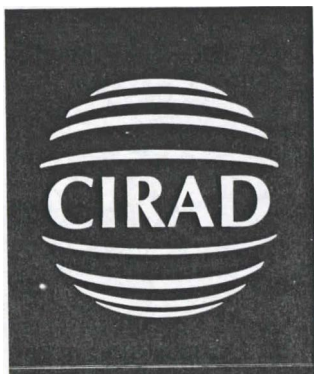


Department of Forestry  
Lao PDR



Centre  
de coopération  
internationale  
en recherche  
agronomique  
pour le  
développement

**ENVIRONMENTAL SPECIALIST'S  
8th TRIP REPORT  
24 November - 6 December 1997**

**CIRAD-Forêt - MIDAS - Burapha**

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

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6 December 1997

**Trip Report**  
**24 November - 6 December 1997**

Prepared for the  
Lao-ADB Plantation Forestry Project  
Department of Forestry  
Vientiane, Lao PDR

5 December 1997

by Anthony M. Zola  
Environmental Monitoring Specialist

**Trip Report**  
**24 November to 6 December 1997**

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## **List of Abbreviations and Acronyms**

### **List of Abbreviations and Glossary**

ADB	Asian Development Bank
APB	Agriculture Promotion Bank
BME	benchmark monitoring and evaluation
DAFO	District Agriculture and Forestry Office
DOF	Department of Forestry
EBS	environmental baseline survey
EMR	environmental monitoring report
EMS	environmental monitoring system
GOL	Government of Lao PDR
MES	Monitoring and Evaluation Section (of PCU)
PAFO	Provincial Agriculture and Forestry Office
PBP	pilot block plantation
PCU	Project Coordination Unit
PFP	pilot farmer plantation
PPCU	Provincial Project Coordination Unit
STP	socio-technical profile

## **1. Introduction**

Trip Report Number 8 covers the visit of the Environmental Monitoring Specialist to the Project during the period 24 November to 6 December 1997. The original proposed objective of this visit was to conduct training on Environmental Protection and Conservation in Tree Plantations for 30 to 40 DOF personnel, including PCU, PPCU, PAFO, and DAFO staff. Due to a conflict of training schedules at DOF, this training was postponed until 1998. Instead, the following tasks were undertaken during the two-week visit to the Project (detailed in **Appendix 2**):

1. Preparation of a Training Handbook for use by the PCU for training of new PPCU and other DOF personnel in environmental aspects of plantation forestry and environmental data collection.
2. Preparation of a Mini Environmental Baseline Survey for use by the PPCU to establish baseline data for private farmer plantations of 5 ha or less, and for groups of private farm plantations with total area greater than 5 ha.
3. Preparation of a Mini Environmental Monitoring form for use by PPCU to follow up on environmental impacts at private farmer plantations of 5 ha or less, and for groups of private farm plantations with total area greater than 5 ha.
4. Preparation of revised Environmental Guidelines for Plantation Establishment.
5. Training of PCU trainers in environmental aspects of plantation forestry and conducting environmental data collection.
6. Consultation with DOF officials and advisors associated with Wildlife and Protected Areas Conservation Component/Forest Management and Conservation Project, on aspects of biodiversity monitoring in conservation forests.

## **2. Environmental Monitoring Activities Undertaken**

### **2.1 Field Trips**

No field trips to plantation sites were made during this visit due to the number of documents that were prepared and the training of trainers that was conducted at the PCU. Field trips to Saravan and Champassack provinces are scheduled for the next visit to the Project in February/ March 1998.

### **2.2 Environmental Survey and Monitoring Forms**

Drafts of "Mini EBS" and "Mini EMR" forms (presented as **Appendix 3**) were completed and submitted to the Project for consideration during the reporting period. The purpose of the Mini EBS form is to allow rapid collection of baseline environmental at individual private farmer plantations of 5 ha or less and those that are located adjacent to or nearby one another, covering an area greater than 5 ha. in one village. The full EBS forms will continue to be used as part of the STP, at potential tree plantation sites that cover an area greater than 20 ha. The Mini EMR form will allow for rapid assessment of environmental impacts by PPCU personnel following establishment of private farmer plantations where the Mini EBS was undertaken.

### **3. Environmental Monitoring Activities Planned**

The following environmental monitoring activities are planned for the next visit to the Project in February/ March 1998:

- completion of the EBS report for the Project's pilot block plantations established in 1997;
- completion of Environmental Monitoring Report No. 2, covering the period 1997/1998; and,
- visits to Saravan and Champassack provinces to assess environmental conditions for plantation forestry.

### **4. Environmental Reporting**

#### **4.1 Environmental Guidelines for Forest Plantation Establishment**

Preliminary *Environmental Guidelines for Forest Plantation Establishment* had previously been issued by the Project in March 1997. These as a result of two years of experience establishing and managing tree plantations, the Project is now able to issue a revised set of *Environmental Guidelines for Forest Plantation Establishment in Lao PDR*, that are presented as **Appendix 4**. The revised guidelines have been prepared based upon lessons learned and experiences of the Lao-ADB Plantation Forestry Project since 1994. The Guidelines are seen as appropriate for the topographic, agro-ecological, and socio-economic conditions prevailing in the four provinces of Lao PDR in which the Project has been implemented to date, namely: Vientiane Province, Vientiane Prefecture, Bolikhamsai, and Savannakhet. The recommended guidelines also have been derived from:

- the results of environmental monitoring at pilot block plantations operated by the Project since 1995;
- application of the *Preliminary Environmental Guidelines for Plantation Establishment* issued by the Project in mid 1996 and early 1997; and,
- observations and recommendations made by individual Project staff and consultants since 1994.

#### **4.2 Environmental Monitoring Specialist's Reports**

During this visit, the Specialist was asked to make a list of documents prepared by him since initiating work on environmental aspects of the Project. This list of documents is presented as **Appendix 5**.

Environmental component technical reports scheduled for preparation in 1998 include the following:

### Environmental Component Technical Reports for 1998

Report	Period of Preparation	Tentative Date for Submission of Draft Final Report	Tentative Date for Submission of Final Report	Remarks
<i>Environmental Baseline Survey Report for 1997 PBPs</i>	February/March 1998	March 1998	March 1998	
<i>Environmental Monitoring Report No. 2 for 1997 - 1998</i>	February/March 1998	March 1998	March 1998	

## 5. Training

### 5.1 Training Handbook for Environmental Monitoring of Forest Tree Plantations in Lao PDR

A *Training Handbook for Environmental Monitoring of Forest Tree Plantations in Lao PDR* was prepared for the Project Coordination Unit of the Lao-ADB Plantation Forestry Project as a guide for trainers providing training to forestry technicians, namely new PPCU and other DOF personnel responsible for facilitating establishment of block (closed spaced) forest tree plantations in Lao PDR, in environmental aspects of plantation forestry and environmental data collection. The *Training Handbook* presents environmental aspects of information that trainers should include in their presentations to forest technician trainees when discussing:

- establishment of block (closed spaced) forest tree plantations (including preparation of socio-technical profiles {STP} and environmental baseline surveys {EBS}, land clearing, land preparation, and tree planting);
- plantation management; and,
- undertaking of benchmark monitoring and evaluation that includes environmental monitoring.

The *Training Handbook* has been prepared with the assumption that it will be used by PCU staff who have been provided with significant training in environmental factors related to establishment of forest plantations through the Project. The *Handbook* provides guidelines for trainers conducting different types of training and is covers three types of training:

- Orientation Training: Tree Plantations and the Environment
- Training in Operating the Environmental Monitoring System
- Field Training in Environmental Data Collection

Under each category of training, the following topics are discussed in detail: key words and definitions; lecture notes; discussion topics; and graphics.

## 5.2 Training of Trainers

The Specialist conducted two, one-half day training sessions for six PCU trainers, in the use of the *Training Handbook*, focusing on environmental aspects of plantation forestry and environmental data collection. Also discussed were the following topics:

- training evaluation processes
- training skills
- use of case studies
- use of simulations
- use of audiovisual materials

The matrix below summarizes environmental training provided by the Environmental Training Specialist to Project and other DOF staff during 1997.

Training Topic	Participants (DOF Unit & Number)	Schedule & Location	Remarks & Status
Environmental Baseline Surveys	PPCU, 30	May 1997; 4 provinces	Refresher training in use of EBS forms and introductory training for newly assigned PPCU personnel. <b>COMPLETED</b>
Environmental Data Analysis	PCU/MES, 6	May 1997; PCU in Vientiane	<b>COMPLETED</b>
Environmental Monitoring	PPCU, 30	May 1997; 4 provinces	<b>Completed</b> for 3 provinces. PCU/MES provided training for Vientiane Municipality separately.
Environmental Reporting	PCU/MES, 6		Training for PCU/MES on extraction, analysis, & reporting of data from environmental monitoring form. <b>COMPLETED</b>
Mitigation Measures	PCU/MES	July 1997; PCU, Vientiane	Introductory remarks <b>COMPLETED</b>
Use of <i>Training Handbook for Environmental Monitoring of Forest Tree Plantations in Lao PDR</i>	PCU/MES, 6	December 1997	<b>COMPLETED</b>



## 6. 1998 Schedule for the Environmental Monitoring Specialist

The following schedule is proposed for visits of the Environmental Monitoring Specialist during 1998:

Dates	Person-Months	Tasks	Outputs	Remarks
23 February - 7 March 1998	0.50	<ul style="list-style-type: none"> <li>• <i>Environmental Baseline Survey Report</i> for 1997 PBPs</li> <li>• <i>Environmental Monitoring Report No. 2</i> for 1997 - 1998</li> <li>• Preliminary environmental assessment of Saravan and Champassack provinces for tree plantations</li> <li>• Environmental training for PPCU in Saravan and Champassack provinces</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Environmental Baseline Survey Report</i> for 1997 PBPs</li> <li>• <i>Environmental Monitoring Report No. 2</i> for 1997 - 1998</li> <li>• Trip Report No. 9</li> <li>• Training of 6-10 PPCU in environmental aspects of establishment of tree plantations in Saravan and Champassack provinces</li> </ul>	
19-31 October 1998	0.50	<ul style="list-style-type: none"> <li>• Preparation of a manual on mitigation of environmental impacts from tree plantations</li> </ul>	<ul style="list-style-type: none"> <li>• Manual for Mitigation of Environmental Impacts from Tree Plantations in Lao PDR</li> </ul>	
<b>Total</b>	<b>1.00</b>			

## 7. Conclusions and Recommendations

### 7.1 Conclusions

1. A Training Handbook for use by the PCU for training of new PPCU and other DOF personnel in environmental aspects of plantation forestry and environmental data collection was prepared by the Specialist and six PCU staff members were trained to use the handbook. The Handbook will be used by the PCU to train PPCU and other DOF personnel in environmental aspects of plantation forestry.
2. A Mini Environmental Baseline Survey form and a Mini Environmental Monitoring form were prepared during the visit for use by the PPCU to collect environmental baseline data and conduct environmental monitoring at plantation sites established by individual farmers planting less than 5 ha and groups of private farm plantations with total area greater than 5 ha. Although EBS and EMR were not originally designed for private farmer plantations, experience of Project

personnel indicates that environmental monitoring of these tree plantation sites also is required.

3. The Environmental Guidelines for Plantation Establishment were revised based upon two years of experience of the Project. Compliance to these 10 Guidelines will be monitored by the PCU/MES and the PPCU, to ensure there are minimal environmental impacts to the natural resource base in communities in the vicinity of the tree plantations.
4. Following consultation with DOF officials and advisors associated with Wildlife and Protected Areas Conservation Component / Forest Management and Conservation Project, on aspects of biodiversity monitoring in conservation forests, the Specialist learned that no monitoring system had yet been developed, and that project advisors were interested in learning more about the Project's Environmental Monitoring System for tree plantations.

## **7.2 Recommendations**

1. Should the Project expand into Saravan and Champassack provinces as planned, an assessment of environmental conditions in these provinces will be required. The Specialist recommends that a field trip to potential plantation sites be undertaken during the next visit to the Project in February/March 1998, for the purpose of observing and better understanding of the possible environmental constraints existing in those provinces.
2. The Environmental Guidelines for Establishment of Tree Plantations in Lao PDR should be reviewed periodically, to take into consideration lessons learned about establishing and managing tree plantations in various regions of Lao PDR.

## **List of Appendices**

- Appendix 1: Environmental Monitoring Specialist's Terms of Reference
- Appendix 2: Itinerary: 24 November - 6 December 1997
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- Appendix 5: Environmental Monitoring Component: List of Documents

## **Appendix 1: Terms of Reference**

## **Terms of Reference for the Environmental Monitoring Specialist**

(from the Project Administration Memorandum  
dated May 1994)

1. Review the environmental aspects of the Project area and carry out a baseline environmental survey. Prepare a comprehensive baseline survey report.
2. Prepare guidelines for environmental protection in industrial tree plantations.
3. Assist the PCU to include environmental aspects in the training program for staff and the Community Organizers, and in the extension service to the farmers.
4. Strengthen awareness among the Project staff and Community Organizers of the importance of environmental protection in effective implementation of the Project
5. Prepare a detailed program and reporting format for the monitoring and evaluation of environmental impacts of tree plantations.
6. Assist the PCU and PPCUs coordinate activities with NGOs, village committees, and other organizations to achieve the necessary level of community involvement in environmental protection.

**Appendix 2: Itinerary**  
**(Work Plan)**  
**24 November - 6 December 1997**

## **Proposed Work Plan for the Environmental Monitoring Specialist for the Period 24 November - 6 December 1997**

Following discussions with Mr. Thomas Brummer, Team Leader, and Dr. Phet Phomphiphak, the chief of the MES, the following work plan and schedule of field trips to project sites during the period 24 November - 6 December 1997 is proposed:

24 November 1997

Meetings with Team Leader and Chief of MES to discuss work plan.  
Preparation of Proposed Work Plan and review of existing training materials.

25 November 1997

Meetings with Team Leader and Chief of MES to discuss proposed work plan.  
Preparation of Training Handbook for use by PCU for training of new PPCU in environmental aspects of plantation forestry and conducting environmental data collection.

26 November 1997

Morning: Preparation of Training Handbook for use by PCU for training of new PPCU in environmental aspects of plantation forestry and conducting environmental data collection.  
Afternoon: Meeting with Mr. Bruce Jefferies, Team Leader, Wildlife and Protected Areas Conservation Component/Forest Management and Conservation Project, to discuss biodiversity monitoring activities and plans in conservation forests.

27 November 1997

Preparation of Training Handbook for use by PCU for training of new PPCU in environmental aspects of plantation forestry and conducting environmental data collection.

28 November 1997

Preparation of Mini Environmental Baseline Survey (EBS) for use by PPCU to establish baseline data for Pilot Farm Plantations (PFP).

29 November 1997

Morning: Preparation of Mini Environmental Monitoring forms for use by PPCU to follow up on environmental impacts at PFP.

1 December 1997

Morning: Preparation of Mini Environmental Monitoring forms for use by PPCU to follow up on environmental impacts at PFP.

1 December 1997

Afternoon: Preparation of Environmental Guidelines for Plantation Establishment.

2 December 1997

Lao National Holiday

3 December 1997

Morning: Preparation of training materials for training of PCU trainers in environmental aspects of plantation forestry and conducting environmental data collection.

Afternoon: Training of trainers in environmental aspects of plantation forestry and conducting environmental data collection.

4 December 1997

Morning: Preparation of Environmental Monitoring Update Report (for inclusion in Project Completion Report).

Afternoon: Training of trainers in environmental aspects of plantation forestry and conducting environmental data collection.

5 December 1997

Morning: Preparation of Environmental Monitoring Update Report and preparation of Environmental Specialist's 8th Trip Report.

Afternoon: Preparation of Environmental Specialist's 8th Trip Report and review of Trip Report with Team Leader and PCU management.

6 December 1997

Travel to Bangkok.



**Appendix 3:**

**Drafts of the Mini EBS and Mini EMR Forms**

*Draft*  
**Lao-ADB Plantation Forestry Project**  
**Environmental Baseline Survey Short Form<sup>1</sup>**  
**(Mini EBS<sup>2</sup>)**

1. Date of Mini EBS: \_\_\_\_\_
2. Province: \_\_\_\_\_
3. District: \_\_\_\_\_
4. Village: \_\_\_\_\_
5. Responsible: \_\_\_\_\_

////////////////////////////////////

**DATA TO BE OBTAINED FROM THE VILLAGE**

**8. LAND DATA**

8.1 Official status of the plantation site:

Public land: \_\_\_\_\_  
*(Current official classification)*

Private land: \_\_\_\_\_  
*(Name and address of owner)*

8.2 Area of the proposed plantation site: \_\_\_\_\_ ha.

8.3 Current land use:

grazing land

alternative site  available  
 unavailable

permanent upland agriculture

alternative site  available  
 unavailable

shifting agriculture

alternative site  available  
 unavailable

source of non-wood forest products

alternative site  available  
 unavailable

other (specify) \_\_\_\_\_  
 alternative site  available  
 unavailable

**9. SITE LOCATION DATA**

9.2.1 Water bodies

Water Body	Name	Inside the Plantation Site	Used as Source of Water for Drinking/Household
Natural ponds	_____	_____ ha.	<input type="checkbox"/> used <input type="checkbox"/> not used
	<input type="checkbox"/> perennial <input type="checkbox"/> seasonal	_____ ha.	<input type="checkbox"/> used <input type="checkbox"/> not used
Constructed ponds <i>(Fish ponds)</i>	_____	_____ ha.	<input type="checkbox"/> used <input type="checkbox"/> not used
	<input type="checkbox"/> perennial <input type="checkbox"/> seasonal	_____ ha.	<input type="checkbox"/> used <input type="checkbox"/> not used
Other water bodies <i>(wells)</i>	_____	_____ ha.	<input type="checkbox"/> used <input type="checkbox"/> not used
	<input type="checkbox"/> perennial <input type="checkbox"/> seasonal	_____ ha.	<input type="checkbox"/> used <input type="checkbox"/> not used

<sup>1</sup> Date of Form: December 1997

<sup>2</sup> Numbers of Mini EBS correspond to those in the full EBS form dated November 1996

**DATA TO BE OBTAINED FROM THE PROPOSED SITE**

**13. PHYSICAL CONDITIONS DATA**

13.2 Total number of sloped areas greater than 15 degrees: \_\_\_\_\_ slopes on \_\_\_\_\_ ha

13.3 Drainage channels: Total number: \_\_\_\_\_

<u>Drainage Channel No.</u>	<u>Approximate Length (meters)</u>
D1	_____ m
D2	_____ m
D3	_____ m
D4	_____ m

**14. NATURAL VEGETATIVE COVER DATA**

14.2 Quality of natural vegetative cover of site designated for the proposed plantation

- |  |               |   |               |
|--|---------------|---|---------------|
| <input type="checkbox"/> well stocked forest cover | _____ percent | <input type="checkbox"/> unstocked forest cover | _____ percent |
| <input type="checkbox"/> scrub forest              | _____ percent | <input type="checkbox"/> shrubs                 | _____ percent |
| <input type="checkbox"/> thick grass               | _____ percent | <input type="checkbox"/> thin ground cover      | _____ percent |
| <input type="checkbox"/> eroded ground cover       | _____ percent | <input type="checkbox"/> rocky area             | _____ percent |
| <input type="checkbox"/> other (specify) _____     | _____ percent |   |               |

**Total vegetative cover** **100 percent**

14.2.1 Scrub forest and shrub cover percentage (*in most cases this will be 100 percent since preferred sites for proposed plantations are unstocked forest lands*): \_\_\_\_\_ percent

14.2.2 Percent of total area covered by ***crowns*** of scrub forest trees and shrubs: \_\_\_\_\_ percent

14.2.3 If crown cover not 100% scrub forest tree and shrub cover, specify composition and density of natural vegetation cover of the proposed site:

List of Dominant and Sub-Dominant Species

Density (percent)

- |    |       |         |
|----|-------|---------|
| 1. | _____ | _____ % |
| 2. | _____ | _____ % |
| 3. | _____ | _____ % |
| 4. | _____ | _____ % |
| 5. | _____ | _____ % |

**15. SOILS DATA**

15.1 Approximate average depth of topsoil: \_\_\_\_\_ cm

*(Average should be calculated based on measuring topsoil depths at a random sampling of points inside the proposed plantation site.)*

15.2 Evidence of existing erosion at the proposed tree plantation site: Roots of trees and shrubs are showing:  yes; number of centimeters: \_\_\_\_\_ cm  
 no

**END**



Results of the Mini Baseline Environmental Survey		Environmental Monitoring Report				
Item No.		1	2	3	4	
<b>9. Site Location Data</b>						
9.2	Category of Water Body Inside the Plantation Site	Seasonality of Water Body & Use as Source of Water for Drinking/ Household	Seasonality for	of Water Body Drinking /	& Use as Source of Household	of Water
	Natural Ponds	Pond No. 1: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used Pond No. 2: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used	Pond No. 1: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used Pond No. 2: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used	Pond No. 1: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used Pond No. 2: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used	Pond No. 1: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used Pond No. 2: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used	Pond No. 1: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used Pond No. 2: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used
9.2.1	Constructed Ponds ( <i>Fish ponds</i> )	Pond No. 1: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used Pond No. 2: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used	Pond No. 1: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used Pond No. 2: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used	Pond No. 1: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used Pond No. 2: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used	Pond No. 1: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used Pond No. 2: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used	Pond No. 1: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used Pond No. 2: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used
	Other Water Bodies ( <i>Wells</i> )	Well No. 1: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used Well No. 2: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used	Well No. 1: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used Well No. 2: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used	Well No. 1: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used Well No. 2: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used	Well No. 1: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used Well No. 2: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used	Well No. 1: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used Well No. 2: <input type="checkbox"/> perennial <input type="checkbox"/> seasonal <input type="checkbox"/> used <input type="checkbox"/> not used

## DATA TO BE OBTAINED FROM THE PLANTATION SITE

Results of the Mini Baseline Survey		Environmental Monitoring Report				
Item No.		1	2	3	4	
<b>13. PHYSICAL CONDITIONS DATA</b>						
13.2	Total number of sloped areas greater than 15°	No. of sloped areas:	No. of sloped areas:	No. of sloped areas:	No. of sloped areas:	No. of sloped areas:
13.3	Drainage channels	Total number of drainage channels:	Total number of new drainage channels:	Total number of new drainage channels:	Total number of new drainage channels:	Total number of new drainage channels:
<b>14. Natural Vegetative Cover Data</b>						
14.2	Total vegetative cover	100 percent	_____ percent	_____ percent	_____ percent	_____ percent
14.2.1	Scrub forest & shrub cover	_____ percent	_____ percent	_____ percent	_____ percent	_____ percent
14.2.2	Percent of total area covered by <i>crowns</i> of scrub forest trees & shrubs	_____ percent	_____ percent	_____ percent	_____ percent	_____ percent
14.2.3	Composition and density of natural vegetation cover of the proposed site: List of Dominant & Sub-Dominant Species Density (percent)	1. _____ % 2. _____ % 3. _____ % 4. _____ % 5. _____ %	1. _____ % 2. _____ % 3. _____ % 4. _____ % 5. _____ %	1. _____ % 2. _____ % 3. _____ % 4. _____ % 5. _____ %	1. _____ % 2. _____ % 3. _____ % 4. _____ % 5. _____ %	1. _____ % 2. _____ % 3. _____ % 4. _____ % 5. _____ %
<b>15. SOILS DATA</b>						
15.2	Measure topsoil loss: Are roots of trees and shrubs beginning to appear above the ground?	<input type="checkbox"/> no <input type="checkbox"/> yes If yes, number of centimeters _____ cms.	<input type="checkbox"/> no <input type="checkbox"/> yes If yes, number of centimeters _____ cms.	<input type="checkbox"/> no <input type="checkbox"/> yes If yes, number of centimeters _____ cms.	<input type="checkbox"/> no <input type="checkbox"/> yes If yes, number of centimeters _____ cms.	<input type="checkbox"/> no <input type="checkbox"/> yes If yes, number of centimeters _____ cms.

**END**

<sup>1</sup> Date of form: December 1997

<sup>2</sup> Numbers of Mini EMR correspond to those in the full EBS form dated November 1996.

**Appendix 4:**  
**Environmental Guidelines**  
**for Establishment of Tree Plantations in Lao PDR**



## **Environmental Guidelines for Plantation Establishment**

### **Introduction**

The Environmental Guidelines for Plantation Establishment have been prepared based upon experiences of the Lao-ADB Plantation Forestry Project since 1994. The Guidelines are seen as appropriate for the topographic, agro-ecological, and socio-economic conditions prevailing in the four provinces of Lao PDR in which the Project has been implemented to date, namely: Vientiane Province, Vientiane Prefecture, Bolikhamsai, and Savannakhet.

Among the conditions that predominate in these provinces include:

- mostly flat alluvial lowland plains (the Vientiane Plain of Vientiane Province and Vientiane Prefecture), Savannakhet Plain, and the Paksan Plain (of Bolikhamsai Province) along the Mekong River and its tributaries;
- high (for Lao PDR) population density (among the highest in Lao PDR, approximately 100 persons per square kilometer) and several population centers (Vientiane, Paksan, Thakhek, Savannakhet);
- most intensive agricultural land use in Lao PDR (particularly in Vientiane Prefecture), with 80 percent of the population engaged in agricultural activities;
- mostly sandy loam or sandy clay loam, with some areas in Vientiane Province and Vientiane Prefecture having alluvial complex with shallow thick loose layer of round gravel; and,
- competition for forest land from agriculture, urban expansion, industrial development, and installation of communications, transportation, and energy infrastructure units.

The Environmental Guidelines recommended here also have been derived from:

- the results of environmental monitoring at pilot block plantations operated by the Project since 1995;
- modifications of Preliminary Environmental Guidelines for Plantation Establishment issued by the Project in mid 1996; and,
- observations and recommendations made by Project staff and consultants since 1994.

These Environmental Guidelines are expected to be modified periodically, as forest plantations are established in other regions of Lao PDR, where agro-ecological conditions (including, for example, steep slopes and loose soils) predominate, and the need for other locally appropriate guidelines may be required.

The purpose of the Environmental Guidelines for Plantation Establishment is to provide Project staff and Department of Forestry personnel with guidelines to control plantation establishment in an effort to minimize negative impacts on the environment. In this way, they can make best use of the types of degraded forest lands usually available.



## **Environmental Guidelines for Plantation Establishment**

1. Flat to gently sloping land, 0 to 15 degrees can be burned and prepared by bulldozer and ploughing prior to planting.
2. Moderately sloping land, 16 to 30 degrees, can be burned and planted using holes, but cannot be prepared by bulldozer or ploughing. Weeding must be only by hand methods.
3. Steep land, more than 30 degrees, should not be cleared; if already cleared, it should be left unplanted and not be weeded.
4. The bottom and banks of wet season drainage channels (dry watercourses) should not be planted nor weeded. For drainage channels with abrupt slopes, natural vegetation also should be preserved for a distance of 5 to 10 meters along the edge of the drainage channels. For drainage channels with gradual slopes, a two meter wide protection strip of natural growth also should be retained on either side of the mid-point of the bottom of the channel; or, a protection strip of natural growth that is as wide as the water is known to flow during wet season rains should be retained at the bottom of the channel.
5. Bulldozers should not travel on tracks and roads inside plantations, nor should these roads be ploughed.
6. A protection strip 40 meters wide (measuring from the wet season water level) must be retained in place around lakes, ponds, and other standing water bodies located inside or adjacent to plantations. If the area around the standing water body is already cleared, the 40 meter strip should remain unplanted to allow for regeneration of a natural growth protection strip. No bulldozer work or ploughing should take place in the strip, nor should it be weeded.
7. A protection strip 20 meters wide must be retained in place on the banks of streams, rivers, and other flowing water courses. If the area around the flowing water course is already cleared, the 20 meter strip should remain unplanted to allow for regeneration of a protection strip of natural growth. No bulldozer work or ploughing should take place in the strip, nor should it be weeded.
8. A protection strip not less than 5 meters wide must be retained around rice paddy fields. If the area around the paddy field is already cleared, the 5 meter strip should remain unplanted to allow for regeneration of a protection strip of natural growth. No bulldozer work or ploughing should take place in the strip, nor should it be weeded.
9. The boundaries of block (closed spacing) forest tree plantations must be a minimum of 40 meters from a village for protection against fire.
10. Existing scattered indigenous trees more than 15 centimeters in diameter, and bamboo species that provide non-wood forest products will be left in the plantation during land clearing.

**Appendix 5:**  
**Environmental Monitoring Component:**  
**List of Documents**

# **Lao - ADB Plantation Forestry Project**

## **Environmental Monitoring Component**

### **List of Documents**

prepared by Mr. Anthony M. Zola  
Environmental Monitoring Specialist  
between December 1995 and December 1997

#### **Trip Reports**

Environmental Monitoring Specialist Trip Report No. 1, December 1995  
Environmental Monitoring Specialist Trip Report No. 2, March 1996  
Environmental Monitoring Specialist Trip Report No. 3, July/August 1996  
Environmental Monitoring Specialist Trip Report No. 4, November 1996  
Environmental Monitoring Specialist Trip Report No. 5, March 1997  
Environmental Monitoring Specialist Trip Report No. 6, May 1997  
Environmental Monitoring Specialist Trip Report No. 7, July 1997  
Environmental Monitoring Specialist Trip Report No. 8, November/December 1997

#### **Technical Reports**

1. Environmental Baseline Survey Report, May 1997
2. Environmental Monitoring System Report: Detailed Program and Reporting Format for Monitoring and Evaluation of Environmental Impacts of Tree Plantations in Lao PDR, May 1997
3. Environmental Monitoring Report No. 1: Environmental Report on 1995 and 1996 Pilot Block Plantations, July 1997
4. Training Handbook for Environmental Monitoring of Forest Tree Plantations in Lao PDR, December 1997