

付 属 資 料

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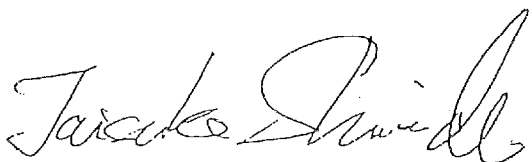
THE MINUTES OF DISCUSSIONS
BETWEEN
THE JAPANESE EVALUATION TEAM
AND
THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF
MALAYSIA
ON
THE FOLLOW-UP PROGRAMME
FOR
THE MULTI-STORIED FOREST MANAGEMENT PROJECT

The Japanese Evaluation Team (hereinafter referred to as "the Team") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") headed by Mr. Taisuke SHIMADA, Auditor, Forest Management Division, National Forest Department, Forestry Agency, Ministry of Agriculture, Forestry and Fisheries, visited Malaysia from May 12 to 21, 1999, for the purpose of reviewing and evaluating the performance of the Follow-Up Programme for the Multi-Storied Forest Management Project (hereinafter referred to as "the F/U").

During their stay in Malaysia, the Team has carried out a field survey and held a series of discussions with the Malaysian authorities concerned.

As a result of the survey and discussions, the Team and the Malaysian authorities agreed to forward to their respective Governments a summary of the evaluation and recommendations which is referred to in the document attached hereto.

Bidor, May 18, 1999



Mr. Taisuke Shimada
Leader,
Evaluation Team,
Japan International Cooperation Agency



Mr. Shaharuddin Bin Mohamad Ismail
Deputy Director-General of Forestry,
Peninsular Malaysia

1. INTRODUCTION

- 1.1 Based upon the Record of Discussions (hereinafter referred to as "the R/D") signed on October 3, 1996, the Government of Japan and the Government of Malaysia have been implementing the F/U since November 1, 1996. The F/U have been conducted based on the Tentative Schedule of Implementation (hereinafter referred to as "the TSI") signed on the same date as the R/D
- 1.2 The purpose of the F/U is to illustrate multi-storied forest management models in the tropics for contributing to the sustainable management of the forest and the promotion of investment on reforestation/afforestation by the private sector.
- 1.3 The activities of the F/U are outlined as follows:-
 - (1) Proper multi-storied forest technology in the tropics has been developed through the following activities.
 - (a) Selection of suitable tree species for multi-storied forests.
 - (b) Comparison of different types of multi-storied forests.
 - (2) Multi-storied forest management models in the tropics have been prepared through the following activities.
 - (a) Estimation of reforestation/afforestation costs.
 - (b) Improvement of the reliability of yield estimation tables.
 - (c) Research into the market price of trees for multi-storied forests.
 - (d) Research into the proper style, content and scale of multi-storied forest management.
 - (3) Others

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2. ITEMS OF EVALUATION

The evaluation survey's items are as follows:-

2.1 Input Related Items

- (1) Cooperation by the Government of Japan
 - (a) Dispatch of Experts
 - (b) Provision of Machinery and Equipment
 - (c) Training of Malaysian Personnel in Japan
 - (d) Other expenditures
- (2) Measures taken by the Government of Malaysia
 - (a) Provision of Land, Building and Facilities
 - (b) Appointment of Counterparts and other Personnel
 - (c) Allocation of Budget

2.2 Output Related Items

- (1) Proper multi-storied forest technology in the tropics are to be developed through the following activities:-
 - (a) Selection of suitable species for multi-storied forests.
 - (b) Comparison of different types of multi-storied forests.
- (2) Multi-storied forest management models in the tropics are to be prepared through the following activities:-
 - (a) Estimation of reforestation/afforestation costs.
 - (b) Improvement of the reliability of yield estimation tables.
 - (c) Research into the market price of trees for multi-storied forests.
 - (d) Research into scientific approaches, contents and scale of multi-storied forest management.
- (3) Others


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3. SUMMARY OF EVALUATION

3.1 Accomplishments in Terms of the Inputs

3.1.1 Cooperation by the Government of Japan

(1) Dispatch of Experts

Five(5) long-term experts comprising of Team Leader, Coordinator and Forest Management Experts and six(6) short-term experts have been sent during the F/U period as of May 1999. They have contributed to implementation of the F/U in their respective fields of research.

(2) Provision of Machinery and Equipment

Almost all necessary machinery and equipment provided by JICA have been well utilized and maintained. These have contributed substantially towards the accomplishment of research activities, as well as up-grading of research works.

(3) Training of Malaysian Personnel in Japan

JICA accepted six(6) Malaysian Project personnel during the F/U period as of May 1999 concerned for observation of Japanese forestry and research works. This method of technology transfer strengthened the F/U activities.

(4) Other expenditures

For effective and smooth implementation of the Project, JICA has borne necessary expenditure.

3.1.2 Measures taken by the Government of Malaysia

(1) Provision of Land, Building and Facilities

The land for the two study sites and offices provided for the F/U, were those from Phase 1 of the Project.



(2) Appointment of Counterparts and other Personnel

A total of twelve(12) Counterparts comprising of Project Manager, Coordinators, Forest Management Officer, State Silviculturist and Forest Engineer were attached to the Project.

(3) Allocation of Budget

Budget had been allocated for emoluments of the personnel related to the F/U, silvicultural works, purchase of equipment and machinery and other administrative cost for the F/U.

3.2 Accomplishment in Terms of the Outputs

(1) For development of proper multi-storied forest technology in the tropics

(a) Selection of suitable tree species for multi-storied forests.

Planting experiments were implemented in 51ha in hill forest site (Bukit Kinta site) and in 375ha in lowland forest (Chikus site). A total of twenty-three(23) species as appears in Annex I were examined in terms of growth, shade tolerance and other parameters. As a result of the investigation, a list of species characteristics were documented.

(b) Comparison of different types of multi-storied forests.

It was shown that the establishment of the multi-storied forests in the hill forest is feasible. But differences in growth and survival rates between various types at line planting and gap planting were not significant.

It was demonstrated that height growth is not significantly related to the width of the planting line in lowland forests while wider planting width resulted in larger diameters, but lower survival rates. As a result, it could be said that type C and D are suitable for establishing multi-storied forests. However, planting of indigenous species in open sites was not successful.



(2) For preparation of Multi-storied forest management models in the tropics

(a) Estimation of reforestation/afforestation costs.

The afforestation/reforestation cost for multi-storied forests per hector was estimated based on contract costs in the F/U and available FD Perak State data.

(b) Improvement of the reliability of yield estimation tables.

The yield estimation table was drawn up for four(4) groups divided by growth rate based on the yield estimation table of *Shorea* species prepared by the Project.

(c) Research into the market price of trees for multi-storied forests.

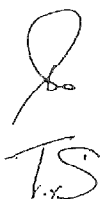
A survey on market pricing of twenty-seven(27) species, including the twenty-three(23) species as appears in Annex I, was undertaken.

(d) Research into scientific approach, content and scale of multi-storied forest management.

The multi-storied forest models for four(4) forest types; natural forests, secondary forest, *Acacia mangium* forest and rubber forest, were developed towards the end of the F/U.

(3) Others

- (a) A light weight sky line logging system was successfully introduced for upper tree logging.
- (b) One of the reasons for the death of *Acacia mangium* is "Red Root Rot Disease" and steps were taken to treat this disease.
- (c) A Propagation facility was established for the steady production of seedlings supply.



4. CONCLUSION AND RECOMMENDATIONS

Since the R/D was signed in 1996, the F/U has progressed smoothly through the efforts of both parties.

As the result of the F/U, the afforestation manual for multi-storied forest management techniques in the tropics such as the selection of suitable tree species and the recommended types of multi-storied forest under different site conditions were drawn up. These would provide useful information for establishing multi-storied forests in the tropics, as well as contributing towards sustainable forest management.

In this regard, the multi-storied forest management models are developed based on research inputs such as, estimation of reforestation/afforestation costs, yield estimation tables and surveys of market pricing. These models would be helpful in the promotion of investment on multi-storied forest management by the private sectors.

Further to this conclusion, as the multi-storied forests established during the F/U and the first five years of this project are unique and valuable examples of man-made multi-storied forests in the tropics, the Team strongly suggests that proper management and data collection on the project site should be continued after the F/U finishes.

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Annex I

Table 1 : Species Characteristics

Species	Growth (1)	Shade Tolerant (2)	Drought Tolerant (3)	Climber Sensitive (4)	Direct Sunlight Sensitive (4)
<i>Shorea glauca</i> (Balau laut)	A		D		
<i>Shorea bracteolata</i> (Meranti Paang)	D	S			X
<i>Shorea hypodehra</i> (Meranti temak)	B		D		
<i>Shorea multiflora</i> (Damar hitam Pipit)	C	S		X	
<i>Shorea ovalis</i> (Meranti kepong)	B		D		
<i>Shorea macroptera</i> (Meranti melantai)	C	S			
<i>Shorea pauciflora</i> (Meranti nemesu)	C	S			
<i>Shorea acuminato</i> (Meranti rambai daun)	C			X	
<i>Shorea parvifolia</i> (Meranti sarang punai)	B			X	
<i>Shorea curtisii</i> (Meranti seraya)	C	S		X	
<i>Shorea leprosula</i> (Meranti tembaga)	A			X	
<i>Parashorea densiflora</i> (Gerutu pasir)	B		D	X	
<i>Hopea odorata</i> (Merawan siput jantan)	B	S			
<i>Neobalanocarpus heimii</i> (Chengal)	D	S		X	
<i>Dipterocarpus baudi</i> (Keruing bulu)	C				
<i>Dipterocarpus cornutus</i> (Keruing gombang)	C				
<i>Dipterocarpus kerrii</i> (Keruing gondol)	B		D		
<i>Dipterocarpus oblongifolius</i> (Keruing neram)	B	S	D		X
<i>Dryobalanops aromatica</i> (Kapur)	B	S		X	
<i>Anisoptera laevis</i> (Mersawa durian)	C				
<i>Dialium Platysepalum</i> (Kerangi Kuning besar)	C				
<i>Intsia palembanica</i> (Merbau)	D	S			
<i>Gonystylus bancanus</i> (Ramin)	D	S	D		

- 1) A : Very fast, B : Fast, C : Average, D : Slow
- 2) S : Good
- 3) D : Good
- 4) X : Sensitive

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