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SECOND
6 MONTHLY PROGRESS REPORT
JANUARY - JUNE 1996

CIRAD-Forêt - MIDAS - Burapha

Lao ADB Plantation Forestry Project - Loan No, 1295 (SF)

July 1996

CONTENTS

LIST OF ABBREVIATIONS & ACRONYMS

PHOTOGRAPHS

1. EXECUTIVE SUMMARY	
Lao	
English	
2. INTRODUCTION	Page no.
2.1 Project	1
2.2 Background	1
3. PROJECT IMPLEMENTATION STATUS	
3.1 Development of Project Implementation and Status	2
3.2 Project Planting Plan	3
4. PROJECT STAFFING	
4.1 PCU	5
4.2 PPCU	5
4.3 Implementation Specialists	6
4.4 Local Support Staff	6
5. PRINCIPAL WORK ACCOMPLISHED	
5.1 Plantation Management	
5.1.1 PBP Establishment	7
5.1.2 PFP Establishment	8
5.1.3 1995 Plantation Maintenance	9
5.1.4 Training and Extension	10
5.1.5 BME	11
5.1.6 Demonstration trials	11
5.1.7 Technical Aspects	11
5.1.8 Plantation Operations Assessments	11
5.1.9 Credit Planting Scheme	12
5.1.10 Project Contacts	12
5.2 Environmental Monitoring	
5.2.1 Preparation	13
5.2.2 Training	13
5.2.3 Surveys	13
5.2.4 Preliminary Plantation Guidelines	13
5.3 Plantation Operations	
5.3.1 Establishment and Field operations	14
5.3.2 Technical Support and Training	15
5.3.3 Protection	15

LIST OF ABBREVIATIONS & ACRONYMS

ADB	Asian Development Bank
APB	Agricultural Promotion Bank
AV	Audio visual
EBS	Environmental Baseline Survey
BME	Benefit Monitoring and Evaluation
BOL	Bank of Lao
DOF	Department of Forestry
EBS	Environmental Baseline Survey
EMS	Environmental Monitoring Survey
GIS	Geographic Information System
GOL	Government of Lao
MCTPC	Ministry of Communication, Transport, Post and Construction
MAF	Ministry of Agriculture and Forestry
PAM	Project Administration Memorandum
PBP	Pilot Block Plantation
PCU	Project Co-ordination Unit
PFP	Pilot Farm Plantation
PPCU	Provincial Project Co-ordination Unit
PSP	Permanent Sample Plot
R&D	Research and Development
STP	Socio Technical Profile
TA	Technical Assistance consultancy for institutional strengthening
TOR	Terms of Reference

PHOTOGRAPHS



Photo 1. During land preparation in the 6 new PBPs wood was salvaged for fence construction using natural materials. This saved 30% capital cost of establishment and valuable foreign exchange. This photo is of Song Khon Mai, Bolikhamsay.



Photo 2. A high level of environmentally sensitive land clearing was achieved in all the 1996 PBPs. This photo is of Pha Baht PBP in Bolikhamsay Province.

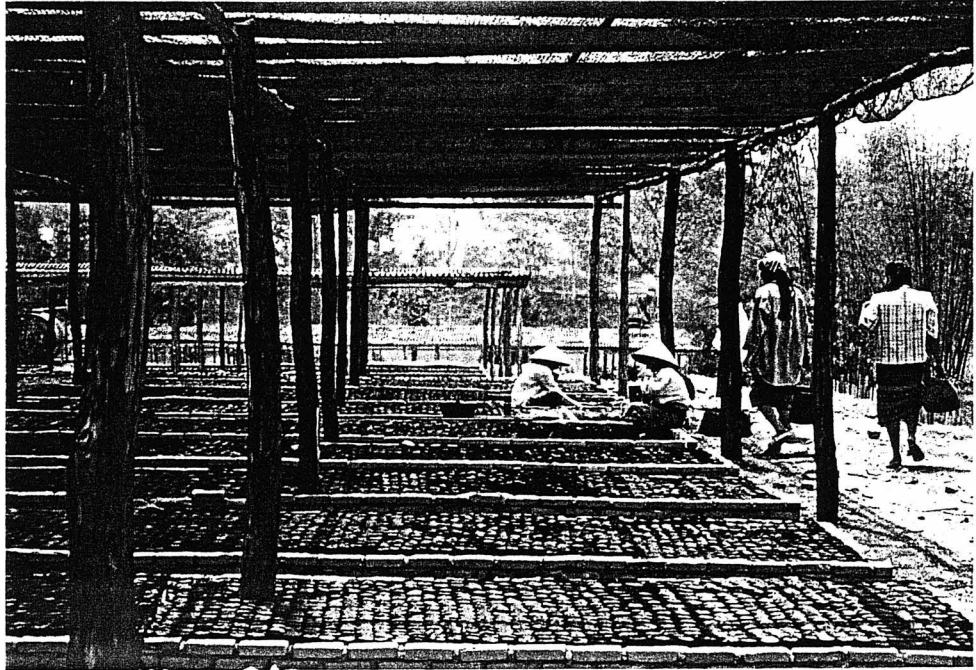


Photo 3. The 4 project nurseries started filling plastic bags for seedling production late February. This photo is of the Phon Savat Co. Nursery in Vientiane Province.



Photo 4. Before delivery of the 441,00 seedlings from the 4 project nurseries to the plantations the PPCUs checked that the quality was as in the contract specifications. This photo is of BAF Co. nursery Savannakhet Province.



Photo 5. One of the extension activities was a working field day for the Lao Youth Organisation assisting with fence construction and planting hole digging at the Na Kaha PBP in Vientiane Prefecture.

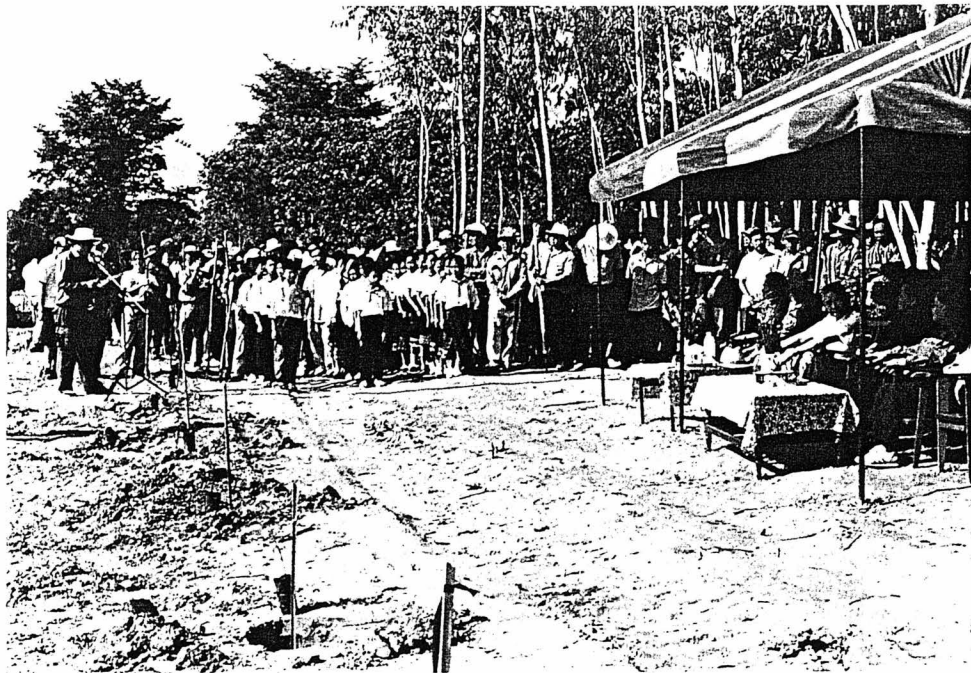


Photo 6. Planting promotion activities of PCU and PPCUs included organisation of National Tree Planting Day ceremonies reported by the news media. This photo is of the Vientiane Prefecture ceremony which was presided over by the President of the Lao PDR.



Photo 7. Various cultivation techniques were demonstrated in 1996 PBPs. Planting was 85% completed in June, the balance in early July. 131 ha of PBPs were established. This photo is of *Acacia* planting on ridge ploughing Phon Tong, Vientiane Province.



Photo 8. Environmental protection strips, protected trees and Internal roads were located, surveyed and marked by PPCUs in all PBPs. This photo is shows Song Khon Mai, Bolikhamsay Province.



Photo 9. A total of 12 species and provenances were planted by the project this year. This photo shows *Alstonia scholaris* grown for the Phon Sim PBP by the village participants with the assistance of the PPCU of Savannakhet.

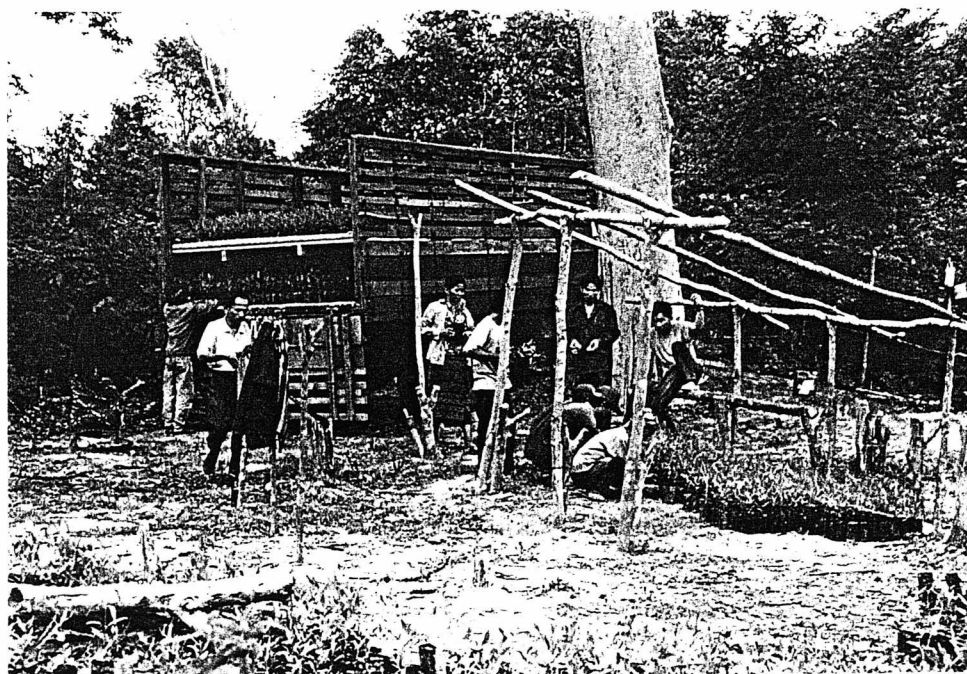


Photo 10. Seedlings were transported from the project nurseries to the PBPs and to distribution points for the farmers PBPs. This photo is shows a Khanthaburi District seedling distribution point, Savannakhet Province.



Photo 11. In the 4 provinces a total of 137 ha of 1996 PFPs were established by 108 families and 11 institutions in 43 villages. Nearly all could not use mechanical cultivation. This photo is of *Eucalyptus* planting in Khantaburi District, Savannakhet Province.



Photo 12. Many farmers used the PFPs to integrate food growing and wood production. This photo also shows one of few cultivated PFPs. Paxan District, Bolikhamsay Province.



Photo 13. Road contract tender and contract documents were completed for 4 of the 5 civil works the 5th is 65% completed and will be finished in early July. Two construction contracts were started. This photo is of shows construction of the Phon Tong access road, Vientiane Province.

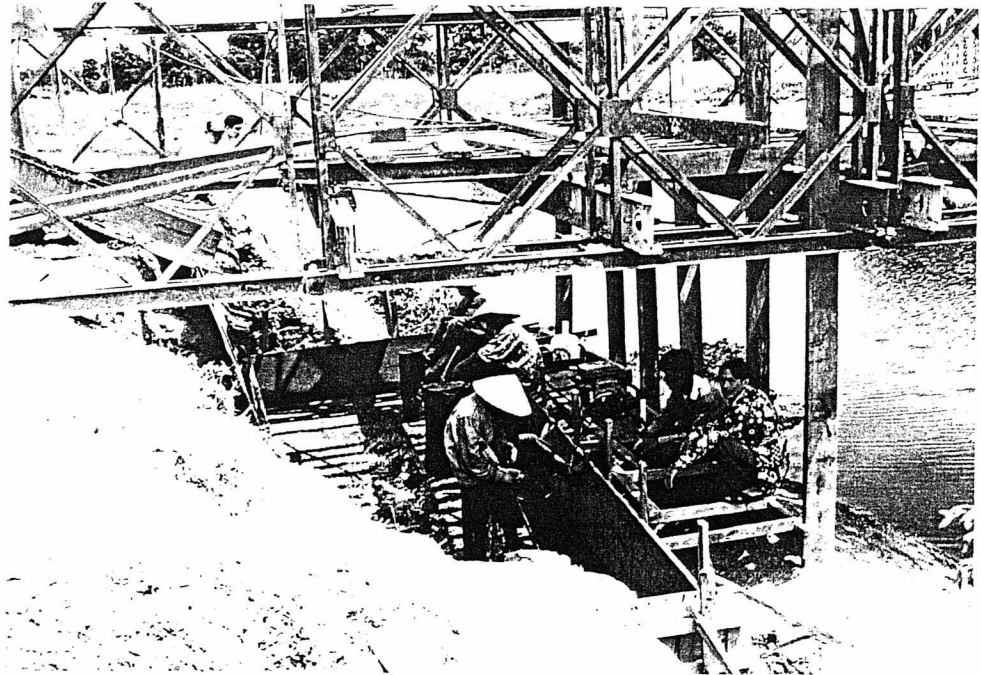


Photo 14. Two of the 5 road access construction works were started in June and will be completed in July. This photo is shows rehabilitation works on the Nam Souang Bridge for the Na Kaha PBP, Vientiane Prefecture.



Photo 15. A feature of the 1996 PFPs was the demonstration of agroforestry. All PFPs were intercropped all over with rice and in part with a variety of other food or cash crops. This photo is of *Eucalyptus* and *Acacia* planting in Pha Baht, Bolikhamsay Province.



Photo 16. A number of new cash crops were tried by the farmer participants in the PFPs this year. This photo shows cotton interplanted with rice and trees at Phon Sim, Savannakhet Province.



Photo 17. The farmer participants were encouraged and advised to intercrop vegetables as well as rice with trees. This photo shows intercropping of rice, taro, water melon and cucumber at Phon Sim, Savannakhet Province.

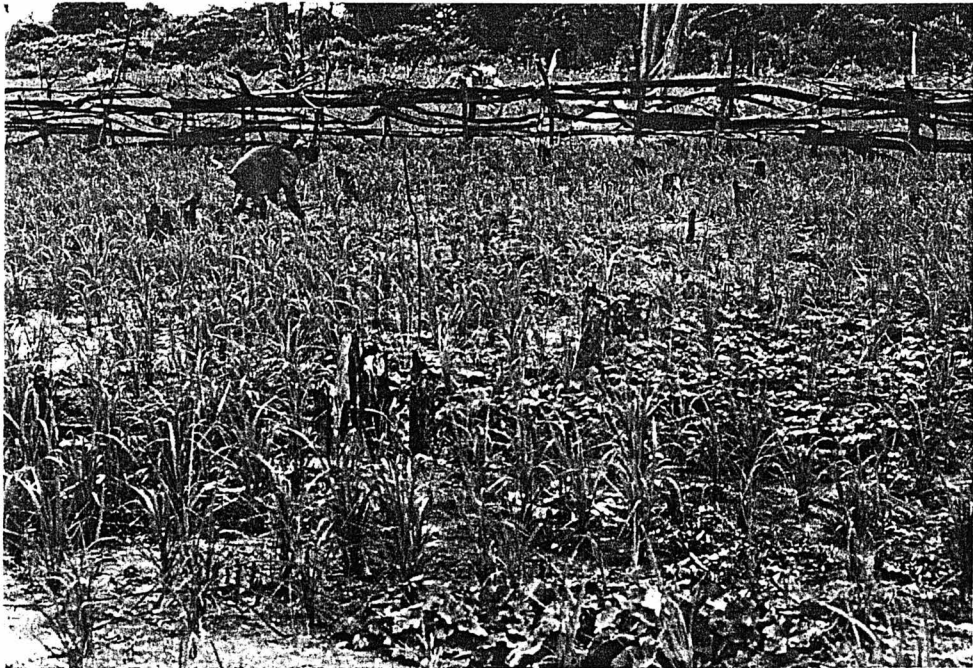


Photo 18. The farmer participants agree that regularly spending time tending the trees and intercrops is more useful to them than tending them separately. This photo is shows Bueang Bouthong PBP, Savannakhet Province.



Photo 19. The Environmental Baseline Surveys were completed in 7 of the 8 PBPs established in 1995 and 1996. The remaining survey will be finished in early July. This photo is shows a survey interview with a village elder of Song Khon Mai, Bolikhamsay Province.

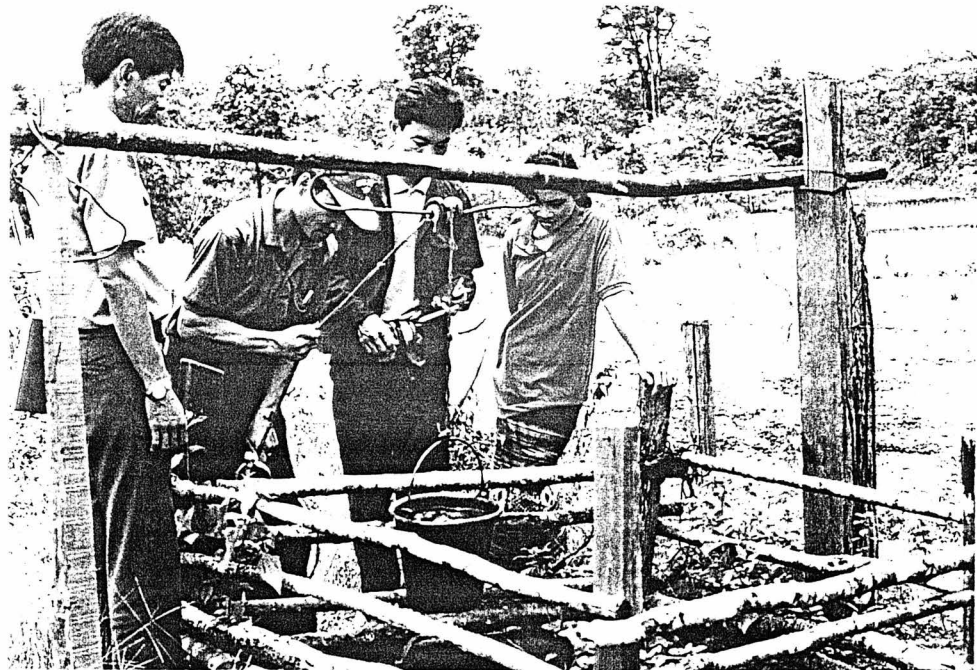


Photo 20. The Baseline Environmental Survey was developed, tested and implemented by PCU after training. The survey measures and records the status of many environmental indicators. This photo is shows examination of a well at Song Khon Mai village, Bolikhamsay Province.

1. EXECUTIVE SUMMARY

This second 6 monthly progress report is a summary of the implementation activity and progress of the LAO-ADB Industrial Tree Plantation Project. The project implementation consultant CIRAD-Forêt in association with MIDAS Agronomics and Burapha Development Consultants are assisting the Department of Forestry of the Lao PDR.

This second report covers the period of 6 months from 1 January 1996 to 30 June 1996.

This document reports on;

- Progress, problems and status of the project implementation over the last 6 months.
- Strength of PCU, PPCU, specialists and local support staff.
- Specialists activities, inputs and time provided over the last 6 months.
- Consultant's expenditure over the last 6 months and since start of project.
- Implementation input work sheets of each specialist for the next 6 months.

During the last 6 months operations have followed the activity schedules of the Implementation Report for all operations with no significant deviations except for the roading operations. These will finish three and one half months later than originally scheduled in the Inception Report.

The actual planting and future planting plan for the project components is summarised in the following table;

Ha planted in year	Project Planting Plan (ha)						Total
	1995 actual	1996 actual	1997	1998	1999	2000	
Part A, credit planting	-	-	2,000	2,300	2,300	2,400	9,000
Part B Block plantations (PBP)	49	118	60	-	-	-	227
Farmer plantations (PFP)	-	137	183	-	-	-	320
Total	49	225	2,243	2,300	2,300	2,400	9,560

From 1 January 1996 to 30 June 1996 which is the second 6 month reporting period these major operational activities have been implemented;

- Provided training in nursery techniques for the production of seedlings in the four provinces.
- Found contractors, negotiated and signed contracts and produced a total of 441,000 seedlings in the 4 provinces.
- Found contractors, negotiated and signed contracts for land preparation and establishment of 6 new PBP areas in the 4 provinces.

- Land preparation, environmental protection areas surveyed and marked, built fences, and cultivation ready for planting was finished at all 6 1996 PBP sites on schedule.
- Completed weeding, maintenance and protection of all the 1995 PFPs.
- Completed planting and fertilising on 4 1996 PBPs, and on the other 2 1996 PBPs planting is in progress and will soon be completed.
- Accomplished extension activities resulting in farmer selection, training, provision of seedlings and technical assistance resulting in planting of 137 ha of PFPs.
- Devised, tested and field data collected for Environmental Baseline Survey, and survey completed for 7 of the 8 1995 and 1996 PBPs.
- Completed Plantation Management Plans for all 1995 and 1996 PBPs.
- Completed survey and design for all PBPs access roads civil works.
- Completed bid documents and contracts for road access works in Vientiane Prefecture, Vientiane Province and Bolikhamsay Province. Savannakhet Province is now well in progress.
- Set up contract evaluation committee, selected contractors and the started construction works for the Phon Thong access road, Vientiane Province and the Nam Souang bridge rehabilitation, Vientiane Prefecture.

2. INTRODUCTION

2.1 Project

The Industrial Tree Plantation Project known in Lao PDR as the Lao-ADB Plantation Forestry Project is located in eight of the thirty four districts which comprise Vientiane Prefecture, and the provinces of Vientiane, Bolikhamsay and Savannakhet. The project is comprised of four parts ;

- Part A : Provision of a credit facility for smallholder farmers and private enterprises to finance the establishment of industrial tree plantations on about 9,000 ha of unstocked and degraded forest land;
- Part B : Establishment of pilot block and pilot farmer plantations on 560 ha;
- Part C : Improvement of plantation access roads; and
- Part D : Project management support including nursery improvement, public awareness programs, incremental staffing and logistical support.

The project implementation started in late 1995 and is scheduled to finish in early 2001.

DOF and APB are the executing agencies of this project.

- APB is implementing Part A .
- DOF is implementing Parts B, C and D also co-ordinating and managing the project through the PCU and four PPCUs.

2.2 Background

Referring to the Contract for Consultants Services between the Government of Lao PDR and CIRAD-Forêt in association with MIDAS Agronomics Co. Ltd. and Burapha Development Consultants Ltd. which is dated 17 April 1995. The Implementation Consultants assistance is funded under the terms of ADB Loan No. 1295 - Lao (SF) : Industrial Tree Plantation Project.

Under the terms of this contract the implementation specialists of the consultant have prepared this second 6 monthly report.

This second 6 Month Report of the project implementation covers the period from 1 January 1996 until 30 June 1996 for the activities of the implementation specialists. This report contains information on the;

- Progress and status of the project implementation to 30 June 1996.
- Specialists activities and inputs provided over the second reporting period.
- Issues arising from the project.
- Consultants expenditure for the period to 30 June 1996.
- Specialists activities planned for the following 6 months.

3. PROJECT IMPLEMENTATION STATUS

3.1 Development of Project Implementation and Status

Up to 31 December 1995 which was the end of the first 6 month reporting period these following operational activities had been achieved;

- Establishment of PCU and PPCU including staffing arrangements and training program for operational staff.
- PBP sites were selected and plantings established in 1995 on 5 of these averaging 8 to 10 ha each with a combined area of 49 ha planted.
- Seedlings were produced for the 1995 PBPs including tree production training.
- Weeded and fertilised existing PBPs and protected them from cattle and fire.
- Searched for and confirmed 4 required new PBP and 90 PFP sites with local people by STP process for rational land use.
- Obtained approval from district and provincial authorities as required for above.
- Implemented access roading survey and design in PBPs.
- Surveyed, demarcated and mapped planting areas for the 1996 planting season.
- Analysed PBP and PFP sites and then put to immediate use the appropriate species and silviculture practices that have proven effective locally and in other regions similar to the Lao site types and formulated plantation concept and design.
- Provided appropriate silviculture schedules for the requirements of the PBP and PFP planting plans.
- Strengthened and developed the extension ability of PPCU to recruit and service farmers and rural community.
- Reviewed and redrafted nursery and plantation prescriptions and contracts as required.
- Provided training on economic principles for commercial plantations. Training courses for plantation establishment methods.
- Planned production of 1996 trees and selected nurseries for this.
- Provided training in appropriate management methods used in the commercial plantation sector. Particularly in the area of contract formulation, management, payments and control.
- Planning of the first annual Environmental Baseline Survey.

From 1 January 1996 to 30 June 1996 which is the second 6 month reporting period these major operational activities have been implemented;

- Provided training in nursery techniques for the production of seedlings in the four provinces.
- Found contractors, negotiated and signed contracts and produced a total of 441,000 seedlings in the 4 provinces.

- Found contractors, negotiated and signed contracts for land preparation and establishment of 6 new PBP areas in the 4 provinces.
- Land preparation, environmental protection areas surveyed and marked, fence building, and cultivation on all 6 1996 PBP sites was finished ready for planting on schedule.
- Weeding, maintenance and protection of the 1995 PFPs.
- Planting and fertilising on 4 1996 PBPs is completed, and on the other 2 1996 PBPs planting is in progress and will soon be completed.
- Extension activities resulting in selection, training, provision of seedlings and assistance to farmers resulting in planting of 137 ha of PFPs.
- Environmental Baseline Survey devised, tested and field data collection completed for 7 of the 8 1995 and 1996 PBPs.
- Plantation Management Plans for all 1995 and 1996 PBPs have been completed.
- Completed survey and design for all PBPs access roads.
- Bid documents and contracts completed for road access works in Vientiane Prefecture, Vientiane Province and Bolikhamsay Province. Savannakhet Province is now in progress.
- Setting up of contract evaluation committee, selection of contractors and the start of construction works for the Phon Thong access road, Vientiane Province and the Nam Souang bridge rehabilitation, Vientiane Prefecture.

Major items of implementation operations that must be completed during 1 July 1996 to 31 December 1996 which is the next 6 month reporting period are;

- Location and approval of 60 ha of PBPs in 3 locations and 183 ha of PFPs.
- Complete road access construction works in Vientiane Prefecture, Bolikhamsay Province and complete 80% of the final road access construction work in Savannakhet Province.
- Complete road maintenance training for PCU.
- Continue extension and plantation promotion programme.
- Environmental monitoring and report.
- Benefit monitoring and evaluation.
- Training and strengthening of PPCU and provincial forestry staff to provide support for the APB credit plantation part of the project.
- Provide support to APB credit plantations work of Part A by doing STP and evaluating applicants' plantation management plans.

3.2 Project Planting Plan

The project actual planting and future planting plan for Part A and for Part B components is summarised in the following table;

Project Planting Plan

Ha planted in year	1995 actual	1996 actual	1997	1998	1999	2000	Total
Part A, credit planting	-	-	2,000	2,300	2,300	2,400	9,000
Part B Block plantations (PBP)	49	118	60	-	-	-	227
Farmer plantations (PFP)	-	137	183	-	-	-	320
Total	49	255	2,243	2,300	2,300	2,400	9,547

4. PROJECT STAFFING

4.1 PCU

During the reporting period the PCU staff experienced a gain of 2 staff. As of 30 June 1996 the PCU staff strength and positions were as follows;

PCU Staff Strength as at 30 June 1996

Section	Staff Nos. and Position
Directors	1 Project Director 1 Deputy Project Director
Monitoring & Evaluation Section:	1 Section Head 3 Section staff
Training & Extension Section:	1 Section Head / Training 1 Extension 1 Extension Materials
Plantation Development Section:	1 Section Head / Supervisor South Region 1 Supervisor North Section 1 Supervisor Nurseries / Seed / Road maint.
Administration Section:	1 Section Head 1 Accountant / Cashier 2 Admin. assistant
A total strength of 16 persons.	

4.2 PPCU

During the reporting period the PPCU permanent staffs experienced one loss, and the co-opted members from the Lao Womans Union and Lao Youth Organisation there were 8 losses. There have been no replacements yet but these will be replaced in the next reporting period so they are able to participate in the training and assist PPCU in extension for Part A. As of 30 June 1996 the PPCU staff strengths were;

PPCU Staff Strengths as at 30 June 1995

Position	Nos. in each PPCU			
	Vientiane Pref.	Vientiane Prov.	Bolikhamsay	Savannakhet
Manager	1	1	1	1
Admin	1	1	1	2
Extension	2	2	3	3 (includes deputy)
Technical	2	2	2	3
Woman Union	0	0	1	2
Lao Youth	2	0	1	2
	8	6	9	13
New staff	0	0	0	0
Departed	2	5	2	0

4.3 Implementation Specialists

The project implementation team of specialists fielded by the CIRAD-Forêt consultant in association with MIDAS and BURAPHA has five people. Their combined consultancy is allocated a total of 79 man months over the period May 1995 to December 2000. The specialists and their work times for the project were;

Specialists & Work Time During Reporting Period

Specialist	Work Time in Months		
	1st period	This period	Remaining
• Thomas Brummer (36 mths.) Plantation Management Specialist / Team Leader	6.17	6.00	23.83
• Anthony Zola (7 mths.) Environmental Specialist	0.20	0.50	6.30
• Khamsay Hongsouvanh (12 mths.) Road Specialist	5.50	5.60	0.90
• Keu Moua (14 mths.) Plantation Operation Specialist	5.03	5.00	3.97
• Keo Nanthasack (10 mths.) Nursery Operation Specialist	1.20	5.00	3.80
TOTAL INPUT	18.10	22.10	38.80

4.4 Local Support Staff

The following local support staff are employed with the implementation consultancy to assist the project;

Local Support Staff Employed During Reporting Period

Position	No. persons	Employment commenced
Secretary	1*	1 June 1995 - 30 April 1996 1 July 1996
Accountant	1	1 November 1995
Driver	1	1 June 1995

* The original secretary resigned on 30 April. A replacement was found and commenced work on 1 July.

5. PRINCIPAL WORK ACCOMPLISHED

5.1 Plantation Management

5.1.1 PBP Establishment

During this reporting period plantation establishment operations were newly started in 6 PBP areas as per plan. By the end of the period 4 PBPs were completed by planting and first fertilising and 2 were in process of planting. Though there were many operational difficulties these have been overcome and added to the on-job training of PPCU and PCU. Standard of PBP establishment was high.

The PBP land preparation activities included boundary marking; inspections with the village farmer contractors; negotiating of contracts; signing of contracts; marking out of environmentally sensitive areas such as streams, dry water courses, paddy fields, steep areas and natural trees that were to be left untouched.

Then came the cultivation contract activities which consisted of; boundary marking; inspections with the contractors; negotiating of contracts; signing of contracts. Supervision of the mechanical operations by PPCU was done with assistance of PCU and specialists as the work required much on-job training because it involved a number of demonstrations of cultivation techniques and environmental protection measures which were new to both PPCU and the contractors. Not all PBP areas were ploughed, some parts of PBPs had hole digging as demonstration of low cost inputs for poor farmers. Other parts of PBPs were not cultivated because of environmental reasons such as slopes of more than 15° or because they were in dry water courses. Plans to cultivate the 2 PBPs in Savannakhet Province were cancelled as quotations were extremely high because of competition from road and dam projects in the region. In these the planting plans were altered to demonstrate more agroforestry aspects.

Prior to planting, fencing and hole digging were completed. This year all fencing was done using natural materials salvaged during the land clearing phase. This reduced costs and saved much foreign exchange. A number of local fencing styles have been used and the most durable of these will be selected and promoted by the PPCUs extension workers in the future.

Early rains disturbed establishment operations but these also resulted in the PBPs of Na Kaha, Pha Bat, Phon Sim being planted and receiving the first fertilising in early June. The remaining PBPs of Song Khon Mai, Phon Tong and Bueang Bouthong started planting at end of June and will be completed in early July provided the erratic rains continue.

There has been some losses of seedlings in a number of PBPs due to Termite and Cricket attack. These trees have been replanted. The aim this year has been to produce robust unchecked trees, transport and plant them while still fresh and unstressed. This method has resulted in about 25 cm of growth by the close of June for the seedlings which were planted in the early part of the same month.

A feature of all the 1996 PBPs is the integration of food growing and forestry. All of the villages were interested to plant crops with the trees. The PBPs have been divided into family plots by the participating farmers. They have planted hill rice as their first need for food but have also added a number of combinations with other crops with the encouragement of the PPCU extension workers. These crops are; cotton, corn, taro, water melon, cucumber, peanuts, and some local vegetables known here as "man dang" and "mang ah".

This seedlings planted this year include a wide range to demonstrate alternative species and provenances and also to provide a resource for the production of good quality,

affordable seed for future plantations in Lao PDR. The following species and provenance have been planted in the 1996 PBPs ;

Species & Provenance Planted in 1996

Species	Provenance
<i>Eucalyptus tereticornis</i>	Holms Creek Laura River Kennedy River Mitchell River
<i>Eucalyptus camaldulensis</i>	Petford Wrotham Park Stn. Katherine NT Morehead
<i>Acacia mangium</i>	Kapal Village PNG Upper Aramia
<i>Alstonia scholrsris</i>	Savannakhet (Mai Tienpet)
<i>Anthocephalus chinensis</i>	Vientiane Province (Mai Saku)

A gross total area of 130.74 ha of PBPs has been established over the 4 provinces. This is 12.9 ha less than the plan. The reason for the deviation from plan for the Bueang Bouthong PBP is that after STP was done and land clearing started there began a disagreement over land boundary that had been previously settled so the PPCU decided to limit the PBP to the land that was not involved. By this time it was too late to find additional area. Next year extra PBP area will be established to compensate.

PBPs Planted in 1996

Province	District	PBP Village	PBP AREA (ha)		
			Plan	Gross ¹	Planted ²
Vientiane Pref.	Naxaithong	Na Kaha *	15.1	15.1	14.7
Vientiane Prov.	Phonhong	Phon Tong *	43.5	43.5	41.6
Bolikhamsay	Thaphabat	Song Khon Mai	21.0	21.2	17.7
		Pha Bath	12.0	12.5	10.5
Savannakhet	Khanthaburi	Phon Sim *	20.0	25.1	20.6
		Bueang Bouthong	32.0	13.3	13.3
				130.7	118.4
* Expansion of area planted 1995.					
¹ Gross area is actual plantation area, including protection strips and internal roads.					
² Planted area is only plantation area occupied by trees.					

5.1.2 PFP Establishment

A total of 137.2 ha of PFPs has been planted or is in process of being planted at the end of this reporting period. This is 8.2 ha more than the plan.

Response from farmers and institutions such as schools, colleges, temples etc. has been good. There have been a few families leave the PFP participation scheme because their situation altered during the year, but others were interested to replace them.

Many farmers have chosen to combine hill rice growing with the planting of trees. A proportion of these have also added; corn, cucumber, watermelon, cotton and local vegetables. But institutions, such as schools and temples, and some bigger farmers have opted to grow trees only.

Establishment has tended to be well done with almost all PFPs using hole digging. Only a few individuals have been able to plough, this was expected because the expense involved is not an alternative to most farmers.

A variety of farmer attitudes is evident to tree planting, some are very interested and are integrating this new activity with their farming while others are just trying it out.

Follow up of the PFP participants is an important extension activity in the coming months to ensure that weeding is done on time so that the trees have the best chance of growth to demonstrate this new crop properly to the farmer.

A summary of 1996 PFPs recruited to the project is contained in the table below;

Summary of 1996 PFPs

Province	District	Villages	Families	Institutions	Ha
Vientiane Prov.	Phonhong	4	2	3	6.0
	Thoulakhom	3	5	-	4.5
	Keoudoom	5	6	1	7.0
Vientiane Pref.	Naxaithong	6	10	-	10.0
	Xaithany	4	7	-	10.0
Bolikhamsay	Paksan	8	8	1	8.0
	Thaphabat	5	23	4	34.2
Savannakhet	Khanthaburi	6	45	2	49.8
	Xaiburi	2	2	-	7.7
Total	9	43	108	11	137.2

5.1.3 1995 Plantation Maintenance

During this reporting period the 1995 planted PFPs have been watched for fire and animal damage. This is carried out by a village family whose duties include maintenance of the PFP fence and patrols to check for fire, security and animal invasion.

During the dry season to May there had been very little weed growth after the clearing of the fire break and the fire protection weeding. But with the onset of the rains there has once again been vigorous weed growth. This has been weeded in all 1995 PFPs and fertiliser applied in 4 of the PFPs as required. The maintenance operations are summarised in the table following.

Maintenance Operations in 1995 Planted PBPs

Province	District	PBP Village	Weeding (ha)	Fertilising (ha)
Vientiane Prefecture	Naxaithong	Na Kaha	14.9	14.9
Vientiane Province	Phonhong	Phon Tong	8.5	8.5
	Thoulakhom	Phon Kham	8.2	
Bolikhamsay	Thaphabat	Phon Savan	6.9	6.9
Savannakhet	Khanthaburi	Phon Sim	<u>10.1</u>	<u>10.1</u>
			48.6	40.4

5.1.4 Training and Extension

On job training of PPCU has continued throughout the reporting period, and has been conducted in all aspects of the work being carried out by each specialist. The methods employed have been instruction and demonstration followed by participation in field work. The specialists and PCU staff have been more heavily involved in this training than was originally planned, but it is good to see PPCUs asking for this now when they feel they require it. Results are starting to show because the PPCU staff are gradually gaining the ability to make initiatives on the implementation of PBP and PFP operations and administration.

Field training of all PPCUs has been carried out on a regular basis to meet their demonstrated needs or requests by the specialist and PCU in the topics of;

- Mapping survey and area calculation
- Establishment of environmental protection areas
- Mechanical cultivation techniques (3 provinces only)
- Contract negotiation and administration
- Contractor supervision
- Financial aspects of contract management and accounts
- Nursery supervision
- Marking out of planting plan in the PBP

A training trip proposal and costing for the PCU and PPCU to visit fast growing plantations in central Thailand was completed by the implementation team leader and sent to the TA team leader for his consideration as was requested.

A 2 day seminar on STP and Plantation Forestry Landuse Policy was conducted by PCU in February for provincial staff. Over 140 training man days were recorded.

In June the PPCUs of Savannakhet, Bolikhamsay and Vientiane Provinces organised a provincial Tree Planting Day ceremony to promote tree planting and plantations. Local radio and newspapers covered these events. In Vientiane Province the PCU organised a national Tree Planting Day ceremony at which the President of The Lao PDR was the honoured guest. Many members of the public, schools and the government ministries participated in tree planting lunch was also provided. This event was widely covered by TV, radio and newspapers.

5.1.5 BME

Training input and field work participation has been provided by team leader to the Monitoring and Evaluation Section for BME survey. This was related to plantation establishment, tree crop development and the sampling and measurement of resulting plantations. Training for measurement of larger trees will be conducted in the next period.

5.1.6 Demonstration Trials

Work plans for all the trials have been completed. The trials have gone ahead as per plan in all PBPs. The specialists plans have been translated into Lao and rewritten to provide guidance to PPCUs for implementation. Trial work has been very new to them and it was found that there had to be a session of explanation and discussion with the PPCUs as each trial has been implemented.

Trials established so far in 1996 PBPs are;

- Spacing trials
- Cultivation trials
- Species demonstrations
- Provenance trials
- Seed stands
- Agro-forestry crops

Trials still in the process of establishment are;

- Chemical fertiliser trial
- Farmers' alternative fertiliser trial
- Economic comparisons of various techniques
- Yield comparisons of various techniques

The Grazing-forestry trial had to be postponed till 1997 because during the preparations it was evident that there was not enough seed available to produce the forage trees required to establish these trials.

5.1.7 Technical Aspects

Plantation Management Plan format was developed and forms were designed, tested and produced in the Lao language by PCU and specialists. These were then utilised for the completion of Plantation Management Plans for all 1995 and 1996 PBPs by the Plantation Development Section and the Monitoring and Evaluation Section of the PCU. These plans will serve as models for the plans required by plantation investors who will plant more than 5 ha using the credit facility of Part A in this project.

The PCU have produced their 1996 / 97 operational plan and budget with input from the specialist, the plan is under consideration by DOF.

5.1.8 Plantation Operations Assessment

During the reporting period the team leader has regularly visited PBPs with PCU and PPCU to assess their management and maintenance. Reports including recommended remedial actions have been made to PCU.

Operations standards have achieved a good level of quality in the plantations this year with the significant assistance of PCU and specialists. In this matter the PCU now has reached the required basic capability for supervision, administration and co-ordination.

Generally all the PPCUs require further strengthening in their supervision and their operations scheduling skills. These will be concentrated on in the training of the next 6 months. Of the 4 PPCUs one is performing very well, two are satisfactory and one needs strengthening.

The *Acacia mangium* has continued to out perform *Eucalyptus* on areas where there was insufficient soil cultivation at the land preparation phase of plantation establishment. The species demonstrated that it can survive the dry season. But this season was not as dry as can be as there were strong showers experienced from time to time.

5.1.9 Credit Planting Scheme

The BOL and APB have completed the pre-conditions of ADB for the release of funds required by Part A of this project. In anticipation of the ADB approval the PCU has prepared operation plans to support Part A of the project by;

- Providing investment seminars for all provinces.
- Training of PPCU, PAFO and APB staff in; STP, plantation economics, environmental requirements, nursery and plantation techniques.
- Assistance in STP field work.
- Assessment of credit applicants Plantation Management Plans (only for plantations of more than 5 ha).
- Assistance in and co-ordination of seed /seedling provision.
- Monitoring of social, economic and environmental aspects of the credit plantations.

The PCU has been co-ordinating with BOL and APB and providing input on technical plantation procedures. It has been decided that activities dealing with Part A will be prepared but not started until the ADB has forwarded funds for the credit. This is to avoid loss of public confidence by doing promotional work without the availability of loans later.

5.1.10 Project Contacts

There have been meetings with three other ongoing projects in Lao PDR who are doing work that in some way connects with this project or are able to pass on experience that will be of benefit. These project contacts were with;

- Forages for Smallholders Project, Department of Livestock
- Forestry Management and Conservation Project, Department of Forestry
- Lao - Swedish Forestry Project, Department of Forestry
- Nam Ngum Watershed Management and Conservation Project, Department of Forestry
- Nam Theun 2 Project Development Group
- Nam Ngum Pump Irrigation Project, Department of Irrigation

5.2 Environmental Monitoring

5.2.1 Preparation

During the environmental specialist's second visit in February - March PCU and he have completed the following;

- Identification of the environmental indicators.
- Design of the Environmental Baseline Survey (EBS) forms
- Field testing of the EBS recording forms.
- Revised the EBS forms.
- Training for conducting of the EBS.

5.2.2 Training

To assist in the soil sampling of PBPs for the EBS and consequent environmental monitoring a member of the PCU Monitoring and Evaluation Section has received training at the Lao soil testing laboratory on soil sampling methods and soil testing.

Training has been given to the PCU Monitoring and Evaluation Section in conducting the EBSs by the specialist.

5.2.3 Surveys

The Monitoring and Evaluation Section of PCU assisted by the specialists have completed EBS field work in 7 of the 8 PBPs. The remaining PBP of Phon Kham will be finished in July.

5.2.4 Preliminary Plantation Guidelines

During the early phase of land preparation and mechanical operations it soon became apparent that the environmental guidelines as taught during the December plantation techniques training courses in the 4 provinces was not working as expected.

On investigation by Team Leader and PCU it was found that three problems were encountered;

- i) There are a number of environmental guidelines that are relevant to this project. They are relatively complex to understand and remember. The farmers who are doing the contract work of PBP establishment were unsure what was required and either did not understand the concepts or found them too complex to follow.
- ii) Food production land use takes priority on flat arable land and when some other potential sites have been eliminated by the STP there are relatively very few areas left that are flat enough to come within the guidelines for use as plantation land.
- iii) If the slope limits are faithfully followed then much of the potential plantation area will not be available for planting. Only the narrow ridge tops could be used among the usually broken or very rolling terrain. This will result in two main effects; extremely scattered and small planting blocks that would be uneconomic, and the result that many farmers would be prevented from planting their own land.

Therefore until the project produces specific environmental guidelines based on the experience gained during PBP and PFP establishment and maintenance preliminary guidelines were issued by the Team Leader after consultation with the environmental specialist in order to;

- Control project plantation establishment effect on the environment, and

- Enable the plantation establishment work to continue making best use of the types of degraded forest land now available to the project.

The preliminary guidelines are;

- Flat to gently sloping land (0 deg. - 15 deg.) can be prepared by bulldozer and ploughing prior to planting.
- Moderately sloping land (16 deg. - 30 deg.) can be burned and planted using manual methods, but can not be prepared by bulldozer or plough. It can be weeded using manual methods only
- Steep land (more than 30 deg.) should not be cleared, planted or weeded.
- Bottom and sides of dry watercourses should not be cleared, planted or weeded .
- Internal roads in plantations must not be ploughed or disturbed by heavy machinery.
- Lakes and ponds: leave not less than 40 m of protection strip from the water level in raining season to the planted trees. These strips should not be cleared, planted or weeded. No bulldozer work or ploughing in protection strip.
- Streams: leave not less than 20 m of protection strip from the top of the stream bank to the planted trees. These strips should not be cleared, planted or weeded. No bulldozer work or ploughing in protection strip.
- Paddy fields: leave not less than 5 m of protection strip from the paddy to the planted trees. These strips should not be cleared, planted or weeded. No bulldozer work or ploughing in protection strip.

These guidelines have been well followed after intensive on-job training of PPCUs, contractors and farmers by the specialists. The result represents a big improvement on the traditional methods used and has started to create an awareness of the problems of environment degradation.

5.3 Plantation Operations

5.3.1 Establishment and Field Operations

In the 1996 PBPs land clearing was done by hand using the participating farmers as contractors. Land clearing was in most cases done quickly and on schedule. There was much interest by the participants about using the plantations to plant hill rice and the policy this year was for the village committee in conjunction with PPCU to allocate plots within the PBP to each interested family. It is then the responsibility of the plot user to do the clearing, planting, weeding and fertilising in that plot and get paid for it. This system has worked very well and has resulted in a more efficient use of the plantations for integrated food growing than last year.

The plot allocation system caused a problem only in Bueang Bouthong PBP where some plot users were not interested to grow hill rice but would not surrender the plot to others to do so because they wanted to keep the option of working on the PBP. This village also was late in starting and completing land clearing, they had problems of co-operation among themselves. During the STP and the later village meetings the villagers were positive and enthusiastic but field operations were not so smooth. The initial plan was for 32 ha PBP but because of the problems of land allocation the realisation was only 13.3 ha before it was decided to stop the late establishment operations. It is planned to establish about 20 ha of PBP in 1997 in a better motivated recipient village.

This specialists time was mostly used in field training all PPCUs in;

- Understanding and applying the new preliminary environmental plantation guidelines.
- Field survey for mapping and calculation of areas for contractor payments
- Planning and supervising land clearing operations.
- Supervision of mechanical contract operations and technical requirements.
- Marking out of planting plan boundaries, environmental protection strips, PBP internal roads.
- PBP trial establishment.

5.3.2 Technical Support and Training

To assist PPCUs to in the correct establishment of 1996 PBPs the specialist produced in the Lao language for the plantations of; Na Kaha, Phon Tong, Song Khon Mai, Pha Baht, Phon Sim and Bueang Bouthong the following documents;

- Plantation strategy,
- Plantation establishment design
- Internal roading plan
- Tree stand maps

As the PPCUs will be required to establish and supervise PBP trials the following were produced by the specialist in the Lao language for their guidance;

- Na Kaha trial work plans for cultivation and Eucalyptus tree spacing.
- Phon Tong trial work plans for Acacia fertiliser, Acacia tree spacing and alternative farmers fertilisers.
- Pha Bat trial work plans for species and provenances, agroforestry and fertiliser.
- Bueang Bouthong trial work plans for agroforestry and alternative farmers fertilisers.
- Phon Sim trial work plans for agro-crops, tree spacing and fertiliser.

5.3.3 Protection

Fire protection measures for 1995 planted PBPs were rechecked with PPCUs. There have been no incidents and the systems seem to be working satisfactorily.

5.4 Nursery Operations

5.4.1 Training

After choosing nurseries to participate in tree production for this project and signing the contracts, formal training courses were run in each of the provinces. The courses were attended by the staff of the contracted nursery and also by PPCU staff that would be involved in the supervision of the contract.

Each course consisted of one day of lecture on the topics of; seedling production technique, supervision, contract administration, reporting and quality control. Then this was followed by two days of technique demonstrations and practical exercises using real materials including seed and seedlings which were grown beforehand for the exercise.

The following topics were covered; media preparation, media mixing, pot filling, labelling, seed sowing, transplanting, watering, spraying and shade control.

The nursery training courses achieved a total of 137 training man days for all the provinces.

The following training materials were provided by the PCU and specialist in the Lao language;

- Overview of seedling Production Techniques
- Supervision Requirements by PPCU
- Soil Preparation for Germination
- Seed Sowing Schedule
- Soil Preparation for Plastic Bags
- Eucalyptus and Acacia Transplanting
- Culling for Good Quality Seedlings
- Transport to Plantation

5.4.2 1996 Seedling Production

During this period the one remaining seedling production contract was finalised and signed. The nurseries, their equipment and supplies was prepared in February and sowing started in early March.

Seedlings were scheduled to be ready for planting in early June which was calculated to be the earliest safe planting time with the reliable start of the wet season. The timing was planned to give the seedlings the longest possible growing season in the plantation before the rains stop in November and also to do seedling and fertiliser distribution before the rains really set in and bog the access roads for transport. During the seedling production planning phase this was identified as a problem last year which was effectively improved this year.

Actual seedling production for PBPs and PFPs in the 4 provinces by the various nurseries is summarised below;

Nursery Seedling Production for 1996 PBP & PFP

Province & Nursery	Species	Provenance	No. Seedlings
Vientiane Pref. (Nam Souang)	E. tereticornis	Holms Creek	2,500
	E. camaldulensis	Petford	50,000
	A. mangium	Kapal Village	5,000
	A. chinensis	Lao	<u>1,083</u>
			58,583
Vientiane Prov. (Phon Savat)	E. camaldulensis	Petford	36,000
	A. mangium	Upper Aramia	1,000
	A. mangium	Kapal Village	3,000
	A. chinensis	Lao	1,083
(Nam Souang)	E. camaldulensis	Petford	<u>68,000</u>
			109,083
Bolikhamsay (Na Euang)	E. tereticornis	Holms Creek	2,000
	E. tereticornis	Laura River	2,000
	E. tereticornis	Mitchell River	2,000
	E. tereticornis	Kennedy River	2,000
	E. camaldulensis	Petford	57,000
	E. camaldulensis	Katherine R.	6,000
	E. camaldulensis	Wrotham Pk.	2,000
	A. mangium	Kapal Village	4,000
	A. mangium	Upper Aramia	8,000
	A. scholsris	Lao	<u>1,000</u>
			86,000
Savannakhet (BAF Co)	E. tereticornis	Katherine	30,000
	E. tereticornis	Kennedy River	26,000
	E. camaldulensis	Petford	120,000
	A. mangium	Kapal Village	10,000
	A. scholsris	Lao	<u>1,200</u>
			187,200
			440,866

5.4.3 Technical Support

In order to assist each of the nurseries and their PPCU in their planning and administration the PCU with the assistance of the specialist produced and distributed the following documents to them;

- Nursery workplan for February - March
- Nursery workplan for April - May
- Seedling production plan
- Administration forms for
 - Weekly nursery report to PPCU
 - Seedling dispatch

As part of it's technical support the project provided high quality seed, imported from CSIRO Australia to all participating nurseries in the following amounts;

Seed Distributed for 1996 Seedling Production

Nursery	Species	Provenance	Seed kg	
Phon Savat Co.	E. tereticornis	Mitchell River	0.240	
	E. camaldulensis	Petford	0.799	
	A. mangium	Kapal Village PNG	0.180	
	A. mangium	Upper Aramia PNG	<u>0.076</u>	1.295
Nam Souang	E. tereticornis	Holms Creek	0.224	
	E. camaldulensis	Petford	0.880	
	E. camaldulensis	Wrotham Park Stn.	0.050	
	A. mangium	Kapal Village PNG	<u>1.110</u>	2.264
Na Euang	E. tereticornis	Mitchell River	0.039	
	E. tereticornis	Holms Creek	0.176	
	E. tereticornis	Nth Kennedy River	0.039	
	E. camaldulensis	Katherine River	0.117	
	E. camaldulensis	Petford	0.635	
	E. camaldulensis	Laura River	1.300	
	E. camaldulensis	Wrotham Park Stn.	2.100	
	E. camaldulensis	Morehead River	0.027	
	A. mangium	Kapal Village PNG	0.112	
	A. mangium	Upper Aramia	<u>0.270</u>	4.815
BAF Co.	E. tereticornis	Nth. Kennedy River	0.300	
	E. camaldulensis	Katherine River	0.311	
	E. camaldulensis	Petford	1.146	
	A. mangium	Kapal Village	<u>0.248</u>	2.005
				10.370

During the 1996 nursery production year the PPCUs carried out the following functions; contract signing, contract administration, inspection of nursery operations and quality control. Such tasks can not be completely learnt in a training course and so the PCU assisted by the specialist made frequent rounds of all nurseries accompanied by the local PPCU.

These inspections were essential in helping seedling production stay on schedule in two nurseries and on delayed but reasonable schedule in two others. It also was critical for solving the problems caused by storm damage in two nurseries and the application of wrong techniques which gave rise to "damping off" disease in one nursery and thin soft seedlings in another.

The quality of seedlings was mostly satisfactory this year but further improvements are still required to reduce seedling variability and the very high percent of reject-quality trees. The advantage of higher quality thus slightly more expensive planting stock is not yet fully believed by many field staff, and the nursery staff see this requirement as decreasing their profits. They have not yet experienced the effect of seedling quality on plantation growth rate and profits. As was pointed out in the Inception Report it always takes at least two years to get seedling quality up to a high level. Results in the next planting year will be better as some PPCU staff are now realise the fast growth possible with high quality unchecked seedlings.

5.5 Roothing

5.5.1 Survey and Design

During January the second survey and design contract # SD-02 for Phon Tong, Na Kaha and Song Khon Mai PBP access roads was completed. The engineering report, construction estimates and construction drawings were checked for the PCU by the engineering specialist and they were approved by Department of Communications of the MCTPC in February

Project road design standards and specifications were approved by MCTPC and the ADB.

5.5.2 Tender and Contract Documents

Preparation of the full set of engineering tender documents and contract documents were completed on schedule and presented to PCU as follows;

Civil Works Tender & Contracts Documentation Completed

Contract #	Civil Work	Documents completed
BC-03	Nam Souang Bridge Rehabilitation	16 March
RC-04	Phon Tong Access Road, 2 km	6 April
RC-03	Na Kaha Access Road, 3.37 km	13 May
RC-02	Song Khon Mai Access Road, 2.4 km	13 May

These contract documents are comprised of the following parts ;

1. Contract agreement and dated contractor's tender.
2. Letter of acceptance.
3. Bank guarantee of contract performance.
4. Invitation.
5. Notice to tenders.
6. Contract conditions.
7. Priced bill of quantities by contractor.
8. Schedules by contractor.
9. Technical specifications.
10. Construction drawings.

It was decided for logistic reasons to concentrate on the civil works nearer to Vientiane first and then later to prepare the documents for RC-01, the 7.94 km Phon Sim access road in Savannakhet Province. Therefore the documents for this civil work will be completed in July of the next reporting period.

5.5.3 Contract Awards

ADB approval was sought and received for the elimination of the requirement for formal contractor pre qualification to be replaced by a simpler one. Justification for this change in procedure was; small value of the contracts, use of small local contractors who have limited administration facilities, extra time required to do this procedure and Road Engineering specialist's long experience and detailed knowledge of local contractors capacities.

According to GOL regulations the committee for road civil works contract awards was found to require representatives of a number of ministries. The members were required to be requested and then appointed. The committee is comprised of the following members;

1. Deputy Director DOF - Chairman
2. Representative of MCTPC
3. Representative of MOF
4. Representative of DOF Finance Section
5. Representative of DOF Procurement Section
6. Deputy Project Director
7. Project Road Engineer Specialist

The committee held their first meeting on 26 April during which contract # BC-03 and contract # RC-04 were approved and arrangements made to advertise for tenders. Four companies purchased tender documents from PCU but only three tenders were received by the closing day of 20 May. The contract awards committee evaluated and scored them. After final negotiations both contracts were eventually awarded to Hong Khum Road and Bridge Construction Co. The contract prices were for contract # BC-03, Kp 30,781,000 (\$ 33,900) and for contract # RC-04, Kp 37,670,000 (\$ 40,300). The consultant's recommendation, consultant's report on contractor selection and copies of contract documents were forwarded to ADB. The contracts were approved by MCTPC and ADB and were then signed on 15 June. Construction operations started on 18 June for RC-04 and on 22 June for BC-03.

5.5.4 Supervision of Works

During January the Road specialist supervised the field work of the topographical surveys and soil investigations of road survey and design contract # SD-02 for access roads in the Vientiane Prefecture and the provinces of Bolikhamsay and Vientiane. The reports and drawings were also supervised and checked to ensure conformity with defined standards, some calculation errors were found and corrected.

With the mobilisation of the contractor for bridge rehabilitation contract # BC-03 and access road contract # RC-04 in June the Road specialist has scheduled two days of field supervision per week. Some additional days have also been required. To make more effective use of his time the Road specialist has completed TOR, report forms and instructions for a PCU staff who will be his representative in the field every day recording the contractors works and materials use as per his training. Because of the closeness of contract sites BC-03 and RC-04 one PCU staff from the Plantation Development Section is able to effectively cover both contracts.

5.5.5 Works Status and Schedule

The status and schedule of the roading program for Part C of the project is indicated in the following table;

Status & Schedule of Roothing Program

	Actually completed	Planned completion	
Identification and description survey	July 95		
Construction design standards	September 95		
Survey and design contracts:			
documentation SD-01	October 95		
SD-02	October 95		
field work SD-01	December 95		
SD-02	January 96		
design completed & approved			
SD-01	December 95		
SD-02	January 96		
Tender / contracts document preparation:			
RC-01	-		July 96
RC-02	May 96		
RC-03	May 96		
BC-03	March 96		
RC-04	April 96		
	Planned start	Planned completion	
Construction works:			
RC-01	October 96		January 97
RC-02	November 96		December 96
RC-03	November 96		December 96
BC-03	June 96 (actual)		August 96
RC-04	June 96 (actual)		August 96

The 12 month contract term for assistance from the Road Engineering specialist will finish on 28 July 1996. Before then the tender contract documentation will be completed for the remaining contract # RC-01. Also the Road Engineering specialist will be available to supervise and accept the works from the contractor for payment for contracts # BC-03 and RC-04 which are now in progress. Advertising for tenders, contractor selection and contract preparation will need to be done by PCU unassisted for contracts # RC-01, RC-02 and RC-03 during August - September. An engineer is required for the construction supervision for these last 3 works which will start in mid October and go through to the acceptance of works in January.

In April the Team Leader advised PCU of the roading implementation status and recommended an extension of consultant's contract for the Road engineer. At the close of this period there has been no extension approved but it is in process. The PCU requested an extension of 120 days. This additional time for the Road Engineer will be used for;

- tender evaluation,
- finalising the contracts,
- works supervision,
- certification for payment,
- finish training.

The delay in the road implementation which requires the extension of the consultant's contract was caused by; (i) delays required by administrative procedures, (ii) requirements for extra administrative work, (iii) awaiting funds to be available for the survey and design contract deposit payments, (iv) awaiting the appointment and assembly of representatives from the various ministries required for the committee to evaluate tenders and award contracts.

6. EXPENDITURE

6.1 Local Expenses

The report for international and local expenditure by the consultancy specialists of the project is in the two tables below. These expenditure reports cover the implementation specialists expenditure only and does not include expenditure made by the consultant's home office. The expenditure summary to the end of the second reporting period on 30 June 1996 follows.

Local out of Pocket Expenses (US\$)			
Item	Total Budget	Total Spent	Budget balance
Per Diem (field)	39,801	12,824.89	26,976.11
Per Diem (Vientiane)	10,968	1,027.00	9,941.00
DSA	13,306	2,471.28	10,834.72
Domestic air Travel	7,910	133.85	7,776.15
Transport	17,643	3,204.07	14,438.93
Communication	9,898	1,774.80	8,123.20
Housing	38,989	14,927.18	24,061.82
Local support staff	27,852	7,131.18	20,720.82
Office supply	<u>5,946</u>	<u>1,183.53</u>	<u>4,762.47</u>
	172,313	44,677.78	127,635.22

6.2 International Expenses

International out of Pocket Expenses (US\$)			
Item	Total Budget	Total Spent	Budget balance
International Travel	38,825	6,432.95	32,392.05
Miscellaneous Travel Exp.	3,909	4,287.77	(378.77)
Per Diem out of Lao	2,798	600.00	2,198.00
Communications	5,108	154.99	4,953.01
Reproduction reports	9,835	506.11	9,328.89
Miscellaneous	<u>1,095</u>	<u>92.38</u>	<u>1,002.62</u>
	61,570	12,074.20	49,495.80

7. IMPLEMENTATION PLANS FOR NEXT PERIOD

The proposed work plans for the next 6 month reporting period, starting from 1 July through to 31 December 1996 for each implementation specialist is as follows;

7.1 Team Leader / Plantation Management Specialist

- | | |
|------|--|
| July | Inspect planting and fertiliser operations in PBP and PFP. Assist PCU with EBS field work. Prepare 6 month progress report. Prepare training to strengthen the PPCU, APB and PAFO staff for technical aspects of Part A. Assist with trials implementation. |
| Aug | 1 week leave. Training of APB, PPCU and PAFO. Inspect weeding and fertiliser operations in PBPs and PFPs. Assist with BME. |
| Sept | Inspect PBP and PFP weeding operations. Inspection of potential areas for 1997 PBPs. Together with PCU assist APB in technical matters. Assist PCU and PPCUs with credit plantation seminars for the 4 provinces. |
| Oct | Preparation of Permanent Sample Plot system for measurement and analysis of tree growth. Together with PCU assist APB in technical matters. |
| Nov | Provide PCU and PPCUs training in the establishment and measurement of Permanent Sample Plots in the 1995 plantings. Assist with establishment and measurement of PSPs. Together with PCU assist APB in technical matters. Assist PCU to assess trials that are complete. Revise seed requirements and place orders for project and for Part A. Assist in finalising 1997 seedling production plan for the project and Part A. |
| Dec | Check field measurement of PSPs. Establish computer system to store and manage the data from field measurements. Train PCU to compute, analyse and use data from PSPs. Check preparations for 1997 seedling production and PBP establishment contracts. Initiate fire break cleaning and fire protection measures for PBPs. 2 weeks leave. |

7.2 Environmental Specialist

- | | |
|------|--|
| July | Analysis of data from EBS. Training PCU to analyse data from EBS. |
| Aug | Preparation of EBS report.

break |
| Nov | Design environmental monitoring system (EMS) with PCU. Install and initiate EMS. Training PCU to operate the EMS.

break |
| Dec | Follow up on operation of EMS. Prepare annual environmental report for 1996. Training PCU to prepare environmental monitoring reports. |

7.3 Road Construction and Maintenance Engineer

- | | |
|------|---|
| July | Completion of tender / contract documents for contract # RC-01. Supervise the works of ongoing contracts # BC-03 and RC-04. |
| Aug | Supervise the works of ongoing contracts # BC-03 and RC-04. On completion of these works certify for payment. |

break

- Oct Assist in tender evaluation, contractor selection and contract finalization for contracts # RC-01. Supervise works of contracts # RC-01. Train PCU staff in planning, design and preparation of road maintenance schedule.
- Nov Assist in tender evaluation, contractor selection and contract finalization for contracts # RC-02 and RC-03. Supervise works of contracts # RC-01, RC-02 and RC-03. Ongoing training PCU staff in planning, design and preparation of road maintenance schedule.
- Dec Supervise works of contracts # RC-01, RC-02 and RC-03. On going training of PCU staff in planning, design and preparation of road maintenance schedules.

7.4 Plantation Operations Specialist

Next assignment is planned for plantation establishment operations in early 1997.

7.5 Nursery Operations Specialist

Next assignment is planned for the nursery season in early 1997.