



RAP PUBLICATION 2001/15

Asia-Pacific Forestry Commission

Regional training strategy:

**supporting the implementation of the code of practice for forest
harvesting in Asia-Pacific**

**Food and Agricultural Organization of the United Nations
Regional Office for Asia and the Pacific
Bangkok, Thailand**

2001

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying or otherwise, without the permission of the copyright owner. Applications for such permission, with a statement of the purpose and extent of the reproduction, should be addressed to the Senior Forestry Officer, Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Pacific, 39 Phra Atit Road, Bangkok, Thailand.

Cover photos: Sarawak Timber Association and Thomas Enters

For copies of the report, write to:

Patrick B. Durst
Senior Forestry Officer
FAO Regional Office for Asia and the Pacific
39 Phra Atit Road
Bangkok 10200
Thailand
Tel: (66-2) 697-4000
Fax: (66-2) 697-4445
Email: Patrick.Durst@fao.org

© FAO 2001
ISBN 974-88439-5-5

FOREWORD

For the past several years, member countries of the Asia-Pacific Forestry Commission (APFC) have directed their efforts at achieving sustainable forest management. An important milestone was reached with the development of the *Code of Practice for Forest Harvesting in Asia-Pacific*. The *Code* encourages environmentally-sound forest harvesting throughout the region. The public and private sectors have responded positively to the *Code*, and many countries have developed national codes. However, although the need for change is acknowledged widely, most countries face considerable difficulties in achieving higher standards in forest harvesting. In many countries, logging and supervisory personnel are insufficiently prepared to put the *Code* into practice.

Providing training to increase the skill levels of forest harvesting operators is not a new idea. Most employees are informally instructed and learn on the job. In addition, many projects have provided training courses for field-level workers over the last decade or longer. However, most efforts have been uncoordinated and conducted in the absence of thorough needs assessments. As a result, the impact of the training has been disappointing. What has been lacking in the past is a cohesive strategy for improving forest harvesting practices through a structured and systematic approach to training and education of industry and forest agency personnel at all levels.

The Regional Training Strategy has been developed by the APFC *ad hoc* Working Group on Sustainable Forest Management to lay the foundation for a comprehensive effort to build a skilled and trained workforce with the ability to implement the *Code*. It provides guidance for developing training activities and encourages collaboration among countries, to avoid the hitherto duplication of efforts. FAO is pleased to have contributed to the formulation of this strategy and we hope that it will ultimately result in the application of the necessary harvesting standards for the benefit of the region's forests and its people.

R.B. Singh
Assistant Director-General and
Regional Representative for Asia and the Pacific
Food and Agriculture Organization of the United Nations

ACKNOWLEDGEMENTS

Numerous organizations and individuals contributed to the development of the Regional Training Strategy, including providing support for the “Regional Workshop to Develop a Training Strategy.” They deserve to be thanked and acknowledged:

Green Tropics International (GTI) for coordinating and facilitating the process of developing this Regional Training Strategy and drafting the document

Ministry of Forestry (MOF, Indonesia) for organizing and hosting the workshop

The Ad Hoc Working Group for Sustainable Forest Management of the Asia-Pacific Forestry Commission (APFC) for providing the secretariat and logistical support

Japan International Forestry Promotion and Cooperation Center (JIFPRO), USDA Forest Service and MOF (Indonesia) for providing financial support

The ITTO Pre-project “Strengthening Sustainable Management of Natural Forests in Asia-Pacific” for providing additional support

Patrick Durst of FAO/RAP for useful guidance and moral support

I.G.M. Tantra of MOF (Indonesia) for his leadership role in the workshop

Benni H. Sormin of MOF (Indonesia) and Borhanuddin bin Hj. Arshad of the Forestry Department, Peninsular Malaysia for chairing workshop group sessions

Peter C.S. Kho of the Sarawak Timber Association (STA) and Augustine Lumanghkun of the Tanjung Pura University for serving as rapporteurs

Grahame Applegate of the Center for International Forestry Research (CIFOR) for providing valuable leads to information relevant to the development of the Regional Training Strategy and for his incisive critique of the draft.

Nunuk Supritanto of Gadjah Mada University for valuable background papers on training strategy development

Robin Leslie and Thomas Enters for their editorial support for this document

ACRONYMS

AFFA	Department of Agriculture, Fisheries and Forestry - Australia
ANFE	Asian Network for Forestry Education
APFC	Asia-Pacific Forestry Commission
AusAID	Australian Agency for International Development
CD	Compact disk
CIFOR	Center for International Forestry Research
COLP	Code of Logging Practices
CPFH	Code of Practice for Forest Harvesting
DFID	Department for International Development (UK)
FAO	Food and Agriculture Organization of the United Nations
FAO/RAP	FAO Regional Office for Asia and the Pacific
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
ITTO	International Tropical Timber Organization
JICA	Japan International Cooperation Agency
JIFPRO	Japan International Forestry Promotion and Cooperation Center
MOF	Ministry of Forestry (Indonesia)
NCIU	National Coordinating and Implementing Unit
NGO	Non-governmental organization
PIFTSP	Pacific Islands Forests & Trees Support Programme
RCIU	Regional Coordinating and Implementing Unit
RIL	Reduced impact logging
RTCT	Regional Training Course for Trainers
SFM	Sustainable forest management
SWOT	Strengths, weaknesses, opportunities and threats
TNA	Training needs assessment
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
USDA/FS	United States Department of Agriculture/Forest Service

TABLE OF CONTENTS

Foreword

Acknowledgements

Acronyms

Introduction	1
The need for a training strategy to support the <i>Code</i> implementation	2
Previous training efforts in support of <i>Code</i> implementation	2
The need for a comprehensive training strategy	3
Regional training strategy	4
Goal	4
Objectives	4
The regional training strategy	4
Key training target groups	6
Actions required to meet the objectives of the training strategy	6
Advantages of the proposed regional training strategy	8
Implementation of the regional training strategy	8
Coordinating and implementing mechanism	8
Design and development of CD-based training materials	9
Development and organization of the RTCT	10
Selection of national trainers to be trained	10
Selection of training specialists	11
Development of the course design	11
Selection of host institutions and course venues	13
Course implementation	14
Course evaluation	15
Development and organization of in-country courses	15
Identification and prioritization of stakeholder groups to be trained	15
Assessment of the training needs of priority stakeholders	16
Preparation of course designs or plans for stakeholders	16
Preparation of training materials	16
Formation of support staff groups	18
Selection of course venues	18
Implementation of courses	18

Course evaluation	18
Integration of the <i>Code</i> in formal forest harvesting and silvicultural courses	19
Sharing of training resources	19
Funding the implementation of the training strategy	19
References	21
Appendix 1 Identifying training groups for <i>Code</i> implementation	23
Appendix 2 Training needs assessment (TNA)	24
Appendix 3 Establishing training objectives based on TNA	26
Appendix 4 Pro forma training modules	28

INTRODUCTION

At the Sixteenth Session of the Asia-Pacific Forestry Commission (APFC), held in Yangon, Myanmar, in January 1996, the Commission decided to develop a regional code of practice for forest harvesting. Under the guidance of the APFC *ad hoc* Working Group on Sustainable Forest Management, the *Code of Practice for Forest Harvesting in Asia-Pacific* was developed during an exhaustive participatory process covering more than two years (FAO 1999a). The *Code* was subsequently endorsed by the Seventeenth Session of the APFC in February 1998, in Yogyakarta, Indonesia. Member countries of the APFC and international organizations were called upon to support the implementation of the *Code*.

The *Code* is intended to encourage environmentally-sound forest harvesting throughout the region. It was developed specifically to provide a basis for subregional or national codes, and to guide forest harvesting practices in the absence of local codes or forest harvesting guidelines. It outlines key principles of improved harvesting in Asia and the Pacific, particularly timber harvesting with reduced environmental and social impacts.

In support of the *Code*, the APFC commissioned the development of the *Regional Strategy for Implementing the Code of Practice for Forest Harvesting in Asia-Pacific* (APFC 2000). The regional strategy was published in July 2000 and provides a model for implementing codes of practice that countries can adopt and adapt to suit national circumstances. Its contents comprise aspects of awareness raising, development of national codes of practice, and complementary measures for assessing adherence to the *Code* with particular reference to training and education. The goals and objectives of the regional strategy are expressed as eight strategies for implementation (see box below), with two of them (3 and 5) referring directly to education and training.

The eight strategies for *Code* implementation

1. *Encourage appropriate public and political support for the implementation of the Code.*
2. *Develop awareness and support for the Code at regional and national policy-making levels by stakeholders.*
3. *Develop a forestry sector that is educated and trained in Code implementation.*
4. *Encourage the development and implementation of national codes based on the original regional code.*
5. *Establish forest sites for demonstration and training.*
6. *Implement monitoring and auditing systems.*
7. *Collate past and present research results for development of appropriate research to support sustainable forest management.*
8. *Further develop and implement sustainable forest management practices in the Asia-Pacific region.*

The public and private sectors in the region have responded very positively to the *Code*, the regional strategy and other awareness-raising activities under the APFC umbrella. At the same time, representatives of the forestry sector have recognized the need to train (or retrain) personnel on the various facets of improved forest harvesting practices before they can implement *Code* techniques properly. Representatives of the logging industries and forestry agencies have especially requested support in human resource development to enhance capacities at all levels, from implementers (operators and front-line supervisors) to management and policy-makers for effective implementation of the *Code* and reduced impact logging (RIL) practices. In response, various organizations in the region have conducted training courses or workshops. Examples are:

- ❑ Australia and the APFC organized a one-month “Training-of-Trainers” Workshop on Development and Implementation of the *Code of Practice for Forest Harvesting in Asia-Pacific*, in May 1999, in Sabah, Malaysia (18 participants from Cambodia, Indonesia, Malaysia, Philippines and Viet Nam).
- ❑ The Pacific Islands Forests and Trees Support Programme organized a three-part “Training-of-Trainers” Workshop on Silvicultural Prescriptions and Reduced Impact Logging Techniques for participants from South Pacific countries in 1998 (Phase I was a four-week workshop held in Papua New Guinea; Phase II was national-level workshops in each country; Phase III was a one-week workshop in Vanuatu).
- ❑ Several bilateral assistance organizations (e.g. GTZ, AusAID, USAID, DFID) and nongovernment organizations (NGOs) are supporting training in RIL and sustainable forest management, consistent with the *Code*.
- ❑ Training materials in support of RIL and *Code* implementation have been, or are being, developed by a number of organizations in the region. Recognizing the need for material in national languages, FAO/RAP is supporting the development of such materials and their translation.

Discussions during a RIL study tour to Sabah, Malaysia in March 1999 revealed that training requirements to support RIL adoption and application are enormous (FAO 1999b). The two dozen high-ranking forestry officials from the region strongly recommended the formulation of a comprehensive training strategy to accentuate training efforts on clearly identified and prioritized training needs. They emphasized that such a strategy was necessary to bring order to the proliferation of training efforts, which at that time were dissipating scarce resources and minimizing benefits.

As a follow-up to this identified need, the APFC *ad hoc* Working Group on Sustainable Forest Management agreed to formulate a regional training strategy. This document is the result of that effort. It presents a generic training strategy that can be adapted to specific needs and situations.

THE NEED FOR A TRAINING STRATEGY TO SUPPORT THE CODE'S IMPLEMENTATION

Previous training efforts in support of *Code* implementation

There have been various notable but uncoordinated efforts to meet the training needs for *Code*/COLP implementation. For instance, Vanuatu, with assistance from Australia, formulated a training manual to address skill deficiencies discovered during initial COLP implementation (Andrewartha 2001).

Several international organizations, such as the Australian Agency for International Development (AusAID), the United States Department of Agriculture/Forest Service (USDA/FS), and the International Tropical Timber Organization (ITTO) have provided technical and financial assistance for training their forest harvesting personnel in Asia and the Pacific.

To achieve an optimal multiplier effect, many programs were set up to train trainers who were expected to return to their respective countries to design, develop and coordinate training courses at the national and local level to support implementation of the *Code* or national COLP. To build up a critical mass of qualified trainers in the South Pacific, a number of these training workshops were undertaken, largely under the auspices of the Pacific Islands Forests & Trees Support Program (PIFTSP)¹, in conjunction with AusAID and the USDA/FS.

¹ For a comprehensive overview of activities concerning the implementation of codes of logging practices and directions for the future in the Pacific see Bulai *et al.* 2000.

The need for a comprehensive training strategy

Generally, the individual country responses to the need for training have been reactive rather than proactive. Training courses tended to be uncoordinated and piecemeal. For instance, many training efforts concentrated on personnel directly involved in forest harvesting such as chainsaw operators, fellers/buckers and skidder operators. Frequently it was overlooked that there is also a need to train other stakeholders whose functions are seemingly unrelated or not directly related to activities on the ground but nevertheless influence the impacts and outcomes of logging. Policy-makers are a good example; the forest policies they formulate can either promote or discourage the application of conservation-oriented harvesting techniques.

Proactive and effective training recognizes the heterogeneity of key training target groups and the variety of functions and tasks that need to be performed in forest management and harvesting. Key training target groups range from policy-makers and corporate planners at the apex of a triangle through frontline supervisors in the middle, to field operators at the bottom (Figure 1). Therefore it is evident that the range of knowledge and skills differs among groups and that training in directional felling and skidding is only one component, albeit an important one, of an array of training activities for which modules need to be designed, appropriate trainers employed and training provided.

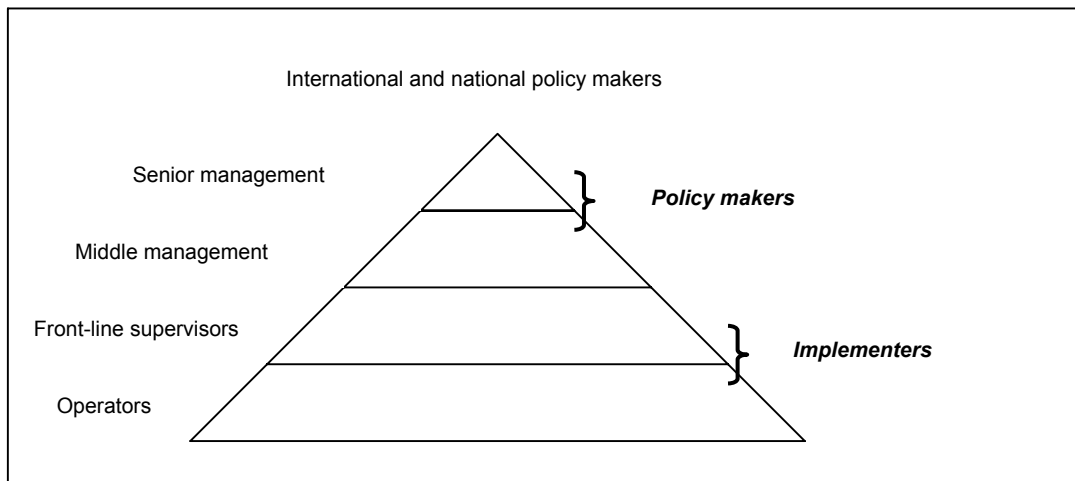


Figure 1. Organizational levels and key training target groups (adapted from APFC 2000)

This clearly indicates a need for a training strategy that is sufficiently comprehensive to encompass all the identified groups of stakeholders, and satisfies most, if not all, of the identified training needs.

Perhaps the single most critical requirement for the successful application of RIL on a wide scale in tropical forests is the availability of skilled logging and supervisory personnel at all levels. Unless tropical countries and the development assistance agencies that work with them recognize this and strive to overcome it, there is little hope that forest concessionaires will be able to implement RIL on a large scale: they simply will be unable to find the personnel who understand both why and how to do RIL.

Dykstra 2001

REGIONAL TRAINING STRATEGY

Goal

The goal of the regional training strategy is to strengthen the capacity of Asia-Pacific countries to implement the *Code of Practice for Forest Harvesting in Asia-Pacific* effectively and to assist countries in the adoption of RIL practices. Achieving this goal is expected to reduce the negative impacts of harvesting operations in the forests significantly; this would greatly facilitate faster recovery and sustained productivity of forests where harvesting operations take place.

Objectives

The training strategy has been developed to support the following objectives:

1. Identify and prioritize the stakeholders in each country who should be trained.
2. Improve national capacity for designing and organizing courses to facilitate the implementation of the *Code*.
3. Develop CD-based training material and modules as an aid for teaching different stakeholder groups in each country.
4. Develop and organize in-country training courses for stakeholder groups prioritized by the different countries.
5. Promote the sharing of training resources among countries to improve the cost-effectiveness of in-country courses.
6. Promote the integration of the *Code* in forest harvesting and silviculture courses offered by various forestry institutions in the Asia-Pacific region.

The regional training strategy

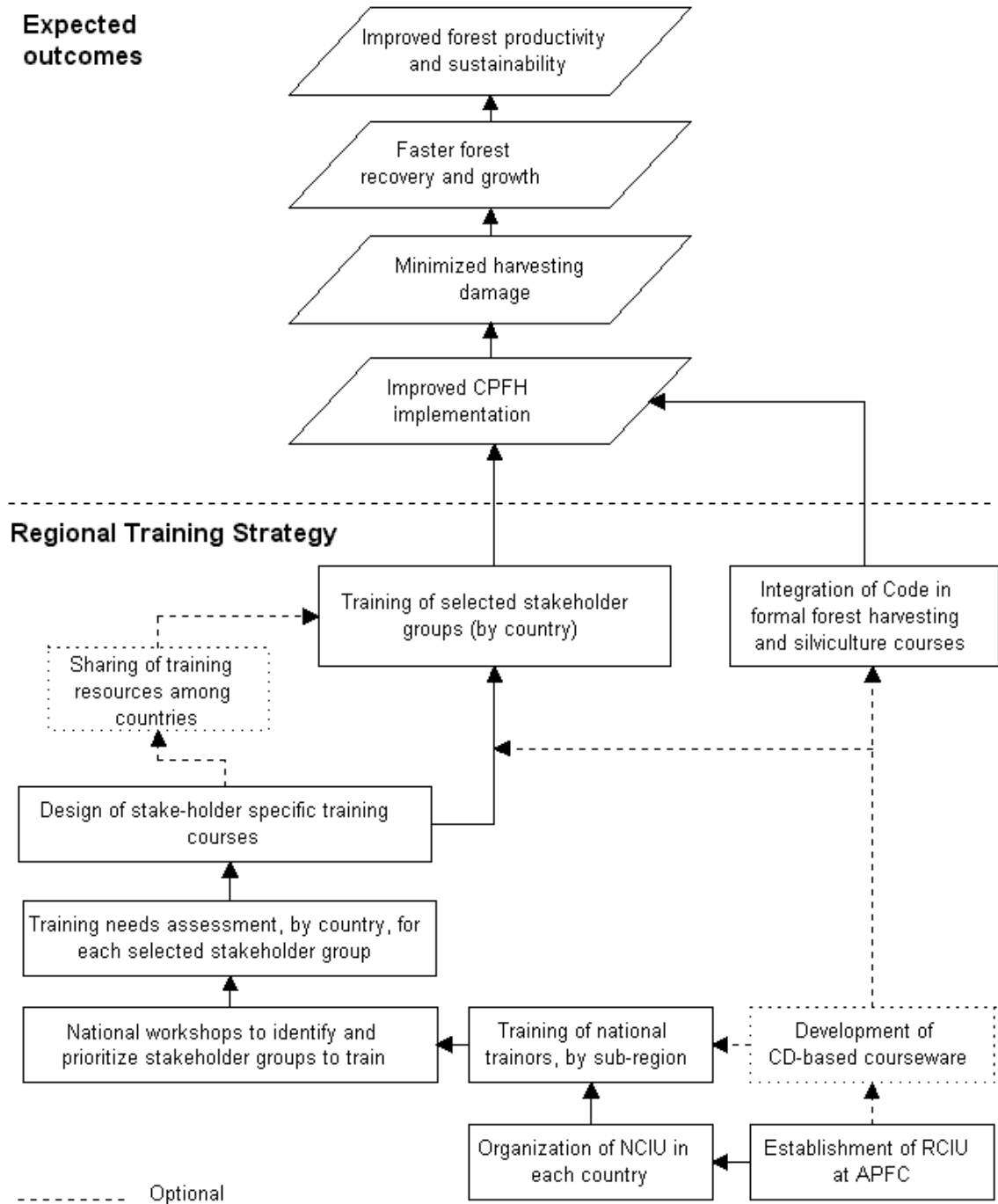
The regional training strategy uses three major tactics:

1. Training of national trainers.
2. Development and organization (by the national trainers) of in-country courses for priority stakeholder groups, including policy-makers and managers.
3. Integration of codes in formal and non-formal forest harvesting and silviculture courses offered by various educational institutions in the Asia-Pacific region.

The adoption of these tactics requires the following activities:

- Organization of national workshops to identify and prioritize the stakeholder groups.
- Design of CD-based training materials for training different stakeholder groups in each country.
- Organization of a course for national trainers at the subregional level.
- Training needs assessment (TNA) of priority stakeholder groups in each country.
- Design and organization of stakeholder-specific training courses in each country.
- Sharing of training resources among the different courses.
- Implementation of in-country training countries.
- Promoting the integration of codes as instructional material in silviculture and forest harvesting courses in universities and colleges.

The major outcome of the regional training strategy will be improved *Code* implementation and the application of RIL practices at the country level. Figure 2 shows the general framework of the strategy and its expected outcomes.



RCIU - Regional Coordinating and Implementing Unit
 NCIU - National Coordinating and Implementing Unit
 CPFH - Code of Practice for Forest Harvesting

Figure 2. The regional training strategy and its expected outcomes

Key training target groups

The regional strategy will provide training to three main groups of potential *Code* trainees:

- national trainers
- code implementers
- other stakeholders

The target training groups may come from the public sector, private companies involved in forest harvesting operations, NGOs, forest-dependent communities and the media (Table 1).

Table 1. The three main groups of potential trainees

Groups or levels	Government sector	Private companies	Others
National trainers	√	√	
Key training target groups			
Senior management, including policy- makers	√	√	
Middle management	√	√	
Front-line supervisors	√	√	
Fieldworkers/operators	√	√	
Other stakeholders			
NGOs			√
Opinion-makers			√
Journalists			√
Forest-dependent communities			√

The target groups are expected to vary from country to country because different countries have different needs. Moreover, priority groups to be trained will be selected by each country. Because there are likely to be funding constraints in many of the countries, prioritization of trainee groups at the country level is desirable.

While identifying priority stakeholders at the country level, it is advisable to disaggregate some of the groups into more or less homogenous subgroups. For instance, the fieldworkers/operators group can be broken down into chainsaw operators, tree markers, tree fellers, heavy equipment operators.

Actions required to meet the objectives of the training strategy

The courses of action needed to meet the objectives of the training strategy and expected outcomes are defined in Table 2.

Table 2. Action needed to meet training strategy objectives and outcomes

Objective	Action	Expected outcomes
<ul style="list-style-type: none"> ◆ To identify and prioritize the groups of stakeholders in each country that require training. 	<ul style="list-style-type: none"> ◆ Organization of national workshops 	<ul style="list-style-type: none"> ◆ List of stakeholders. ◆ Shortlist of priority stakeholder groups that should be trained. ◆ List of country institutions or organizations with qualified personnel to train the priority trainee groups. ◆ List of potential sources of funds for the training courses to be organized. ◆ Lists of major topics to be included in training the different trainee groups, as baseline information for the TNA to be conducted later. ◆ Potential venues for training.
<ul style="list-style-type: none"> ◆ To improve the capacity of countries to design and organize courses. 	<ul style="list-style-type: none"> ◆ Organization of a course for national trainers to be conducted at the subregional level. 	<p>National trainers with enhanced skills in:</p> <ul style="list-style-type: none"> ◆ Conducting TNAs. ◆ Designing, organizing and coordinating short courses. ◆ Preparing teaching aids. ◆ Teaching short courses.
<ul style="list-style-type: none"> ◆ To develop CD-based materials for teaching different stakeholder groups in each country. 	<ul style="list-style-type: none"> ◆ Commissioning of a group to design and develop the tutorial. 	<ul style="list-style-type: none"> ◆ A CD containing training modules for different stakeholder groups.
<ul style="list-style-type: none"> ◆ To develop and organize in-country training courses for priority stakeholder groups. 	<ul style="list-style-type: none"> ◆ TNA of the priority stakeholder groups by the national trainers. ◆ Design and development of the training courses for each priority stakeholder group by the national trainers. ◆ Implementation of training courses. 	<ul style="list-style-type: none"> ◆ Lists of topics to be included in the courses to be developed for the different priority stakeholder groups. ◆ Course plans for each stakeholder group. ◆ Stakeholders with improved skills in <i>Code</i> implementation.
<ul style="list-style-type: none"> ◆ To promote the sharing of training resources among the different countries to improve the cost-effectiveness of the in-country courses. 	<ul style="list-style-type: none"> ◆ Establishment of a unit within the APFC that will serve as a repository of and distribution centre for <i>Code</i>-related training materials developed by the different countries. 	<ul style="list-style-type: none"> ◆ Collection of training materials that can be used by the different countries involved in training.
<ul style="list-style-type: none"> ◆ To promote the use of codes as instructional material in universities and colleges that offer formal or informal courses in forest harvesting. 	<ul style="list-style-type: none"> ◆ Holding of meetings with concerned university or college officials to distribute copies of the <i>Code</i> and to discuss the possible use of the <i>Code</i> as training material for forest harvesting courses. 	<ul style="list-style-type: none"> ◆ Increased use of the <i>Code</i> as training material for forest harvesting courses in universities and colleges.

Advantages of the proposed regional training strategy

An important feature of the regional training strategy is that trainers will be trained at the regional or subregional level while implementers will be trained at the country level. It is expected that the total number of in-country courses to be organized will be many times greater than the number of courses to be held at the subregional level. Assuming, for instance, an average of only two courses per country, the total number of in-country courses would be 40 for 20 countries.

The strategy, which emphasizes in-country training, has several advantages. The most important ones are:

- It is cost-effective. As most of the courses will be held in-country, it will be less costly to expand the human resource base for each country. The cost will be much higher if the strategy involves organizing many regional or subregional courses.
- It uses national languages as the medium for instruction; this facilitates communication between the national trainers and the participants, and recognizes that language barriers frequently limit the effectiveness of training courses.
- It enriches the courses for the different trainee groups by using examples that are based on local conditions. This makes it easier for the participants to relate the knowledge and skills they acquire during the training to the jobs they perform.

IMPLEMENTATION OF THE REGIONAL TRAINING STRATEGY

Coordinating and implementing mechanism

The training strategy aims to provide training to several groups of stakeholders: the national trainers, the *Code* implementers, people representing the media, NGOs and forest-dependent communities. The implementation of the strategy calls for the development and organization of two categories of training courses. The first is regional and the second is in-country. The regional course is designed to produce national trainers who will design, organize and help to coordinate in-country or national courses. The in-country courses, on the other hand, will be held primarily to train national *Code* implementers and other priority stakeholder groups involved in forest management and timber harvesting.

To help implement the regional training strategy effectively, it is essential that coordinating and implementing mechanisms are set up both at the regional and the national levels. At the regional level, there is a need for the establishment of a Regional Coordinating and Implementing Unit (RCIU) with suitable staffing and adequate financial resources to perform the following functions:

- Prepare and execute a plan for the development and organization of the Regional Training Course for Trainers (RTCT).
- Arrange for the development of CD-based training materials for different stakeholder groups in each country.
- Compile, store and disseminate information on in-country courses to facilitate the sharing of training resources among the different countries.
- Coordinate with National Coordinating and Implementing Units (NCIU) on matters relating to course design, availability of training resources and other relevant matters.

The NCIU will perform the following tasks:

- Prepare and execute TNAs for the priority stakeholder groups in each country.
- Design courses for the priority stakeholder groups based on the results of the TNAs.
- Secure funding for the training courses.
- Identify suitable trainers/teachers/resource persons and venues for the courses.

- Provide guidelines on the preparation of visual aids and other training materials.
- Coordinate with agencies, companies or organizations that will be involved in developing and organizing the in-country courses.
- Conduct seminars on effective training/teaching methods for course trainers/teachers who have not participated in the RTCT.
- Help organize and manage the courses.
- Coordinate with the RCIU.

The NCIU will comprise the following personnel:

- A team leader to be designated by the head of the forest agencies. The team leader should preferably be the head of a training unit.
- Two or more national trainers depending on the number of priority training courses identified for implementation. The trainers should come, preferably, from the logging sector and forestry schools and colleges. For courses intended for fieldworkers (e.g. chainsaw operators, fellers, heavy equipment operators, etc.) it is advisable to designate NCIU members from the logging industry.

Design and development of CD-based training materials

CD-based training materials are designed to assist in teaching any subject with the aid of a computer. They can be used by trainers to teach various groups directly. They can also be used for interactive training at home or in the office without the physical presence of a trainer/teacher (self-teaching material). The training materials describe and explain the different topics using not only text but also pictures, drawings and sketches, graphs, video clips, animation, tables, glossaries and other help features. CDs can be viewed at any time or repeatedly, making it possible for the user to acquire knowledge in a very flexible manner.

Developing training materials on the *Code of Practice for Forest Harvesting* and/or RIL can have a major impact on the training of the different stakeholder groups. They can be used by trainers as a training/teaching aids for regional and in-country courses and by forest harvesting and silviculture instructors in forestry schools and colleges. For those who have participated in regional or national courses, CDs can also function as refresher or reference material. The development of the CDs can reduce the cost of preparing training material considerably by minimizing the duplication of effort among countries in producing expensive lecture notes, handouts or visual aids.

In designing and developing the CD, care should be taken to ensure that it:

- Is comprehensive and covers the different topics included in the *Code* and/or the different elements of RIL.
- Employs easily understandable language.
- Makes use of appropriate graphics (artwork, graphs, animation, video clips, etc.) to supplement textual explanations.
- Is user-friendly and provides drop-down and pop-up menus that enable the users to move from one topic to another easily or to find help.
- Provides soft links and hyperlinks to relevant information.
- Includes a help feature to further aid users to understand the different topics covered.
- Is accompanied by a user manual.

To develop the CD, the RCIU should contract a firm with the following expertise:

- A training specialist familiar with the *Code* and experienced in the development of self-teaching materials. He/she will be responsible for developing the structure and contents of the tutorial, including how each topic will be presented.
- A computer programmer experienced in tutorial development. He/she will be responsible for writing the tutorial.
- A graphic artist who will be responsible for artwork and animation.
- A photographer/video cameraman experienced in outdoor photography to produce photos and video clips.

The production of the CD will take about six months and modifications to the tutorial will have to be made after it has been tested and reviewed by selected users. Production should commence soon after the establishment of the RCIU so that it can be used for the RTCT. The RTCT will provide an opportunity for testing the tutorial and obtaining comments and suggestions from the instructors and participants.

Development and organization of the RTCT

The RTCT is a key component for the successful implementation of the training strategy, as the trainees will have a strong influence on the quality of the in-country courses. Therefore, it is essential that its development and organization are planned carefully.

The development and organization of the RTCT will be the responsibility of the RCIU. The RCIU may either undertake the RTCT itself or commission an appropriate and experienced training agency or institute. Ideally, the development of the CD and activities concerning the RCTC are conducted by the same group of people to increase efficiency.

The development and organization of the RTCT will consist of six major activities:

1. Selection of national trainers to be trained.
2. Selection of training specialists.
3. Development of the course design (in collaboration with specialists).
4. Selection of host institutions and course venues.
5. Course implementation.
6. Course evaluation.

Selection of national trainers to be trained

The selection of the national trainers will be coordinated by the government agency responsible for timber harvesting. The concerned government agency will ensure that trainers come not only from the agency itself but also from the logging industry and forestry schools and colleges.

The national trainers have a vital role to play in the organization of in-country courses, including:

- Designing and conducting TNAs for each stakeholder group.
- Designing training courses for each stakeholder group.
- Serving as training/teachers for some subjects covered by the courses.
- Providing training for other trainers/teachers, particularly on effective training/teaching techniques and the preparation of visual aids and other training/teaching materials.
- Coordinating the training courses to be organized in their respective countries.

It is imperative that the national trainers are selected carefully. It must be determined that once trained under the RTCT, the national trainers will remain in their training assignments for at least one year. The following criteria are recommended for the selection of the national trainers:

- Proficiency in English, as the RTCT, being regional in nature, will be conducted in English.
- Experience in training. It is important that they have at least five years of teaching/training experience particularly in forest harvesting.
- Familiarity with the *Code*, national codes or similar guidelines. This will be a great advantage because of its bearing on the duration of the RTCT.
- Availability and willingness to serve as members of the NCIU.

The selection process in each country should be carried out systematically according to the selected and agreed upon criteria. The national agency concerned with forest harvesting should create a small committee that will call for nominations from the logging industry and various institutions involved with training/teaching in forest harvesting and undertake the screening of the nominees.

In each country, the team of national trainers should consist of at least three individuals. One to serve as team leader, one to take the lead in TNA and course design and one to take charge of training material preparation and to instruct trainers/teachers on innovative and effective training/teaching methods.

Selection of training specialists

A team composed of two training specialists will be needed to develop and implement the RTCT. The specific tasks include:

- Preparing the course plan (outline, day-to-day activities, assignments of resource persons, equipment and supplies needed, schedule of field trips, support staff required, etc.).
- Preparing training materials.
- Teaching the course.

The following considerations should be taken into account in selecting the team:

- One training specialist should be an experienced trainer/teacher in forest harvesting while the other should be an expert in educational planning and forest management.
- Both members should have senior status with many years of experience in their respective fields, have proficient English language teaching skills, be familiar with the *Code*, national codes and similar harvesting guidelines, and be skilled in preparing teaching aids.

The best way to identify a suitable team is to solicit proposals from professional consulting firms with proven track records in forestry education and training at the regional or international level.

Development of the course design

The logical starting point for developing any training course – formal or non-formal – is to set the course objectives.

It is recommended that the course objectives focus on:

- Familiarizing the national trainers with the salient features of the *Code*.
- Developing or enhancing the skills of the national trainers in:

- conducting TNA for different groups of trainees;
- preparing training course plans;
- developing teaching aids (using computers);
- using the Internet as a source of training materials;
- delivering effective lectures/demonstrations;
- organizing field trips;
- managing training courses.

Achieving these objectives will necessitate inclusion in the RTCT of the following major topics and subtopics:

1. The *Code*
 - Objectives
 - Significance
 - Salient features
 - Stakeholders and key target groups
2. TNA
 - Objectives
 - Methods
 - Analysis
3. Designing/planning training courses
 - Basic principles
 - Formulation of training objectives
 - Defining the course contents and training methods
 - Selecting trainers for different topics
 - Identifying needed training materials
 - Setting schedules
 - Organizing field trips
 - Arranging accommodation, meals, transport and social events for participants
 - Preparing a course budget
4. Development of training/teaching aids
 - Types of teaching aids
 - Tips on developing visual aids
 - Developing visual aids with the use of computers
 - Searching the Internet for teaching aids
 - Sharing of teaching aids among countries
5. Effective teaching
 - Teaching methods
 - Tips for effective teaching
6. Training course management

The ideal course duration would be four weeks but this can be reduced to three weeks if the time allocated to familiarize participants with the *Code* is shortened. There are several reasons to limit the course duration to three weeks. They include the following:

- Participants should already be familiar with the *Code*, respective national codes, similar harvesting guidelines or the elements of RIL, as this is an important selection criterion.

- Copies of the CD with training materials and an overview of the *Code* will be presented and distributed to the participants before the course.
- Hard copies of the *Code* and other relevant documents are to be made available to the national trainers for advanced reading before the RTCT commences.
- Portions of the *Code* can be taken up as examples in other topics included in the course.
- The national trainers will become more acquainted with the *Code* during TNAs and developing courses for different stakeholders in their own countries.

Nonetheless, it is important that a portion of the course is devoted to the *Code*, national codes, similar harvesting guidelines and the elements of RIL. A two- to three-day field trip to exemplify *Code* implementation and non-implementation would undoubtedly provide the national trainers with greater awareness and appreciation of improved harvesting.

Selection of host institutions and course venues

With three national trainers per country and possibly more than 20 countries joining the course, the RTCT is expected to have more than 60 participants. Obviously, they cannot all be accommodated in just one course. The RTCT will have to be offered three to four times to ensure that the needs of all the countries are satisfied.

Using the same venue for the same course a number of times is not advisable because of high travel expenses. A preferred strategy to minimize cost is to offer the course in different subregions. Assuming that adequate funds are available to conduct the RTCT three times, the Asia-Pacific region can be divided into three subregions, each consisting of a similar number of countries (Table 3).

Table 3. Asia-Pacific countries by subregions to implement the regional training strategy

Subregion I	Subregion II	Subregion III
Bangladesh Bhutan China India Japan* Maldives Mongolia Nepal Pakistan Republic of Korea* Sri Lanka	Cambodia Indonesia Lao PDR Malaysia Myanmar Philippines Thailand Viet Nam	Australia* Fiji New Zealand* Papua New Guinea Samoa Solomon Islands Vanuatu

* Countries believed to already have sufficient capacities to implement the *Code*.

The venue can influence the smooth implementation of a course considerably, particularly courses comprising participants of different nationalities. Therefore, the selection of a course venue should be carried out with care.

The strategy recommended for the selection of an appropriate venue for the RTCT in each subregion involves the following steps:

1. In each subregion, identify national forest departments or comparable agencies that are willing to serve as a host for the RTCT.
2. Select the venue for the course according to the following criteria.

- Cost.
- Standard of classroom and workshop facilities.
- Availability of communication equipment.
- Availability of comfortable but reasonably-priced accommodation for participants and resource persons.
- Transport facilities.
- Accessibility.
- Availability of equipment to reproduce training materials.
- Proximity to forest harvesting operations (past and present).
- Security.

During the selection process the potential host institutions also need to be made aware of their roles and responsibilities, such as:

- Assisting the participants to secure visas.
- Making arrangements for transport from and to the port of entry as well as accommodation and meals for the course participants and trainers/teachers.
- Providing a core group of support staff headed by a coordinator to perform various duties such as obtaining supplies and materials, word processing, photocopying, operation of audio-visual equipment, organizing field trips, confirming return tickets, arranging social activities, securing medical assistance if necessary, and other course-related matters.
- Inviting national officials as speakers at the opening and closing sessions.

The RCIU should ensure that adequate funds are provided to the host agencies or institutions to carry out their functions effectively to facilitate smooth course performances.

Course implementation

The successful implementation of the course depends on numerous factors, the most significant being:

- The quality of the course design.
- The quality of course delivery.
- The capability of the host agency or institution to provide requested support.
- The suitability of the selected trainees.

The course design is the essence of the training course. It contains the knowledge that the course participants should acquire to improve their skills as national trainers. A sound course design is one in which the course contents are in perfect harmony with the skills planned for development or enhancement.

The quality of course delivery is a major determinant of the success of any course. An effective course turns the traditional teacher-student relationship into an interactive and participatory process. Knowledge is not only transmitted; it is elaborated jointly by small groups of participants under the guidance of a team of facilitators. Good course delivery stimulates participants to be more (i) attentive, (ii) serious in conducting exercises, (iii) active in discussions and (iv) interested in learning about innovations. It challenges participants and demands active involvement, which will ultimately result in the better achievement of the course objectives.

The failure of the host agency to perform its functions satisfactorily can seriously affect the delivery of the course, the schedules of lectures and group work, demonstrations and field trips, the timely distribution of course materials and other components. In the same way, the selected trainees should be qualified and properly motivated, otherwise the RTCT will be ineffective.

The keys to controlling these factors effectively are sound decision making and a good coordination strategy by the course organizer. The RCIU should be careful in selecting the team of

training specialists who will prepare the course design, deliver the course and facilitate interactive teamwork. The APFC should see to it that the team selection process is based on well-conceived criteria and that the selected team fully understands its responsibilities and tasks. The progress of course preparatory work by the team should be monitored by the RCIU. These conditions also apply to selection of the host institutions to ensure that they are equipped to provide the support required for course implementation.

Course evaluation

At the end of the course, the participants should evaluate the course for the following purposes:

- To determine whether the course contents are adequate to meet the objectives.
- To determine which topics should be given more weight in subsequent courses.
- To assess the performance of the training specialists.
- To assess the quality of training materials used.
- To assess the facilitation of teamwork.
- To make a general assessment of the quality of support provided by the host institution.

The evaluation should be carried out for the RCIU. The results should be made available to the training specialists so they can make improvements for the next course.

An assessment of the suitability of the trainees sent by the countries will also be made. This assessment will be conducted by the RCIU representative and the training specialists.

Development and organization of in-country courses

The development and organization of the in-country courses will involve the following activities:

- Identification and prioritization of the stakeholder groups to be trained.
- Assessment of the training needs of priority stakeholder groups.
- Preparation of course design for each priority stakeholder group.
- Preparation of training materials.
- Formation of support staff groups.
- Selection of the venue for each course.
- Course implementation.
- Course evaluation.

Identification and prioritization of stakeholder groups to be trained

The stakeholder or key training target groups in each country will be identified and prioritized through national workshops (see also Appendix 1). The workshops, to be organized by forestry agencies, will comprise representatives of various stakeholder groups (Table 1). Groups may be prioritized according to the following criteria:

- Nature of involvement in forest harvesting. Is the group directly involved in forest harvesting operations or not?
- Consequences of not providing training to the group. What would be the effects on the forest if the group were not provided training on the *Code* and/or RIL practices?
- Advantages of providing training to the group. What would be the effects on the forest if the group were given training on the *Code* and/or RIL practices?
- Urgency of training. Would training the group stimulate the uptake of improved forest harvesting practices in natural forests of high value and/or facilitate the early recovery of the residual forest?

- Availability of funds. Are funds available for training the group?
- Sufficiency of qualified trainers in the country.

In addition to identifying and prioritizing the stakeholder groups to be trained, the national workshops/meetings can also:

- Identify local institutes or organizations that have qualified instructors to train the priority stakeholder groups.
- Identify potential sources of funds for organizing the training courses.
- Identify major subjects to be included in training the different groups. This output can be used as baseline information for the TNA to be conducted at a later stage.
- Identify potential venues for training.

Assessment of the training needs of priority stakeholders

Based on feedback from the RTCT, the NCIU will conduct a TNA for each of the priority stakeholder groups.

Preparation of course designs or plans for stakeholders

The national trainers will prepare the course designs or plans for the priority stakeholder groups in their respective countries after completing the TNAs. The designs or plans will include the following components:

- Course title.
- Course objectives.
- Course venue.
- Course topics.
- Resource person for each topic.
- Teaching method for each topic.
- Time allocation for each topic.
- Handouts and visual aids needed for each topic.
- Equipment needed for each topic.
- Field trips – places to be visited and schedule, assigned coordinators.
- Social events and other activities – schedule, venue and assigned coordinators.
- Support staff requirements.
- Course budget.
- Day-to-day program of activities.

To facilitate the preparation of the course design, it is suggested that national trainers use a training course organizing sheet (Table 4). The sheet, which is self-explanatory and easy to follow, is a planning tool that allows the systematic development of any training course. The NCIUs should always provide the RCIU with a copy of the design it has developed for each in-country course, for comments by the RCIU, and to share the information with other countries.

Preparation of training materials

After the course design has been finalized, the instructors or resource persons selected for each topic will start preparing the training materials needed for the course. The preparation of the materials will be undertaken by the national trainers based on knowledge they have acquired from the RTCT. Instructors or resource persons designated to handle some of the topics in the course who have not participated in the RTCT will be guided by the national trainers so they have appropriate training materials for the course.

Table 4 Training course organizing sheet

Course title

--

Course objectives

1	
2	
3	

Technical coverage and resource needed

Course topics	Resource persons		Time allocation	Teaching method	Course handouts		Equipment needed
	Expertise	Name			Preparation	Reproduction	
1							
2							
3							
4							
5							

Field trips

	Activities	Schedule	Things to see	Coordinator	Resource persons	Transport
1						
2						
3						

Social events and other activities

	Activities	Schedule	Venue	Coordinator	Remarks
1					
2					
3					

Calendar/programme of activities

Date	Time	Topic/activity	Resource persons
		Opening session	
		Course topics	
		Closing session	

Formation of support staff groups

For each course, a group of support staff shall be formed to carry out, *inter alia*, the following functions:

- Procurement of supplies and materials.
- Word processing and other work requiring computers.
- Relaying information to participants and other concerned individuals.
- Photocopying.
- Arranging for transport, needed equipment, accommodation and meals.
- Operation of audio-visual equipment.
- Preparation of the course venue.
- Arranging social activities.
- Making in-country travel arrangements.

The NCIU should ensure that all members of the group fully understand their respective roles in the course before the course begins.

Selection of course venues

As for organizing regional courses, criteria must be used in the selection of course venues. The following criteria are suggested for the selection of suitable venues for in-country courses:

- Cost.
- Quality of classroom and workshop facilities.
- Availability of communication facilities.
- Availability of comfortable and reasonably-priced accommodation for participants and resource persons.
- Transport facilities.
- Accessibility.
- Availability of equipment for reproducing training materials.
- Proximity to demonstration sites.
- Availability of harvesting equipment to be used in field demonstrations.
- Security.

Implementation of courses

The NCIU will serve as the coordinating unit for all the in-country courses. The NCIU, with the assistance of support staff, will ensure that all resource persons, training materials, equipment, supplies and services are available at the correct time. The NCIU should see to it that one of its members is available daily to take action on problems that may arise during training courses.

Course evaluation

Post-course evaluations will be carried out for each in-country course by the NCIU for the same reasons that an evaluation is proposed for the RTCT.

The results of the evaluation are used as a guide by the NCIU to improve the design and implementation of other in-country courses.

Integration of the *Code* in formal forest harvesting and silviculture courses

The integration of the *Code* in formal forest harvesting and silviculture courses offered by forestry schools and colleges in the Asia-Pacific region is a tactic that contributes to awareness and support for the *Code*. If the *Code* becomes part of the curriculum, all students will gain substantial knowledge about improved forest harvesting, which they can apply later as officers of government and private entities in forestry.

There are many institutions in the Asia-Pacific region, which offer education in forestry at the professional and technical levels. If the *Code* can be integrated successfully in the curricula of these institutions, each country in the region will have a large pool of human resources that is not only aware of but also supportive of the *Code*.

The institutions that will be targeted for integration can be classified into four major categories:

- Professional-level (those that offer degree programs at BA and higher levels).
- Sub-professional-level (those that offer diplomas and associate degrees in forestry).
- Technician-level (those that offer one-to-two year courses for forestry technicians).
- Schools for forest workers.

A logical approach to promoting integration is to bring the matter to the attention of the Asian Network for Forestry Education (ANFE), which is coordinated by the Regional Office of FAO in Bangkok. Furnishing each member of ANFE with a copy of the CD could help stimulate the integration of the *Code* in existing courses.

Sharing of training resources

Sharing of training resources among the different countries would prevent costly duplication of efforts and help to reduce the funding requirements of in-country courses. Examples of training resources that can be shared are course designs, audio-visual aids (e.g., slides, transparencies, films, video clips, etc.), course handouts and even human resources.

To facilitate sharing, the RCIU will make a collection of course designs, audio-visual aids and course handouts that have been developed by different countries. It will prepare a database for the collection from which information on training resources available for sharing can be elicited. It will disseminate information contained in the database and duplicate and dispatch training resources needed by the different countries. It is recommended that the database be made accessible to the different countries through the Internet to facilitate dissemination of its information.

Funding the implementation of the training strategy

Even the best-planned strategy will be worthless if the countries concerned cannot implement it due to lack of suitable human and financial resources. To ensure that the strategy can be realized, it is necessary to consider funding. Possible funding sources are:

- Domestic funds from national governments and the private sector.
- Grants from donor agencies.
- Loans from either domestic or international financial institutions.

Since domestic funds are scarce among most countries in the region, and loans are often acquired for projects that are perceived to have more urgency, funds for the training strategy can only be expected to come in the form of grants from benevolent donors, although it is expected that the private sector will also contribute.

Donor agencies, which have established track records in providing financial assistance for projects of a similar nature in the region, include:

- AusAID and the Department of Agriculture, Fisheries and Forestry - Australia (AFFA)
- The government of New Zealand
- Japan International Cooperation Agency (JICA)
- ITTO
- USDA Forest Service
- UNDP
- FAO

Resource-poor countries can negotiate directly with donors for such financial and technical assistance. However, in the case of *Code* implementation, it may be more effective if an international/regional agency, such as FAO or APFC, serves as a broker to facilitate the negotiations between donors and countries. One significant advantage of a broker is that it can negotiate simultaneously with a pool of donors to support a common activity, such as training, which is undertaken by several countries in separate but coordinated ways.

References

- Andrewartha, R. 2001. Training to achieve competence. *Tropical Forest Update* 11(2): 15-16.
- APFC. 2000. Regional strategy for implementing the code of practice for forest harvesting in Asia-Pacific. Asia-Pacific Forestry Commission. Center for International Forestry Research, Bogor, Indonesia.
- Bulai, S., H.T. Tang, K. Poursu, and B. Masianini. 2000. Proceedings of Regional Consultation on Implementation of Codes of Logging Practice and Directions for the Future. Field Document No. 3 RAS/97/330. Pacific Islands Forests and Trees Support Programme, Suva, Fiji.
- Dykstra, D.P. 2001. The old and the new of reduced impact logging. *Tropical Forest Update* 11(2): 3-4.
- FAO. 1999a. Code of practice for forest harvesting in Asia-Pacific. Food and Agriculture Organization of the United Nations Regional Office for Asia and the Pacific, Bangkok, Thailand.
- FAO. 1999b. Study tour on reduced impact logging: practices and potentials. Asia-Pacific Forestry Commission Food and Agriculture Organization of the United Nations Regional Office for Asia and the Pacific, Bangkok, Thailand. unpublished.

Appendix 1: Identifying training groups for *Code* implementation

Background

South Pacific countries that have implemented the *Code* used existing personnel who were expected to carry out activities immediately due to their experience with forest harvesting. After several years of *Code* implementation, South Pacific country representatives convened in Vanuatu in mid-1999 to exchange information. It became apparent that personnel assigned to *Code* implementation should first be trained (or retrained) to carry out the new harvesting techniques specified by the *Code* more effectively.

This meeting and other fora determined that it is inappropriate to subject the various groups in the forest harvesting sector to the same kind of training since each group has separate responsibilities and tasks that require particular skills. Therefore, it is necessary to identify these groups to assess their training needs and the appropriate training courses for them.

Personnel and their tasks in *Code* implementation

Based on logging operations observed in the region, and on feedback from experienced personnel, it is understood that tasks related to *Code* implementation are a continuum of related hierarchical activities. Starting from the top, national policy formulation is needed to provide clear direction for forestry programs. Under the policy umbrella, *Code* formulation is necessary to provide a guide for sustainable forest management. Considering the *Code*, corporate plans and subsequent operational plans are prepared to ensure efficient harvesting with minimal negative impacts on the forest ecosystem. Finally, the harvesting plans are implemented at the field level.

Representatives of various other groups carry out appointed tasks. National policy-makers in governments and industry or corporate planners in the private sector are responsible for developing high-level policies. Middle management officers develop management plans for corporations. Front-line supervisors directly oversee field activities, while fieldworkers execute harvesting operations. These groups and their corresponding tasks are shown in Table 1.

Table 1. Target groups and their corresponding tasks

Group	Tasks
<ul style="list-style-type: none"> Government policy-makers 	<ul style="list-style-type: none"> Formulate national forest policy and propose enabling legislation for national governments
<ul style="list-style-type: none"> Industrial/corporate policy-makers 	<ul style="list-style-type: none"> Develop policies for industry and corporations
<ul style="list-style-type: none"> Middle-management planners for forest management (government) Planners for forest harvesting operations (private sector) 	<ul style="list-style-type: none"> Formulate sustainable management plans for government forests Develop detailed operational plans for sustainable forest harvesting
<ul style="list-style-type: none"> Front-line supervisors (private sector) 	<ul style="list-style-type: none"> Directly oversee operational activities of field staff
<ul style="list-style-type: none"> Fieldworkers (private sector) 	<ul style="list-style-type: none"> Carry out field activities for sustainable forest harvesting operations

Since these groups have different job descriptions, they have different training requirements; therefore it is necessary to assess the nature and scope of their work to determine their training needs. Likewise, stages of forest development and management vary in the Asia-Pacific region and *Code*-related tasks and training needs may differ among countries. For instance, if a country has a national forest policy firmly established and is positioned strategically to undertake *Code* implementation, it may not need to identify policy-makers as a group requiring training. On the other hand, a country that has yet to establish policies to create a policy climate conducive to formulation and adoption of the *Code* may have to include policy-makers for training.

Appendix 2: Training needs assessment (TNA)

The importance of TNA

An essential step in developing a training strategy is a training needs assessment (TNA) for different key training target groups.

This is necessary because:

- It is a basis for setting up training objectives.
- It serves as a guide for designing training courses.

TNA involves three basic steps:

1. Determine the present level of knowledge and skills of a person or group to be trained (the present capacity).
2. Communicate the standard level of competence required for efficient work performance of each personnel group (the standard capacity).
3. Ascertain the difference between the present and the standard capacities (the knowledge/skills gap).

The gap reflects the deficiency that can be bridged by training.

A TNA is necessary for each key training target group assigned to a specific task (e.g., tree felling). Since each task is defined clearly, the required standard capacity is known. Thus, it is easy to compare the present capacity with the required standard to ascertain the gap to be bridged through training.

Since there is a wide variety of tasks in forest harvesting, there should be a TNA for each group, e.g., one TNA for skidder operators, one for truck haulers, and another for fellers/buckers (chainsaw operators).

Determining the present capability of personnel

This task may be carried out by using methods such as:

- Formal or informal testing of knowledge (oral or written).
- Observation of work performance (e.g., actual viewing of felling with chainsaws; skills in directional felling).
- Examination of quality of outputs (e.g., minimal log breakage and damage to residuals due to quality of directional tree felling).
- Testimony of supervisors about performance of subordinates.

Even if members of a group have had similar work experiences over the same period of time, there may still be performance differences. However, these are often not substantial enough to require different training.

Setting the standards of competence

In forest harvesting, the nature of certain tasks is unchanging. For example, a standing tree has to be felled to harvest the wood. However, the tools and equipment used in felling evolved from the use of axes in the early twentieth century, to two-man handsaws by the middle of the century, to chainsaws today. Thus today's felling crews require standard competence to:

- Operate and maintain a chainsaw.
- Use the saw for cost-effective felling.
- Implement new techniques (e.g., directional felling) to minimize damage to logs and residual stands, and to make skidding easier.

Determining training needs

In forest harvesting, felling crews already possess sufficient competence to operate, maintain and use chainsaws, in the same way that skidder operators are expected to have mastered driving the machine and log loader operators are experts in operating the front-end loader. Therefore they no longer require training on the ‘equipment operation’ aspects of their work. However, they require training in processes and techniques such as environmentally-friendly felling, skidding and loading techniques that minimize damage to soil, water, residual vegetation, wildlife etc. without adversely affecting productivity.

Alternative approach to TNA

An alternative approach is “organization analysis”. The whole range of activities of an organization, for example a logging company, is examined and performance criteria are identified or set up, such as damage to residual trees, rate of forest destruction, injury to field crews. If an indicator shows performance below accepted standards (e.g., damage to residuals becomes so extensive that it threatens the sustainability of the forest) then training of felling crews may be needed to reduce or eliminate the particular problem.

Appendix 3: Establishing training objectives based on TNA

The importance of establishing the training objectives

This appendix is based on the assumption that:

- The personnel groups that need training in *Code* implementation have been identified (e.g., policy-makers, planners, supervisors, fieldworkers, trainers).
- The specific training needs for each group have been determined through appropriate needs assessment.

In the development of a training course or program for any of the stakeholder groups, the training objectives will be based on the training needs. This is logical since the main objective of training is to fill deficiencies in knowledge and skills.

The objectives, in turn, will become the basis for the development of the training course. The choice of training content, materials and training methods will be influenced heavily by the objectives of the training course.

If the TNA is not conducted properly, the training objectives may not be appropriate to fill the identified needs. This interdependence should be borne in mind so that each “link in the chain” will be as strong as possible.

Factors influencing training objectives

The objective of training personnel groups will be influenced by the following needs:

- Top policy-makers in government and industry need to be aware of, and sensitive to, the extreme threats posed by the relentless depletion of forest resources, and should have the vision and capacity to formulate appropriate policies that motivate or encourage all sectors to help promote sustainable forest management.
- Planners in both government and industry need to respond positively to favourable policies and incentives, and should develop strategic and operational plans that lead to harvesting techniques that are economically viable while simultaneously safeguarding the productive and protective capacities of forests.
- Supervisors at the field level need to oversee field operations effectively to ensure profitable execution of production plans without ignoring environmentally-sound means to maintain forests.
- Workers at the field operations level need to acquire technical knowledge and skills to implement the field operation plans so efficient harvesting operations are achieved without impairing the integrity and productive capacity of the forest ecosystem.

Policy-makers and top government administrators set the parameters for forest management, focusing on sustaining the forest resources for both economic development and environmental services. They need to recognize the importance of the policy environment for the *Code* and that the *Code* is a tool for achieving sustainable forest management. But first they have to understand *Code* recommendations and how they contribute to sustainable forest management in particular, and environmental management in general. A major objective for such policy-makers and administrators may be to internalize the concepts of sustainable forest management (SFM), how SFM contributes to long-term economic development of the country (or of the region) and how SFM is also a strategy for environmental protection. Another specific objective may be for these trainee groups to recognize the link between the *Code* and SFM.

Planners in forestry agencies and in the forest industry translate policy into strategic and operational plans. In the context of the *Code*, the training objective may be to enhance their skills to analyze options (at the strategic and operational levels) for incorporating *Code* recommendations in the plans.

Recommended processes and outputs

The following steps should be taken in formulating a training course:

- Arrive at a common understanding of the nature of the various trainee groups and their respective roles and responsibilities in the decision-making and implementation of timber harvesting.
- Confirm their full understanding of the identified training needs of each of the trainee groups.
- Dissect the phases of forest management ranging from policy development, planning and actual timber harvesting operations, and relate these phases to each of the trainee groups. This will ensure that the training objectives for each trainee group will be correlated appropriately with the roles and responsibilities of that group. The workshop group may consider the following phases:
 - i. Forest policy development.
 - ii. Strategic and operational forest management planning.
 - iii. Forest inventories (pre- and post-logging inventories) and road location surveys (reconnaissance, preliminary layout, final layout).
 - iv. Layout of logging blocks (coupes) and logging set-ups.
 - v. Pre-harvesting inventories and tree-marking (for identifying trees to harvest, trees to be left, directions of fall, etc.).
 - vi. Felling and bucking.
 - vii. Yarding/skidding operations.
 - viii. Transport from log-landings to the log-ponds, log depots, etc.
 - ix. Road construction and maintenance.
 - x. Support services (workshop workers, camp maintenance and operations).
- Prepare a matrix of training objectives, e.g.:

Table 1. Matrix of training objectives

Trainee group	Identified needs (from TNA)	Objectives of training	Expected knowledge/ skills gained
Policy-makers	Knowledge of the <i>Code</i> recommendations and its importance in promoting national development interests	To familiarize policy-makers with the <i>Code</i> , and how its national implementation can promote sustainable development	Positive appreciation of the <i>Code</i> as a tool to stabilize the forest resource base and promote environmental protection and conservation
Strategic and operational planners (government and industry)	Skills in cost-benefit analysis of <i>Code</i> implementation at strategic and operational levels	To provide planners with the skills necessary to undertake cost-benefit analysis of implementing <i>Code</i> activities at macro- and operational planning levels	<ul style="list-style-type: none"> • Familiarity with the rationale and recommendations for <i>Code</i> implementation • Cost-benefit analysis of <i>Code</i> implementation
Fieldworkers	Yarding methods under the <i>Code</i>	For fieldworkers to be able to implement yarding methods recommended by the <i>Code</i>	Yarding crews able to make on-the-spot decisions that distinguish between "with" and "without" <i>Code</i> yarding methods

Appendix 4: Pro forma training modules

Training module for policy-makers

Target participants

- Policy-makers and decision-makers in governments.
- Top management/corporate policy-makers in wood industries.

Objectives

On completion of the training, the participants should:

- Have a clear understanding and appreciation of the economic, environmental and social values of the country's forest resources.
- Recognize the main causes of forest degradation, with particular attention to exploitative logging, and impacts on national development and welfare.
- Be able to analyze the policies (or lack of policies) that have contributed to the present state of forestry affairs.
- Be able to analyze the costs and benefits of the *Code*.
- Understand how *Code* implementation could lead to sustainable forest management.
- Be able to formulate policies that encourage stakeholders to formulate, accept and apply the *Code*.

Training methods

- Briefing on the multiple benefits from forests.
- Discussions on the current state of forestry in the country.
- Exercises in cost-benefit analysis of the *Code*.
- Exercises in strengths, weaknesses, opportunities and threats (SWOT) analysis of existing and proposed policies.
- Field visits to observe forests "with" and "without" *Code* implementation.

Training period

- Two days of discussions and exercises.
- One-day field visit.
- One day for formulation of conclusions and recommendations.

Training materials

- Country papers: state of the nation's forests.
- Compendium of forest policies.
- Exercise materials:
 - case study materials (logging production and cost data);
 - interest tables;
 - calculators; and
 - cost-benefit analysis methodology outline.

Training schedule

Day 1: Introducing participants; explanation of the objectives of the training; discussion of the training methods; expectations of the participants; expected outputs of the training. Discussion of

the state of the forestry sector of the country; main reasons for the degraded status of the forests; remedial measures that have been applied by the government; introduction to *Code*.

Day 2: Identification and analysis of existing policies that may have contributed to the deterioration of the forests; identification of policy options that could help reverse forest degradation. Discussion of the nature and goals of the *Code*; analysis of problems in *Code* acceptance and implementation by industry; identification and analysis of policy and economic incentives that may encourage *Code* adoption and application.

Day 3: Field visit to observe: logged over areas where the *Code* has not been applied; areas logged under the *Code*; collect data on comparative costs and outputs of “with *Code*” and “without *Code*” logging operations.

Day 4: Exercises in cost-benefit analysis of the *Code* and SWOT analysis of policy options that favour *Code* implementation.

Conclusions: *Code* adoption (drawn from the discussions and analyses); recommendations to the government and industry that policy-makers may submit.

Training module for trainers

Objectives

At the end of the training course the participants are expected to have a good working knowledge of the objectives and scope of the *Code* and a good grasp of the advantages of observing the *Code*. They should also be able to:

- Prepare a training course plan.
- Prepare visual aids using computers.
- Deliver lectures/demonstrations using appropriate visual aids.
- Organize field trips and carry out training in the field.

Training methods

- Lectures
- Demonstrations
- Exercises
- Field trip

Training period

- One-day lecture on main features of the *Code*.
- One-day lecture/demonstration on effective teaching.
- One-day field trip to observe forest harvesting.
- One-day exercise on preparing visual aids and presentations.

Training materials

- Slides/transparencies
- Software for preparing transparencies
- Handouts (*Code*, effective teaching methods)

Training schedule

Day 1: Introducing participants; explanation of the objectives of the training; discussion of the training methods; expectations of the participants; expected outputs of the training. Main features of the *Code*.

Day 2: Preparing a training course plan:

- setting the course objectives;
- defining the course contents and training methods;
- selection of trainers for different topics;
- identifying training materials needed;
- setting schedules;
- arranging accommodation, meals and transport for participants;
- preparing a course budget;
- preparing visual aids for more effective teaching.

Day 3: Field visit to observe/demonstrate differences between logged over areas where the *Code* has not been applied and areas logged under the *Code*. Relevant provisions of the *Code* will be discussed in the field.

Day 4: Exercises on preparing visual aids using computers, presentations on selected *Code* topics using visual aids, course summary and closing.

Training module for fieldworkers

Objectives

At the end of the training course, the participants shall have a good working knowledge of:

- Preharvest field preparations
- Harvesting operations
- Harvesting equipment maintenance and servicing
- Camp hygiene
- Safety
- Fire precautions

Training methods

- Lectures on preharvest preparations and harvesting operations.
- Field observation and demonstration (tree marking, felling, skidding, equipment handling and maintenance, safety precautions, and camp hygiene).

Training period

- Two days of lectures using slides/transparencies.
- Two days for observation and demonstration in the field.

Training materials

- Slides and transparencies.
- Handouts on various topics related to logging operations.

Training schedule

Day 1: Introducing participants; explanation of the objectives and significance of the training; discussion of the training methods; expectations of the participants; expected outputs of the training. Preharvest field preparation.

- tree marking;
- locating log landings and skid tracts; and
- skid tracts.

Day 2: Harvesting operations.

- harvesting;
- extraction systems;
- log storage and transportation systems;
- weather limitations on harvesting;
- log scaling/grading/measuring; and
- post-harvest activities.

Day 3: (Field). Harvesting equipment maintenance, servicing.

- moving equipment;
- workshop facilities;
- toxic waste;
- main fuel and oil storage;
- field servicing and maintenance;
- refuse disposal;
- camp hygiene;
- camp design plans;
- water supply;
- waste disposal;
- domestic wastewater;
- refuse disposal;
- water ponding; and
- additional facilities.

Day 4: (Field). Safety.

- protective clothing and safety equipment;
- equipment safety requirements;
- fire precautions;
- operational requirements; and
- chainsaws and machines.