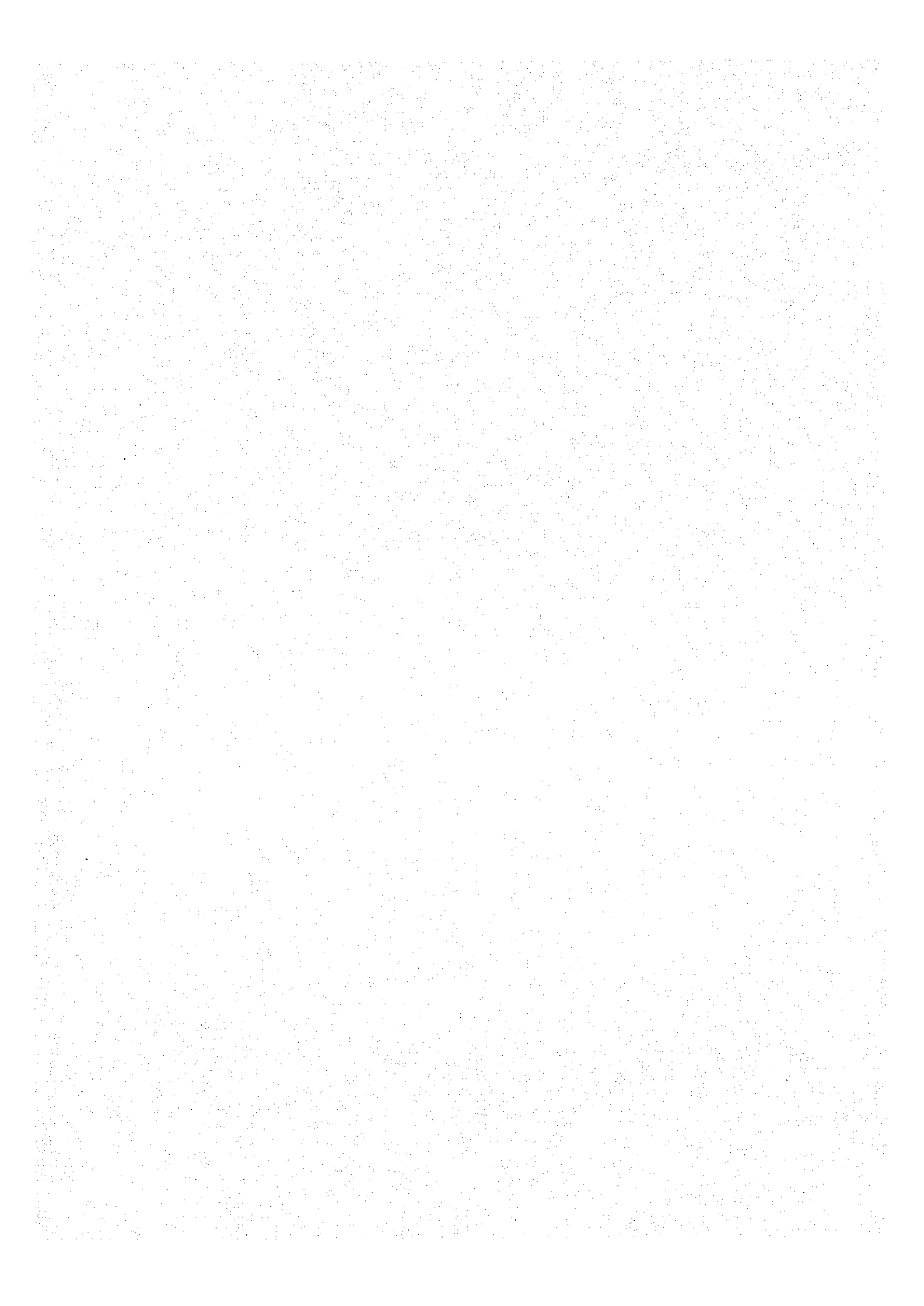


THE INTERIM REPORT OF
THE TRIAL PLANTATION PROJECT IN BENAKAT, SOUTH SUMATERA.
(ATA-186)

September 1982

JAPAN INTERNATIONAL COOPERATION AGENCY

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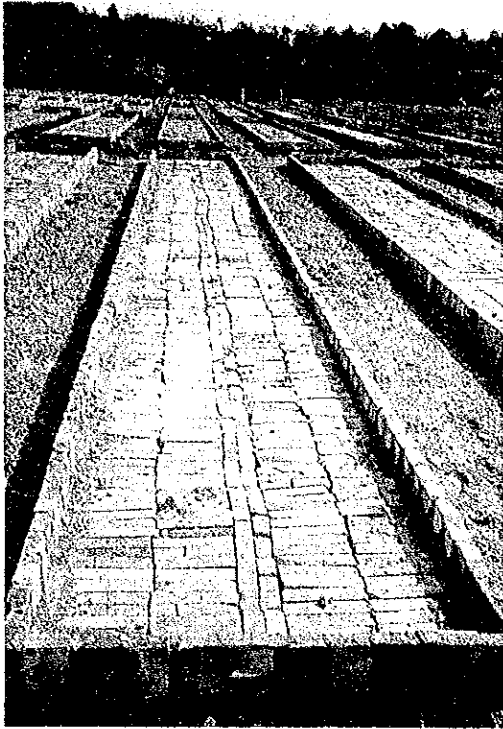
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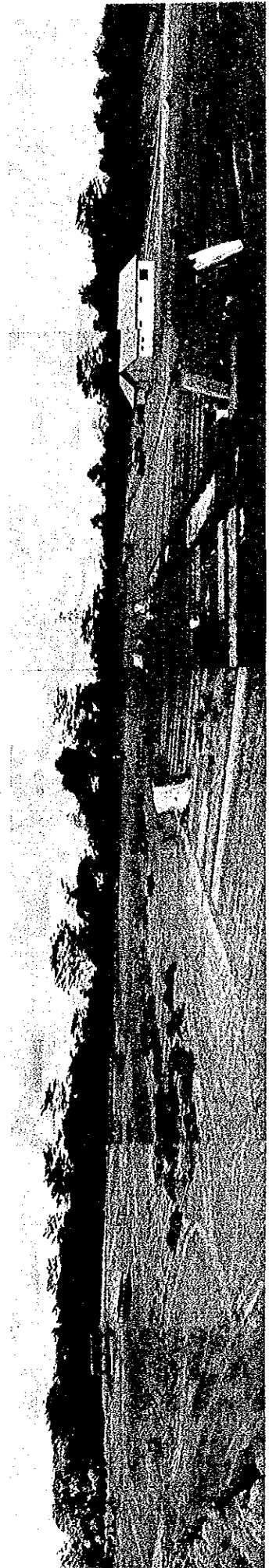
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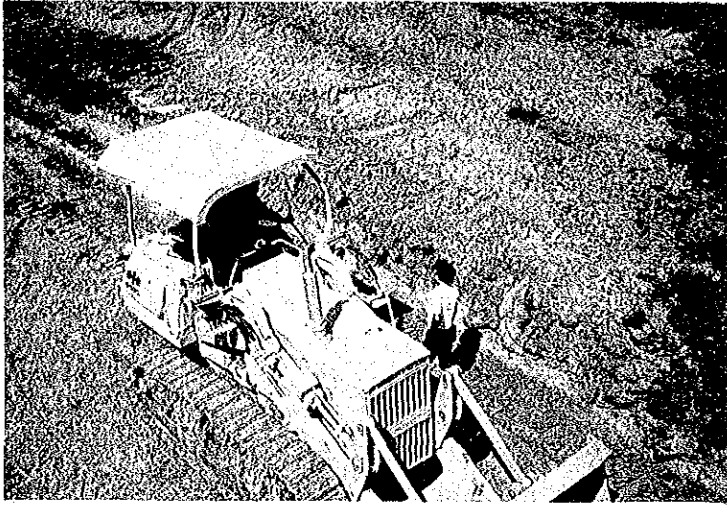
Nursery bed
May 1980



Meeting at the nursery site
Jan. 1980



Nursery site
Jul. 1980



Forest road construction
Nov. 1980



Main forest road
Dec. 1980

Trial plantation site
May 1980



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PREFACE

This report is the interim report of the technical cooperation for the trial plantation project in Benakat, South Sumatra (ATA-186) during our stay in Indonesia as the experts for the project from the middle of November, 1979 to the middle of March, 1982.

It is said that there is a large area of alang-alang grass-land amounted to 15 million ha in Indonesia, so that the reforestation activity on grass land in this country is one of the most important problems from the viewpoint of the conservation and maintenance of forests.

Accordingly, our project activity that has a plan to establish the trial plantation of 2,100 ha including various kinds of experimental plots is being expected to implement smoothly by Indonesian government concerned. However, there were lots of troubles at the initial stage of the project because of the lack of experience by both side of Indonesian and Japanese officials concerned. But these troubles were gradually conquered by the cooperative efforts between Indonesian counterparts and Japanese experts of the project.

We have already had the two year's experience and this report is the record of these experiences that is written based on the experiences by 4 experts, that is to say, R. KATO, K. OHMI, Y. SAKAMOTO and S. MIURA who have returned to Japan after completing their two year's assignment in Indonesia.

At the time of submitting this report, we should like to appreciate for the nice cooperation between the Indonesian counterparts and Japanese experts during our stay and for the good guidance given by the Indonesian and Japanese officials concerned.

April 15, 1982

Ryosuke KATO
ex-Chief Adviser

for

Technical Cooperation Program

for

Trial Plantation Project in Benakat,

South Sumatra

(ATA-186)

I. OUTLINE OF HISTORY ON THE PROJECT

1. Short history of activity before the project has actually started

The project activity has been started when the Record of Discussion of the project was signed on April 12, 1979. After that the implementation plan was designed by the Japanese survey team dispatched from September 11 to October 14, 1979 in cooperation with Indonesian officials concerned. The result of this survey was reported as the "Report of implementation design of survey team on the technical cooperation for the trial plantation project in Benakat, South Sumatra" in English and Japanese on February, 1980.

However, the actual starting time of the project activity was the time when the Japanese experts arrived in Indonesia. Accordingly, here the development of the activities relating the project before it has actually started will be stated.

The origin of the project goes back to 1972 when Mr. SUDJARWO, director of Directorate General of Forestry of the Republic of Indonesia, visited to Japan and required the cooperation of the Japanese government on the afforestation activity in Indonesia. This request, especially asking the cooperation for the afforestation of the grassland in Kalimantan and Sumatra, was repeated by directors of Directorate Forest Planning, of Directorate Reforestation and Land Rehabilitation and of Forest Research Institute under the Directorate General of Forestry of the Republic of Indonesia during their visit to Japan in 1974.

Undertaking this request, the Japan International Cooperation Agency dispatched two basic survey teams to Indonesia in June and November, 1975 to commence the afforestation project as a development and cooperation project.

The first survey team surveyed in North and South Sumatra to find out the most suitable area for the afforestation project and had decided the grassland and forest of South Sumatra as the project area in June, 1975. And the result of this survey was reported as "The report of feasibility survey (first survey) on silviculture project in Indonesia (South Sumatra)" written in Japanese.

The second survey team negotiated with the Indonesian government of the planning for the afforestation project in the grasslands of Benakat

and Subanjeriji areas in South Sumatra in November, 1975. And the result was published as "The report of feasibility survey (second survey) on silviculture project in Indonesia (South Sumatra)" in English and Japanese in December, 1976. Based on the results of this second survey team, a survey team was sent to discuss the planning and then an agreement to establish the cooperation project on a government to government basis was made upon the negotiation with the Indonesian government in August, 1976. This afforestation development cooperation project was listed on the BAPPENAS list as ATA-186, and was officially requested to the government of Japan in April, 1977.

Based on the Scope of Work for this project which had concluded in September, 1977, aerial photography covering 50,000 ha in Benakat areas was commenced to shoot in November, 1977 and the topographical charts were commenced to be made in May, 1978. Furthermore, the soil surveys and afforestation planning etc. were performed in accordance with the afforestation development cooperation project in June, 1978, and the result of these surveys was reported in Japanese in June, 1979.

Based on these surveys and plannings, the implementation of the trial plantation project was recognized to be done before the execution of large scaled afforestation development cooperation project. And then the Record of Discussion for the technical cooperation program for the trial plantation project in Benakat, South Sumatra was signed in April, 1979 and the project activity have actually begun.

Needless to say, this Record of Discussion is something like a Constitution of the project and all activities and implementations of the project done by Indonesian and Japanese side have to be depended on this Record of Discussion. Accordingly, the Record of Discussion is attached in this report as Appendix 1. To this Record of Discussion, one item on the provision of special measure by the government of Japan was added after agreement by both Indonesian and Japanese side on March 21, 1980 as shown in Appendix 2.

After the conclusion of the Record of Discussion, the implementation design survey team was dispatched to produce the implementation plan for the trial plantation of 2,100 ha in Benakat area as in inter-governemnt cooperation project and to analyse the problems of planting mechanization technique in grassland. Before returning to Japan, this team exchanged the opinion with the Indonesian official concerned and concluded the

preliminary report as shown in Appendix 3.

This preliminary report was the basis for the implementation design and the annual operation plan compiled afterward, but was only the rough idea to be corrected in future. The report of implementation design survey team was reported as mentioned above, and this report included the necessary design for the improvement and development of the afforestation technique that must be examined, the forest road, the nursery technique and also the facilities essential for the trial plantation activity.

2. Short history after the arrival of Japanese experts

Comparing with the date of sign on Record of Discussion, the dispatch of the Japanese experts was delayed because the arrival of A-1 form by Colombo plan from Indonesian side had been delayed.

Mr. K. OHMI was the first expert who was dispatched to Indonesia on November 16, 1979 as the team leader and the expert of silviculture for the project. This date is the actual starting point of the project. After one month, Mr. R. KATO and Mr. Y. SAKAMOTO were dispatched to Indonesia on December 17 as chief adviser and liaison officer respectively.

At that time, main problem in our project was firstly how to establish the organization and structure of the project to begin and promote the real implementation of the project activity in the field, and secondarily in order to implement our project smoothly, the essential problem was to construct the accommodation for the experts and counterparts in the field site and to prepare the nursery site. However, all these construction and preparation were not yet carried out at all by Indonesian side who had responsibilities for these implementations by the Record of Discussion. But these implementations were very difficult because of budgetal and technical problems, and then Indonesian side sent the request letter to JICA asking the implementation of model infrastructure for nursery and forest road and it was accepted by Japanese government.

Anyhow, after arriving of the Japanese experts the liaison office for project in Palembang was decided officially by the lease of one house on December 29, 1979 and the project office in Bogor has been opened on December 31, 1979 at the corner of the office of the Sub-Directorate Reforestation and Rehabilitation. However, the opening of the project office as the separate room in Bogor had to be waited until December 1, 1980 and although the opening of the project implementation center in

Benakat was done after the construction of the temporary office on the end of June, 1980, the formal new office built by Indonesian side was used as the center at last on January 28, 1981.

Accordingly, the period until the end of fiscal year 1979/80 was the preparative time to start our project activity smoothly, so that all efforts by Japanese experts and Indonesian counterparts were directed to establish the organization of the project and to arrange the infrastructure of the project activity.

Then the annual operation plan of the project was prepared based on the Record of Discussion and it was almost the same with the report written by the implementation design survey team, but some parts, especially about the planting tree species, were little different from the report because it was modified in accordance with the result of consultation between Indonesian counterparts and Japanese experts. The plan of operation that has been gradually solidified and finally approved by the meeting of the 3rd Joint Steering Group as shown in Appendix 4. And also the preparation for the model infrastructure that was decided to be carried out by Japanese government including the site preparation of a part of nursery, the establishment of a part of nursery bed and the construction of a part of nursery road and forest road were conducted.

During this period, the saddest happening was the sudden death of Mr. Soeharto, head of Sub-Directorate Reforestation and Rehabilitation and the co-manager of the project, on February 17, 1980. It was a shock for the project because Mr. Soeharto was the person who had important position to proceed the project activity and the activity was exactly on the starting point at that time. All experts and counterparts who know him well hope again that Mr. Soeharto's memory should be blessed.

There was also some accident in Japanese side that Mr. H. YAMATE who was supposed to be the nursery expert could not come to Indonesia because of his illness and had to postponed to come until his recuperation. And then Mr. S. MIURA who was supposed to be the expert for forest protection was dispatched as the nursery experts temporarily on March 12, 1980.

The second step of our project was the implementation of model infrastructure and the starting of nursery activity. For these implementation and activity, two short-term experts were dispatched, namely, Mr. K. YAMAZAKI as the expert for civil engineering and the supervisor for the implementation of model infrastructure, and Mr. M. KAWASAKI as the expert

for the nursery technique. By their activity, our project had begun to be active and from June, 1980 the sowing and the raising the seedlings had been started.

At that time, the budget for the project activity in 1980/81 was the big problem, that is to say, the decided amount of the budget for the field activity was too low to implement the activity in the field and especially the budget for the construction of required facilities was so small that the smooth implementation of the project activity was doubtful to experts and counterparts. As the results of the consultation between counterparts and experts, the request letter asking to increase at least 50 million rupish to implement the annual plan of the proeject smoothly was sent from the chief adviser for the Director of Directorate Reforestation and Rehabilitation.

The accommodation and drinking water at the implementation site for the counterparts and experts were also big problems at that time. The JICA technical cooperation planning survey team headed by Mr. K. KOTARI for our project was sent to Indonesia on June 4 to 15, 1980 and all problems being closely connected with our project activity were discussed and the results of discussion were outlined in the form of minutes as shown in Appendix 5, and the report written in Japanese was published on June 1980.

During their stay in Indonesia, the First Joint Steering Group meeting was held on June 12, and also all problems were discussed eagerly to be solved. The shortage of budget was covered by Indonesian government to a certain extent and the accommodation problem was also solved to some degree by renting the room of the STANVAC guest house at Pendopo. However, these solution was not full, especially the complete solution of the accommodation problem was put off until the end of 1981 fiscal year when the construction of the dormitory by Japanese grant aid was completed. The drinking water problem was also the same condition as the accommodation problem and now the drinking water is being supplied by STANVAC at Pendpo, so that it is hoped or expected that complete solution would be done at the same time as the completion of dormitory by Japanese grant aid.

Mr. K. TASHIRO, the expert for forest machinery was dispatched to our project on July 30, 1980, but at first the agreement for him as the expert for two year's assignment was not accepted by Indonesian government because of misunderstanding of his carrier by Indonesian side. Finally he was accepted as the expert for one year and after one year his assignment was postponed by the request of Indonesian government who had recognized

his carrier.

Mr. H. YAMATE, the expert for nursery was dispatched to our project on September 24, 1980 after complete recovery from his illness and consequently Mr. S. MIURA has changed his position to the expert for forest protection from the expert for nursery.

One of the big problem concerning the supplied machinery and equipment from Japan was taking a lot of time to receive through the necessary formalities after arriving at the Palembang harbour. For example, the first supplied machinery and equipment arrived at the Palembang harbour on April 20 but their acceptance through necessary formalities was on July 30, and the second supplied machinery and equipment which arrived at Palembang harbour on June 16 and was taken out on September 1 except the bulldozer and shoveldozer that were postponed to be accepted until November 10. One of the reason why these acceptances were so delayed was the lack of experience for the procedure to go through necessary formalities, so that the procedure was hastened a little in next year after one year's experinece.

Anyhow, these delays of acceptance for supplied machinery and equipment induced the delays for the construction of forest road and the site preparation in 1980/81, but after arriving of the machinery at the field site these delays were conquered step by step through the cooperative efforts by experts and counterparts.

The first training for the counterparts in Japan had begun and for this year 3 persons, namely, Mr. Wazir Nengkeman, former project field manager, Mr. Zulkifli Mulsani, present field manager, and Mr. Hardjono Arisman, counterpart for nursery, had been sent to Japan on September 17, 1980, and had the good training and experience thanks to the kind guidance given by Japanese official concerned. During the period when the field manager was in Japan, the field manager was acted by Mr. Suhariyanto for 3 months.

The advisory team headed by Mr. T. MATSUDA had visited our site from November 23 to 30, 1980 to give us the advice and guidance from technical and administrative point of view and their report written in Japanese was published in February, 1981. They had left the letter as shown in Appendix 6 to Mr. Apandi, Director of Directorate Reforestation and Rehabilitation, who had been unwell at that time and had no chance to discuss together.

The first planting activity had been from the beginning of December, 1980 and established the plantation of 200 ha according to the annual plan up to the end of February, 1981. Unfortunately, the survival percentage of some planting tree species like Eucalytus urophlla and Pinus merkusii were not so good as we had expected because of low quality of seedlings, delay of planting time and unsuitable treatment of seedlings during the transportation. Of course it is hoped that these factors affecting the survival percentage of the planting seedlings will be improved in next year's operation as shown in the field manager's letter (Appendix 7).

From the middle of December, 1980, I myself had returned to Japan for one month's vacation. During my stay in Japan, the Japanese government had decided unofficially to give the grant aid in order to construct the trial plantation training center for our project. This was the big event for us because all the accommodation and facilities problems at the field site was settled by the construction of this center. And then JICA team headed by Mr. K. TAKAHASHI was sent on February 9, 1981 in order to consult with the Indonesian authorities about the basic design for the center as shown in Appendix 8 and from the beginning of June the construction work which will be completed by the middle of March, 1982, have begun.

The budget for 1981/82 was consulted so eagerly between Indonesian counterparts and Japanese experts that there was no big shortage in each field except the budget for the facilities, but the shortage of budget for the facilities was covered by the forth mentioned grant aid.

Dr. S. OTA was dispatched as the expert for the forest ecology March 31, 1981 and as the result of his arriving the number of expert that was decided in the Record of Discussion was filled up finally.

Next big event in 1981/82 was the preparation for the agro-forestry activity in our project. According to the Record of Discussion, the tests and studies on the social implication of afforestation are supposed to be conducted and in this connection the agro-forestry activity was planned under the trial plantation proejct. JICA consultation mission headed by Mr. M. FURUYA was dispatched on the end of June to make the basic plan for the pilot infrastructure scheme that aims at carrying out agro-forestry activity under the trial plantation project, and exchanged the minutes of discussion between the mission and the Indonesian authorities concerned (Appendix 9), and report written in Japanese was already published on March, 1982.

From October 3 to 5, 1981, the guidance team for agriculture and forestry technical cooperation projects headed by Mr. R. MATSUYAMA, Executive Director of JICA, visited our plantation site to observe our activity and discuss how to develop our activity.

Based on the minutes of JICA consultation mission headed by Mr. M. FURUYA, the short term experts, that is to say, Mr. T. TAKAHASHI as the expert on designing for pilot infrastructure, Dr. M. KUMAZAKI as the expert on socio-economy of the community and Dr. Y. IZUMIYAMA as the expert on the experimental plan of dry field farming were dispatched. And then the guidance team for the pilot infrastructure improvement works headed by Mr. K. KOTARI was sent to make the detailed pilot infrastructure scheme. They had consulted with the Indonesian authorities on this scheme after finishing their field survey and their program and supplement document as shown in Appendix 10 and 11 were discussed together and approved generally on the meeting with the Indonesian authorities concerned, and report written in Japanese was published on March, 1982 together with the report by Mr. Furuya's mission.

The period of the end of 1981 was the time when some experts had to be changed because of the completion of their two year's assignment. Mr. K. KATO has come to Indonesia on the middle of October as the successor for Mr. K. OHMI, team leader and expert for silviculture, and Mr. H. HACHINOHE has also arrived on the middle of November as the successor for Mr. Y. SAKAMOTO, the liaison officer. And then Mr. K. OHMI and Mr. Y. SAKAMOTO have returned to Japan on November 15 and December 16, 1981 respectively after leaving their own final report as shown in Appendix 12 and 13. However, Mr. R. KATO who was supposed to go back to Japan together with Mr. Y. SAKAMOTO had to stay in Indonesia another two months because both Indonesian and Japanese side required to postpone my service another two months in order to avoid the confusion that might be happened by the change of three experts almost at the same time. And now it is the time when my assignment is going to be completed.

This is the short history of our project and further explanation of our project will be continued in detail according to each activity of our project.

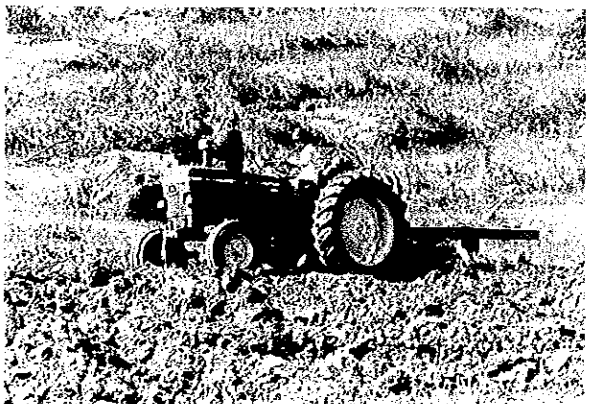
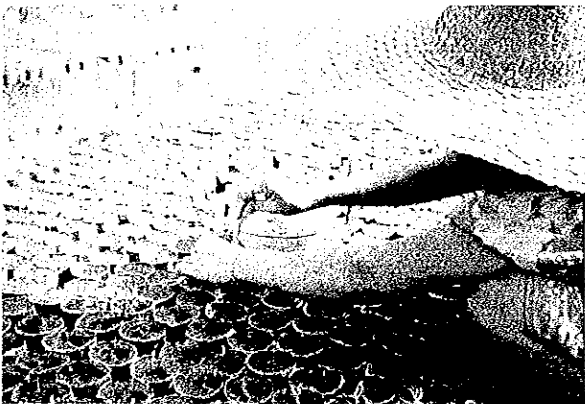
Mr. R. KATO have returned to Japan on February 16, 1982, and Mr. S. MIURA have also finished his assignment on March 12, 1982. Mr. R. KATO left the interim report which was the example of this interim report and

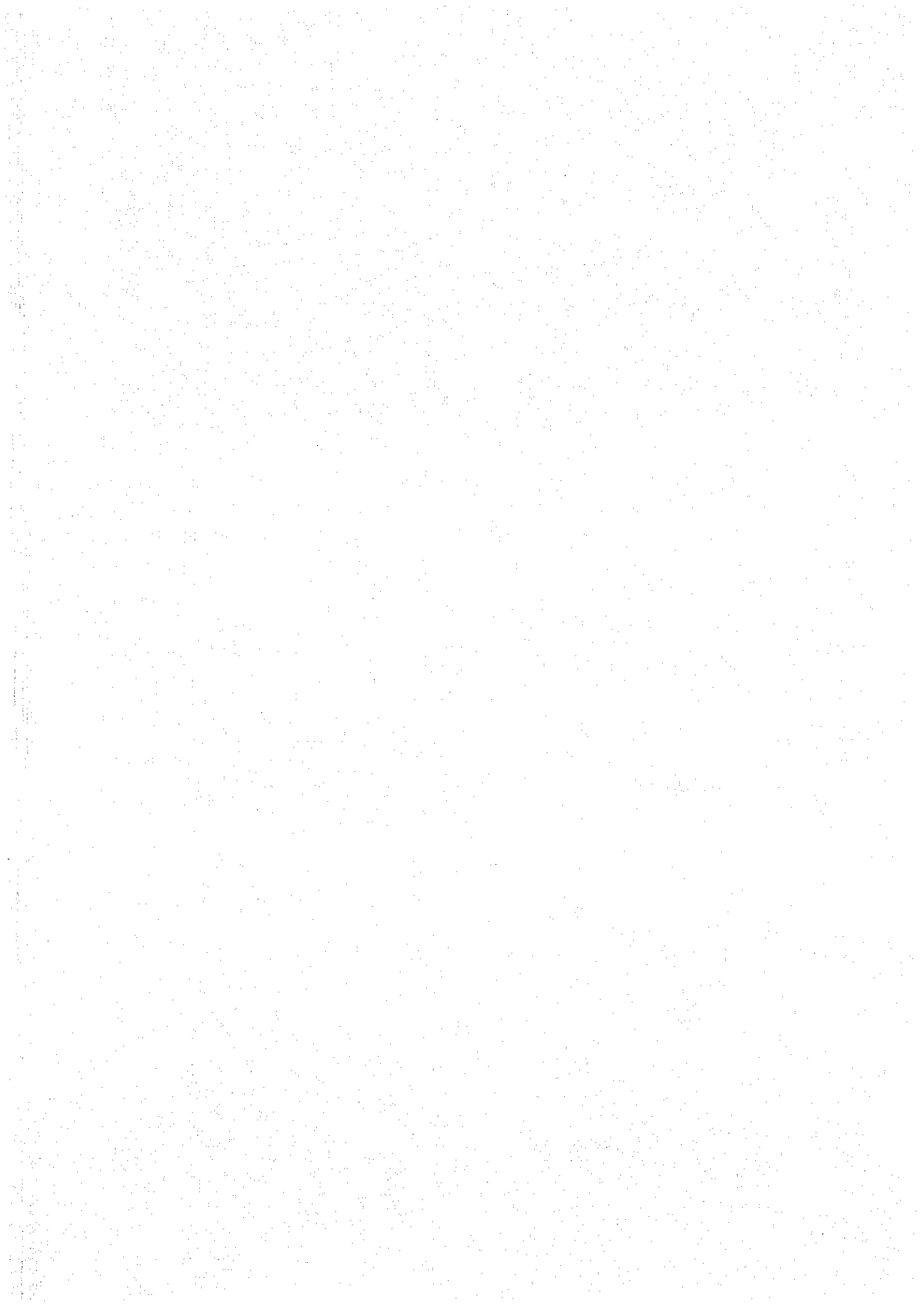
Mr. S. MIURA wrote the report "Laporan Akhir Hasil Kerja Tentang Perlindungan Hutan Persemaian dan Alat-Alat Mekanik Reboasasi" as shown in Appendix 14.

Nursery activities
1979/1981 ~ 1981/1982



Plantation activities
1979/1980 ~ 1981/1982





II. ORGANIZATION OF THE PROJECT

The organization of the project in order to implement the project activity effectively is prescribed in the Record of Discussion as shown in Annex VII of Appendix 1. According to the Record of Discussion, the Joint Steering Group and the project office in Bogor should be established as the central functions of the project under the Directorate General of Forestry. And also as the operating body in the field site the project implementation center in Benakat and the liaison office in Palembang should be established. The each organizations are as follows:

1. Joint Steering Group

The member of Joint Steering Group was nominated by Soedjarwo, director of Directorate General of Forestry, on December 26, 1979 as follows:

Chairman

- * Apandi Mangundikoro: Director, Directorate Reforestation and Land Rehabilitation.

Member

- * Suduono Surjo: Secretary, Directorate General of Forestry.
- * Harsono Rekwardayo: Directorate Forestry Planning.
- * R. Soerjono: Director, Forest Research Institute.
- * Nyoman Ardha: Chief, Sub-division of Bilateral Cooperation, Agricultural Planning Department.
- * M. Saleh: Director, Regional Forestry Office in South Sumatra.
- * Wazil Nengkeman: Field manager for ATA-186.
- * Moriya Miyamoto: Representative, JICA JAKARTA office.
- * Ryosuke Kato: Chief advisor for ATA-186, JICA.

Hearer

- * Experts and Secretary of Japanese Embassy in JAKARTA.

After that, the some of the nominated persons were moved from their position, so the name of the member at present time are as follows:

Chairman

- * Apandi Mangundikoro: Director, Directorate Reforestation and Land Rehabilitation.

Member

- * Hendarin Wargaaputra: Secretary, Directorate General of Forestry.
- * Armana Darside: Director, Directorate of Forestry Planning.
- * H. Moch. Soenaryo Hardjo Darsono Mec.: Director, Central Research Institute for Forestry.
- * Nyoman Ardhar: Staff, Division of Billateral Cooperation, Bureau of Foreign Cooperation, Ministry of Agriculture.
- * Victor Sinaga: Director, Regional Forestry Office in South Sumatra.
- * Wazir Nengkeman: Project Leader, P3RPDAS Musi, South Sumatra.
- * Moriya Miyamoto: Representative, JICA JAKARTA Office.
- * Ryosuke Kato: Chief Adviser for ATA-186. JICA.

Hearer

- * Experts and Secretary of Japanese Embassy in JAKARTA.

2. Project office in Bogor

The Project office in Bogor was opened on December 31, 1979 at the corner of the office of Sub-Directorate Reforestation and Rehabilitation, but the separate room expected to be used as the project office was not prepared because the room was still being used by another section. The opening of the project office as the separate office had to be waited until December 1, 1980.

Before opening the project office, Mr. Soeharto Soemarmo and Mr. P. S. Sagala were nominated officially as the co-manager and the assistant co-manager for the project respectively. And Mr. R. Kato have been dispatched as the Chief adviser for the project on December 17, 1979.

According to the Record of Discussion, in the project office in Bogor a project manager should be nominated so that it was strange that there was no project manager in the project office at that time, and the reason why there was no project manager in the project office was not clear. Some officials of Directorate General of Forestry said that all responsibilities

concerning this project should be taken by Mr. Soedjarwo, Director-General of Directorate General of Forestry, and Mr. Apandi, Director of Directorate Reforestation and Land Rehabilitation, so that there is no need to keep the project manager in the office. However, at the third Joint Steering Group Meeting this problem was questioned by Japanese side and the co-manager and the assistant co-manager was promoted to the project manager and co-manager respectively.

The personnel in the project office in Bogor has been as follows:

Indonesian side

Project manager

- * Soeharto Soemarmo: Director, Sub-Directorate Reforestation and Rehabilitation.
From September 19, 1979 to February 17, 1980.
- * Sjahrir: Director, Sub-Directorate Seed.
From March 1, 1980 to March 1, 1981.
- * Soejadi Hartono: Director, Sub-Directorate Reforestation and Rehabilitation.
From March 1, 1981 up to now.

Co-manager

- * Arip P.S. Sagala: Chief, Reforestation Section of Sub-Directorate Reforestation and Rehabilitation at the time when nominated but present position is chief, Forest Maintenance of same Sub-Directorate.
From September 17, 1979 up to now.

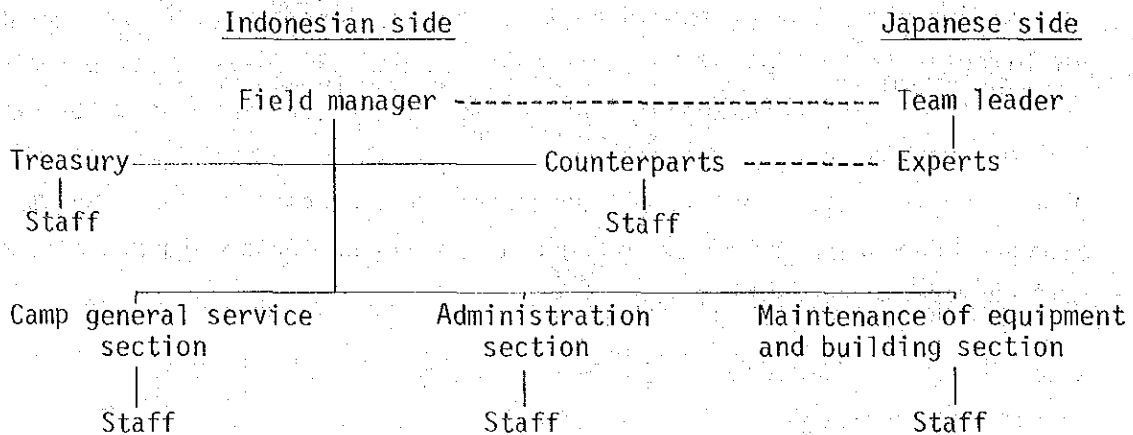
Japanese side

Chief adviser

- * Ryosuke KATO: From December 17, 1979 to February 16, 1982.
- * Sadao SUGIMOTO: From February 1, 1982 to January 31, 1984 (expectation).

3. Project implementation center in Benakat and liaison office in Palembang

The organization of the project implementation center in Benakat was settled on April 27, 1981 by field manager officially as follows:



The counterparts and experts consist of six fields, that is to say, nursery, silviculture, forest engineering, forest protection and forest ecology.

The personnel in the project implementation center in Benakat has been as follows:

Indonesian side

Field manager

- * Wazil Nengkeman: From September 18, 1979 to April 30, 1980.
- * Zulkifli Mulsani: From May 1, 1980 up to now, but during his absence by his training in Japan Mr. Soehariyanto had been in charge of field manager from October 1 to November 17, 1980.

Nursery counterpart

- * Hardjono Arisman: From September 18, 1979 up to now.
- * Retno Triyogo: From November 1, 1981 up to Now.

Silviculture counterpart

- * Zulkifli Mulsani: From September 18, 1979 to April 30, 1980.
- * Anto Rimbawanto: From May 20, 1980 up to now.
- * Tata Wiharta: From September 30, 1980 up to now.

Forest protection counterpart

- * Nyoman Yuliarsana: From October 15, 1980 up to now.

Forest engineering counterpart

- * Rismulyadi: From September 25, 1980 up to now.

Forest ecology

* Triyogo Soekamto: From November 1, 1981 up to now.

Other staff of the office

Treasurer--Amiruddin. Finance staff--Sri Parwati, Mastuti, Hazamun Aini. Chief of general service--Rusmini Arsyad. General service staff--M. Ali Effendi, Abd. Salim, M. Rukbi. Chief of maintenance section--Irzan Arief. Maintenance staff--Nasrun S., Samsul Rizal. Camp general service--Maas Ramli. Camp general service staff--Muctar Asnawi, Sadariah. Supervisor of plantation--Soesiyanto S. Supervisor of nursery--A. Kaini. Driver--Masri Realif, Mardeli M., Darmawan, Robinson, Selamat, Nuraswan. Operator--Ersan, Kamaludin, Abdullah, Yakkub. Mechanic--Omaidi.

Japanese side

Team leader and silviculture expert

* Katsuyuki OHMI: From November 16, 1979 to November 15, 1981.

* Kuniaki KATO: From October 14, 1981 to October 13, 1983 (expectation).

Nursery expert

* Seisi MIURA: From March 12 to September 21, 1980.

* Hirota YAMATE: From September 22, 1980 to September 21, 1982 (expectation).

Forest protection expert

* Seisi MIURA: From September 22, 1980 to March 11, 1982.

* Masaharu TABATA: From April 1, 1982 to March 31, 1984 (expectation)

Forest engineering

* Koji TASIRO: From July 30, 1980 to July 29, 1982 (expectation).

Forest ecology

* Seiichi OTA: From March 31, 1981 to March 30, 1983 (expectation).

Liaison officer

* Yoshiichi SAKAMOTO: From December 17, 1979 to December 16, 1981.

* Hideki HACHINOHE: From November 19, 1981 to November 18, 1983 (expectation).

Among these organization, the activity of the Joint Steering Group will be stated in another (chapter VIII-1).

Concerning the function of the project implementation center in Benakat and the liaison office in Palembang, there was some misunderstanding by counterparts and experts on the relationship between the center and the office. Due to the delay for the construction of the project office in Benakat, one house which was lent by Indonesia side for the liaison office had a function as if it was the project implementation center. The significance of the liaison office in Palembang by the Record of Discussion is the means of communication between the project implementation center and the project office in Bogor or the regional forestry office in Palembang in order to promote the project activity smoothly, therefore it is not necessary that there are lots of clerk in the liaison office. As the result of this misunderstanding, some confusions to interfere the activity had often happened in the field site, because of the absence of service superiors who could make the decision. As it has been hoped to improve these circumstances by not only Japanese experts but also Indonesian counterparts, the situation has changed gradually after the construction of the new project office constructed by Indonesian side and the project implementation center may have it's own original function by the beginning of Next fiscal year as the result of the completion of facilities which have been constructed by Japanese side and Indonesian side, especially the trial plantation training center constructed by grant aid of Japanese government.

Postscript: Concerning the counterpart, the new member from the regional forestry office were nominated to follow the agro-forestry activity of the project as follows:

- * Munawawi: From November 18, 1981 up to now.
- * Sumarto Bina Santoso: From November 18, 1981 up to now.

III. SHORT-TERM EXPERT DISPATCHED FROM JAPAN

The experts dispatched from Japan consist of long-term and short-term experts. The long-term expert is dispatched usually with two years assignment by request letter (A-1 form of Colombo plan) from cooperation country and the number of long-term expert is fixed by the Record of Discussion. The short-term expert is also dispatched by request letter from cooperation country, but his dispatching period is short from one month to six months. The role of short-term expert is to give the guidance in order to cover or conquer the technical problem that is difficult to be solved by long-term expert in liaison with the experts and counterparts.

As the long-term experts dispatched from Japan were already mentioned in preceding chapter, here the dispatch and activity of the short-term expert from Japan will be explained briefly.

During the fiscal year 1979, two experts were dispatched from Japan as follows:

* Kiyohiro YAMAZAKI: Expert on forest civil engineering to supervise the model infrastructure for nursery site and forest road of the project from March 19 to June 15, 1980. He had performed the supervision for the model infrastructure of the project which was done from February 29 to June 24, 1980 in order to give a good start for the nursery site preparation and the forest road construction. Thanks to his supervision the model infrastructure was done well and the real project activity could start after his work.

* Masaji KAWASAKI : Expert on nursery works to guide the preparation for nursery activity of the project from March 31, to May 29, 1980.

He who had the experience on the nursery activity in Malaysia gave the guidance on the preparation of the soil and compost for the germination boxes and seedlings pots, established the test for amount of phosphatic fertilizer for the seedlings in the pots and examined the operational process for the nursery practice to raise the seedlings by the pots. His work which was done during his stay

gave us an index to the nursery activity which would just start.

During the fiscal year 1980, three experts were dispatched as follows:

* Haruo HASEGAWA : Expert on forest mechanization to guide the construction of sprinklers in the nursery from October 20 to November 9, 1980.

He had been engaged in the construction of the sprinkler which was supplied by Japanese government in the nursery and finished the construction of the sprinkler in the nursery area where it was needed to the nursery activity at that time.

* Tadao YOKOKOJI : Expert on forest mechanization to plan how to mechanize the operational activity of the project from October 20 to November 9, 1980.

He had given us some idea on how to mechanize the potting system after observing the mechanization activity of the project. However, these ideas were not yet realized because of the financial and technical reasons. It has been hoped by the Indonesian side that these ideas should be realized as soon as possible.

* Isao HOTTA : Expert on soil analysis to decide the standard of fertilization at the nursery and plantation site, and to design the experiment laboratory from March 2 to 22, 1981.

He had investigated the reason why the poor growth of *Pinus merkusii* seedlings in the nursery, and proved that the reasons might be the uneven fertilization and the difference of physical chemical character in the potting soil. He suggested to improve the fertilization method, the physical condition of the soil by using the compost or sand and the low PH of the soil, and to avoid the use of subsoil of the forest. He had performed some surveys on the soil condition of the plantation site and also made the plan for the fertilization

test in the field.

During the fiscal year 1981, four experts were dispatched as follows and one more expert will be dispatched in order to supervise the pilot infrastructure of the agro-forestry activity of the project.

* Takahiko TAKAHASHI: Expert on designing for agro-forestry activity to make the design of the pilot infrastructure for the agro-forestry activity of the project from October 14 to December 13, 1981.

He made the principal plan for the pilot infrastructure of the agro-forestry activity in the project and decided the design in detail in liaison with the experts and counterparts. Based on his design, the pilot infrastructure was approved by Japanese government.

* Yoichi IZUMIYAMA : Expert on experiment plan for dry field farming to make the plan for the agro-forestry activity of the project from October 14 to November 12, 1981.

He had investigated the situation of the farm management in the villages around the project site from the agricultural point of view and given us the valuable informations for the practical method on agriculture, especially on the area and rotation of farming land, and farm crop species and its *technique which would be suitable for the project area to promote the agro-forestry activity in the project.*

* Minoru KUMAZAKI : Expert on society and economy of the community to design the plan for the agro-forestry activity of the project from October 14 to November 12, 1981.

He had obtained the information on the socio-economical situation of the farmers through the collecting materials, the questionnaire and hearing and analysed the socio-economical condition whether the agro-forestry activity would be accepted by the farmers living in the villages around the project site or not.

According to the results of his investigation, it was clear that the agro-forestry activity would be not only one of the useful method to raise the socio-economical condition of the farmers but also the effective means to expand the reforestation activity. Therefore, he has given us the foundation to promote the agro-forestry activity in our project from the socio-economical point of view.

* Yoshiyuki ZINNO : Expert on the tree pathology to guide the experts and counterparts how to observe and protect the tree pest in the nursery and plantation of the project from November 1 to December 18, 1981.

He investigated the diseases of the seedlings at the nursery in Benakat and recognized some kind of tree diseases such as needle blight of Pinus merkusii, damping off of various tree species in the sowing box, anthracnose of Albizzia falcataria, Acacia auriculiformis, A. mangium and Schima bancana and others. He reported the symptom, damage and control way of these diseases and the needle blight of Pinus merkusii had the severest damage on the potted seedlings in the nursery and the planted seedlings in the field among these diseases. He had given some lectures on some important diseases observed in Benakat nursery for the counterparts in order to let them learn to pay more attention on the tree diseases to get the good results in the nursery and planting activity.

IV. MACHINERY AND EQUIPMENT SUPPLIED BY JAPAN

The machinery and equipment supplied by Japanese government through JICA up to present have been used for the project activity. As it was mentioned before in chapter I-2, the big problem concerning the supplied machinery and equipment from Japan was taking a lot of time to receive through the necessary formalities after arriving at the Palembang harbour. This problem had much influences on the implementation of project activities, especially on the construction of forest road and the site preparation in 1980/81, but after arriving of the machinery at the field site these influences were conquered step by step through the cooperative efforts by experts and counterparts.

The machinery and equipment were provided by the request letter (A4-form of Colombo plan) from the Indonesian government, but the list of supplied machinery and equipment had been prepared after consultation between counterparts and experts according to the annual plan of the project. The total money used for the machinery and equipment in each field of activity supplied by Japanese government through JICA from 1979/80 to 1981/82 were is as follows:

Use for	1979/80	1980/81	1981/82
Nursery	46.782.260 yen	20.510.000 yen	18.000.000 yen
Planting	11.855.000	32.144.000	32.000.000
Road construction	17.859.000	19.054.000	28.500.000
Forest protection	1.782.000	4.001.500	5.500.000
Forest ecology	0	1.105.450	3.000.000
Repairing	0	2.109.500	7.500.000
Experiment	1.249.900	850.500	0
Surveying	814.800	0	0
Meteorological observation	1.004.000	1.216.050	0
General use	6.785.040	4.016.000	0
Freight and insurnace	16.735.025	18.822.427	15.500.000
Total	104.867.025	103.829.407	110.000.000

In this figure the money for 1981/82 is a estimation.

Main machinery and equipment supplied in each year were is as follows:

1979/80: Crawler tractor 1, Wheel tractor 1, Land cruiser 3, Micro bus 1, Truck 1, Truck with crane 1, Dump truck 1, Light jeep 1,

Angledozer 1, Motor cycle 4, Soil heater 2, Belt conveyor 6, Roller conveyor 2, Watering facilities 1, Soil mixer 1, Generator 24 kw 1, Generator 15.2 kw 1, Portable generator 1, Chain saw 3, Brush cutter 10, Auto auger 12, etc.

1980/81: Forlift truck 1, Dump truck 1, Jhon deere tractor 2, Carrier 1, Power tiller 1, Motor cycle 3, Motor grader 1, Land cruiser 1, Disk harrow 2, Steel plow 2, Rotary 2, Generator 1, Platform scale 250 kg 1, Automatic scale 500 g 1, Soil mixing machine 1, Trailer 1, Sprayer 8, Engine generator 1, Rock drill 1, Watering equipment 1, Prefabricated house 1, Earth auger 10, Belt conveyor 4, Soil analyser instrument 1, Air conditioner 2, Toilet house 2, Steel cabinet 5, Agricultural chemicals, etc..

1981/82: Land cruiser 1, Cargo truck 1, Wheel tractor 3, Mist sprayer 9, Dust sprayer 5, Water pump 4, Soil crash-screen machine 1, Soil mixer 1, Portable sprinkler 1, Seed stocker 1, Chain saw 5, Bulldozer 1, Prefabricated house 4, Wire telephone unit 1, Fire control facilities 1, Colour television video unit 1, Agricultural chemicals and fertilizer, etc..

One of the problem concerning the supplied equipment and machinery is taking much time to send the request letter (A-4 form in Colombo plan) from Indonesia and also to clear through the customs after the arrival of equipment and machinery from Japan at the Palembang harbour. It was very difficult to find out the reason how to make haste the procedure mentioned above but both Indonesia and Japanese sides should make more effort and pay more attention to deal with the procedure smoothly in future.

The other problem was the difficulty of the maintenance and mending of the heavy machines such as bulldozer and tractor from Japan, so that it is hoped that the heavy machine and other equipment should be bought as much as possible in Indonesia because of the easiness to get the servicing after purchase.

V. TRAINING IN JAPAN

Training in Japan for the counterparts is one of the most important activities of the project and up to present the following counterparts were dispatched or are supposed to be dispatched to Japan to receive the training for their own special field.

1979/80: In this year, Japanese government wanted to accept the two high or semi-high officials, that is to say, Mr. Apandi, Director of Sub-Directorate Reforestation and Rehabilitation, in order to observe the general forestry activity in Japan, but the request letter as A 2-3 form in Colombo plan from Indonesian side was not prepared. There was some misunderstanding that Indonesian side thought this training tour was an invitation tour to be prepared by Japanese government so that there was no need to submit the request letter from Indonesian side. In spite of consultation between Japanese expert and Indonesian official concerned, the request letter was not submitted after all and the observation tour by them was cancelled partly due to Mr. Soeharto's sudden death on February 17, 1980.

1980/81: It was so difficult to arrange the A 2-3 form for the high or semi-high official that it was also impossible to be done as planned in 1979/80. In this fiscal year, the following three officials were sent to Japan as trainees.

- * Wazil Nengkeman : Former project field manager and present chief for P3PPDAS Musi, South Sumatra.
From September 17 to October 17, 1980.
Observation tour on general forestry in Japan.
- * Zulkifli Mulsani : Former counterpart for silviculture and present field manager.
From October 1 to December 17, 1980.
Reforestation activities and silvicultural techniques.
- * Hardjono Arisman : Counterpart for nursery.
From September 17 to December 17, 1980.
Nursery activities and techniques.

1981/82: Five trainees and planned to be sent to Japan and two of them had already finished their training in Japan as follows:

* Rismulyadi : Counterpart for forest engineering.
From August 6 to November 5, 1981.
General silviculture and forest mechanical engineering.

* Tata Wiharta : Counterpart for silviculture.
From August 6 to November 5, 1981.
Reforestation activities and silvicultural techniques.

Three trainees were also be sent to Japan in the end of fiscal year as follows:

* Soedjadi Hartono : Project manager and Director of Sub-Directorate Reforestation and Rehabilitation.
From March 24 to April 4, 1982.
Observation tour on forestry activities in Japan.

* Nyoman Yuliarsana : Counterpart for forest protection.
From March 25 to June 24, 1982.
Forest protection activities and techniques.

* Anto Rimbawanto : Counterpart for silviculture.
From March 25 to June 24, 1982.
Tree breeding activities and techniques.

In addition the trainees mentioned above, the other four persons were sent to Japan from Indonesia as the trainee by JICA in order to attend the XVIIth IUFRO World Congress which was held in Kyoto, Japan from September 6 to 17, 1981 as follows:

* Abdurahim Martawijaya: Director, Forest Products Research Institute.
Study tour and attendance at the XVIIth IUFRO World Congress under the individual training, course.

* R. Soerjono : Director, Forest Research Institute.
Study tour and attendance at the XVIIth IUFRO World Congress under the individual training course.

* Harun Alrasyid : Research staff, Forest Research Institute.
Attendance at the seminar in forest research training course.

* Shafii Manan : Lecturer for silviculture and watershed management, Faculty of Forestry, Bogor Agricultural University.
Attendance at the seminar in forest research development and the XVIIth IUFRO World Congress under the group training course.

The training in Japan had a good reputation for all trainees from the project thanks to the kind guidance and cooperation by the official concerned in Japan. And all counterparts who had their training in Japan have been working for the project after returning from Japan.

VI. OPERATIONAL ACTIVITY OF THE PROJECT

The progress report of the project was submitted to the joint steering group meeting from the field manager every time when the meeting is held. However, the contents of the report did not always cover all the activities, for example, the activity on the construction of facilities done by Japanese side was not reported sometimes. Therefore, in this chapter the operational activity done by Indonesian and Japanese side in the project will be stated briefly.

I. Budget for the project activity

According to the Record of Discussion, the budget for the execution of the project activity should be funded by Indonesia government, and Japanese government provide the necessary equipment and machinery for the activity of nursery, plantation, road construction, forest protection and general services as stated in chapter IV. However, Japanese government can allocate some special kind of expenses to cover the shortage of budget by partner country sometimes when it is urgently needed.

The budget available for the project activity in Benakat from 1979/80 to 1981/82 were as follows:

(Rupiah)

Year Expenses for	1979/80	1980/81	1981/82
Planning	7.860.000	-	-
Nursery	8.850.000	10.432.000	10.100.000
Plantation	-	25.775.000	60.001.000
Forest road	-	7.200.000	15.780.000
Forest protection	-	2.675.000	3.925.000
Facility	14.440.000	40.220.000	51.875.000
Administration	33.396.000	53.672.000	127.625.000
Total	64.546.000 (59.456.000)	139.974.000 (123.286.000)	269.306.000

Figures in () are original budget.

The budget for in 1979/80 was decided before the Japanese experts came to Indonesia and in the budget there was no expenses for the facilities

which was required by Japanese side after consulting with Indonesian officials concerned on September, 1979 as shown in Appendix 3. The budget for 1980/81 was also too low than the expenses that was estimated by Japanese experts, especially for the building facilities. The progress report of first joint steering group meeting held in June, 1980 reported that even a temporary building of 300 m² which was added to the budget in 1979/80 was not yet completed.

At that time the activities for nursery, planting, forest road and fire break were no problem or supposed to be no problem because some part of the activities was covered by model infrastructure scheme which was to establish some part of nursery site preparation and construction of forest road done by special expense of Japanese government, but the most important problem was that there was no accommodation to stay for experts and counterparts in the project site so that they had to stay in the STANVAC guest house which was allowed to stay with a limited time. These problems were not only discussed in the first joint steering group meeting but also were argued between the member of cooperation planning survey team for the project headed by Mr. K. KOTARI who had just visited to our project and the Indonesian authorities concerned as shown in Appendix 5 of this report.

Concerning the shortage of the budget in 1980/81, the Japanese expert asked to get the total amount of 50 million rupiah as the shortage of the budget after estimating the actual expenses. However, the Indonesian side did not agree such an additional allocation of the budget through the financial agency, and as a matter of fact there was some amount of money which was carried forward from the last fiscal year's budget. This system which was common in Indonesia and the remainder from the last year's budget could be carried forward to the next year was not understood by Japanese experts at the beginning of the project activity. Anyhow, some amount of additional budget was supplemented to the budget in 1980/81 by Directorate Reforestation and Rehabilitation itself afterwards. However, in spite of all efforts to get the budget for the facilities and buildings needed for the project activity, it is very difficult to increase the budget because of the regulation for the size and unit cost for the facility and building by the financial authority in Indonesia all the time.

In order to prepare the third year's budget in 1981/82, it was attempted to pile up the actual expenses needed by the counterparts and experts in the field. The total expenses which would be needed in 1981/82 reached the total amount of 355 million rupiah but the final allocation of

the budget for our project was decided as 269.306.000 rupiah after negotiation with the financial official of Directorate Reforestation and Rehabilitation. And this amount was not necessarily too small with exception of the expense for facility and building because the remainder from the previous year could be added to this year's budget. However, the quick and appropriate disbursement of the budget was always required by Japanese side and it should be considered more by Indonesian side to implement the project activity smoothly.

The budget available for the project office in Bogor from 1979/80 to 1981/82 were as follows:

(Rupiah)

Year	1979/80	1980/81	1981/82
Expenses for			
Personnel	1.390.000	1.340.000	1.000.000
Expendables	700.000	500.000	500.000
Fixtures	1.000.000	400.000	-
Travelling	7.400.000	4.456.000	4.480.000
Others	4.500.000	2.280.000	2.500.000
Total	14.990.000	8.976.000	8.480.000

There was no information whether the budget for the project office in Bogor was enough or not. However, it was strange that all the cost for the travelling expense for chief adviser had not been paid until now, only the expense for the air ticket between Jakarta and Palembang had been paid, and also the cost for making copies of the Japanese document had not been paid by the budget.

2. Progress of construction work

i) Construction works by Indonesian side

At the time to make the implementation plan before dispatching the long-term expert, total amount of 2,460 m² of the minimum facilities and buildings needed for the project activity was discussed and arranged between the Japanese side and Indonesian side as shown in Appendix 3. As already mentioned above, it was very difficult to construct such facilities and buildings in the project site because of

the shortage of the budget and regulation of the financial authority in Indonesia.

Up to now, the facilities and buildings constructed by Indonesian side were as follows:

1979/80 fiscal year:

* Temporary building for office, storehouse and lodging.

Area: 300 m². Cost: 7.090.000 rupiah. Date of completion: July, 1980.

1980/81 fiscal year:

* Dormitory. Area: 165 m². * Office. Area: 120 m². * Storehouse for nursery. Area: 60 m². * Working shed for nursery. Area: 50 m². * Generator house. Area: 20 m². * Oil stock room. Area: 15 m².

Total area: 430 m². Total cost: 24.830.000 rupiah. Date of completion: February, 1981.

1981/82 fiscal year:

* Dormitory for counterparts. Area: 120 m². Cost: 9.600.000 rupiah.

* Labourer's house. Area: 150 m². Cost: 7.500.000 rupiah.

* Laboratory for nursery. Area: 70 m². Cost: 7.000.000 rupiah.

* Storehouse. Area: 200 m². Cost: 10.000.000 rupiah.

* Construction of electric and drinking water facilities. Cost: 15.722 rupiah.

Up to now, these constructions are not yet started.

It was strange that all constructions by Indonesian side had been completed at the end of fiscal year or the beginning of next fiscal year. The proposal from the Japanese side was to make faster to conclude the contract as soon as possible, but as a matter of fact this expectation was not answered until now.

ii) Construction works by Japanese side.

As the Japanese government had recognized the shortage of budget, especially the low expenses for construction of necessary facilities and buildings to be borne by Indonesian government, which were indispensable to the living condition of the experts and the smooth implementation of the project activity, Japanese government have given

a lot of help to our project as follows in order to promote the project activity more efficiently.

As a matter of fact, without these construction of facilities and buildings done by Japanese government, our project could not start to raise the seedlings needed in 1980/81 and the actual project activity had been postponed one or two years.

* Construction work for model infrastructure

This construction work was required by the Indonesian side to build the access road, land preparation of nursery site and nursery bed in view of their financial difficulties as the model infrastructure. The Japanese government decided to give some expenses as the model infrastructure and the contents of this construction work consists of access road with a total length of 1,520 m, the land preparation of nursery of 1.5 ha and the arrangement of 108 nursery beds. The total expenses used for the construction of these model infrastructure was 56.000.000 rupiah and the period of the work was from February 29 to June 24, 1980. This construction work had just given the starting dash for the project and the other construction work for forest road and nursery bed was promoted thanks to this model infrastructure.

* Construction work for temporary potting shed

It was done at the expense of the emergency measure of Japanese government to construct the temporary potting shed which was urgently needed at that time. The area of the shed was 300 m², total expenses used for this contract was 5.600.000 rupiah and the period of the work was from August 25 to September 25, 1980. This shed have been used for the potting work, namely, the burning and mixing work of the soil used for sowing boxes and pots.

* Construction work for drinking water facility

It was done at the expense of the improvement for the expert's living condition of the Japanese government to improve the drinking water condition at the nursery site. Total expenses used for the contract was 5.090.000 rupiah and the period of the work from October 30, 1980 to January 13, 1981. However, one of the construction works to dig the well in order to get the underground water for the drinking water was not succeeded because of the difficulty to reach the vein of underground water.

* Consturction work for temporary storehouse

It was done at the expense of the emergency measure of Japanese government to construct the temporary storehouse in order to cover the shortage of storehouse after arriving of the second supplied equipment and machinery at the site. The area of storehouse was 160 m², total expenses used for this contract was 5.858.000 rupiah and the period of the work was from February 10 to May 9, 1981.

* Construction work for wiring for electricity out of door

It was done at the expense of the emergency measure of Japanese government in order to wire the electricity of the nursery site after the completion of the dormitory constructed by Indonesian side to cover the shortage of wiring expenses to be done by Indonesian side. The length of wiring was about 580 m, total expenses used for the contract was 7.081.000 rupiah and the period of the work was from April 30 to May 31, 1981. By this construction work the generators supplied by Japanese government could display their ability and all the electric lamps in the nursery site were lit brightly since then.

* Construction work for site preparation of new facilities

This work was done at the expense of the emergency measure of Japanese government in order to prepare the site for the trial plantation training center which was suddenly decided to be constructed as the grant aid by Japanese government to conquer the poor living condition of the site. Total area of site preparation was 4.000 m², total expenses used for the contract work was 7.287.000 rupiah, and the period of the work from June 25 to July 30, 1981. Thanks to this construction work, the construction work for the trial plantation training center has able to start smoothly.

* Construction work for temporary improvement of sprinkler pond and iron bridges

This works were done at the expense of the emergency measure of Japanese government in order to improve the leakage of water in the sprinkler pond and to recover the two bridges damaged the rainy season. The size of pond was 5 x 5 x 2 m and the structure of bridges were 4m. x 10m. and 4m. x 8m.. Total expenses used for the contract was 6.240.000 rupiah and the period of the work was from September 7 to October 10, 1981.

* Construction work for trial plantation training center

This work was done at the expense of grant aid by Japanese government in order to cover the shortage of facilities and to improve the living condition of the expert in the field site. The basic design was made by JICA team for design of facilities of the project headed by Mr. K. TAKAHASHI and the design in detail was made by NIPPON KOEI Co., Ltd., and the construction work was contracted by TOBISHIMA Construction Co., Ltd. after tendering. The trial plantation training center consists of dormitory of 580 m², workshop of 220 m² and laboratory and training room of 92 m². Total expenses used for this center was about 100.000.000 yen and the construction work has begun from June 25, 1981 and is now under construction. By this construction work, the accommodation problem and drinking water problem which could not yet be conquered until that time in spite of all effort paid by Japanese and Indonesian are expected to be solved perfectly.

* Construction work for protection fence with barbed wire.

This is done at the expense of the emergency measure by Japanese government in order to protect the nursery site area from the invasion by cattles, goats and thieves. As a matter of fact, the nursery beds were damaged by the cattles and some kind of the equipments were stolen by thieves frequently at that time. After consulting with the Indonesian side, it became clear that the construction work would be very difficult because of the difficulty for budgeting in the middle of fiscal year by Indonesian side, so Japanese government has decided to give the expense of emergency measure for it. Total length of the fence will be 1,475 m and the total expenses used for the contract will be 5,650.00 rupiah and this construction work is now under the consulting of contract.

* Construction work for pilot infrastructure

This work is done at the expense of pilot infrastructure of Japanese government in order to implement the agro-forestry activity smoothly which is aimed to test and study the social implication of our afforestation activity under the trial plantation project. The basic design of this construction work was made by JICA consultation mission headed by Mr. H. FURUYA and the detailed plan was made by JICA guidance team for pilot infrastructure improvement works headed by Mr. K. KOTARI and designed by Mr. T. TAKAHASHI who had been short-term expert to

make the design in detail. In response to the request for this construction work from the Indonesian government, Japanese government decided to allocate the expenses of 55,295,000 yen for this pilot infrastructure based on the detailed design mentioned above. The construction work will be started from March 1, 1982 and will be completed at the end of December, 1982. The contents of the construction work for the pilot infrastructure consists of the construction of access road and forest road, the establishment of demonstration forest and the facilities for the fire protection which are indispensable for the agro-forestry activity of the project.

3. Annual technical activity in the field site.

The technical activity of the project consists of five aspects, that is to say, nursery, silviculture, forest engineering, forest protection and ecology which are conducted by respective Indonesian counterpart and expert.

Each annual technical activity was implemented according to the annual operation plan of each year based on the five years plan of trial plantation project which should be approved by the Joint Steering Group Meeting and supported by the budget of Indonesian government.

Here, each activity will be stated briefly according to the fiscal year until now.

i) Technical activity in 1979/80

The fiscal year 1979/80 was the starting year of our project and the preparation for all the activities was done. However, until the end of this fiscal year, the actual activities in the field were not done with the exception of the preparation work for model infrastructure and all efforts were concentrated not only to make the five year operation plan and annual operation plan for 1980/81, but also to promote to submit the request letter to Japanese government asking for the short-term experts, the equipment and machinery to be supplied by Japan and training in Japan by A 1-4 form of Colombo plan.

And at the end of fiscal year, the construction work for model infrastructure had begun to prepare the nursery site and to construct the forest road.

ii) Technical activity in 1980/81

According to the five year plan, the target to establish the trial plantation in this year was the area of 200 ha by following four species, namely, Pinus merkusii, Swietenia macrophylla, Albizzia falcataria and Eucalyptus deglupta or E. urophylla. In order to realize this target, the target of the technical activity in each field was decided automatically and the actual activity of each field was as follows:

* Nursery

Land preparation for 2 ha of nursery site was performed completely and the target of this year to produce the sufficient number of seedlings were carried out. The necessary number of seedlings for planting were 439,100 seedlings, but the actual number of nursery stock which had been prepared were more than those. So that it was the problem how to use the remainder stocks and it was discussed at the 3rd joint steering group meeting and approved to transfer to the activity of the regional forestry office, South Sumatera.

After delivering the seedlings to the plantation site, the preparation for the soil preparation by collecting the top soil, sand and compost, the construction of germination shed and the purchases of seed, polyethylene pots and fertilizer for the next fiscal year had begun at the end of this fiscal year.

The problems of this year were: a) the height of seedlings, especially of Pinus merkusii was too low by the delay of potting period because of the disturbance on the germination boxes by someone who was not identified, b) the seedlings of Eucalyptus deglupta had not been prepared because of low availability of the seeds and at last the seedlings of Eucalyptus urophylla which were transferred from the other nursery were used for planting.

* Plantation

The target of the plantation activities which consists of the land preparation, strip line clearing, site cultivation, hole digging, replanting and weeding for this year were carried out perfectly. Each 50 ha of Albizzia falcataria, Eucalyptus urophylla, Pinus merkusii and Swietenia macrophylla which are planted at the three kind of planting density, namely, 4 x 1.5 m, 4 x 2 m and 4 x 4 m were established based

on the five years plan of the project.

The survey for the survival rate was done at two month after planting and the survival percentage of A. falcataria, E. urophylla, P. merkusii and S. macrophylla were 87%, 76%, 90% and 93% respectively and the replanting was executed for all species.

The problems of the plantation activity in this year were as follows:

a) use of the auto-auger for hole digging and bush-cutter for strip line clearing could not reached the expected target and efficiency compared with the manual power because of labourer's inexperienced skill to treat the machine, b) the growing of alang-alang after cutting was so fast that it was necessary to carry out the intensive weeding to keep the seedlings free from the suppression by alang-alang, c) the survival percentage of some planting tree species like E. urophylla and P. merkusii were not so good because of the low quality of seedlings, the delay of planting time and the unsuitable treatment of seedlings during the transportation as shown in the field manager's letter of Appendix 7.

* Forest road (Forest engineering)

As the supplied equipment and machinery had delayed to arrive at the field site because of taking much time to pass the customs, the activity of the forest engineering was compelled to postpone until the arriving of the heavy machine at the field site.

However, after arriving of the heavy machine the activity could be promoted so quickly that the forest road construction activity had gotten the result of the construction of 3.1 km that exceeded 0.6 km from the annual target and 1.5 km of the main road was applied with pavement. Accordingly, there was no problem to construct the forest road in this year but what the problem was the most efficient and suitable forest road under the circumstances of tropical rain forest area.

* Fire belt (Forest protection)

The fire belt was established along the main road and working road with the average width of 25 m. The establishment of fire belt was delayed because of the same reason as in the forest road construction. But at the end of April, 1981 the fire belt of 5.4 km was established. There were three kinds of the fire belt which was constructed in our

project, that is to say, a) the green belt which was planted 4,500 m along the main road with Swietenia macrophylla, the same kind of fire belt with Acacia mangium, b) the fire belt was planted to 200 m covered with cover crop such as Centrosema pubescens was 500 m and c) the yellow fire belt which was unplanted was 200 m of along the belt. Which is better among them has not yet been fixed.

iii) Technical activity in 1981/82

According to the five years plan, the target to establish the trial plantation in this year was the area of 400 ha which was consisted of three kind of experiment, that is to say, the manual experiment of 200 ha, the mechanization experiment of 150 ha and the introduction experiment of 50 ha. The tree species used for this year were as follows: for the manual experiment, Acacia cadamba, Schima bancana, Peronema canescens and Acacia auriculiformis, for the mechanization experiment, Eucalyptus deglupta, Albizia falcataria and Pinus merkusii, and for the introduction experiment, Enterolobium cyclocarpum, Leuceana leucocephala, Pterocarpus indicus, Acacia mangium and Aleulites molucana. However, the collecting amount of seeds, especially for the introduction experiment was not so sufficient that the expected area could not be fulfilled.

The technical activity in each field until the end of November, 1981 will be stated briefly as follows:

* Nursery

The nursery facilities concerning the cutting shed, germination shed, nursery bed and germination box which was planned to be established in this year have already finished with the exception of nursery bed which has completed 87.5% of the target. However, the realization of nursery operation concerning the land preparation of 2 ha, the collecting soil media which consists of top soil of 200 m³, sand of 100 m³ and compost of 100 m³, the germinating the seeds of 16 kg for 13 species, the filling of soil, the pricking out and the tending of 800,000 pots, and the purchasing of seed, polyethylene pot and fertilizer were conducted completely.

The main problem in the nursery activity in this year was the insufficient seeds for some species, such as E. cyclocarpum, A. mangium and A. molucana. For the next operation, it was suggested to survey the availability of some native species which would be produced from the

surrounding area near Benakat such species as S. bancana, A. cadamba and P. canescens.

* Plantation

The four species which was planted in last year are now growing well and the main activity at these area is tending and replanting of E. urophylla, P. merkusii. According to the latest evaluation survey which was done on September 1981, the survival percentage of four species were as follows: A. falcataria 87%, E. urophylla 67%, P. merkusii 52.3% and S. macrophylla 89.2%. These percentages were too low, especially E. urophylla and P. merkusii were so low that they needed replanting.

The reason why the survival percentages of these two species were so low was examined by the field manager as mentioned in Appendix 7 of this report. Accordingly, it is expected that this year's plantation activity will be improved and the higher survival percentage will be obtained in this year as the result of the paying consideration for the last year's experience.

Now the land preparation for manual test, mechanization test and introduction test were already completed and the planting activity has already begun.

The problems for the machineries occurred during the operation of site preparation. There are two kinds of the attachment for tractor provided by JICA, namely, molboard plough (bottom blough) and disc harrow. During the operation of site preparation, it was proved that the the molboard plough was not so toughful to cultivate such a heavy clay soil as in Benakat area and also this type was not suitable for alang-alang field mixed with the bush and shrub vegetation which remained a lot of stump and root after clear cutting of the vegetation. And from the view point that almost all the reforestation contractor in South Sumatra has used the disc plough type for the site preparation, it must be considered to change from the molboard plough type to the disc plough type in the coming year.

The planting activity is now being carried out in the site, but the starting of planting activity was a little late because of slow coming of rainy season in this year.

* Forest road

The construction of forest road in this year was completed in October, 1981, total length of the road was 8 km and 5 km of them was graveled. Accordingly, the forest road construction work did not meet with the difficult problem because of the availability of the basic machineries such as angle dozer and motor grader.

* Forest protection

The establishment of the fire belt in this year was 9.8 km for green fire belt and 0.2 km for yellow fire belt. The average width of fire belt along the main road and working road is 25 m. For the green fire belt, 4 species were planted, that is to say, Swietenia macrophylla was planted along the road of 2,750 m, Acacia mangium was 550 m, Anthocephalus cadamba was 50 m and the cover crop, Calopogonium mucunoides, was planted 50 m. Which is better among them will be examined in future.

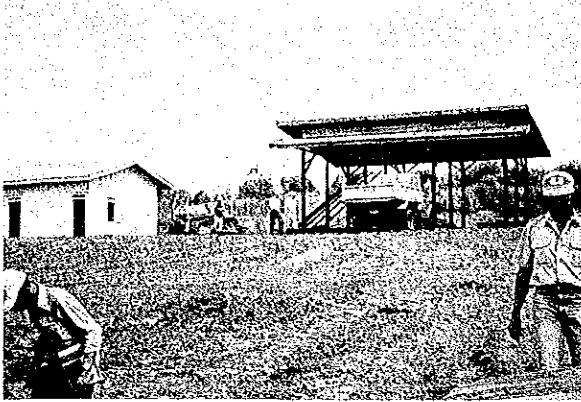
The two watching towers were planned to be constructed at the field site, and one tower is already established but the other one is now under construction.

The problem for the forest protection is same with the problem for the site preparation of the planting activity.

* Forest ecology

The beginning of this fiscal year, the expert for forest ecology from Japan has arrived at his post in the implementation center. But the appointment of the counterpart for the forest ecology was delayed until November and also the budget for the forest ecological activity was not allotted in the budget of this year. After arriving of the forest ecology expert the request for the budget to the activity has been proposed by Japanese side, but the allocation of the budget has not yet been fixed because of difficulty to ask for the new budget in the middle of fiscal year. Accordingly, the activity was not vigorous. Furthermore, the preparation for the pilot infrastructure of the agro-forestry activity has begun and the expert for forest ecology has been engaged in this activity. So that, the real activity of the forest ecology is now being carried out gradually after the appointment of the counterpart.

Facilities
1979/1980~1981/1982

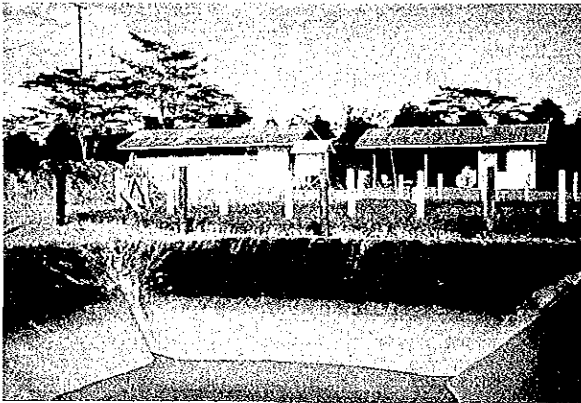


Working house at plantation site

Fire protection activities
1979/1980~1981/1982



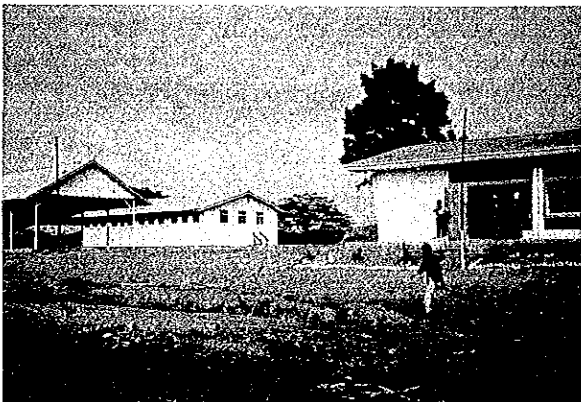
Site preparation for green fire belt



Drinking water pond



Site preparation for yellow fire belt



Project Center



Temporary planting
(*S. macrophylla*)

