樹種の植栽間隔試験	0.80ha 1.485本	1/96	Agua da Cachoeira	継続 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano
1 6	Monitoramento do incremento mensal em diâmetro de sete espécies nativas em floresta primária	永久プロット内における成長速度試験	0.60ha 70本	2/96	Est. Ecol. Caetetus	継続 ◎	1998年1月までは毎月1回測定し、それ以降は1年に1回測定する。 Até janeiro de 1998 (por mes) Depois 1 vez por ano
1 7	Estudo do crescimento de algumas espécies de potencial econômico na cabeceira do manancial d'água	水源地における経済性のある郷土樹種の成長試験	3.00ha 4.872本	1/97	Est. Exp. ASSIS	継続 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano
1 8	Plantio de uma espécie nativa com valor comercial (<i>Anadenanthera macrocarpa</i>) consorciada com uma pioneira (<i>Croton floribundus</i>)	有用樹種とパイオニア樹種との混植試験 (1) (パイオニア-カ-リ-と-カ-ツク)	1.00ha 1.200本	2/97	Agua da Cachoeira	継続 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano
1 9	Plantio de uma espécie nativa com valor comercial (<i>Tabeuia zveilingae</i>) consorciada com uma pioneira (<i>Croton floribundus</i>)	有用樹種とパイオニア樹種との混植試験 (2) (パイオニア-と-カ-ツク)	1.00ha 1.200本	2/97	Agua da Cachoeira	継続 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano
2 0	Plantio de uma espécie nativa com valor comercial (<i>Astrouium urundeua</i>) consorciada com uma pioneira (<i>Croton floribundus</i>)	有用樹種とパイオニア樹種との混植試験 (3) (パイオニア-と-カ-ツク)	1.00ha 1.200本	2/97	Agua da Cachoeira	継続 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano
2 1	Monitoramento da microclima ambientes com diferentes coberturas vegetais	森林タイプ毎の林内微気象観測	5 基	3/97	ASSIS Caetetus Agua da Cachoeira	継続 ◎	毎月1回、各クワーからデータ収集を行い、データを整理する。 Colheita dados 1 vez por mes
2 2	Plantio misto de essências nativas com fertilização em mata ciliar	郷土樹種の施肥試験 (採種林地)	1.09ha 1.402本	4/97	Agua da Cachoeira	継続 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano

NUMERO	TITULO	タイトル	AREA	PLANTIO	LUGAR	方針	研究計画(案)
2 3	Monitoramento da sobrevivência e crescimento nas TATU e VOCOROCA NOVA (PLOTES)	タツノ次とボソロッカノボの成長追跡調査(プロット設定)			Agua da Cachoeira	継続 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano
2 4	Monitoramento da sobrevivência e crescimento na VOCOROCA VELHA	ボソロッカ植栽地の成長追跡調査			Agua da Cachoeira	新規 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano
2 5	Monitoramento da sobrevivência e crescimento na PLOTE TESTE (em colaboração grupo do erosão)	プロット内での植栽木成長追跡調査 (侵食グループと共同調査)			Est. Exp. ASSIS	新規 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano
2 6	Monitoramento da sobrevivência e crescimento na Bacia A e B (em colaboração grupo do erosão)	A/B流域山腹工事の植栽木成長追跡調査 (侵食グループと共同調査)			Agua da Cachoeira	新規 ◎	生存率、生長量を1年に1回測定する。 Medição 1 vez por ano

10 供与機材の配備状況表

平成9年度 第3四半期現在

(160万円以上の機材)

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)
1992		<現見地高岡文達>				
	001	車両(VW. Quantum)		1	アソ 試験場	
	002	車両(トヨタ. ハイラックス)		1	バカ試験場	1996年度車両事故後 保険売却代替車購入
		<本邦具購送>				
	003	多容量土壌pH測定装置(大起理化) DIK-3480	1,833	1	バカ試験場	現地調査の時使用
	004	表層地下水位計測システム (NMBサイテック)9点	2,558	1式	バカ試験場	現地調査の時使用
	005	総合気象観測装置(横河カエック) 機器-13点、予備品-5点	2,750	2式	アソ 及び バカ	
	006	気象データ演算解析装置(横河カエック) 機器-6点	2,250	2式	アソ 及び バカ	
	007	ビデオカメラ(ソニ-本体DXC-537K) 付属品18点	4,003	1式	カノ加 州森林院	調査時や催しに応じ 使用
1993		<現見地高岡文達>				
	001	散水施設 <本邦具購送>	3,800	1式	アソ 試験場	
	002	現場一面セン断試験機(ヤマ)	2,600	1式	バカ試験場	
	003	浮遊土砂計測システム(岩崎)	6,184	2台	バカ試験場	

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)
1993	004	長期自記水位雨量計 (横河ケイダック)	3,540	2 式	バカ試験場	
	005	フロト流出量観測装置 (横河ケイダック)	3,250	1 式	バカ試験場	
	006	表面侵食流出土砂計測システム (岩崎)	2,328	1 式	バカ試験場	
	007	G I S 解析装置 (東芝)	6,823	1 式	カカ加 森林院	
	008	浮遊土砂ろ過装置 (柴田科学) 他	1,670	1 式	バカ試験場	
	009	中間流出量観測装置 (横河ケイダック)	3,005	1 式	バカ試験場	現地調査時に使用
1994		<< 現地調査 >>				
	001	基盤整備用トラック (メルセ)	5,247	1 台	バカ試験場	
	002	保育用トラクター (フォード)	1,950	1 台	バカ試験場	
	003	植栽用トラクター	4,727	1 台	バカ試験場	
	004	調査用車両バンパ (フォード)	1,324	1 台	バカ試験場	
	005	基盤整備用運搬車コンビ (クワン)	1,159	1 台	バカ試験場	
	006	巡回用バイク (ホンダ)	1,796	4 台	バカ 及び バカ	
	007	車両バラチ (クワン)	1,637	1 台	バカ試験場	
	008	バックフオー (メルセ)	4,207	1 台	バカ試験場	
	009	保育用散水タンク	2,090	1 台	バカ試験場	
		<< 本邦内搬送 >>				
	010	水位デジタル測定システム	3,150	1 式	バカ試験場	雨期のみ使用
	011	表面侵食流出土砂計測システム	6,990	3 式	バカ試験場	

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)
	012	流水計	1,950	3式	バカ試験場	
	013	土壌水分測定装置	2,990	4式	バカ試験場	
	014	土壌水分測定装置	3,020	4式	バカ試験場	
	015	自動水質測定装置	6,636	2式	バカ試験場	
1995		<< 現地巡回送 >>				
	001	種子貯蔵装置	4,232	1式	73A 試験場	
	002	消火用タンク	1,661	2式	73A 試験場	
		<< 本邦既済送 >>				
	003	表面侵食流出土砂計測システム	2,259	2式	バカ試験場	1基は B流域工事完工後設置
	004	法面吹き付け装置	1,940	1式	バカ試験場	風水施設補修時に使用
1996		<< 現地巡回送 >>				
	001	車両トヨタバンデランテ(94年型)	2,400	1台	バカ試験場	
	002	気象観測装置	6,144	5基	73A、バカ、カバカ	
	003	トラクター(70-F5636 TR)	3,751	1台	73A 試験場	
	004	治山工専用トラクター(70-F5636)	3,080	1台	バカ試験場	
	005	無線機(RADIO VHF - 避雷機付)	2,532	1式	バカ試験場	

(10万円以上160万円未満の機材)平成9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	等
1992		< 玉見地盤調査 >					
	001	ポ-機 (キャノン-NP2020)	1		1		
	002	ポ-機 (キャノン-NP1020)	1		1		
	003	コンピュータ (MICROTEX-MF386SX)	1		1		
	004	タイプライター (リベック-ET-2450MD)	1		1		
	005	発芽器 (MOD-100G)	1		1		
	006	立体顕微鏡 (Carl Zeiss-DRC)	1		1		
	007	フタミツリ (シャープ-F0130)	1		1		
	008	ビデオカメラ (ソニー-CCD-TR50BR)	1 式		1	特定な時期に使用	
		< 本邦産品調達 >					
	009	チェンソー (日立工機-CS-40L)	1		1		
	010	トランソット (リキア-BT-20, 三脚付き)	1 式		1		
	011	オートバレー及び三脚 (クイルド-NA-2B)	1 式		1		
	012	上皿電子天秤 (オトラ-AJ-100型)	1		1		
	013	上皿電子天秤 (オトラ-PJ-3000型)	1		1		
	014	上皿電子天秤 (オトラ-PJ-15型)	1		1		
	015	上皿電子天秤 (オトラ-KB-60型)	1		1		
	016	ろ過装置 (ホーホ (柴田GR-3型))	1		1		
	017	アツク炉 (柴田SWS-200)	1		1		
	018	土壌抵抗測定器 (大起SR-2)	1		1	土壌調査を行う時に使用	
	019	低温恒温器 (柴田SP0-45D)	2		2		

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 等
1992	020	簡易貫入試験機(筑波丸東)	1式		1	
		S-21-4B				
	022	ハンドガン(丸東)	1式		1	土層構造調査時に使用
		S15-4A(クリエック)S15-1B(秋トホル)				
	023	発電機(スズキSV-1200)	1		1	
	024	降雨強度観測装置(横河エレクトロニクス)	2式		2	
		機器等7点				
	025	自記地中温度計(横河エレクトロニクス)	2式		2	
		E-162,その他消耗品				
	026	長期自記雨量計(横河エレクトロニクス)	3式		3	
		B-432,その他消耗品				
	027	土壌水分計測定装置(大起)	2式		2	
		DIK-3020,その他付属品				
	028	フロー式流速計(ケネック)	1式		1	
		V0-401A,その他センサー2点				
	029	携帯用水質計(セトシ)	1式		1	
		濁度計等機器4点				
	030	土壌簡易pHメーター(藤原)	2		2	
		SPAD PHS-120				
	031	塩素濃度計(笠原)ホウケイ型CL-1)	1		1	
	032	フロン7濃度計(笠原)NH4-1F	1		1	

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 等
1992	033	振動器 (丸東) C34-2	1		1	
		< 携行用機材 >				
	001	PC (NEC) PC-9801na	1 式		1	(1996年 8月本邦で修理後再使用)
	002	GPS (ソニー) IPS-360	1 式		1	
	003	実体鏡 (トコ)	1 式		1	
	004	PC (IBM) 5523SV4	1 式		1	
1993		< 現見土世高岡建設 >				
	001	ジェットシュタ (JACTO-2000F)	1		1	使用する事態が発生していない
	002	立体顕微鏡 (CARL ZEISS-SV6)	1		1	
	003	オートM (HONDA-XLS125)	2		2	
		< 携行用機材 >				
	004	BULEME LICE (ドイツ製) BL-6	1 式		1	
		< 本邦具轉送 >				
	005	降雨強度観測装置 (横河クワック)	2 台		2	
		雨量計感部等 5点				
	006	土壌水分計測定装置 (大起)	4 式		4	
		デジコン等 5点				
	007	上皿電子天秤 (オハラ社)	1 台		1	
	008	チェンソー (共立工)	1 台		1	
	009	簡易貫入試験器 (丸東製作所)	1 台		1	

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 等
1993	010	携帯用オシロスコープ (セトナル 科学)	1台		1	
		DO/O ₂ /Tempメータ				
	011	携帯用オシロスコープ (セトナル 科学)	1台		1	
		PH/ORPメータ				
	012	電磁流速計 (横河電機)	1台		1	現地調査時に使用
	013	地すべり計-変位測定装置 (コナシタム) テクタ等 3点	1式		1	現地調査時に使用
	014	実体鏡 (トプコン) 3型	1台		1	
	015	オートヘッドプロジェクター (クワダ) CU-575-S	1台		1	
1994		< 互見地周辺 >				
	001	噴霧器	1台		1	
	002	噴霧器運搬用アタッチメント	1台		1	
	003	整地用アタッチメント	1		1	
	004	木工用ミキサー	1		1	
	005	耕転用アタッチメント	1		1	
	006	レーキ アタッチメント	1		1	
	007	簡易木工用アタッチメント	1		1	
	008	後置式地捨えアタッチメント	1		1	

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 等
1994	009	前置式地植えアタッチメント	1		1	
	010	トラック用荷台	1		1	
	011	大型重機洗浄器	1		1	
	012	大型重機洗浄器収納庫	1		1	
	013	コンピュータ用エアコン(コヤマ)	2		1	
	014	ビデオテレビ (シャープVC1394)	1式		1	
	015	オーバヘッドプロジェクター(コダック)	1		1	
	016	スライドプロジェクター(コダック)	1		1	
	017	モトローラー	8		1	(回線数により変更)
	018	調査整理用コンピュータ (IBM)	1		1	
	019	チェーンソー (STIHL 08S)	2		1	
	020	火の見槽消火器 (S-3)	10		1	使用する事態が発生していない
	021	ポンプ (YANES)	1		1	
	022	ベルトコンベアー (TCS080)	1		1	
	023	植物標本室用除湿器	1		1	
	024	分光光度計	1		1	
	025	溶存酸素計	1		1	
	026	植物標本棚	5		1	
		＜本手印移送＞				
	027	避雷器 (パイプライン-トラス)	4式		4	
	028	流量観測装置	1式		1	現地調査時に使用

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 等
1994	029	地滑り計	1式		1	現地調査時に使用
	030	オーガ TS-112	1式		1	
	031	伝導計 SC-82	1式		1	
	032	カメラ (ALPHA-3Xi)	1式		1	
	033	ポケット コンパス LS-25	1式		1	
	034	作業服	20着		20	
	035	長靴	20足		20	
	036	野外ベスト	20着		20	

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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 等
1995		< 現存品目調査 >				
	001	種子用重量計	1		1	
	002	種子検査計	1		1	
	003	散水タンク	1		1	
	004	小型苗畑用耕耘機	1		1	
	005	耕耘整地アタッチメント	1		1	
	006	標本庫	5		5	
	007	汎用道具セット	1		1	
	008	種子バック装置	1		1	
	009	給油装置一式	1		1	
	010	噴霧器	1		1	
	011	コンプレッサー	1式		1	
	012	アーター保存用タイプライター	1式		1	
	013	両方向回転力アタッチメント	1		1	
	014	土中除虫剤散布装置	1		1	
	015	立体顕微鏡	1		1	
	016	苗畑用給水ポンプ	1		1	
	017	キャリアア型下刈機	4		1	
	018	薬剤散布用アタッチメント	1		1	
	019	消化用タンク	2		1	
	020	携行用消火ポンプ	10		10	使用する事態が発生していない

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	処理由等
1995		<本美区贈送>				
	021	量水観測用土堰	1		1	
	022	土壌水分測定装置	4		4	
	023	蒸発計センサー	1式		1	
1995		<携行用機材>				
	024	圧力センサー(圧力センサー、受感部)	1式		1	
	025	フロート式水位センサー	4台		4	
	026	精密面積計算機器	1式		1	
1996		<携行用機材>				
	001	3連マニホールド (SPC GB-3E)	1		1	
	002	マッフル炉 (Mod. SM-200)	1式		1	
	003	1ト7kg タイプ (東芝)	1	1		1997年 4月15日 専門家出張中 盗難
1996		<現用機材>				
	004	データ等解析用ソフト一式	1式		1	
	005	マイクロ コンピューター	1式		1	
	006	パソコン印刷機 (HP 680C)	1		1	
	007	パソコンスキャナー (HP4C2400)	1		1	
	008	電動ドリル	1		1	

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	等
1996	009	植物標本棚	10		10		
	010	ロー式整地7クックアウト (ICMA)	1		1		
	011	無線システム一式	1 式		1		
	012	移動式灌水機	1		1		
	013	ポンプ (DV10)	1		1		
	014	金属用鋸 一式	1 式		1		
	015	電動鋸 一式	1 式		1		
	016	簡易土工用7クックアウト 一式	1 式		1		
	017	乗用車用荷台	1		1		
	018	製図用具セット 一式	1 式		1		
	019	荷物用キャリヤー	1		1		
	020	カメラ (REFLEX ZOOM GUST)	1		1		
1997		< 携行機材 >					
	001	ハンドック 417 Nコン クック-付 (東芝)	1 式		1		
	002	電子天びん (オクラーノク PG3001)	1		1		

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