

**THE FINAL REPORT OF
THE TRIAL PLANTATION PROJECT IN BENAKAT
SOUTH SUMATRA
(ATA-186)**

April 25, 1986

**Hiroji Okabe
Ex-Chief Advisor**

for

Technical Cooperation Program

for

**Trial Plantation Project in Benakat
South Sumatra
(ATA-186)**

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PREFACE

The Technical Cooperation for the Trial Plantation Project in Benakat, South Sumatra, hereinafter referred to as "the Project", which was started in April 1979, and its cooperation period extended for two years in March 1984, is terminated on April 11, 1986 and its follow-up cooperation starts from April 12, 1986 until the end of March 1988.

It is said that there are more than 15 million ha. of alang-alang grasslands in Indonesia, so that the reforestation activities in these alang-alang grasslands should be carried out for the purpose of not only conservation of national land but also urgent maintenance of forests. Accordingly, the Indonesian government gives high priority to afforestation activities, planning more than four million ha afforestation in alang-alang grassland during 15 years. In the present situation, I think the importance of the Project as the source of afforestation techniques is unfathomable. Fortunately, with strong support from both the Indonesian and Japanese government authorities concerned, all counterparts and experts who have been engaged in the Project from the beginning until now have done their best and might be proud of the results of the Project.

A Plantation acreage of 2.500 ha. was planned during seven years as the main activity of the Project, the planned area has been planted completely until February 1986. The forest which was planted in the 1980/81 Fiscal Year has become a good forest, and it seems to me that officials concerned appraise the excellent fruits through the technical cooperation. However, at the initial stage, it was said that there were a lot of troubles because of lack of experience on both Indonesian and Japanese officials concerned. But now, the Project has been implemented quite smoothly.

At the initial stage, the Project was quite small, but it has developed into a Reforestation Technology Development Center, like the growth of the trees which were first planted in Benakat.

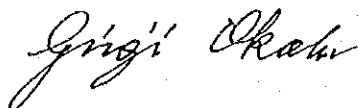
This report is an interim report of Project activities during 1979 to April 1986. There is an excellent report of the Project activities written by Mr. R. KATO, the first Chief Advisor for the Project, for the initial stage. Although I should write a report concerning Project activities from 1982 to 1986, I am trying to write this one from the initial stage in order to record all the Project activities in one report.

I have to ask Mr. R. KATO's forgiveness for having quoted a great part of his report in this report, I am afraid that I might have marred his report by quoting from it and causing misunderstandings. And I have to clarify that this report has been written on the base of many reports which were written by many long and short term experts concerned.

Submitting this report, I would like to express many heartfelt appreciation for the nice cooperation between Indonesian counterparts and Japanese experts and for the good guidance given by both Indonesian and Japanese government officials concerned.

I would like to express my thanks to Mrs. Luky S. Yasin who checked my report to correct my mistakes in English, and Miss. Endang Anastasia L. who typed my manuscript. I think if there were not these two ladies, I could not finish this report.

April 25, 1986



Hiroji Okabe
Ex-Chief Advisor
for

The Technical Cooperation Program
for
Trial Plantation Project in Benakat
South Sumatra
(ATA-186)

I. OUTLINE OF HISTORY OF THE PROJECT

1. Short history of activities before the project 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 in February 1980.

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

The origin of the project dated back in 1972 when Mr. SUDJARWO, Director General of Forestry of the Republic of Indonesia, visited Japan and requested for cooperation of the Japanese government for afforestation activities in Indonesia. This request, especially for the cooperation in the afforestation of grasslands in Kalimantan and Sumatra, was repeated by the Directors of respectively Forest Planning, Reforestation and Land Rehabilitation and of the Forest Research Institute under the Directorate General of Forestry of the Republic of Indonesia during their visits to Japan 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 made surveys in North and South Sumatra to find the most suitable areas for the afforestation project and decided the grassland and forest of South Sumatra as the project area in June 1975. The result of this survey was reported as "The report of the feasibility survey (first survey) on silviculture project in Indonesia (South Sumatra)" written in Japanese.

The second survey team negotiated with the Indonesian government about the planning of the afforestation project in the grasslands of Benakat and Subanjeriji areas in South Sumatra in November 1975. The result was published as "The report of feasibility survey (second survey) on the silviculture project in Indonesia (South Sumatra)" in English and Japanese in December 1976. Based on the results of this second survey team, the third 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 enlisted in 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 in November 1977 and topographical charts started 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 the large scale 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 has 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 the Indonesian and Japanese sides should depend 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 sides 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 an inter-governmental cooperation project and to analyse the problems of planting mechanization technique in grassland. Before returning to Japan, this team exchanged opinions with Indonesian officials concerned and concluded the preliminary report as shown in Appendix 3.

This preliminary report was the basis for Mr. R. KATO's report, many long /short term experts ones and other material, but was only the rough report to be corrected in the future.

2. Short history after the arrival of first Japanese Expert

All project activities have been carried out on the base of the Five Years' Plan for Technical Cooperation for the Trial Plantation Project in Benakat, South Sumatra that was made in January 1980 (Appendix 4), or Two Years Plan of Operation for the Trial Plantation in Benakat, South Sumatra that was made in 1984 (Appendix 11).

Six and a half years have passed since the first Japanese expert arrived in Indonesia on November 16, 1979. In this section a short history after the arrival of the Japanese expert until now will be described briefly.

According to the project activities, the period from the arrival of the first Japanese expert to the present time may be divided into three phases, i.e. Phase I was from Mr. K. OHMI's arrival in Indonesia to the time when the Trial Plantation Training Center was completed and experts began to live in it in March 1982; Phase II was from April 1982 to April 1984 when the Record of Discussion signed April 12, 1979 was over, and Phase III was the period of the Record of Discussion signed on March 24, 1984. Each period has special characters: Phase I was spent for the organizing of the Project and making the basic foundation of the Project, Phase II was the period of the development of Project activities in Phase I and Phase III is the period when all project activities are put together.

2.1. Phase I

Phase I started with Mr. K. OHMI's arrival in Indonesia on November 16, 1979, as the first experts from Japan for the Project activity. About six months have passed since the Record of Discussion was signed on April 12, 1979. The reason for the delay in the expert's arrival was the delayed arrival of the A-1 form by Colombo plan from the Indonesian government to the Japanese government.

When the Record of Discussion was signed and the Japanese Implementation Survey Team was dispatched, the Japanese side requested for the preparation of essential facilities before the arrival of the Japanese expert, but there was no response to the request. After the arrival of Japanese experts, the first problem was how to organize the Project which should be based on the Record of Discussion; the second one was how to set the basic foundation of Project implementation. As the Project organization, the Project Office and the Project Implementation office organization based on the Record of Discussion were to be organized first, but at the beginning of the Project there was no Project office. On December 29, 1979 the Project Implementation Office in Palembang was opened at a rented house, and the Project Office in Bogor was opened at the corner of the office of the Sub-Directorate of Reforestation and Rehabilitation on December 31, 1979.

Owing to Indonesia authorities concerned, the organization was developed by step by step, but it took a long time to become a sufficient organization.

In phase I, seven experts had dispatched until March 31, 1981 from Japan i.e. as follows:

Table No. 1: Table of Experts in Phase I, arranged in the order of arrival.

Category	Name	Date of arrival
Silviculture/Team Leader	Katsuhiko O H M I	November 16, 1979
Chief Advisor	Ryosuke K A T O	December 17, 1979
Liaison Officer	Yoshiichi SAKAMOTO	December 17, 1979
Forest Protection	Seishi MIURA	March 12, 1980
Forest Engineering	Koji TASHIRO	July 30, 1980
Nursery	Hirota YAMATE	September 22, 1980
Forest Ecology	Seiichi OHTA	March 31, 1981

Although by March 31, 1981 all category of experts who were nominated in the Record of Discussion had been dispatched to Indonesia. When receiving those experts the Indonesian side had some doubt that transfer of technology to counterparts would be difficult because of the experts' school career and their command of the English language, but this problem was overcome soon. During Phase I, eleven short-term experts were dispatched, namely the supervisor for the Model Infrastructure, nursery, forest mechanization (four persons), soil analysis, agroforestry, socio-economy, tree pathology and design for Pilot Infrastructure for agro-forestry, and they had obtained good results in each field.

The end of 1981 was the time when experts had to be changed because of the completion of their two year's assignment. Mr. K. KATO came to Indonesia on October 14, as the successor for Mr. K. OHMI (Team Leader) and expert for silviculture, Mr. H. HACHINOHE arrived on 18 of November as the successor of Mr. Y. SAKAMOTO, the Liaison Officer. Afterwards Mr. K. OHMI and Mr. Y. SAKAMOTO, returned to Japan respectively on November 15 and December 16, 1981. However Mr. R. KATO who was supposed to go back to Japan together with Mr. Y. SAKAMOTO had to stay in Indonesia for two more months because both Indonesian and Japanese sides required to postpone his service another two months in order to avoid the confusion that might happen with the change of three experts almost at the same time. Mr. S. SUGIMOTO successor of Mr. R. KATO arrived in Indonesia on February 1, 1982. Mr. S. MIURA, expert for forest protection, left for Japan on March 11, 1982, however Mr. N. TABATA did not come to Indonesia until April 1, 1982.

There were no sufficient number of counterparts at first. At the Project Office in Bogor, there were two counterparts, namely, the Project Co-Manager and the Assistant Project Co-Manager, but there was no Project Manager, strangely. At the

Third Joint Steering Group Meeting, the Project Co-Manager and Assistant Project Co-Manager were promoted to the posts of Project Manager and the Project Co-Manager respectively by the Japanese side.

The first Project Co-Manager was Soeharto Soemarmo who, unfortunately, died on February 17, 1980. Then Mr. Syahrir, Sub-Director for seeds was appointed the second Project Co-Manager on March 1, 1980. And on March 1, 1981 Mr. Soedjadi Hartono became Project Co-Manager, as successor of Mr. Syahrir, but it was very strange that there was no Project Manager, therefore the Japanese side insisted on appointing a Project Manager, according to the Record of Discussion. Then Mr. Soedjadi Hartono was appointed Project manager as above mentioned.

At the project Implementation Center, Mr. Wazir Nengkeman was appointed first Field Manager, and Mr. Zulkifli Mulsani, former counterpart for silviculture, was appointed Field Manager in place of Mr. Wazir Nengkeman on April 30, 1980. At the end of the December 1980, there were six counterparts in the Project Implementation Center including the Field Manager, but it is hard to tell the qualification of the counterparts because two counterparts of the six were the so-called assistant counterparts, young men fresh from the Academy, and the other two counterparts were also young men newly graduated from the University, so they had few experience on field activities. As they did not have enough knowledge in the field of their specialities and experience in management, specialities and experience in management, project activities were not carried out smoothly. Furthermore Mr. Harjono Arisman, counterpart for nursery, held concurrently the post of the Chief of Sabanjerigi Nursery, so there was inconvenience in the implementation of nursery activity. No immediate solution was given to the problems in spite of requests.

At the beginning of 1980, there were only the project office in Bogor and the project Implementation Center in Palembang;

of course, there was no accomodation at the Project site, so it was very inconvenient to carry out the Project activity. Owing to the efficient performance of officials concerned, the accomodation problem was solved to some extent by renting the room of STANVAC's guest-house at Pendopo. However, accomodation problem has not been solved completely until the end of March 1982 on the completion of the Trial Plantation Training Center by Japanese grant aid.

Meanwhile, shortage of budget was also a big problem for the Project activity, so at the First Joint Steering Group Meeting that was held on June 12, 1980, this problem was discussed to be solved. The shortage of the budget was covered by the Indonesian government to a certain extent. On the other hand, the Technical Cooperation Planning Survey Team led by Mr. K. KOTARI, and the Advisory Team headed by Mr. T. MATSUDA were dispatched by JICA in order to solve those problems. In the 1980/81 budget of Indonesia side the project office, dormitory for counterparts, storehouse, and electric power house were planned to be constructed, these building were completed in February 1981.

Meanwhile, the grant aid for the Trial Plantation Training Center consisting of a guest-house, a work shop and laboratory which consumed 100 million yen was completed in March 1982. The completion of the guest-house solved the problem of experts' accomodation. The temporary storehouse, wiring for outdoor electricity, site preparation for the Trial Plantation Training Center, and so on were done by the Japanese side. Facilities and buildings necessary for teh Project activity were thus arranged.

One of the big problems concerning the supplied machinery and equipment form Japan was that it took a long time to receive them through the necessary formalities after their arrival at the Palembang harbour. For example, the first supply of

machinery and equipment arrived at the Palembang harbour on April 20, 1980 but their acceptance through necessary formalities was on July 30, 1980, and the second supply of machinery and equipment which arrived at the Palembang harbour on June 16 were taken out on September 1 except for the Bulldozer and shoveladozer which were postponed until November 10. One of the reasons for the delay of the acceptance was lack of experience concerning the procedure to go through necessary formalities.

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

Counterpart training in Japan was started from September 17, 1980, but training in 1979 was not done because of some misunderstandings of A-2,3 forms. In 1980, Mr. Wazir Nengkeman, former Field Manager, Mr. Zulkifli Mulsani, Field Manager at that time and R. Hardjono Arisman, counterpart for nursery at that time were sent to Japan as trainees. In Fiscal Year 1980/81 five officials were also sent to Japan for training, namely Mr. Rismulyadi, counterpart for forest engineering, and Mr. Tata Wiharta, counterpart for silviculture from August 6 to November 5, 1981. Mr. Soedjadi Hartono, Project Manager at that time, from March 24 to April 4, 1982; and Mr. Nyoman Yuliarsana, counterpart for forest protection at that time, and Anto Ribawanto, counterpart for silviculture at that time, from March 25 to June 24, 1982. Thanks to good cooperation of Japanese officials concerned, they had obtained good training and experience which were useful for their future activities.

The planting activity was started on December 8, 1980 on the 200 ha area of manual land preparation. On the first day, December 8, Albizia falacata seedlings were planted in A 1 compartment. Unfortunately, planting activity in this fiscal year

did not obtain good results especially Eucalyptus urophylla and Pinus merkusii which had low survival percentage due to the quality of seedlings, delayed planting and the poor manner in handling seedlings. In 1981/82 Fiscal Year the plantation area became 400 ha, but the survival ratio was very good thanks to the good guidance provided by the Chief Advisor and other persons concerned.

One of the big events in the period was the preparation for the agro-forestry activity in the Project. According to the Record of Discussion, test and studies on the social implication of afforestation were supposed to be conducted and in this connection the agro-forestry activity was planned under the Trial Plantation project. JICA consultation Mission headed by Mr. M. FURUYA was dispatched on June 25, to stay until July 10, 1980 in order to make the basic plan for the pilot infrastructure scheme that aimed 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 5), and the report written in Japanese was published in March 1982.

Based on the above mentioned minutes, the short-term experts, i.e. Mr. T. TAKAHASHI as expert for the designing of pilot infrastructure, Dr. M. KUMAZAKI as expert for socio-economy of the community and Dr. Y. IZUMIYAMA as expert for the experimental plan for dry field farming were dispatched. And then the Guidance Team for the Pilot Infrastructure Improvement Works led by Mr. K. KOTARI was dispatched to make the detailed pilot infrastructure scheme. They consulted with the Indonesian authorities on this scheme after finishing their field survey and their program and supplement document were discussed together and approved generally on meeting with the Indonesian authorities concerned, and report written in Japanese was published on March 1982 together with the report by Mr. M. FURUYA'S mission.

In spite of insufficient budget, delay in the preparation of facilities and inexperienced counterparts, the Project activity has shown to be a good project for afforestation, by having planted on 200 ha and 400 ha in 1980/81 and 1981/82 Fiscal Years, having performed nursery activity, forest road and fire belt constructions and constructing buildings and facilities. And the project has been expected to obtain good result for Indonesian forestry especially afforestation in along-alang grass-lands

2.2. Phase II

Although Phase I was a period for the Project organization and setting up the basic foundation, Phase II can be said to be a period for carrying out the Project activity upon the result of Phase I. At Phase I the Project Implementation Office had its location at Palembang and the Field Manager stayed there, but many facilities and buildings, especially the office and accomodation were then prepared and the Field Manager and main staffs of the Project Implementation office is moved to the project site at Benakat. Hereby all project activities could be performed at the Project site. By the effort of the Indonesian side a radio communication system between the Project and Palembang Liaison Office which was located at the conner of South Sumatra Provincial Forestry Office was introduced in the beginning of 1982/83 Fiscal Year.

One of the biggest events during Phase II was that the Pilot Infrastructure for agro-forestry was done, the contract of construction of Pilot Infrastructure, that was planned carefully, was contracted between the Resident Representative of Japan International Cooperation Agency and the Director of P.T. Pramantan on June 5, 1982, and construction was started on June 9, 1982; however, the construction works had to be discontinued for about one month because of draught. So the construction period had to be extended, and construction was completed on January 15, 1983. Unfortunately, on September 30, 1982, Mr. K. MITANI who was on his way to Benakat by car with

the contractor, who was supervisor for the pilot infrastructure had received a serious wound by traffic accident and the contractor was killed in the accident. In relation with the serious wound, he left for Japan to undergo medical treatment, which is still undergoing to day. Mr. T. TAKAHASHI was dispatched as successor of Mr. K. MITANI and he was in charge of the supervision of the Pilot Infrastructure. The construction of the Pilot Infrastructure led to the accomplishment of the agro-forestry scheme. Before its completion, the first contract of participation in the agro-forestry scheme was made between the Directorate General of Reforestation and Land Rehabilitation(D G R L R) and each participant farmer. The agro-forestry scheme has started in October 1982.

There was no big construction which was done by the Japanese side in this period besides the above-mentioned Pilot Infrastructure, but the Indonesian side constructed counterparts' houses, accommodation for labourers, a laboratory for the nursery, garages, drinking water system etc.

The planned plantation areas in each fiscal year in Phase II increased quickly. e.g. 700 ha in 1982/83, 800 ha in 1983/84 , following the 200 ha in 1980/81, 400 in 1981/82

When the works were increased quickly, if the implementation must be done under fit plan and done smoothly, it would be impossible to plant trees in suitable timing. Since the 1982/83 Fiscal Year, the budget for afforestation, nursery and forest road construction has become INPRES budget. The change into INPRES budget itself passed no problem, but the delay of distribution on the INPRES budget was a problem; this delay disturbed the implementation of the Project activities in suitable timing. Especially in 1983/84 fiscal year, although the planned plantation area became 800 ha, distribution of the INPRES budget was delayed, so all project activities could not be completed by the end of March 1984, while some parts of the area had to be planted in

January 1985. Because of seedling condition, some area had to be planted outside the rainy season. As necessary consequence, survival ratio was not so good compared with that in the other fiscal years where they were planted in the right season.

On March 17, 1983 the Directorate General of Forestry was promoted to level of Ministry of Forestry. The Ministry of Forestry moved to the new building in Jakarta. In this connection and the Project Office in Bogor moved to Jakarta.

In this period the Chief Advisor was Mr. S. SUGIMOTO who arrived in Indonesian on February 1, 1982 and left for Japan on January 31, 1984. Experts for the Project activities in Benakat were as follows:

Table No. 2: Table of Experts in Phase II arranged in the sequence of arrival

Category	Name	Arrival
Silviculture / Team Leader	Kuniaki KATO	October 14, 1981
Silviculture/Acting Team Leader	Tadao OHARA	July 15, 1983
Nursery	Hirota YAMATE	September 22, 1980
Forest engineering	Koji TASHIRO	July 30, 1980
Forest protection	Masaharu TABATA	April 1, 1982
Forest ecology	Seichi OHTA	March 31, 1981
	Motohiro ARIHARA	March 15, 1983
Liaison Officer	Hideki HACHINOHE	November 18, 1981

Mr. K. KATO'S assignment ended on October 14, 1983. After that Mr. OHARA was appointed Acting Team Leader until Mr. T. IKEDA, expert for forest protection and Team Leader, arrived in Indonesia on February 4, 1984. Dr. S. OHTA, expert for forest ecology, who was engaged in the preparation of a agro-forestry scheme left for Japan on March 30, 1983, and Mr. M. ARIHARA was appointed expert for forest ecology in place

of Dr. S. OHTA. On January 31, 1984 Mr. S. SUGIMOTO left for Japan, but his successor was not dispatched until February 27. Mr. M. TABATA'S assignment ended on March 31, 1984, and Messrs H. YAMATE, K. TASHIRO and H. HACHINOHE ended their assignment on April 11, 1984 and left for Japan.

During Phase II, 15 short-term experts were dispatched, namely, supervisors for the Pilot Infrastructure (2 persons), tree pathology, forest entomology, forest mechanization (5 persons), agro-forestry, audiovisual (4 persons) and survey, and they had good results in each field. Meanwhile as change of counterparts, Mr. Soedjadi Hartono, Project Manager, was transferred to another post, and Mr. Victor M. Sinaga was appointed Project Manager in September 1982, and he was succeeded by Mr. Saptana PH, as Project Manager in January 1984. At the Project Implementation Center, Mr. Zulkifli Mulsani was succeeded by Mr. Triyogo Soekanto as Field Manager. Many counterparts changed their positions, but details were to be neglected here. In connection with the agro-forestry scheme which was started since the end of Phase I, Mr. Yadi Haryanto and other persons were engaged in agro-forestry scheme as experts.

In this phase seven persons were sent Japan for training: Mr. Victor M. Sinaga, Director of South Sumatra Regional Forest Office at that time was sent in November 1982; Mr. Arip P.S. Sagala, Chief of Forest Maintenance of Sub-Directorate Reforestation and Land Rehabilitation and Project Co-Manager at that time, was sent from November 4 to December 15, 1982, Mr Triyogo Soekanto, counterpart for forest ecology at that time, and Mrs. Retno Sekarsari, counterpart for nursery, were sent from March 2 to June 1, 1983, to Japan. And Mr. Tonny Hariwidianto, staff of the Sub-Directorate of Reforestration at that time, was sent from August 25 to November 24, 1983, Mr. Desman Pardede, staff of the Sub-Directorate of Forest Rehabilitation that time, was sent from December 1, 1983 to February 24, 1984 and Mr. Yadi Hariyanto, counterpart, was sent from March to June 1984, to Japan.

The Project would be terminated on April 11, 1984, but the Indonesian side wanted it to be extended, so the Secretary General of the Ministry of Forestry sent a letter to the Head of Overseas Technical Cooperation Bureau, Cabinet Secretariate, and the Chief National Planning and Development Agency, proposing extension of the term of the Project in order to achieve the anticipated objectives. In relation to this problem, after Joint Evaluation Team which consisted of the Japanese team led by Mr. Y. NOMURA and co-headed by Dr. KUMAZAKI, and the Indonesian team led by Mr. Victor M. Sinaga visited the Project site and had discussions with the authorities concerned and Japanese/Indonesian staffs concerned of the Project in September 1983. Then the Joint Evaluation Meeting was held in Jakarta on September 13, 1983. As the result of the Meeting, the team presented its evaluation report and accordingly agreed to recommend to their respective governments the matter referred to in the attached document, in which it was written that the Indonesian-Japanese Evaluation Team deemed its necessary and recommended to their respective governments that the term of cooperation of the project should be extended for at least two years more. According to the document, the reason for extending the term of cooperation of the Project is as follows: "In the light of the initial purpose of the Project which is development and transfer of afforestation techniques so as to ensure successful afforestation on tropical grassland, there remain some outstanding issues. Among them there are four points regarded to be important, namely the fire protection system, agro-forestry system, transfer of technology and further techniques and development of plantation aspects".

Equipment and machinery from Japan have been delayed in 1981 and 1982 due to the procedures in obtaining the right documents. Two tractors from Japan by 1981 Japanese budget arrived at Palembang harbour on July 1982, but they did not reach the Project site until the end of December 1982, because it took a long time to obtain import licences, the tractors had to be kept in the bonded warehouse of the Palembang harbour. Although the equipment

and machinery by 1982 year's budget from Japan arrived at Palembang harbour in May 1983, they did not arrived the Project site until June 1984 because of the delay in custom formalities, in the meantime they were kept in the bounded warehouse and many machine parts, machines and equipments were stolen. Project activities were thus disturbed by the theft.

On December 4, 1982 the R.I. Minister of Agriculture, Mr. Toshio YAMAZAKI, Ambassador of Japan to Indonesia, the governor of South Sumatra etc. visited Benakat to inspect the afforestation area, the agro-forestry scheme and the nursery activity, and this inspection was televised and obtained news coverage, This inspection meant that the officials concerned assessed the Project as successful.

2.3. Phase III

The cooperation of the Project in Phase III was based on the Record of Discussion which was signed on March 24, 1984 (Appendix 6). The Japanese Project Consultation Team led by Mr. R. KATO, the first Chief Advisor for the Project, was dispatched from May 16 to 29, 1984 in order to give consultation about the Project activities during the two extended years. After visiting and discussing with both experts and counterparts at the Project site, the Team had a meeting with members of the Joint Steering Group Meeting in Jakarta on May 28, 1984, and then the minute of understanding was signed by Mr. R. KATO and Mr. Victor M. Sinaga. The keynote of the Project activity during Phase III depended on the minute of understanding.

In Phase III, the afforestation area was decreased to 200 ha including the agro-forestry scheme each year; this was only a quarter of the area in 1983/84 Fiscal Year. The big decrease of the afforestation area was because the activities of the Phase III were mainly for fire protection system, agro-forestry scheme, transfer of technology and further study and development.

Long-term experts from Japan were dispatched from February to June 1984, i.e. the following:

Table No. 3: Table of Experts in Phase III arranged according to the date of arrival

Category	Name	Arrival date
Forest ecology	Motohiro ARIHARA	March 15, 1983
Silviculture	Tadao OHARA	July 15, 1983
Forest Protection/ Team Leader	Tsuyoshi IKEDA	February 4, 1984
Chief Advisor	Hiroji OKABE	February 27, 1984
Nursery	Osamu TANDO	March 26, 1984
Forest engineering	Hirosato TAGUCHI	March 26, 1984
Silviculture	Minoru ARAI	April 12, 1984
Liaison Officer	Kyoji HASHIMOTO	June 15, 1984

All experts, except Mr. T. OHARA who left for Japan on July 14, 1984, were active in the Project activities until the end of their assignment, mostly by April 11, 1986.

The trial Plantation Project which was a temporary organization for Project Implementation was raised to the status of Reforestation Technology Development Center on October 20, 1984, and this center is a permanent organization in the Ministry of Forestry. Mr. Kardi Sabaruddin has been appointed chief of the center. Before becoming a center, Project activities were under control of DAS MUSI, but after becoming the center, they belong to the Director General, DGRLR directly. Herewith, the Project Implementation organization was positioned as main part of the organization of the center. When on April 30, 1985, Mr. Triyogo Soekanto, Field Manager, changed his position to Section Chief of Silviculture, Directorate of Reforestation Mr. Kardi Sabaruddin held concurrently the post of Field Manager, about that time new counterparts, namely Messrs Edi Iswahyudi, Agus Masudiono, Bustami, Hariyono and Burham Ismail, were appointed.

Meanwhile Mrs. Retno Sekarsari was moved to Seed Technology Center as the Section Chief in April 1985. As the result of these change, there were 12 counterparts including the Project Manager.

In this Phase seven persons were sent Japan for counterpart training, they were:

Mr. Pramono, Chief of Sub-Directorate of Evaluation and Reporting DGRLR and Mr. Saptana PH. Chief of Sub-Directorate of Forest Rehabilitation DGRLR, from September 27 to October 26, 1984, Mr. Sutomo, counterpart for Silviculture, and Mr. Endang Setiawan, staff of Sub-Directorate of Rehabilitation, DGRLR, from September 27 to December 26, 1984 were sent Japan as trainees. Mr. Bin Setiono, staff of Sub-Directorate of Forest Rehabilitation, DGRLR, and Mr. Kardi Sabaruddin, Chief of Reforestation Technology Development Center, from January 19 to February 7, 1986 were sent Japan. Mr. Munawawi, staff of the South Sumatra Provincial Forest Office, was sent to Japan as a trainee from March 25 to June 24, 1986. In addition to the trainees mentioned above, two other officials were sent to Japan in order to attend a special training course for reforestation techniques and forest management from August 26 to November 25, 1984. They were Mr. Lilik Amin Rahadjo, staff of Sub-Directorate of Nursery DGRLR, at that time, and Mr. Loekito, staff of Sub-Directorate of Planning DGRLR.

The main activity of afforestation in Phase III planting on the 340 Ha new plantation site located to the North-west of the agro-forestry scheme, but there is no map of the area to make the plan for the planting activities. Therefore, at Benakat, experts made a land feature line map, and afterwards counterparts, experts and other staff members took measurements of the area which would be planted with the use of compasses and the land feature line map in order to make plans of e.g. compartment, forest roads, fire belt etc. An on-the-job training on afforestation plan should be provided for the counterparts for their use in making an of forestation plan.

Distribution of 1984/85 INPRES budget was delayed for a long time, and finally in March 1985, all INPRES budget was available for use. But some of the activities had to be done before distribution of budget. So the Project had to ask the South Sumatra Provincial Forest Office for good cooperation in lending temporary budget. Because of the delay of INPRES budget, although planting area was 200 ha in 1984/85 fiscal Year, planting activity at the new plantation site could be started by medio February and could not be finished until the middle of April.

After discussion of the Project activity plan in 1985/86 Fiscal Year at the Project Management Meeting in Benakat, the Project activity plan was made by counterparts mainly, and the activity had to be carried out under main guidance by counterparts. Fortunately, INPRES budget was distributed early, so the Project activities were carried out almost smoothly and all plantations were finished by the middle of February 1986.

One of the biggest problems in afforestation in the alang-alang grasslands is fire. To make a success in afforestation in alang-alang grasslands it is necessary to them protect against fire. Therefore the Japanese government decided to construct model infrastructure against fire based on Indonesian proposal and dispatched Mr. K. FUJI, short-term expert on fire protection. The construction work of model infrastructure which consisted of a forest road, fire belts, look-out towers, gates and ponds was started at the end of December 1984 and lasted until the beginning of April the following year, expending about 100 million Rupiah. Mr. K. KOBAYASHI, short-term expert, was dispatched for the construction works. For the model infrastructure, all experts made good cooperation in making the design and carrying it out.

Except the construction of model infrastructure against fire, two construction works, namely those for a concrete floor for the work shop and for rain water supply system improvement,

were done in Phase III by the emergency measure of the Japanese government. The purpose of the former construction work is to keep the inside of the work shop clean, and the latter is to supply clean water for experiments and for drinking.

Cost analysis of afforestation and seedling production in the extended two years operational plan should be made. Unless there was detailed record of all activities, cost analysis in afforestation and seedling production could not be done. But such detailed record has not been made, because the Project is one of Trial Plantation, so the Project staffs thought that all they had to do was making experiments and surveys and not construction. In 1985 two short-term experts were dispatched to Indonesia for cost analysis of plantation and seedlings production. Although necessary data was insufficient, they had analyzed with data which they could get in the Project site. During the cost analysis, through their discussion with each field counterparts and some staff members of South Sumatra Regional Forest Office and of South Sumatra Provincial Forest Office concerned, the understanding of the importance of cost analysis in forestry management was given.

Equipment and machinery supplied from Japan by the budget of 1983 Fiscal Year arrived at Benakat in 1984. Arrival of the equipment and machinery by 1982 Fiscal Year budget, as already written in Phase II, was very late, and some equipment and parts of machines were stolen, so when Mr. H. YAMAMURA, Resident Representative JICA, visited the Project, he paid courtesy call on South Sumatra Government Office and asked to secretary Governor to give good cooperation concerning custom formalities. Equipment and machinery, until the 1983 Fiscal Year, were usually sent from Japan, but according to the Indonesian side request a greater part of those of the 1984 Fiscal Year were purchased in Indonesia, and those of 1985 Fiscal Year, except some which were not available in Indonesia, were purchased

in Indonesia. Since the equipment and machinery for the 1985 Fiscal Year by Japanese government discussed at the Eighth Joint Steering Group Meeting were made pending on June 1985, it was decided to send proposal to Japan concerning the case. A-4 forms which should be sent to Japan were delayed, hence the delay in purchasing equipment and machinery fortunately, there were few hindrances in the planting activity during the 1985/86 Fiscal Year.

When the Annual Consultation Meeting on Technical Cooperation between Japan and Indonesia was held at Jakarta on July 1985, the follow up of the Project activity which was requested by the Indonesian side was discussed and was recognized as a necessity of the follow up. Meanwhile, the Japanese Technical Guidance Team led by Mr. K. WATANABE, Forestry Advisor at the JICA Headquarter, was dispatched from October 21, to November 1, 1985. The Evaluation Team consisting of the Japanese Team and the Indonesian Team led by Mr. Victor M. Sinaga, Director Reforestation DGRLR visited and evaluated the achievement of the Project during the two extended years at the site, and gave some advice for future. The achievement of the Project activity was given high evaluation.

The Team held a final Joint Evaluation Meeting in Jakarta on October 28, 1985. As a result of the review, the Team prepared a report that, for further improvement of afforestation and forest management techniques, it was necessary to extend the Japanese Technical Cooperation until the end of March 1988 as "follow-up cooperation", and to submit it to their respective governments. Contents of the follow-up cooperation were as follows:

- a. Techniques for countermeasures against fire, insects diseases and meteorological damage

- b. Studies on social and environmental implication of afforestation
- c. Planning, management and evaluation techniques of the afforestation Project
- d. Other necessary techniques

The Record of Discussion on The Extended Period of The Technical Cooperation for The Trial Plantation Project in Benakat, South Sumatera was signed at Ministry of Forestry by Mr. Wartono Kadri, Director General, DGRLR, and Mr. Hideo ENDO, Resident Representative JICA Jakarta Office, on April 2, 1986 (Appendix 7) As a result of this signing of the Record of Discussion, the Project activities will be continued on a reduced scale until March 31, 1988.

The Technical Exchange Program Among JICA Reforestation Cooperation Porject was carried out in 1985 and 1986. At first, from March 27, to April 3, 1985, one Japanese expert who was dispatched to Thailand and two Thai counterparts visited Indonesia in order to see the Project activities and to exchange some technical opinions. On the other hand , Mr. T. IKEDA and Mr. O. TANDO, both Japanese experts, and Mr. Kardi Sabaruddin and Mr. Sutomo, both counterparts, visited Thailand for the same purpose as that of last year.

Training was carried out at Benakat. About 110 trainees divided in 2 groups were gathered from throughout all Sumatra Island, and they have learned silviculture in along-alang grass-land and fire control mainly. This training course was carried out as activity of the Reforestation Technology Development Center, so Counterparts of each section were engaged in training as lecturers in each their field. Counterparts have developed the skill of practical techniques which they got in the Project activities and track it, and it can be said that transfer of technology has developed very well; the Indonesian side also

recognized that techniques in the Project have reached quite a high level.

During Phase III writing technical guidance is one of important items, so all expert made their very effort to write it. The technical guidance was written by the experience and knowledge got through all period since the beginning of the Project. I am sure the Technical Guidance to be useful for afforestation in along-alang grassland.

II. ORGANIZATION OF THE PROJECT

The organization of the Project for the effective implementation of the Project activities is prescribed in the Record of Discussion which was signed in Jakarta on April 12, 1979. According to the Record of Discussion, first of all, the Joint Steering Group and the Project Office in Bogor should be established as the central function of the Project under the Directorate General of Forestry. And as the operating body at the site, the Project implementation center in Benakat and the liaison office in Palembang should be established. In line with the raising of the Directorate General of Forestry into the Ministry of Forestry, concerning the extension and development of the Project, the above mentioned organizations have been changed in the Record of Discussion signed on March 24, 1984. The organizations are as follows:

1. Joint Steering Group:

Members of the Joint Steering Group were nominated by Mr. Soedjarwo, Director General of Forestry, on December 26, 1979, as follows:

Chairman

- * Apandi Mangundikoro: Director of Reforestation and Land Rehabilitation.

Member:

- * Sudiono Surjo : Secretary, Directorate General of Forestry.
- * Harsono Reksowardoyo: Director of Directorate of 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.
- * Wazir Nengkeman : Field Manager for ATA-186.

- * Moriya Miyamoto : Representative, JICA Jakarta Office.
- * Ryosuke Kato : Chief Advisor for ATA-186, JICA.

Hearers

- * Experts and Secretary of Japanese Embassy in Jakarta.

In 1983, the Directorate General of Forestry has become the Ministry of Forestry and thus organization has been changed. In addition to the 6 years period, all the first nominated persons as Joint Steering Group members were changed in their positions, so the names of members at the present time are as follows:

Chairman

- * Wartono Kadri : Director General of Reforestation and Land Rehabilitation.

Member

- * Victor M. Sinaga : Director of Reforestation, DGRLR
- * Saptana PH : Chief of Sub-Directorate of Forest Rehabilitation, DGRLR.
- * Harsono : Secretary of DGRLR.
- * Saryono : Director, Bureau of Planning, Ministry of Forestry.
- * Komar Soemarna : Director, Forest Research and Development Center, Agency of Foerstry Research and Development.
- * R, Soenarso : Director, Forest Education and Training Center.
- * Djumra : Director of Programming, DGRLR
- * Sutisna Wartaputra: Director of Regreening and Arable Land Control, DGRLR.
- * Bambang Soekartiko: Director of Land Conservation DGRLR.
- * Toga Sirait : Director, South Sumatra Regional Office.

- * Rusdin Akasse : Head, South Sumatra Provincial Forest Office.
- * Mudatir Iskandar : Project Leader of P3RP-DAS Musi Palembang
- * Kardi Sabaruddin : Field Manager of ATA-186, Chief of Reforestation Technology centre

2. Project Office in Bogor and Jakarta

The Project office in Bogor was opened on December 31, 1979 at the corner of the Office of Sub-Directorate Reforestation and Land Rehabilitation, and the exclusive office was opened on December 1, 1980.

When Mr. R. KATO, was dispatched as Chief Advisor for the Project on December 17, 1979, there was no project office. According to the Record of Discussion, in the Project Office in Bogor, a project manager should be nominated so that it was strange that was no project manager in the office at that time, there was no clear reason why there was no project manager in the project office. At the third Joint Steering Group Meeting, this problem was questioned by the Japanese side and it was promoted to appoint a project manager.

In March 1983 the Directorate General of Forestry became Ministry of Forestry; in this connection the Sub-Directorate Reforestation and Land Rehabilitation office moved to Jakarta, and the Project office had to be moved from Bogor to Jakarta in August 1983.

The personnel in the Project Office was as follows:

Indonesian Side

Project Manager

- * Soejadi Hartono : Chief, Sub-Directorate Reforestation and Rehabilitation From March 1, 1981 to September 30, 1983

* Victor M. Sinaga : Director of Reforestation From
September 30, 1983 to January 28,
1983.

* Saptana PH : Chief of Sub Directorate Reforesta-
tion.
From January 28, 1984 up to now

Project Co-Manager

* Soeharto Sumarmo : Chief, Sub-Directorate Reforestation
and Rehabilitation.
From September 19, 1979 to
February 17, 1980

* Sjarir : Chief, Sub-Directorate Seed.
From March 1, 1980 to March 1, 1981.

Assistant Project Co-Manager

* Arip P.S. Sigala : Chief, rfeorestation Section of
Sub-Directorate of reforestation
and rehabilitation at the time
when nominated, but his later
position was chief, Forest Mainte-
nance of the same Sub-Directorate.
From September 17, 1979 to July
31, 1983.

Japanese side

Chief Advisor

* Ryosuke KATO : From December 17, 1979 to
February 16, 1982

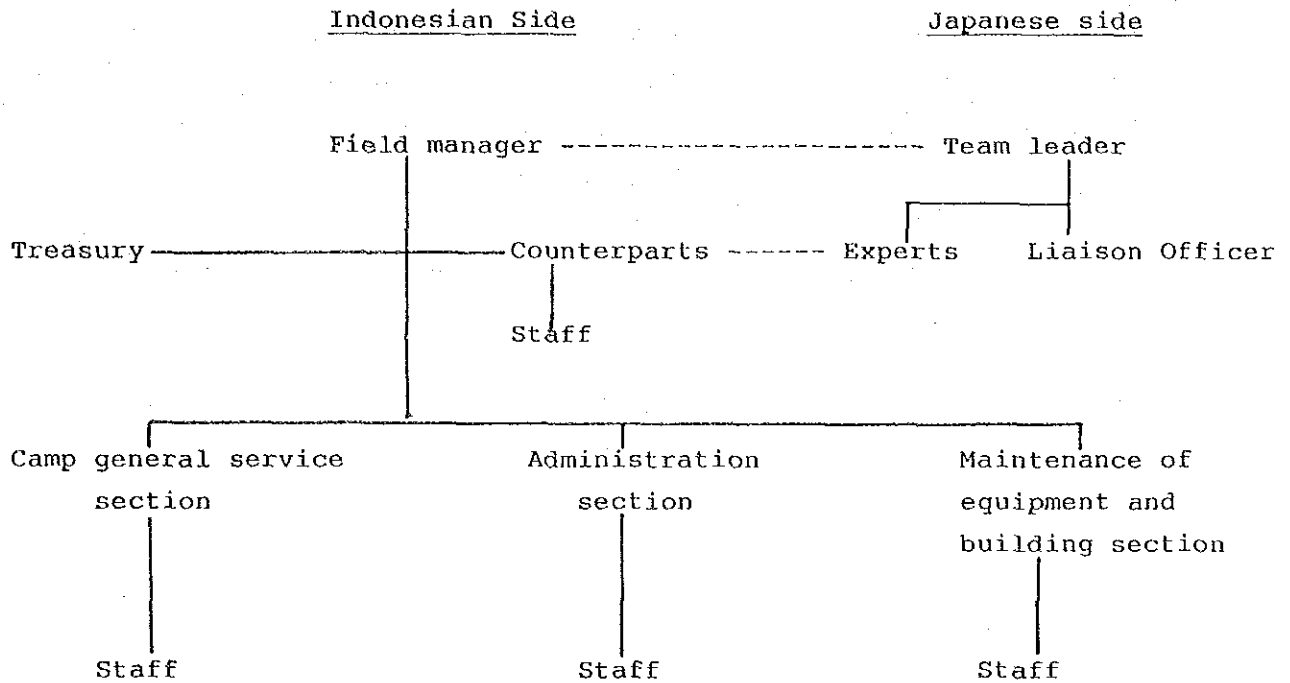
* Sadao SUGIMOTO : From February 1, 1982 to
January 31, 1984

* Hiroji OKABE : From February 27, 1984 to
April 30 1986

3. Project Implementation Centre and Liaison Office

The Organization of the Project Implementation Centre
in Benakat was settled on April 27, 1981, by the field manager
officially as follows:

The Organization of the Project Implementation Center



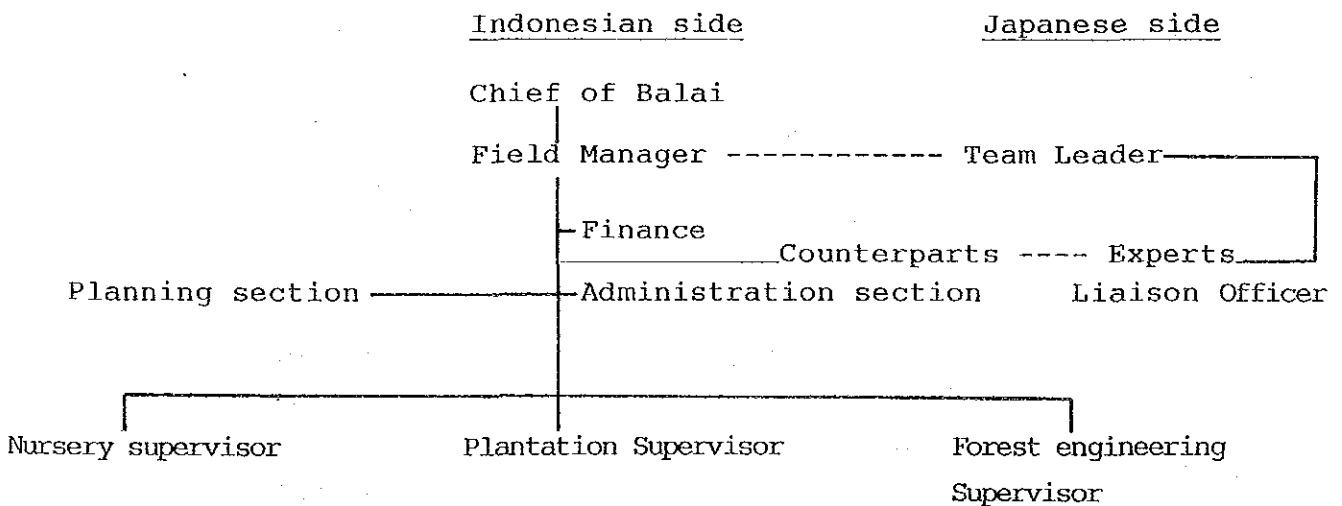
Concerning the function of the Project Implementation Center in Benakat and the Liaison Office in Palembang, there was some misunderstanding among counterparts and experts on the relationship between the center and the office. Due to the delay of the construction of the project office in Benakat, one house which was lent by the Indonesia side for the Liaison office functioned as if it were the project implementation center. The significance of the Liaison Office in Palembang by the Record of Discussion is as 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 did not need too many clerks in the Liaison Office. As result of this misunderstanding, and with absence of a decision maker, some confusion frequently occurred in the field.

It was expected to improve these circumstances not only by Japanese experts but also Indonesian counterparts, and the situation changed gradually after the construction of the new project office constructed by the Indonesian side and the Project Implementation Center has had its own original function since the beginning of 1982 owing to the completion of facilities which had been constructed by the Japanese and Indonesian sides especially the trial plantation training center constructed by grant aid of the Japanese government.

In June 1982, after the buildings were constructed, most of the main staffs in the Liaison Office in Palembang moved to Benakat. The moving of staff members from Palembang to Benakat had solved the above-mentioned inconveniences. Now the Liaison Office in Palembang is settled a small room in the South Sumatra Provincial Forest Office, only one clerk remaining.

After that, the Reforestation Technique Development Center was established at Benakat on October 20, 1984. In accordance with this, the Project Implementation Center in Benakat was changed as follows:

The Organization Project Implementation Center



In the above organization, from April 30, 1985 Mr. Kardi Sabaruddin, Chief of Balai, has held occurrently the position of Field Manager, because Mr. Triyogo Soekanto, former Field Manager, moved to the Ministry of Forestry.

The counterparts and experts covered five fields, that is, nursery, silviculture, forest engineering, forest protection and forest ecology. As more than six years have passed from the starting of the Project, many personnel who had belonged to the Project Implementation Center in Benakat are as follows:

Indonesian site

a. Counterparts

Counterparts who belonged/belong the Project Implementation Center were/are as follows:

Table No. 4:Counterparts up to the present

Category	Name	Assignment	
		From	To
Field Manager	M. Wazir Nengkeman	Apr.1979	Apr.1980
	Zulkifli Mulsani	Apr.1980	Sep.1983
	Soeharyanto	Oct.1980	Dec.1980
	Triyogo Soekanto	Sep.1983	Apr.1985
	Kardi Sabaruddin	Apr,1985	-
Silviculture	Zulkifli Mulsani	Sep.1979	Apr.1980
	Anto Rimbawanto	May.1980	Sep.1983
	Tata Wiharta	Sep.1980	Sep.1983
	Sutomo	Sep.1983	-
	Tata Wiharta	Apr.1985	-
Nursery	Hardjono Arisman	Nov.1979	Jan,1983
	Retno Sekarsari	Nov.1981	Mar.1983
	Adam Nur Yahya Putra	Jan.1982	Sep.1982
	Nyoman Yuliarsana	Apr.1983	Sep.1983
	Retno Sekarsana	sep.1983	Apr.1985
	Edi Iswahyudi	Apr.1985	-

Forest Engineering	Rismulyadi	Sep.1980	-
	Adam Nur Yahya Putra	Apr.1985	-
	Agus Marsudiono	May.1985	-
Forest Protection	Nyoman Yuliarsana	Oct.1980	Mar.1983
	Triyogo Soekanto	Apr.1983	Sep.1983
	Tata Wiharta	Sep.1983	Apr.1985
	Hariyono	Jan.1985	-
Forest Ecology	Triyogo Soekanto	Nov.1981	Mar.1983
	Retno Sekarsari	Apr.1983	Sep.1983
	Adam Nur Yahya Putra	Sep.1982	Apr.1985
	Bustami	Jun.1985	-
Agro-Forestry	Munawawi	Nov.1981	Mar.1982
	Sunarto Bimo Santoso	Nov.1981	Mar.1982
	Agung Suko Rahardjo	Jun.1982	Sep.1982
	Yadi Haryanto	Mar.1982	-
	Burham Ismail	Jun.1985	-

b. Supervisors

Supervisors belonging to the Project now are as follows:

Silviculture : Mulyanto, Sofyan Suri
 Nursery : Yenih Husnaeni
 Forest engineering : Sarino, Sudarto
 Forest ecology : Marlan
 Agro-Forestry : Sukijan
 Forest Protection: Felix Richard Gobel

c. Other staff of the Office.

Other staff of the Project Implementation Center now a days are as follows:

Treasurer : Widodo
 Finance : Muhamad Rukbi, Hazamun Aini,
 Karnanto, Lely Heriyani.
 General service I: Nasrun Sagala, Subakair, Awalludin,
 Lugino, Abd. Halim

General service II : M. Ali Effendi, Bachtiar effendi,
Mughtar Asnawi.

Maintenance/Inventory : Mass Ramli (Inventory), Irzan Arief,
(Inventory), Marsuan, Aswandi, Bustam
Effendi, Yitno, Yanto Chandra.

Drivers : Nur Aswas, Siswanto, Robinson,
Sykri, Darmawan, Mardeli, Syarifuddin

Guardsmen : Sunaji, Parman, Thamrin, Hasan.

Operators : Abdulla, Helmi, Lasidi, M. Yakkub,
Ersan Waluyo, M. Kodir Kofli,
Kamaluddin, Suwardi A (helper)

Foremen : effendi (plantation), Ambran
Supandi (Plantation), Suhanda (Plantation)
Mashri (Nursery) Syarifudin Bin Bustam
(Nursery) Jamal (Nursery), Budiono
(Nursery).

Experts who belonged/belong the Project Implementation
center were/are as follows:

Table No. 5: Experts up to now.

CATEGORY	NAME	ASSIGNMENT	
		FROM	TO
Team Leader (Silviculture)	Katsuyuki OHMI	Nov. 1979	Oct. 1981
Team Leader (Silviculture)	Kuniaki KATO	Oct. 1981	Oct. 1983
Team Leader (Forest Protection)	Tsuyoshi IKEDA	Feb. 1984	Apr. 1986
Silviculture (Acting Team Leader)	Tadao OHARA	Jul. 1983	Jul. 1984
Silviculture	Minoru ARAI	Apr. 1984	Apr. 1986
Nursery	Hirota YAMATE	Sep. 1980	Apr. 1984
	Osamu TANDO	Mar. 1984	Apr. 1986
Forest Protection	Seishi MIURA	Mar. 1980	Mar. 1982
	Masaharu TABATA	Apr. 1982	Mar. 1984
Forest Engineering	Koji TASHIRO	Jul. 1980	Apr. 1984
	Hirasato TAGUCHI	Mar. 1984	Mar. 1986
Forest ecology	seiichi OHTA	Mar. 1981	Mar. 1983
	Motohiro ARIHARA	Mar. 1983	Apr. 1986
Liaison officer	Yoshiichi SAKAMOTO	Dec. 1979	Dec. 1981
	Hideki HACHINOHE	Nov. 1981	Apr. 1984
	Kyoji HASHIMOTO	Jun. 1984	Jun. 1986

III. SHORT-TERM EXPERT DISPATCHED FROM JAPAN

The experts dispatched from Japan consisted of long-term and short-term experts. Long-term experts are dispatched usually with two years assignment by request letter (A-1 form of Colombo Plan) from the country of cooperation and the number of long-term experts is fixed by the Record of Discussion. Short-term experts are also dispatched by request letter from the cooperation country, but for shorter periods, ranging from one month to six months. The role of short-term experts is to give guidance in order to overcome technical problems difficult to be solved by long-term experts in liaison with the experts and counterparts.

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

During 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 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 has been done well and the real project activity could start after his work.

* Masaji KAWASAKI : Expert on nursery works to guide the preparation of nursery activity of the project from March 31, to May 29, 1980. He who had the experience in nursery activities in Malaysia gave the guidance on the preparation of the soil and compost for the germination boxes and seedlings pots, established tests for the 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 performance during his stay gave us an index to the nursery activity which was just to start.

During the Fiscal Year of 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 for 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 have not yet been realized because of financial and technical reasons. The Indonesian side expected that these ideas could 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 of the poor growth of Pinus merkusi seedlings in the nursery, and proved that the reasons might be the uneven fertilizer application and the difference of physical-chemical characters in the potting soil. He suggested to improve the method of fertilizer application and the physical condition of the soil by using 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 into the soil condition of the plantation site and also made the plan for the test of fertilizer application in the field.

During the Fiscal Year 1981 the five following experts were dispatched:

* Takahiko TAKAHASHI: Expert on designing of 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 detailed design 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 farm management in the villages around the project site from the agricultural point of view and given us valuable information of the practical method of 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 collected materials, questionnaires and hearings 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 result of his investigation, it was clear that the agro-forestry activity would not only be one of the useful methods 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 tree pathology to guide the experts and counterparts in observing tree pests and protection against tree pests 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 kinds of tree disease such as needle blight of Pinus merkusii, damping off of various tree species in the sowing box, anthracnose of Albizia falcata, Acacia auriculiformis, A. mangium and Schima wallichii var. bancana and others. He reported the symptom damages and ways to control these diseases; 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 lectures on some important diseases observed in Benakat nursery to 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.
- * Katsumi MITANI : Expert on forest civil engineering to supervise the pilot infrastructure for agro-forestry scheme from March 8 to October 10, 1982. He was engaged in supervision for the pilot infrastructure, which included facilities such as forest road, bridge, look-out tower, pond, ware-house, working-house tillage and so on. Thanks to his eager effort, the contract was started and its construction was carried out smoothly. But unfortunately, on September 30, 1982, at night, he met with a severe traffic accident on the way to Benakat and was severely injured. He is still undergoing medical treatment in Japan, we hope he will be better soon.

During the Fiscal Year of 1982, four experts were dispatched as follows:

- * Takahiko TAKAHASHI: Expert on Forest civil engineering who had been Benakat before to supervise the pilot infrastucture for agro-forestry scheme as the successor for Mr. Katsumi Mitani from November 22, 1982 to January 20, 1983. Thanks to his eager effort in supervision, the pilot infrastructure was done well , and agro-forestry scheme activities were able to start.

- * Haruyoshi SAHO : Expert on tree pathology to guide counterparts and experts on how to observe and present tree pests on seedlings in the nursery and trees in the plantation area from January 25 to March 30, 1983.
He showed many kinds of pathogens on many tree species, namely, Guignardia, Macrophoma, Cytoepora and unknown ascomycetous fungus of Albizzia falcata, Lophodermin austlare, Cercopors and Phoma of Pinus merkusii, Pestalotia and Macrophoma of Eucalyptus alba, Colletorichum and Cytospora of Acacia mangium, root rot and fungus unknown of Swietenia macrophylla etc. in the field.
He pointed out that foreign tree species required special attention, because the combination of foreign tree species and native pathogens could bring the most dangerous diseases.

- * Hiroshi MAKIHARA : Expert on forest entomology to give guidance in pests survey and how to protect trees against pests from January 25 to March 30, 1983.

He had guided counterparts and experts on how to survey insects using many kinds of traps so they would be able to survey insects later on . He recognized Xylestcera festiva which was well known pest of Albizzia falcata at the plantation and nursery sites.

He caught a harmful pests on the leaves of Schima wallichii var. bancana trees. But it is not necessary to control this one. He suggested that because there were many cases where the same kind of pest attacked all kinds of the same family or genus trees, therefore it was undesirable that the same kinds of family or genus of trees were planted side by side in one area.

* Eizo IWAYA

: Expert on forestry mechanical engineering to guide on the maintenance and management of vehicles and machines from February 18 to April 16, 1983. During his stay in Benakat, he gave guidance in repairing many vehicles and heavy duty machines, and through those repairs, some guidance in view of technical points were given by the method on the job training. He suggested that counterparts, mechanics and operators take full responsibility in controlling spare parts, and tools, the necessity of periodical checking and some format necessary to control vehicles and heavy duty machines.

During the Fiscal Year 1983, seven experts and a Audio Visual Team were dispatched as follows:

* Tadashi NAKATA : Expert on forestry mechanical engineer to guide in the management and repair of heavy duty machines from April 8, to May 7, 1983. He gave guidance in daily and periodical checking, how to manage suddenly trouble and adjustment of some systems of heavy duty machines through on the job training. Besides, he gave the following suggestions:

- a. Some machine that is not being used must be parked in the garage; if it is parked outside, cover it with tent.
- b. All keys should be kept in a box that can be locked and the key of the box should be kept by some managing person.
- c. A shelf for parts of being repaired machines should be introduced in order not to lose its parts.
- d. All tools should be kept by a person in charge of keeping it.
- e. Tools and spareparts should be put back in place after every day's work.

* Takashi KATO : Expert on socio-economy to make a survey of the performance of the agro-forestry scheme from August 8 to November 8, 1983. His survey aimed at the effect of the pilot infrastructure to the participants' home-economy, basic inhabitant measures which were necessary for the success of agro-forestry scheme. Also he had analyzed data of the growth of planted trees in the agro-forestry scheme. He had suggested particularly that some farmers unenthusiastic in agriculture should be changed gradually to enthusiastic ones and that questionnaires about farmers' home economy should be simplified, and he suggested to let write only 6 farmers and showed the questionnaire

form. Also he pointed out to clarify the effect of cultivation by tractor and to find out and introduce some second crops which are attractive ones for farmers.

* Kunihiro KAMIJO : Expert on survey method to advise in making examination from August 8 to September 5, 1983. During his stay at Benakat, he suggested that we make examination design or survey method uncomplicated and clear since examination terms are very long in forestry. After observing the mechanized plantation area, he also suggested there were some differences in vegetation change and numbers among mechanized land preparation method. He designed permanent observation plots for long term observation and for establishing afforestation techniques in alang-alang grass-lands.

* Tetsuya WATANABE : Expert on audio-visual visiting Indonesia for survey to write a scenario for a film which would be used for forestry education from September 16 to 30, 1983. During his stay in Indonesia he had collected some data for the purposed scenario for an audio-visual film. After coming back to Japan, he wrote a scenario based on what he had seen, heard and experienced in Indonesia particularly in the Project.

* Mamoru YOSHIMUTA : Expert on maintenance and survey for machinery to give advice on machinery maintenance including through maintenance of heavy duty machines by letting maintenance by P.T. United Tractor which is an agent of Komatsu Ltd.

in Indonesia from October 14 to November 2, 1983. During his stay in Benakat, he had guided counterparts how to reduce maintenance cost and how to keep heavy duty machines in high activity by explaining the following items:

- a. Operators' and mechanics' share in business
- b. Periodical maintenance and its schedule
- c. Management of workshop (Including repair)
- d. Management of fuel and oil
- e. Management of machinery activity and how to use its data
- f. Management of spare parts
- g. Method of preventive maintenance

* Kohya TAKAHASHI : Experts on forestry mechanical engineering to give guidance in machinery maintenance and management from October 14 to November 2, 1983. He suggested making a pit in order to repair or maintain heavy duty machines intentionally and smoothly, paving front yard of the work shop with concrete to keep clean the work shop clean inside and changing the method of supplying fuel oil in a better one in order not to have any engine trouble. He had also suggested that some important heavy duty machine repair should be done by an agent for those machines for making good relations in repair, maintenance and spare parts supply. He had proposed that it is useful to check machinery before so they could be used more efficiently: checking machinery system by counterparts and mechanics during field operation should be established.

* Messrs Tetsuya WATANABE, Kuniyasu SAGARA and Kazushige FUJISAKI: Experts on audio-visual to film afforestation

activities from December 15, 1983 to January 18, 1984. They had filmed main daily afforestation activities in Benakat. After coming back Japan, the audio-visual film which was titled "Building the Nation in Verdure" was completed in Indonesian and English languages. some volume of films had arrived in Indonesia. They are not only useful forestry education but also public relations for afforestation activity.

- * Tominobu YAMAMOTO : Expert on forestry mechanics engineering to guide in the maintenance of vehicles and heavy duty machines from February 1 to March 12, 1984. He had engaged in guidance eagerly through on the job training in the maintenance of vehicles and heavy duty machines. He had suggested mainly that some spare parts should be bought in Indonesia; as its result spare parts and its stock area should become less in quantity and space, and in order to get spare parts easily, the most popular model of machines should be introduced. he pointed out that, although many short term experts of forestry mechanical engineering had pointed out, tool control was still not enough, so it should be more severe.

During the Fiscal Year of 1984, four short-term experts were dispatched i.e. as follows:

- * Tadao OHARA : Expert on silviculture to analyze some data from October 26 to December 25, 1984. He was engaged in analyzing data of weeding time experiment and study on fertilizer application those which had been collected regarding Acacia mangium, Eucalyptus deglupta,

Swietenia macrophylla and Shima wallichii Var bancana in the old plantation site.

As the result of his analysis, he made the following suggestions:

- a. An economical method of land preparation and a suitable time of weeding are land clearing plus once plowing for land preparation and to practice weeding in the second, sixth and tenth months after planting in the first year of the weeding time.
- b. According to the results of analyzed data at the age of only 10 months, effects of fertilizer application were found in tree height of Eucalyptus deglupta and is scarcery found in the other three species. At the present condition, land preparation is rather effective for the growth of height.

* Katsuhiko KOBAYASHI: Expert on forest civil engineering to supervise the Fire Protection Model Infrastructure from November 19, 1984 to April 11 1985. At first he promoted the preparation of the contract and after the construction was performed the supervision of the fire protection model infrastructure of the Project. Thanks to his activity, the Model Infrastructure was done well and the facilities of the Model Infrastructure have been strengthened against fire.

* Sukeharu TSURU : Expert on socio-economic survey on agro-forestry to analyze the socio-economic data on the participants in agro-forestry scheme

through the analysis and evaluation he had shown that some participants were successful in agricultural production inside the scheme (in intercropping area) while others failed in it (in the year of 1983/1984), and also suggested how to improve soil productivity which is equal to improving agricultural productivity and to select diligent farmers as candidates and participants should be worth-while to be tried.

- * Kiyoshi FUJII : Expert of fire protection to give advice on how to control fire in the field from November 26 to December 25, 1984. He made investigation into meteorological data, conditions of holding fire fighting equipment, fire fighting facility in the plantation site, trace of fire surrounding the agro-forestry scheme and new plantation area, and shifting cultivation and cattle grazing surrounding the Projects site. He had suggested the necessity of public relations to inhabitants and complete provision of fire fighting equipment, and also fire watching systems and patrol systems for fire. He had also pointed out the necessity of fire fighting exercise for the fire brigade in months vulnerable to fire. According to his report, "Hittaki" and "fire ranger" are more effective in fire fighting.

During the Fiscal Year 1985 four experts were dispatched, i.e. as follows:

- * Masahiro TAJIMA : Expert on nursery to calculate the standard cost of seedlings in Benakat Nursery from

September 18 to November 2, 1985. Despite shortage of data and difficulty to find them thanks of his devotion in calculating costs, the six species tree seedlings cost had been calculated for 1984/85 Fiscal year at Benakat. According to result of cost accounting of seedlings production per one unit (one unit means 1.000 seedlings), the highest one is about Rp. 65,000.- in Swietenia macrophylla, and lowest one is Rp. 55.000.- in Eucalyptus deglupta. He had suggested the necessity of cost accounting, not only to know the cost of seedlings but also to improve the method of seedling raising in view of the cost. He has also delivered lectures to counterparts on the importance of tree breeding surrounding Benakat.

* Katsuyasu YAMAGUCHI: Expert on silviculture to calculate the standard cost of plantation from October 1 to November 29, 1985. Despite shortage of data and difficulty to find necessary ones, his eager devotion in calculating costs enabled the calculated of planting costs by data of 1983/84 and 1984/85 fiscal year, under the condition of mechanized land preparation which was land clearing plus ploughing I plus ploughing II plus harrowing and weeding for 3 years after planting, totally 7 times weeding. The result of calculation shows about 505 thousand rupiah excluding indirect cost and seedling cost, and also shows that about half of the planting cost (52.7%) is machinery cost. As it is one of the most important fundamentals that cost analysis should take a great role in forest

management, so in order to get useful guide posts, cost analysis should be done every year.

* Takashi KATO

: Experts on agro-forestry to analyze socio-economic data concerning agro-forestry from November 15 to December 14, 1985. He engaged in analyzing data from October 1984 to September 1985, and got some results as follows:

- a. Among participants of agro-forestry, there were differences between participants who were eager in agriculture in intercropping area and those who were not eager in agriculture in the yield and the total income.
- b. Participants who were eager in agriculture were concerned about cultivating peanut which is a cash crop, and showed tendency to get their income increase compared with the ones before participating in an agro-forestry scheme.
- c. Some participants cultivated outside agro-forestry scheme area, and the yield of the outside area was more productive as compared with that of the agro-forestry scheme area especially for paddy, per unit area. And he suggested some measures which should be improved soon, such as ploughing method, supplying fertilizer application in the project, seeking good cash crops etc.

* Koji TASHIRO

: Expert on forest engineering to guide in the management of machinery supplied from the Japanese government from November 28 to December 29, 1985. During his stay at Benakat he suggested that importance of machinery

maintenance especially some machines which were supplied at earlier time, and the record card should be filled in order to control and analyze machinery itself and its work, and that machines which cannot be used any more by deterioration should be scraped soon. Besides gave guidance at the workshop for the following practices:

- a. Meeting in the morning
- b. Instruction of operation
- c. Spare parts keeping
- d. Rearrangement after work

IV. MACHINERY AND EQUIPMENT SUPPLIED BY JAPAN

The machinery and equipment supplied by the Japanese government through JICA hitherto have been used for Project activities. As it was mentioned before in chapter 1-2, the big problem concerning the supplied machinery and equipment from Japan was that it took much time to receive them through the necessary formalities after arriving at the Palembang harbour. This problem had great influence on the implementation of the Project activities, especially on the construction of the forest road and land preparation in 1980/1981 and extension of fire protection to the inhabitants surrounding the Project site in 1984/85; later on the problem was not only the long time for customs formalities but also the thefts of some parts of vehicles and heavy duty machines, and some small machines and equipments. Machinery and equipment supplied from Japan in 1983/84 have passed customs formality comparatively smoothly and no trouble in robbery, this owed to Mr. H. YAMAMURA'S request to the governor's secretary, for good cooperation concerning customs formalities for machinery and equipment on August 29, 1984.

But fortunately, forest road construction and site preparation at the field site were done after the gradual of arrival of the machinery through cooperative efforts of experts and counterparts.

The machinery and equipment were provided by the request letter (A-4 form of Colombo Plan) from the Indonesian government, but the list of supplied machinery and equipment had been prepared after consultation between experts and counterparts according to the annual plan of the Project. The total amount of money used for the machinery and equipment in each field of activities supplied by Japanese government through JICA from 1979/80 to 1985/86 are shown in table No.6.

MACHINERY AND EQUIPMENT SUPPLIED BY JAPANESE GOVERNMENT

Table No. 6

Unit ¥ 1,000

Use for/Fiscal Year	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/85 (Planned)
Nursery	46.782	20.510	19.641	5.467	1.367	446	-
Planting	11.855	32.144	26.312	39.217	5.010	5.728	34.200
Road Construction	17.859	19.054	16.511	8.249	8.525	-	-
Forest Protection	1.782	4.001	4.285	7.314	5.477	3,542	744
Forest Ecology	-	1.105	9.225	-	-	-	-
Repair	-	2.110	9.795	-	10.976	27	9.512
Experiments	1.250	851	-	3.311	-	-	-
Surveying Meteorological	815	-	-	-	1.714	-	-
Observation	1.004	1.216	-	-	-	-	3.120
Agro-Forestry	-	-	-	-	2.109	494	-
General use	6.785	4.016	5.519	3.300	352	69	4.467
Freights and insurance	16.735	18.822	15.618	11.028	9.798	3.798	-
Remittance	-	-	-	-	2.200	45.753	-
Total	104.867	103.829	106.906	77.886	47.528	59.855	52.043

But in the figures in table No. 6, the money for 1985/86 is an estimation, and "remittance" means the money that was sent from Japan for purchasing machinery and equipment in Indonesia.

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

- 1979/80 : Suzuki Jimny 2, Crane cargo truck, Dump truck, Cargo truck, Land cruiser hard top 3, Nissan micro bus, Tractor (KUBOTA), Bulldozer shovel (KOMATSU D50S), Angledozer system (KOMATSU D50A), Manure spreader, Incubator, Sprinkler system, Generator (24Kw), Generator (15.2 Kw), Earth auger 12, Bush cutter 10, Chain saw 3, Conveyor with gasoline engine 6, Spare parts.
- 1980/81 : Dump truck, Land cruiser hard top, Forklift truck Carrier (Model RC-20), Tractor (JOHN DEERE) 2, Motor grader, Diesel power tiller, Water equipment, Prefabricated house, Air conditioner 2, Toilet house 2, Power system (KYORITSU) 10, Engine compressor, Engine generator (DCA-85), Soil analyser instrument, Spare parts.
- 1981/82 : Land cruiser pick up 3, Land cruiser station wagon, Tractor (ISEKI), Bulldozer (CATERPILLAR D6D), Tractor (KOMATSU INTERNATIONAL) 2, Steel locker 7, Aluminium pipe, Color video set, Incubator, Bush cutter (FUJI ROBIN) 13, Hammer knife mower, body for balance table 4, Benrate hydrate 10, Spare parts.
- 1982/83 : Angledozer (KOMATSU D 60A), Tractor (KOMATSU INTERNATIONAL), Hydraulic excavator, Wheel carrier, Forest roader, Disc harrow 2, Seedling container 100, Drying oven, Disc harrow, Rake blade, Spare parts.
- 1983/84 : Wheel loader, Air conditioner 2, Heavy duty disc harrow plough, Sample display case 2, Fire extinguisher 30, Pocket compasses 10, Master pinremover=installator, Spare parts.

1984/85 : Diesel land cruiser hard top 2, Diesel land cruiser hard top (Vinyl) 2, Diesel cargo truck (MITSUBISHI COT) 2, Hammer knife mower, Crawler type tractor (KOMATSU FD-800)2, Photo copy machine (CANON), Radio SSB and transceiver 3, Disc plough 3, Generator (15 KVA), Spare parts.

1985/86 : Tractor (JOHN DEERE) 2, Truck trailer, Color video set, Film 17, Computer, Meteorological observation implement 3, Spare parts.

One of the problems concerning the supplied machinery and equipment is taking much time to send the request latter (A-4 form in Colombo Plan) from the Indonesian government and also to clear through the custom house after arrival of machinery and equipment from Japan at the Palembang harbour. It was very difficult to find the way to speed up the procedure mentioned above, but both Indonesian and Japanese sides should make more effort and pay more attention to deal with the procedure smoothly.

There was an other problem, which was the difficulty in the maintenance and mending of the heavy duty machines such as bulldozer and tractor from Japan, so it was expected that the heavy duty machine and other equipment could be bought as much as posible in Indonesia because of the easy service after purchase. Fortunately, more than 75% in amount of money of machinery and equipment supplied from Japan in 1984/85 Fiscal Year was used in Indonesia to buy them, and in 1985/86 Fiscal Year, it would take a greater rate to buy them in Indonesia.

V. TRAINING IN JAPAN

Training in Japan for the counterparts is one of the most important activities of the project and up to the present the following counterparts have been dispatched to Japan to receive the training for their own special field.

1979/80 : In this year, the Japanese government wanted to accept two high or semi-high officials, that is, Mr. Apandi, Chief of the Sub-Directorate of Reforestation make observation of general forestry activity in Japan, but the request letter as A-2,3 form of Colombo Plan from the Indonesian side was not prepared. There was some misunderstanding that the Indonesian side thought this training tour was an invitation tour to be prepared by the Japanese government, so that there was no need to submit the request letter from Indonesian side. In spite of consultation between Japanese experts and Indonesian officials concerned, the request letter was not submitted after all and their observation tour 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 of the higher or semi-high official that it was also impossible to do it as planned in 1979/80. In this fiscal year, the following three officials were sent to Japan as trainees.

*Wazil Nengkeman: Former Project Manager and present Chief of Forest Utilization Division, South Sumatera Regional Forestry Office
From September 17 to October 17, 1980
Observation tour on general forestry in Japan

* Zulkifli Mulsani : Former counterpart for silviculture and present Section Chief of Mechanized Rehabilitation of Sub-Directorate of Forest Rehabilitation Directorate of Reforestation, DGRLR. From October 1 to December 17, 1980. Reforestation activities and silvicultural techniques.

* Hardjino Arisman : Counterpart for nursery and present Section Chief of the Sub-Directorate for Seed Distribution, Directorate of Reforestation, DGRLR. From September 17 to December 17, 1980. Nursery activities and techniques.

1981/1982: The following five officials were sent to Japan as trainees:

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

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

* Soedjadi Hartono : Former Project Manager and Director of Sub-Directorate Reforestation and Rehabilitation and present Director of Recreation Forest and National Park, Directorate General of Forest Protection and Natural Conservation. From March 24 to April 4, 1982.

Observation tour on forestry activities in Japan.

- * Nyoman Yuliarsana : Former counterpart for forest protection and present Section Chief of Forest Tending of Sub-Directorate of Forest Rehabilitation, Directorate of Reforestation, DGRLR. From March 25 to June 24, 1982. Forest protection activities and techniques.
- * Anto Rimbawanto : Former counterpart for silviculture and present Staff of Sub-Directorate of Industrial Forest Plantation, Directorate of Reforestation, DGRLR. From March 25 to June 24, 1982. Tree breeding activities and techniques.

In addition the trainees mentioned above, other four persons were sent to Japan from Indonesia as trainees 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 Product 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 XVII th IUFRO World Congress under the group training Course.

1982/83; The following four officials were sent Japan as trainees.

* Victor M. Sinaga : Former Director, South Sumatera regional Forest Office and present Director of Reforestation, DGRLR. From November 4 to 17, 1982. Observation tour an general forestry in Japan.

* Arip P.S. Sagala : Former Chief of Forest Maintenance of Sub-Directorate Reforestation and Land Rehabilitation, present Chief of Reforestation Technology Development Center in South Kalimantan. From November 4 to December 15, 1982. Reforestation and Silviculture techniques.

* Triyogo Soekanto : Former forest ecology counterpart and present Section Chief of Sub-Directorate of Silviculture, Directorate of Reforestation, DGRLR. From March 2 to June 1, 1983. Forest conservation techniques and management.

* Retno Sekarsari : Former counterpart for nursery and present Section Chief of Research Dissemination, Seed Technology Center. From March 2 to June 1, 1983, Nursery techniques and management.

1983/84; The following three officials were sent to Japan as trainees.

- * Tonny Hariwidianto : Former staff of the Sub-Directorate of Reforestation present staff of Industrial Forest Plantation Sub-Directorate, Directorate of Reforestation, DGRLR.
From August 25 to November 24, 1983.
Reforestation and nursery activities and techniques.
- * Desman Pardede : Former Staff of the Sub-Directorate of Forest Rehabilitation, DGRLR present Section Chief of Overseas Technical Cooperation, Directorate of Programming, DGRLR.
From December 1, 1983 to February 24, 1984.
Forest protection activities and techniques.
- * Yadi Hariyanto : Counterpart for agro-forestry.
From March to June, 1984.
Agro-forestry activities and techniques.

1984/85; The following four officials were sent to Japan as trainees:

- * Pramono : Chief of Sub-Directorate of Evaluation and Reporting, Directorate of Programming, DGRLR.
From September 29 to October 26, 1984. Observation tour on general forestry in Japan.

- * Saptana PH. :Chief of Sub-Directorate of Forest Rehabilitation, Directorate of Reforestation, DGRLR.
From September 27 to October 26, 1984. Observation tour on general forestry in Japan.
- * Sutomo :Counterpart for silviculture.
From September 27 to December 26, 1984. Reforestation activities and silviculture techniques.
- * Endang Setiawan :Staff of Sub-Directorate of Forest Rehabilitation, Directorate of Rehabilitation, DGRLR.
From September 27 to December 26, 1984. Reforestation activities and silviculture techniques.

In addition to the trainees mentioned above, two other officials were sent to Japan in order to attend the special training course for reforestation techniques and forest management from August 26 to November 25, 1984 as follows:

- * Lilik Amin Rahardjo :Former Staff of the Sub-Directorate of Nursery, Directorate of Reforestation. DGRLR.
Present staff of Timor-Timur Regional Forest Office.
- * Loekito :Staff of the Sub-Directorate of Planning and Programming, Directorate of Programming, DGRLR.

1985/86: The following three officials were sent to Japan as trainees:

- * Bin Setiono :Staff of Sub-Directorate of Forest Reforestation, Directorate of Reforestation, DGRLR. From October 26 to December 23, 1985.
Forest protection activities and techniques.

- * Kardi Sabaruddin : Chief of Reforestation Technology Development Center in South Sumatera. From January 19, to February 7, 1986.
Observation tour on general forestry in Japan.
- * Munawau : Staff of South Sumatra Porvincial Forest Office,
From March 25 to June 24, 1986,
Reforestation activities and silvicultural techniques.

The training in Japan had a good reputation for all trainees from the Project thanks to kind guidance and cooperation by the officials concerned in Japan. Not only have all the trainees become more familiar to Japan than before they went there but they also have got much technical knowledge.

VI. OPERATIONAL ACTIVITY OF THE PROJECT

The operational activity of the Project done by Indonesian and Japanese sides during approximately seven years may be one of the important parts of this report, because past performance and how some activities are to be done will be useful for future afforestation in along-along grasslands. Annual activity of every year has been reported at every Joint Steering Group Meeting, so detailed activity could be known by seeing the Joint Steering Meeting Report. The operational activity will be stated briefly here.

1. Budget.

According to the Record of Discussion, the budget for the execution of the Project activity should be funded by the Indonesian government, and Japanese government provides necessary equipment and machinery for the activities of nursery, plantation, road construction, forest protection and general services. However, the Japanese government could allocate some special kind of expense to cover the shortage of budget by partner country sometimes when it was urgently needed, for example, the model pilot infrastructure and many emergency measures which will be stated later in this chapter.

The budget available for the Project activity in Benakat from 1979/80 to 1985/86 is shown in Table 7.

Table 7.

B U D G E T

Unit : Rp.1.000,-

	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86
1 Planning	7.860	-	-	-	-	-	-
2. Nursery	8.850	10.432	10.100	16.117	13.758	11.053	6.484
3 Plantation		28.450	63.926	84.841	96.378	104.496	100.287
4 Forest road construction		7.200	15.780	33.708	46.896	33.492	35.604
5 Forest ecology	-	-	-	2.250	2.500	2.130	1.588
6. Road maintenance	-	-	-	7.905	6.750	4.534	3.890
7. Investigation evaluation (included facilities)	-	-	-	5.100	3.600	-	-
8 Maintenance development of technology	7.350	45.220	51.875	38.690	21.890	-	-
9. Experiment	-	-	-	-	-	127.123	112.949
10. Administration	33.396	48.672	127.625	178.527	160.751	61.340	75.102
11. Total	57.456	139.974	269.306	367.138	352.523	344.168	335.904
Total	1	2	3	4	5	6	7
	7.860	76.794	478.378	172.680	8.468	23.079	8.700
	8	9	10	11	-	-	-
	165.025	240.072	685.413	1.866.469			

The budget for in 1979/80 was decided before the Japanese experts came to Indonesia and it did not include expenses for the facilities which were required by the Japanese side after consulting with Indonesian official concerned in September 1979 as shown in Appendix 3. The budget for 1980/91 was also lower than the expenses estimated by Japanese experts, especially for the building facilities. The progress report of the first Joint Steering Group Meeting held in June 1980 reported that even the temporary building of 300M² which was added to the budget in 1979/80 was not yet completed.

At the 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 the Japanese government, but the most important problem was that there was no accommodation for experts and counterparts at the project site, so that they had to stay in the STANVAC guest house which was allowed for some limited time. These problems were not only discussed in the first Joint Steering Group Meeting but also argued between the members of cooperation planning survey team for the project led by Mr. K. KOTARI who had just visited our project and the Indonesian authorities concerned.

Concerning the shortage of budget in 1980/81, Japanese experts 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 budget could be carried forward to the next year was not understood by the Japanese experts at the beginning

of the project activity. Anyhow, some amount of additional budget was supplemented to the budget in 1980/81 by the 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 was 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 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 335 million Rupiah but the final allocation of the budget for our project was decided to be 269.306.000 Rupiah after negotiation with the financial official of the Directorate Reforestation and Rehabilitation. And this amount was not necessarily too small with exception of the expenses for the facility and building because the remainder from the previous year could be added to this year's budget. However, quick and appropriate disbursement of the budget was always required by the Japanese side and it should be considered more by the Indonesian side to implement the Project activity smoothly.

From the budget of 1982/83 Fiscal year, budget sources of the Project activity were changed, namely, one for plantation, nursery and forest road construction from the Presidential Instruction Scheme Budget (INPRES), another for facilities including forest road maintenance and administration from the Project Sheet (DIP). INPRES budget should be distributed from the President, through South Sumatra Governor and Director of South Sumatra Provincial Forest Office to the Project. The procedure of budget distribution sometimes takes a very long time.

In 1982/83 Fiscal Year, INPRES Budget was Rp.

134.666.000,- and that from DIP was Rp.232.472.000,-, total Budget was Rp.367.138.000,-. Although the Project is the Trial Plantation Project, the budget from INPRES was estimated the same that of afforestation contract systems. But the Project should conduct many kinds of trials and tests so the Budget allocation was too short for the needs.

There was a severe problem in the late distribution of INPRES budget, which should have been used from August in this fiscal year. Late budget distribution had interfered with smooth implementation of the nursery and forest road construction. But the nursery and forest road construction should be completed early so these activities were financed by the budget for other activities. Temporary diverting money from budgets of other activities to these ones meant that these activities should be carried out without enough money and guarantee, and late budget distribution embarrassed the activity which would be included works by the year.

For the budget for 1983/84 Fiscal Year, INPRES budget was Rp.157.032.000,- and DIP was Rp.195.491.000,- Total Budget was Rp.352.523.000,-.

While in this fiscal year, the planned area which would be planted was 800 ha, the biggest area during these six years, the Project activities should be done smoothly as planned, using the budget from beginning of the fiscal year. But INPRES budget was frozen until March 1, 1984. Therefore, the Project implementation was troubled with budget. As some activities such as nursery, agro-forestry and forest road construction should be done early, these activities got good cooperation from South Sumatra Provincial Forest Office. Even if counterparts and experts had done all their best, only 550 ha planting has been finished up to 31 March because of the delayed distribution of INPRES budget, later an area of 200 ha has been planted from April to July, due of

the seedling condition, and an area of 50 ha to be planted in December 1984. It is said that the survival ratio of planted seedling is the most important factor to judge the success or failure of the planting activity; seedlings survival ratios in this fiscal year were not so high as compared with those in other fiscal years on the whole, depending on the distribution of INPRES budget.

In the budget of 1984/85 Fiscal Year, INPRES was Rp.149.041.000,-, DIP budget was Rp.195.127.000,- and total was Rp.344.168.000,-. From this fiscal year, the Project activity had been extended for two more years, the first period aimed afforestation activity of 2.100 ha had already been finished up to end of December 1984. On October 20, 1984 the Balai Teknologi Reboisasi (Re-forestation Technique Development Center) was established, but activities of the Balai were nearly the same as those of the Project, so there was no change in the budget system.

As the INPRES budget similarly delayed as that last fiscal year, plowing and harrowing for the agro-forestry scheme which would have a renewed contract in October in this year, were impeded. Sometimes, even the maintenance of heavy duty machines and fuel were imbedded by the budget. At the Project site, counterparts and experts occasionally held meetings in order to discuss the solution of the problem. Fortunately, the Project has had good cooperation with the South Sumatra Provincial Forest Office, as in the Seventh Joint Steering Group Meeting, when the delay of INPRES budget was discussed, the chairman asked the Director of South Sumatra Provincial Forest Office for good assistance to the Project.

In the budget of 1985/86 Fiscal Year, INPRES was Rp.142.375.000,-, DIP budget was Rp.193.529.000,- and total budget was Rp.335.904.000,-. In this fiscal year, not as usual, the delivery of INPRES budget was so delayed. As the Project activity was started early, even

though some activities were rather late, most activities were carried out according to schedule.

All kinds of work seemed to depend on the early delivery of INPRES budget. Early budget distribution could allow every work to be carried out on time and efficiently.

Some times there was no money to buy spare parts and fuel for vehicles and heavy duty machines. This meant that the problems of budget were not only the delay of distribution but also the shortage.

Finally, there was budget available for the Project Office in Bogor and Jakarta. This budget should have included the cost for the travelling expenses for the chief advisor, but the Chief Advisor did not get full travelling expense, while he made official travels. According to some official, the budget for the Project Office in Bogor and Jakarta was not sufficient for the activity.

2. Progress of the construction work.

a. Construction works by Indonesian side.

When the making implementation plan was made before the dispatch of long term experts a total amount of 2,460m2 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 building at the Project site because of the shortage of budget and regulation of the financial authority in Indonesia. Up to the present, the facilities and building constructed by Indonesian side are as follow :

Table No.8 : Facilities by Indonesian side.

Fiscal Year	Item	Area	Cost	Remarks
		M2	Rp.1000.-	
1979/80	Temporary building for 300 the office, store house and lodging	300	6.500	

1980/81	Dormitory	165	11.000	
	Office	120	7.552	
	Nursery store house	60	999	
	Nursery store house	50	1.289	
	Generator house	20	1.030	
	Oil stock room	15	744	
	Garage	60	1.520	
	Green house	30	1.200	
	Germination shed		900	12pcs
Pump house	5	25		
1981/82	Dormitory for counterparts	120	8.550	
	Laborer house	150	6.400	
	Laboratory for nursery	70	5.710	
	Store house	200	8.600	
	Electric and drinking water facilities		15.722	
1982/83	Seed dry floor	200	2.000	
	Look out tower		1.998	2 units
	Plantation working house and garage		7.484	5 unit
1983/84	Generator house		6.800	1 unit
1984/85	Composs house		4.800	1 unit
	Laborer house			1 unit

b) Construction works by Japanese side.

As the Japanese government has recognized the shortage of budget, especially the low expenses for construction of necessary facilities and building to be borne by Indonesian government, which were indispensable to the living condition of the experts and the smooth implementation of the project activity, the Japanese government have given a great help to the Project as follows in order to promote the project activity more efficiently. As the matter of fact, without the construction of facilities and buildings done by Japanese government, the Project

could not start to rise the seedlings needed in 1980/81 and the actual project activity had been postponed for one or two years. Here the construction of facilities and building were stated briefly in the order of dates of construction.

* Construction work for model infrastructure.

This construction work was required by the Indonesian side to build the access road, land preparation for the nursery site and nursery beds in view of their financial difficulties as the model infrastructure. The Japanese government decided to provide some expenses as the model infrastructure and the contents of this construction work consisted of the access road with a total length of 1,500 m, the land preparation for the nursery of 1.5 ha and the arrangement of 108 nursery beds.

The total expense used for the construction of these model infrastructure amounted to 56.000.000 Rupiah and the period of the work was from February 29 to June 24, 1980. This construction work has just given the starting dash for the project and the other construction work for forest road and nursery beds were promoted thanks to this model infrastructure.

* Construction work for the temporary potting shed.

It was done at the expense of the emergency measure of the Japanese government to construct the temporary potting shed which was urgently needed at that time. The area of the shed was 300M², total expense 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 experts' living condition of the Japanese government to improve drinking water condition at the nursery site. Total expenses used for the contract amounted to 5.090.000 Rupiah and the period of the work were from October 30

1980 to January 13, 1981. However, one of the construction works, to dig the well in order to get underground water for drinking water did not succeed because of the difficulty to reach vein of underground water.

* Construction 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 the arrival of the second supply of equipment and machinery at the site. The area of the storehouse was 160M², total expense 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 outdoor electricity

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 580m, total expense 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 the Japanese government could display their ability and all the electric lamps at the nursery site have lit brightly since then.

* Construction work for trial plantation training center

This work was done at the expense of grand aid by the Japanese government in order to cover the shortage of facilities and to improve the living condition of the experts at the field site. The basic design was made by JICA team for design of facilities of the project led 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 a dormitory of 580M², a workshop of 220M² and a laboratory and training room of 92M². Total expense used for this center was about 100.000.000 Yen, the construction work began on June 25, 1981 and was completed on March 20, 1982. By this construction work, the accomodation problem which could not be conquered untill that time in spite of all efforts by the Indonesian sides has been solved perfectly.

* 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 at the site. Total area of site preparation was 4.000M², total expense used for the contract work was 7.287.000 Rupiah, and the period of construction was from June 25 to July 30, 1981. Thanks to this construction work, the construction of the trial plantation training center has been able to start smoothly.

* Construction work for temporary repair of the sprinkler pond and iron bridges

The works were done at the expense of the emergency measure of the Japanese government in order to repair the leakage of water in the sprinkler pond and to restore the two bridges damaged during the rainy season. The measurement of the pond was 5M X 5M X 2M and the structure of bridges were 4M X 10M and 4M X 8M. Total expense used for the contract was 6.240.000 Rupiah and the period of the work from September 7 to October 10, 1981.

* Construction work for protection fence with barbed wire

This was done at the expenses of the emergency measure by the Japanese government in order to protect the nursery site from invasion by cattle, goats and thieves. As

a matter of fact, the nursery beds were damaged by cattle and some of the equipment were frequently stolen by thieves at the time. After consulting with the Indonesian side, it became clear that the construction work would be very difficult because of the difficulty of budgeting in the middle of the fiscal year by the Indonesian side. so the Japanese government has decided to provide the expense of emergency measure for it. Total length of the fence was 1,475M, the total expense used for the contract was 5.650.000 Rupiah and this construction work was completed in March 1982.

* Construction work for pilot infrastructure

This work was conducted at the expense of pilot infrastructure of the 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 led by Mr. H. FURUYA and the detailed plan was made by JICA's guidance team for pilot infrastructure improvement work led 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, the 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 was started on March 1, 1982 and was completed on January 10, 1983. The contents of the construction work for the pilot infrastructure consisted 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.

* Nursery road drainage work

This work was done at the expense of the emergency mea-

sure of the Japanese government in order to improve nursery road condition that was muddy in the rainy season. The length of drainage work was 600M, total expense used for the construction was 8.670.000 Rupiah, and the period of the work was during March 1984.

* Construction work for the fire protection for model infrastructure

The Indonesian side required this construction as fire protection facilities. The Japanese government decided to provide some expenses in model infrastructure and the contents of this construction work comprised forest roads with total length 1,3 Km, fire belt with total length 11,5 Km, 5 units look-out towers, 3 units ponds, 15 units gates, an under drainage and 3 units bridges repair. Mr. K. KOBAYASHI was dispatched by JICA as a short-term expert engaged in the construction work as the supervisor. Total expense used for this construction was 101.615.000 Rupiah and the period of the work was from December 27, 1984 to April 5, 1985. By this construction work, the fire problem which could not be overcome in spite of all the efforts made by counterparts and experts is expected to be effectively protected.

* Construction work for the concrete floor of the workshop

This construction work was done at the expense of the emergency measure by the Japanese government in order to keep the inside of the workshop clean from dirt which was carried by vehicles and heavy duty machines and to make car wash area. Total volume of concrete was 66,22M² and total expense used for the construction was 7.910.000 Rupiah. The period of the work was during March 1985.

* Construction work for the improvement of the rain water supply system

This work was done at the expense of the emergency measure by the Japanese government in order to supply clean