



***TESTING CRITERIA AND INDICATORS FOR THE
SUSTAINABLE MANAGEMENT OF FORESTS***

office address: Jalan Gunung Batu 5 Bogor 16001 Indonesia
mailing address: P.O. Box 6596, JKPWB Jakarta 10065 Indonesia
telephone: +62 (251) 34-3652 *fax:* +62 (251) 32-6433
e-mail: cifor@cgnnet.com

**FINAL REPORT
TEST BRAZIL OCTOBER 22-NOVEMBER 21, 1995**

Johan Zweede
with
Jan Kressin, Rita Mesquita, Jose Natalino M. Silva
Virgilio M. Viana and Carol Colfer
Editors: Ravi Prabhu and Lay-Cheng Tan

INSTITUTO SOCIOAMBIENTAL

data / /

cod. 19000013



***TESTING CRITERIA AND INDICATORS FOR THE
SUSTAINABLE MANAGEMENT OF FORESTS***

office address: Jalan Gunung Batu 5 Bogor 16001 Indonesia
mailing address: P.O. Box 6596, JKPWB Jakarta 10065 Indonesia
telephone: +62 (251) 34-3652 *fax:* +62 (251) 32-6433
e-mail: cifor@cgnet.com

**FINAL REPORT
TEST BRAZIL OCTOBER 22-NOVEMBER 21, 1995**

**Johan Zweede
with
Jan Kressin, Rita Mesquita, Jose Natalino M. Silva
Virgilio M. Viana and Carol Colfer
Editors: Ravi Prabhu and Lay-Cheng Tan**

Table of Contents

I. Preface	2
<i>Ravi Prabhu</i>	
II. Team Leaders Report	3
<i>Johan Zweede</i>	
1. Background	
2. Objectives	
3. Project Team and Support Group	
4. Summary of Test Schedule	
5. Consolidated Test Report	
a. Phase I: Preparation Activities	
b. Phase II: C&I Evaluation and Field Work	
c. Phase III: Field Work Consolidation and Analysis	
d. Phase IV: Closing Workshop	
e. Phase V: Post Workshop Activities	
f. Phase VI: Results	
6. Critique and Suggestions	
7. Conclusions	
III Annexes	
Annex 1. Report on Testing Social Criteria and Indicators	16
<i>Jan Kressin, Carol Colfer</i>	
Annex 2. Report on Testing Ecological Criteria and Indicators	30
<i>Rita de Cássia G. Mesquita</i>	
Annex 3. Report on Testing Forest Management Criteria and Indicators	38
<i>José Natalino M. Silva and Johan Zweede</i>	
Annex 4. Report on Testing Policy and Planning Criteria and Indicators	57
<i>Virgílio M. Viana</i>	
Annex 5. Terms of Reference	74
Annex 6. Agenda of the Closing Workshop	79
Annex 7. List of Participants	82

PREFACE

The Brazil test was the fourth in the CIFOR series of tests of criteria and indicators for sustainable forest management (C&I), following on from tests in Germany, Indonesia and Côte d'Ivoire. This was the first test of C&I to have taken place on private lands, previous tests had taken place on government land which were either managed directly by government agencies or through a concession system. The fluid and somewhat complicated land ownership and tenure situation in the Brazilian Amazon threw up some additional novel problems.

The test itself was conducted by a five member inter-disciplinary team consisting of Johan Zweede, Natalino Silva, Virgilio Viana, Rita Mesquita and Jan Kressin. This was a team that blended vast experience with fresh intellectual curiosity. The Instituto de Pesquisas e Estudos Florestais (IPEF) in São Paulo, CIFOR's partner for the Brazilian test, was responsible for logistics and the organization of the workshops. This was a difficult task given the huge distances involved.

Initial discussions between members of the CIFOR/IPEF project team and officials at the Ministry of Environment and the Legal Amazon had indicated a strong interest on the part of the Brazilian government and IBAMA¹ in the testing exercise, especially given Brazil's contribution to the development of C&I in the Tarapoto agreement. However shortly after the test commenced a more neutral stance to the test had been adopted. This was somewhat unfortunate as it affected the composition of participants at the workshops.

The Brazil test provided extremely valuable inputs to the CIFOR C&I project as has been reported elsewhere (Prabhu et al. 1996). Unfortunately due to circumstances beyond the control of the project, this full report on the Brazil test has been delayed by over a year. A fifth test of C&I has been carried out subsequently in Cameroon in October/November 1996. This report is due in March 1997.

¹ Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis

TEAM LEADER'S REPORT

Johan Zweede

INTRODUCTION

In February 1994, the Weilburg Group, an informal group of forestry experts, suggested the need for the testing of criteria and indicators (C&I) for sustainable forest management (SFM), and called for the comparative field testing of those most developed certification systems currently available for tropical forests.²

Such a project was initiated and funded by the European Commission (EU), the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) and the Center for International Forestry Research (CIFOR). With the support of forestry advisors, CIFOR officially commenced the project on August 1, 1994. From the beginning, this activity was to be a participatory project involving producers and consumers of forest products as well as incorporating input from the public and private sectors.

To develop the testing of C&I, CIFOR first had to define the principle of SFM. Acknowledging that the sustained yield principle of the past is insufficient, CIFOR supports the principle that the ecosystem integrity should be ensured, and the well being of people maintained or enhanced. The principle also considers the continuity in the temporal aspects of SFM, such as goods and services, but accepts that these aspects may not be constant and will fluctuate due to the dynamic natural system.

For the field tests, five sets of existing C&I were selected and tested in three countries with tropical forests which were Indonesia, Côte d'Ivoire and Brazil. The results were compared to a trial performed in a managed production forest in Germany and Austria.³ Each test was conducted by an interdisciplinary expert team selected, co-ordinated and aided by a support group organised by CIFOR. Both the methodology and test procedure were developed by CIFOR with the aid of a Scientific Support Group composed of independent scientists. The project was overseen by an International Project Advisory Panel which also ensured that transparency was maintained.

OBJECTIVES

"The expert panel will aim at identifying a minimum set of criteria and indicators considered to provide a reliable and cost-effective evaluation of the sustainability of forest management under the conditions prevailing at the management unit."⁴

For this primary objective, five existing sets of C&I were to be used by the team in the Brazil test. They include:

- Woodmark, Soil Association (SOI);
- Smart Wood Program, Rainforest Alliance (SMW);
- Initiative Tropenwald (ITW);
- Lembaga Ekolabel Indonesia (LEI); and
- Dutch Working Group (Deskundigenwerkgroep Duurzam Bosbeheer, DDB).

² Ravi Prabhu, 1994. Assessing Criteria for Sustainable Forestry. ITTO Tropical Forest Update 4 (5).

³ Editors' Note: The results of all five tests have been analysed and reported in Prabhu *et. al.* (1996). Testing Criteria and Indicators for the Sustainable Management of Forests: Phase 1. Final Report. CIFOR, Bogor.

⁴ CIFOR, 1995. Testing Criteria and Indicators for the Sustainable Management of Forests. Briefing Book: Test Brazil October 23-November 19, 1995.

These sets formed the base from which the team had to develop a reliable minimum set considering the management unit in the Brazil test. The selected C&I finally recommended were to be plausible, cost-effective, acceptable and capable of producing repeatable results. Whenever possible, the C&I from the five sets were to be used or modified to best reflect the ideal C&I. If none existed which satisfied the requirement, new C&I were to be generated to fulfil the necessary conditions. It should be further noted that the focus here was on a case study of CEMEX S.A., a private timber company in Santarém, as stipulated in the Terms of Reference. Therefore, this test was not an attempt to derive a definitive set of C&I for the whole Brazilian Amazon forest. Rather, the Brazil test, as mentioned earlier, is part of a larger project whose results are aimed to serve as tools to aid in the development of C&I for SFM.

PROJECT TEAM AND SUPPORT GROUP

For the purpose of the test, the C&I were classified into three areas, with management C&I being further sub-divided into three categories:

- 1. Bio-physical
- 2. Social
- 3. Management:
 - a. Policy and Planning
 - b. Yield Control Management
 - c. Damage Control Management

Each team member was assigned the responsibility of evaluating the C&I in one of the disciplines assigned to him/her. The team members and their respective disciplines were as follows:

Mr. Jan Kressin (Sociologist)	Social	Social aspects
Dr. Rita Mesquita (Biologist)	Bio-physical	Ecology
Dr. Jose Natalino M. Silva (Forester)	Yield control management	Silviculture
Dr. Virgilio M. Viana (Forester)	Policy & planning	Policy
Mr. Johan C. Zweede (Forester)	Damage control management	Management

The team benefited from the support team managed by Dr. Ravi Prabhu (Forester), CIFOR, who also supplied permanent support for methodological issues. Dr. Carol Pierce Colfer (Anthropologist), CIFOR, acted as the resource person for the social scientist in addition to helping various team members with administrative tasks. Logistical and administrative support were provided by the co-ordinator, Mr. Tasso Rezende de Azevedo (Forester) and Mr. Marco Antonio Malagodi (Agronomist). In addition the bio-physical expert and the management team members were supported by a well qualified tree identifier, Mr. Manoel Silva, SUDAM.

CEMEX S.A. provided the test site, located 110 km south of Santarém and to the east of the Tapajos National Forest, as well as offered accommodation for the test team and support group during the field test.

SUMMARY OF TEST SCHEDULE

The test schedule as outlined in the Terms of Reference and the Briefing Book was adhered to, although two Brazilian holidays interrupted some team members' interviews. Prior to arrival in Belém each team member was allocated five working days for the initial review of the C&I as presented in the five sets to be tested. The itinerary is as shown below:

FIRST PHASE

Arrival in Belém	22 Oct 95
In Belém:	23-29 Oct 95
<ul style="list-style-type: none"> - Introductory meeting of team and support group - Planning and Policy round table - Selection of sub-sets of C&I - Reformatting Form 1⁵, and selecting disciplinary priorities - Individual meetings with sector representatives - Preparation for field work, maps, air-photos, contacts with CEMEX - Preparation of literature and materials to be used in the field 	

SECOND PHASE

Journey to Santarém, with meetings and preparations, followed by trip to the test site and setting up camp	30 Oct 95
Field work	31 Oct - 11 Nov 95
<ul style="list-style-type: none"> - Field visits by individual team members or in groups - Sector and individual interviews - Field testing and observation - Filtering C&I for Form 2⁶ - Discussions and meetings on procedures - Developing conceptual framework - Initial selection of C&I for forest management unit (FMU) 	

THIRD PHASE

Back in Belém	12 - 20 Nov 95
<ul style="list-style-type: none"> - CIFOR co-ordinator meeting to set tasks and schedule - Preparation for workshop including the selection of key people - Final selection of C&I for workshop presentation - Compiling C&I within the conceptual framework - Continued preparation of Form 2 	

FOURTH PHASE

Workshop in Belém:	
<ul style="list-style-type: none"> - CIFOR presentation - Panel discussion on certification - Team presentation of test findings - Work group sessions - Presentation of work group findings - Preparation of workshop report - Preparation of final set of C&I as modified by workshop 	

⁵ A form designed to capture the initial evaluation of all criteria and indicators by each team member at his/her home base.

⁶ A form designed to assist and record the evaluation of the sub-set of C&I selected for field testing.

FIFTH PHASE

- First wrap-up meeting of team and co-ordinator
- Group work of team for preparation of page 4, Form 2.
- Final wrap-up team meeting
- Departure for home countries

Individual report writing, preparing of annexes, translations,
and organising individual and team reports

21 Nov - 28 Dec 95

CONSOLIDATED TEST REPORT

This report on the C&I test of SFM in Brazil includes the perspectives of the interdisciplinary team members on the various phases of the test.

a. Phase I: Preparation Activities

This first phase began at home with each team member carrying out the initial filtering of the C&I from the five sets of C&I (listed under 'Objectives' previously) provided for the CIFOR test. Five days were allotted for this work. The base set of C&I totalled 1085 items which in turn had to be weighed against five questions, as itemised below, designed to aid in the selection, grading, and classification of the C&I:

- closely and unambiguously related to the assessment goal?
- easy to detect, record & interpret?
- provides a summary of integrative measure?
- adequate response range to stresses?
- important and therefore selected as 'priority'?

Upon the team's arrival in Belém, some of the members had yet to complete this assignment and extra time was needed to finish this task. This very time consuming task could be simplified in the future, as suggested by all team members.

The second step in the first phase consisted of initial meetings and briefings in Belém by the CIFOR co-ordinator, which were extremely important to bring team members up to date, in addition to the various interdisciplinary team discussions. The CIFOR co-ordinator analysed the results of the initial evaluation recorded on Form 1 using scores given to the 1085 items by each of the five team members. Some C&I were discarded following this analysis, and priority C&I for field testing were identified and selected. The sub-set of selected C&I were further divided into the various disciplines, recognising that some overlap would occur and some of the C&I would fall into more than one disciplinary area. The CIFOR co-ordinator and team then discussed the division of tasks and responsibilities.

The second filtering was initiated by the entries of the chosen C&I on Response Form 2, which required grading the attributes, on a scale of 1-5, in the first evaluation. These attributes were:

1. provides a summary or integrative measure?
2. closely and unambiguously related to the assessment goal?
3. adequate response range to stresses?

4. diagnostically specific?
5. appealing to users?
6. easy to detect, record and interpret?
7. precisely defined?
8. will it produce replicable results?
9. how relevant is this criterion or indicator?
10. other?

This form was designed to be used in the field for a more detailed assessment of the criterion or indicator in question, to provide a record of conclusions reached and the final outcome of the selected C&I. Many team members received help in the arduous task of filling in the form from Carol Colfer who obviously had gained much experience from previous tests.

During this phase in Belém, the team members, individually and in small groups, met with representatives of government, non-government organisations (NGOs) and the private sector. These activities also included obtaining and organising support documents for the field testing of the C&I.

A workshop was also held in Belém, which included all the team members and selected individuals from the government and NGOs for specific discussion of policy and planning factors influencing SFM. There were differences of opinion among the team members of the value of this workshop. For those whose principal concern was the policy and planning aspects of the C&I, it was useful in establishing an operational framework for that discipline. Others felt that the time would have been better spent on interdisciplinary discussion of the C&I within the Brazil context. The main result of the workshop was that country level preconditions and C&I were not considered relevant for the objectives of the CIFOR test. There was a strong agreement that the focus of the C&I should be at the FMU level which conforms to the guidelines specified in the introduction of the Briefing Book for the Brazilian test.

b. Phase II: C&I Evaluation and Field Work

The actual field evaluation was considered the most important filter for the research project. Even though interdisciplinary interaction was not sufficient, a strong relationship developed among the individual team members and the CIFOR staff present during the field work. Initially the team members completed the second selection of C&I which reduced their number considerably from 1085 prior to the Form 1 exercise to about 600 thereafter. This number was reduced further after overlaps and redundancies were identified.

Throughout this first phase of filtering, all the work was done from the bottom up, i.e. each and every one of the C&I was evaluated mainly on its own merit. At this point, a conceptual framework was developed which, in a top down approach, sought to place the C&I in a hierarchical framework to ensure that the C&I were contributing efficiently to the assessment of SFM. Most team members took quite some time to come up with a workable framework. In the evenings these thoughts were discussed and every third evening team members had to present their findings and the status of the work in a general session.

Along with this administrative work, there were individual and group site visits depending on the need. The social scientist visited and interviewed local people and other stakeholders both within and outside the CEMEX FMU. The person involved in the ecological aspects conducted field measurements of damage indicators. The forest

management team members visited many sites in order to understand the “modus operandi” within the CEMEX FMU. The policy and planning team member spent quite a bit of time away from the team interviewing, collecting data and filling in questionnaires.

During the second week in the field, the team members, with the help of the CIFOR co-ordinator, developed a conceptual framework. With the framework in place, it became simpler to allocate the selected C&I. However, some confusion was still caused by the differences between the preconceived and actual situations concerning the FMU, as discussed under point 5 of ‘Critique and Suggestions’. This was found to be true by all team members for all disciplines. This, however, helped to confirm the need for many C&I in the physical disciplines such as forest management and ecology, but unfortunately confused the issue even more for the social and policy areas.

Team members were encouraged to interact, either by design on part of the organisers or simply by being in close proximity, but heavy individual work loads and pressure of time did not allow sufficient opportunity for such interaction.

c. Phase III: Field Work Consolidation and Analysis

Three days were spent on the consolidation and analysis of the field data. In part this involved completing Form 2, and in part finalising the conceptual framework for the C&I of each disciplinary area. With the framework in place, the following step was to format and develop a bilingual C&I worksheet for all the C&I and verifiers for presentation at the workshop.

Meetings and group discussions on the selected C&I were also held during these three days. In addition, each team member had to prepare a presentation for the plenary session of the workshop. Nearly a half day was lost due to a virus attack on the half of the laptops available.

d. Phase IV: Closing Workshop

The first day of the workshop was a general plenary session for the invitees, team members and CIFOR staff. The morning was devoted to a presentation of the research project from CIFOR, followed by a panel discussion on the utilisation of C&I. Many participants thought that the only use for C&I was for certification and the main discussion in the panel session tended to concentrate on certification. The afternoon plenary session focused on the presentation of the methodology and approaches used for the test by the team members, and ended with an open discussion on the reports of the expert team.

The morning session of the second day consisted of a presentation by Carol Colfer on “Who counts most in forest management”, a presentation on policy and planning C&I and a plenary discussion on policy and planning. In the afternoon of the second day and through the morning of the third, the participants and team members were divided into the following four disciplinary areas: social C&I, ecological C&I, political and planning C&I, and SFM C&I.

The results of the various workshops were mixed and so was the response to the workshop by the team members. Many considered that part of the problem was of an imbalance among the group of people invited to the workshop. (This will be discussed in the Critique section of this report).

The team member responsible for the political and planning C&I considered the workshop as a whole very good but thought that the plenary on public policies not successful (see Annex 4). The working group on ecological C&I worked well: the main point by this group was that a FMU has the responsibility of locating itself appropriately within the regional landscape since it is not an isolated entity-but has to deal and interact with its surroundings. Some ecological C&I overlapped with the forest management C&I but both groups, after some discussion, decided to retain them in both sections. The forest management work group worked very well and was considered successful. The main issue that came up was in the definition of "long term". Although the team members chose to define "long term" as the duration of a cutting cycle as specified in the Brazilian law, this was changed to multiple cutting cycles during the group discussion. The workshop on social issues was the most problematic with the basic problem being the definition of the FMU (as discussed in the Critique section). The NGO representatives had a definite agenda which had to include all possible social circumstances that could affect or be affected by the FMU. They wanted to focus on the problem areas of the Amazon in general and was unwilling to accept the choice of CEMEX as a singular and representative FMU.

e. Phase V: Post Workshop Activities

The post workshop activities was very short and hectic. The time for this interdisciplinary work supposedly consisted of three days but on the third day team members had to depart for their respective home countries. The first activity during this phase was to amend the C&I following the discussion at the workshop. A final wrap-up meeting was held by the co-ordinator and the whole team at which time the team leader also presented the requirements for the contents of the individual reports and backup information. The second day was devoted to filling out page 4 of Response Form 2. This was done at the same time by all team members, as suggested by the project co-ordinator. This last activity was a tedious assignment and more time should have been devoted to this task. Most of the individual discipline reports were sent to the team leader after the departure of the team members. A great amount of time was spend on preparing and organising all the reports with attachments in a logical fashion. All the C&I were translated into both English and Portuguese. Some of the workshop reports and other materials were only in Portuguese and had to be translated into English. The hasty departure by most team members at the end meant that some items had to be sent at a later date thus delaying the whole process.

f. Phase VI: Results

The final task of the test was to arrive at a set of C&I (and verifiers) for the sustainable FMU in Brazil which were field tested and reviewed in the workshop. These C&I (and verifiers) have to be cost effective, diagnostically specific, precisely defined, be directly related to the assessment goal, and show an adequate response range to stresses. Attached to this report are two sets of C&I as they were developed in the Brazil test for the selected management unit. The first one was developed by the team members responsible for their disciplinary area, and the second was revised according to the workshop results. Also given in the tables are the relevant references to the C&I which corresponded to those in one of the five base sets. Where no reference is given, then the C&I (and verifiers) are new. Due to the interlinkages the yield control management and damage control management are consolidated in the tables. A summary of the number of C&I relating to the disciplinary areas follows:

<u>Disciplinary Area</u>	<u>Criteria</u>	<u>Indicators</u>	<u>Verifiers</u>	<u>New</u>	<u>Total</u>
Bio-physical - ecological sustainability	4	19	1	10	24
	3	15	16	10	34
Social aspects	6	30	27	24	63
	6	31	25	34	62
Management:					
- Policy & planning	3	23	63	74	89
	3	23	80	76	106
- Yield & damage control	4	15	42	16	61
	4	15	41	14	60

NOTE: The light numbers were presented by the team members to the workshop and the bold numbers are those which resulted from adjustments after the workshop.

Through the CIFOR test process, a set of C&I were developed which were to assure that the ecosystem integrity is ensured/maintained, and the well being of people is maintained or enhanced through the sustainable management of the FMU. Since the aim of the test was not to evaluate CEMEX as a company or the management of the CEMEX land holdings per se but to use this FMU as a base for developing the C&I, the set of C&I which were developed should be tested in a real situation on a FMU similar to that of CEMEX.

As expected the physical dimensions, such as ecological, yield control and damage control are usually easier to detect and work into a conceptual framework than the social and political factors. The C&I presented in this report, although the best considered within the test, are yet to be considered a cost effective minimum set for SFM under the conditions prevailing at the FMU level.

CRITIQUE AND SUGGESTIONS

The following comments are in no fashion meant as criticism of the testing process as such but as constructive observations for future use. Some of the comments are from team members and the team leader will provide his opinion if contrary. In some cases team members differed in their opinions which will also be observed. For future reference the items will be numbered.

1. An initial briefing of team members should not be done on an individual basis but as a team. A closed session of two days when not only the team but all participants are briefed by the CIFOR staff, on the national, regional and local realities of SFM, within the context of the disciplines to be tested, would be extremely valuable. Having the same information right at the start would facilitate discussion during the course of the test, thus avoiding lengthy recapitulation and additional work pressures. In addition, those team members less familiar with either the region or subject matter can, through intense interdisciplinary discussion, gain more pertinent knowledge. These advantages would help to build a common foundation for the whole process.

2. The evaluation of the C&I by the team members at their home bases was controversial. Virtually all team members agreed that if the whole team had gathered in a hotel and gone over the list together, a better result would have been obtained. Perhaps the purpose of the test was that no interaction should take place for this phase. However, most of the team members felt that analysing and discussing the C&I together would certainly help to avoid individual interpretation, and those C&I which were not understood could be clarified. If this evaluation would take place after a common briefing session, as stated in item 1 above, then the time needed for additional discussion during the test itself could be saved through a better understanding of the situation.

3. If items 1 & 2 above would have taken place, then the initial workshop might have been more meaningful. At this point of the test, most team members did not share the same level of understanding. Some team members did not consider this initial workshop worthwhile. Certainly this was not a fault of the CIFOR support and co-ordinating group but rather the lack of the government interest.

4. The field conditions were quite primitive and distracted the team's concentration, although everyone accepted the situation. The logistics were not sufficiently well organised and the support group should have visited the actual work site and prepared the facilities prior to the team's arrival. The team spent valuable time setting up and carrying out support team tasks.

5. The most important critique and controversy was the selection of CEMEX and the definition of FMU. The following guidelines were provided in the TOR:

"It is important to note that we are trying to identify a minimum set of reliable and cost-effective criteria and indicators focusing on CEMEX as a case study. We are not attempting to define a definitive set of criteria and indicators for the whole of Brazilian Amazon forests."⁷

"The expert panel will aim at identifying a minimum set of criteria and indicators considered to provide a reliable and cost-effective evaluation of the sustainability of forest management under the conditions prevailing at the management unit."⁸

When three team members were asked to give an opinion on a potential test site, the ideal characteristics cited included the following: a typical and representative mechanised operation on "terra firme"; the logistics for the test site should be reasonable; the selected enterprise should have above average operations in its forest management, forest product utilisation and harvesting practices; the FMU should have a forest management plan which is practised in the field.

Except for the last item, unbeknown to the team members, CEMEX best fitted the requirements and was proposed. The greatest portion of the forest product resources which are harvested in the Amazon region comes from this type of property ownership and enterprise structure and thus is the most representative. The other site options in the Amazon region where "forest management" is practised and wood is harvested, in terms of importance with regard to the amount of land affected and volume harvested, are as follows:

⁷ Quote from the Terms of Reference. See Annex 5.

⁸ Briefing Book.

- a. Amazon varzeas both in the lower and upper Amazon. These lands account for the second largest volume of wood produced, mainly by the traditional system of collecting wood as for other any forest product by the local people who are extremely selective and do not have a management plan. They in turn sell the wood to traders who supply the wood industry.
- b. Wood obtained from "authorised land clearing". This activity, from doubtful sources, represents the third largest volume of wood resources for the industry. Since this has nothing to do with forest management, it could not be considered further.
- c. The fourth largest harvesting activity is mahogany harvesting which can be divided into two sources.
 - i. Mahogany wood which comes from private sources. Most of this originate from large land holdings "claimed" (through squatters titles) by the large mahogany traders. They harvest only mahogany and then generally abandon the land. Since most of the mahogany have been logged on these lands and very little new area exists, this activity is being reduced.
 - ii. Mahogany from indigenous lands. Most of the mahogany today are harvested from such lands, in many cases with the active consent of the indigenous people. There is no management plan and such harvesting is illegal.
- d. Community forest and extractive reserves. Both these entities are future candidates as suppliers of wood from forests with potential management plans. At present most of them are in the initial stages of being defined as forest reserves and developing their management plans but are not active suppliers of wood products.
- e. National production forest. Although these have existed for a long time they have not contributed to the wood supply. Unfortunately, there are no active public forest concessions in Brazil at this time.

One team member observed that "the field site had some negative aspects, which included: (i) lack of representativeness of some social issues (indigenous people, violent conflicts), (ii) lack of professional forestry administration, and (iii) limited quality of management itself." All the above were true. In most cases, with regard to the social issues (except for mahogany), very little private land holdings conflict with the indigenous people. Most of the violent conflicts occurred in the recent in-migration areas which generally are not on the private lands from which most of the wood are obtained.

A member also noted that the FMU should include all the land owned by the enterprise including the farms which are interspersed within the forest. At the same time, this member concluded that the entity who holds the forest management plan is what defines FMU. The problem here is that the forest management plan according to Brazilian law only applies to a single land title and cannot be made for multiple properties. Therefore I agree with the first statement but not with the second because they are in conflict.

A final observation is that the Brazil test appears to be the only CIFOR test of C&I which took place on private land. This factor has a strong influence on many of the C&I tested. In many instances, it was obvious that the C&I were developed with public land, such as national forests, or concessions in mind. This may cause some confusion, particularly with the social C&I, and to a certain degree with some of the environmental

ones as well. A similar situation could be likened to choosing C&I for a national forest in northwest USA or for private wood lots in the southeast USA. Although it might be desirable for society to have more say in private forest land ownership, or for private forest owners to have more social responsibility, limitations are inevitable in this regard to private land ownership.

As we see from above, if we want a representative FMU, it has to come from the private sector and located on "terra firme".

The debate on what constitutes a FMU is more difficult to resolve. According to Brazilian law, each CEMEX property would constitute a FMU. For the certification process, all the properties located within a given industrial setting (depending on the certification request) would be evaluated together. If the industry and its products were to be evaluated for certification, then all sources of the forest products would have to be assessed, whether they come from the enterprise's properties or from other lands. The choice to restrict the FMU to the CEMEX properties was based on the Briefing Book and Terms of Reference.

6. Interdisciplinary co-operation was considered a weak point in the Brazil test. It certainly was true that interaction among the expert team members was insufficient. One person was away from the team most of the time and the two members responsible for the forest management C&I tended to work together most of the time. These actions were not because of the lack of interest but rather due to the lack of time and the intensity of the filtering activities. To facilitate interdisciplinary work, the team members would have, to some degree, share the same level of understanding the actual site situation and the operations connected with the test. This was not the case, as noted in item No. 1 above. If anyone should bear the responsibility for this lack of interaction, the team leader should be the one held accountable. I was very intimidated by the amount of work to be done and devoted too much time to my own work. I believe again that if we would have had the opportunity to follow items No. 1 & 2 above, this would have reduced the need for elaborate explanations and more interactions would have taken place.

7. Although the length of time for the test seemed long, it was considered insufficient by all team members. Following items No. 1 & 2 would reduce the amount of time spent on "getting a hold of the situation" for each team member, perhaps allowing for more quality time for work. The period between the field test and the workshop was too short. A day off and an additional day just for discussions on the findings would have been helpful. Again this is true at the end of the test after the workshop. Each team member was worried about his/her own report and data organisation. This had a negative influence on filling in page 4 of Form 2. The only reason that the work was completed was with the help of CIFOR staff.

8. The contributions of other participants during the workshop were somewhat disappointing. Most of the participants were from the NGOs and many of them had limited local experience. From the private sector there was only one higher level person. Many were not working actively in the region and numerous regional key people were either uninvited or not invited in time. All the working groups were affected by this oversight. One team member commented that "the organisation of the event should not have been delegated to an institution⁹ situated so far from the region where the test would be carried out."

⁹ Editors' Note: The institution concerned is IPEF, São Paulo.

CONCLUSIONS

For the Brazil test the objective "identify C&I that are objective, cost-effective, and relevant to the sustainable management of forest" was met to a certain degree. The applicability of the C&I should be tested by third party evaluators in the field. It was obvious from the test that those C&I from institutions which are active in applying them tended to be more fine tuned than those which lacked field testing in various sites.

The combination of results from the five separate tests will serve as an initial tool for further development of C&I. It is obvious that "regionality" and even site specific C&I will have to be developed, but any organisation, be it government or non-government, can utilise the conceptual framework as developed by the CIFOR test. The importance of the basic conceptual framework and the resultant C&I from the test is that it can be applied in any forest type. More work should still be done on developing specifics for the indicators, and subsequently the verifiers, on a regional and site specific level. We hope the test provided useful results. Certainly team members, some of whom are involved in applying C&I in the certification process, also learned a lot from their involvement.

ANNEX 1

REPORT ON TESTING SOCIAL CRITERIA AND INDICATORS FOR SUSTAINABLE FOREST MANAGEMENT

Jan Kressin

1. OBJECTIVES

Identify social criteria and indicators (C&I) that are objective, cost effective, reliable and relevant to sustainable forest management (SFM) in the selected testing area.

2. SELECTION AND EVALUATION OF CRITERIA AND INDICATORS

The study is based on the five existing sets of C&I which have been elaborated by five different institutions (Soil Association, Rainforest Alliance, Initiative Tropenwald, Lembaga Ekolabel Indonesia, and the Dutch Working Group). The existing C&I were to be evaluated on their plausibility, acceptability and feasibility, with an interdisciplinary approach using the expertise of foresters, an ecologist and a sociologist, supplemented by the additional support from an agricultural engineer.

In a first step, the conceptual framework was explained and discussed giving first of all importance to the definition of sustainability, forest actors, the characteristics of C&I, and the methodological approach proposed by CIFOR (which has already been practised in field tests in three other countries: Indonesia, Côte d'Ivoire and Germany).

In a second step the sets of criteria were evaluated and selected in an iterative way:

- a. A pre-selection of the C&I was made against the general background of forest management in terra firme Amazonian forests, but without knowing the specific location of the test site, using the evaluation criteria proposed by CIFOR (summary or integrative measure, closely and unambiguously related to the assessment goal, adequate response range to stresses, diagnostically specific, appealing to users, easy to detect/record/interpret, precisely defined, reliable, relevance of C&I);
- b. The second selection and evaluation were carried including the information of the site and taking into account the judgement of the other team members;
- c. The third selection and evaluation were done at the beginning of the information gathering phase, at the site of the forest management unit (FMU).

At the same time an operational scheme and guidelines for interviews were developed. The guidelines were then tested in pilot interviews and modified according to the results. Several visits to the different forests of the FMU and the local communities were made. Local housing, workers' camps and the sawmill were inspected. Interviews were carried out with the following persons and institutional representatives:

- members and leaders of the communities of Rio Monju, Pau Rosa, Tavari;
- forest workers of CEMEX;
- CEMEX management in Santarém;

- local CEMEX management;
- IBAMA;
- Ministry of Labour;
- NGOs: Saude e Alegria, Grupo defesa de Amazonia; and
- Rural Workers' Union.

In addition, CEMEX's forest management plans were also examined.

A final selection of the C&I was made, taking into account the results of the fieldwork. In this step, most of the original indicators were reformulated according to the situation found in the FMU. In addition to the evaluation criteria mentioned earlier, the applicability of the C&I to the existing situation was also of special interest. In cases where no appropriate C&I was found in the existing sets, new ones were created.

3. PROPOSED INDICATORS AND DISCUSSION

During the process of analysis and evaluation, the C&I were structured into six groups as shown below. They are important in assessing social and economic conditions of forest actors with reference to forest sustainability.

1. Land tenure
Criterion: Forest actors' long term tenures and user rights are secure.
2. Labour conditions and relations
Criterion: Income and security of life conditions are perceived as acceptable by all forest actors.
3. Interaction and co-ordination
Criterion: Forest actors' rights to monitor, control and negotiate are strengthened with special attention to disadvantaged groups.
4. Economic and social benefits
Criterion: There are contributions to social and/or economic development of the local population by the FMU.
5. Cultural heritage
Criterion: Respect for and protection of cultural and religious sites of special significance have priority over any utilisation.
6. Behaviours
Criterion: The people involved with the forest show a concern for sustainability.

All accepted and proposed indicators have proven to be quite feasible and cost effective, although more verifiers need to be identified.

In this field test, we identified a new topic for which C&I are needed. This new set of indicators deals with forest actors' concern and awareness of sustainability resulting in behaviour which is favourable or unfavourable to sustainability. This could be of special importance for the functions which the local population should exercise on FMUs, like monitoring and control. In this regard, we identified a question: Are environmental concern and awareness necessary for communities to serve such functions of monitoring and control? Similarly, can forest companies whose personnel show no such concern or awareness hope to manage their FMUs sustainably? Possible criteria or indicators of behaviour could include the following ones:

- The function of local populations and other forest actors to monitor, control and correct forest management is legitimised by behaviour which is oriented towards sustainability;
- Forest managers' effort to look for support of local population is legitimised by behaviour which is oriented towards sustainability.

A number of C&I could not be tested because they did not apply to the situation in the area (e.g., those referring to indigenous communities).

A source of steady discussion within the team had been the definition of the FMU and to what extent the surrounding area outside the CEMEX property had to be included. For instance, the probability of accelerated in-migration, and thus deforestation due to the roads built by logging companies, struck us as important. One conclusion drawn was attributed to the lack of a clearly defined land use plan and settlement policy, which would stop the chaotic and uncontrolled immigration. Respective indicators in the subject areas of policies and planning were to be formulated. Also, question about the conditions and limitations attach to private forests arose because they are essentially a public good with important functions for environmental preservation. This question emerged especially in connection with the indicator referring to the necessity of control of sustainability endangerment through transfer of capital from forest activities to other activities of the FMU operating company.

One source of problems for assessment proved to be the complicated land tenure and the multiple activities of the company operating the FMU (logging, ranching, conventional agriculture and sawmilling). The CEMEX situation in this aspect seems to be typical for the logging sector in the Brazilian Amazon.

4. MAIN TOPICS OF DISCUSSION IN THE SOCIAL WORKING GROUP OF THE FINAL WORKSHOP

A description of the results from the working groups has been made by the rapporteur Carol Colfer (see Annex 1.1). Additional comments based on these reports are given below.

4.1 Definition of FMU

The consultant used the following concept:

- the FMU is defined by its social constitution and land demarcation;
- there are existing impacts of different social, economic or bio-physical intensity from or to the FMU.

All impacts, whether big or small, have to be included into the process of indicator identification and formulation if relevant for sustainability. If this is followed, the question whether the FMU should be extended to all impacted areas seems not to be so important any longer. Besides, the complicated discussion of where the FMU ends (are the sawmill, the supply shop in Santarém from which the workers' families buy their supplies or the community with the road built by the forest company still part of the FMU?) can be avoided.

4.2 Site selection

The selection of CEMEX as the test site was controversial as some participants considered it to be atypical of the region. However, first hand information in the area and from academic sources seem to contradict this as Zweede, Silva and Vianna also pointed out in their respective reports. Altogether, the company's multiple activities and the dominance of immigrant squatters, small farmers and ranchers in the local population are not uncommon for the western Amazon uplands.

4.3 Conflicts

Some conflicts and mechanisms for their resolution were studied. Although it is possible that more conflicts existed than were observed by the consultant, they were irrelevant for the formulation of the indicators. It was important only to test the viability of existing indicators against the background of a real life situation. Study of all conflicts in the area is neither requested nor necessary. The method was based on key studies and not on a baseline survey. The indicator should focus on conflicts **inside** the FMU, or **between** FMU and local population or other stakeholders, and not on conflicts which did not involve the FMU and had no mutual impacts.

Results of the field study showed that there were no conflicting claims on property or use rights of land (sources: local population, CEMEX, management, IBAMA, INCRA, NGOs). Conflicts existed on benefits for communities whose lands were used for infrastructure (roads and log deck). The selected and new formulated indicators seemed to be sufficient to identify and evaluate relevant conflicts in the past and present.

4.4 Existence of Indian Communities

Although there was no proof of the presence of indigenous people in the FMU area in the past, the FMU should be prepared to respect possible future claims of reappearing descendants according to national and international law. The difficulty is to formulate an indicator about a possible future situation. Discussion on whether to include a prescription like "future claims of land or use rights by indigenous population have to be respected according to national and international law" is necessary.

5. COMMENTS ON OUTPUT OF SOCIAL WORKING GROUP

For the following comments, please refer to Annex 1.2 for the set of social C&I.

C.1, I.1, V.1: Not recommended by the consultant. It touches on labour questions (see criterion 2). What is public action? The original indicator (Kressin's list) proved to be effective.

C.1, I.3 V.1-4: OK, could include one more verifier: "other".

C.1, I.4, V.1-3: OK, add "other".

C.2: Not recommended: secure income and life conditions can never be mandatory nor realistic in a market economy. Vague.

C.2, I.2, V.1: OK.

C.2, I.5, V.1: It is already included in indicator 1.

C.2, I.9, V.1-3: They are included in indicator 1. According to all information in the test site and from team members, the indicator has a zero value in forest management units in the region.

C.2, I.10, V.1-5: Not recommended. Verifiers are neither conducive to indicator verification (it asked for whether the FMU shares responsibility that means monitoring and reacting in case of infringement). Nor are they quick, cheap and easy to implement.

C.3: "...and strengthened..." should not be excluded because "guarantees" are all too often not respected and put into reality.

C.3, I.2: The guarantee exists already, what is important is its recognition.

C.3, I.3: This is a prescription and not an indicator.

C.3, I.4: An indicator should not contain a causal relation like: "...in order to...."

C.4, I.1, V.1: It is a desire far from gaining the consensus of involved parties.

C.4, I.3: Unrestricted use of roads does not correspond with the objective of sustainability.

C.6: Seems to be more vague than the original formulation. In view of the complexity of the criterion, verifiers should not be excluded. The originally proposed ones have the advantage that in part they are already identified. The consultant believe better ones could still be formulated.

6. SUGGESTIONS TO IMPLEMENTATION OF TESTING PROJECT

a. In future, the number of initial C&I should be reduced based on the previous selections made, **with priority given ahead those without any acceptance**. By doing this, time and energy will be saved. Validation of C&I by all members is not necessarily in tune with the real value of the indicator, as shown later in the field.

b. Some more time should be given for field work, conceptual discussion and team work because the stress was too great. Additional costs would be marginal, and productivity could be improved.

c. At the beginning of the final workshop, participants should be clarified about their roles, understanding that their suggestions were meant only to be an additional source of information to be used at the discretion of the team. Assurance can be given that all information is passed to CIFOR, and would be taken into consideration.

ANNEX 1.1

REPORT OF SOCIAL WORKING GROUP

Summarised by Carol Colfer

The Social Working Group was initially composed of nine members, including representatives of NGOs and bilateral aid agencies, university professors, independent consultants, CIFOR staff and one team member. The group was moderated by Peter Saile from GTZ. Carol Colfer was the rapporteur. Two sessions were initially scheduled, and a third session was deemed necessary to complete the group's tasks.

SESSION No. 1

Conceptual Framework

During the first meeting, which was very productive, Jan Kressin gave an introduction to his conceptual framework. He first identified the important *problems* that interfered with SFM in the CEMEX area as well as the *effects* of unsustainability. He then set aside two particular areas of emphasis for the social group to consider (on which he had based his initial set of C&I), calling these behaviour and socio-economic conditions. His C&I can be organised within these two categories.

Description of CEMEX

He then described the situation at CEMEX to orient the group to the problems he was facing when he selected the C&I in the set we were examining. This description prompted a lively discussion of what was meant by a FMU.

Criteria and Indicators

The group then proceeded to examine each item in Kressin's set. Making use of an element in the ZOPP method, Kressin requested that each member write down their suggestions of wording for changes he/she wanted to make. These suggestions were then written on cards and placed on the wall for general viewing.

During the course of the discussion several items emerged as important, as summarised below:

- Definition of FMU. Many group members felt that the FMU had been too narrowly defined. They were concerned that many of the important problems of the Amazon had not been considered or used to test the C&I. Wide agreement with this concern was voiced within the group, though eventually all agreed that the decision had already been made, and the group would have to accept it.
- Existence of Indian communities. One of the members understood that there had been Indian communities in the area some fifteen years ago (consistent with Johan Zweede's observations on forest species in certain areas). The C&I made no mention of Indians, since the team had concluded there were none there now. Indeed, they had been told by several sources that there had not been any Indians in the area. The group was

uncertain about how to deal with the issue, since any Indians who had been there are obviously no longer there.

- Identification of conflict. Kressin viewed that there was little conflict in the area, but many group members expressed scepticism. They were concerned that conflicts might be smouldering, invisible to a brief visitor. They gave examples of conflicts in other areas, and the group discussed how one might identify the existence of conflicts in a reliable and cost effective way.
- Multiple owners. One of the group members pointed out that every square inch of the Amazon is owned by at least one owner, and that many are owned, in some sense, by several. He questioned the conclusion that conflicts over land were not important in the CEMEX area.
- Importance of listening/learning from local people. One member emphasised the importance of attending to the concerns of people in the areas, stressing the possibility of learning from them (particularly Indians).
- Communities have no legal status. There is no legal entity called a community in Brazil. The terminology used in several of the C&I was discussed, with this in mind.
- Vague words. Like the other working groups, there was considerable concern over vague terms like “acceptable”, “significant”, “reasonable”. In some cases, the group came up with verifiers which allowed for more quantification or more definition to these terms; in other cases, the group could not do so.
- Well being. Several group members felt that human well being (beyond economic factors) should be more explicitly addressed, although others felt this kind of concern presented special problems of definition and measurement.

In this session, the group completed most of Criteria Number 1 and 2. Kressin and Colfer took the cards and tried to incorporate the suggestions into Kressin’s initial document that evening.

SESSION No. 2

This session, again led by Peter Saile, and reported by Colfer, began with a reading of the changes incorporated the night before. Although most suggested changes had been included, there was a feeling among several of the group members that Kressin and Colfer had “censored” or “filtered” group input unnecessarily. Some of this derived, I think, from differences in language (translations into English, from the cards provided in Portuguese). There seemed also to be a fear on the part of some that there was a purposeful attempt to alter the group’s input. In any event, the discussion proceeded to such a state that two group members threatened to provide no more input into the proceedings. After more than an hour of discussion, Peter called for a vote, and it was agreed that every suggestion would be recorded for incorporation into some sort of report.

After each C&I had been evaluated and changes suggested, Colfer and Kressin made a list of these suggestions which were then read to the complete workshop in a Plenary Session. The problem was discussed more widely and it was agreed that a third session would be held in which the suggestions would be further discussed and incorporated into the normal format (Principles, Criteria, Indicators, and Verifiers).

SESSION No. 3

In this session, two more NGO representatives with extensive experience in the Amazon joined the group, and some other members dropped out. Ana Fanzeres (Greenpeace) chaired the session. The discussion began with a report of timber companies and worker conditions in Paragominas by Paulo. It was reiterated by several group members that the purpose was to get the input of workshop participants, and that we would create a final set which was derived from the group (building on Kressin's original set). Colfer typed the changes in as the group decided on wording, with Fanzeres helping with exact phrasing of translations. It was agreed that the C&I should have a preamble which stated three things:

1. A description of the location (private upland forest) with a list of stakeholders;
2. The fact that social actors are seen as having a stake in forest management;
3. Respect for national legislation and international agreements.

Some of the significant changes made include the following:

- Worker safety. A series of specific indicators was condensed into one, referring to SIPA (a legal requirement which covers the same issues).
- "Slave" and child labour. This was added as an indicator, with three associated verifiers.
- FMU responsibility for third party contractors. Five verifiers were added to this, to make it more measurable and concrete.
- Criterion on stakeholder participation (No. 3). Three additional items were added: Independent auditing of social conditions, worker representatives' guaranteed access to workers, and rights of local communities to participate in all phases of management planning.
- Respect for cultural and religious sites. This was discussed for some time, because of their apparent absence at CEMEX. The group eventually decided to leave it in as an indicator with a "0 value" at CEMEX.
- Ethic of sustainable land use. This was discussed at some length. Some group members felt that it should be dropped completely. Others thought it should be put into the management component. In the end, no decision was made about it due to fatigue.

The group process here was considerably more productive than in Session 2, in the sense that little or no energy was wasted on conflict. On the other hand, Kressin's views on the suggested changes were not incorporated. The productive give and take, and exchange of differing views which was successful in the first session was missing. The final workshop document, however, does include many useful suggestions for improvements.

ANNEX 1.2

SOCIAL CRITERIA AND INDICATORS

(Note: Post Workshop Version - in bold)

P	C	I	V	Description	DDB	ITW	LEI	SOI	SMW
	I			<i>Forest actors' long term tenure and user rights are secure.</i>					
		1		Forest management unit is implementing forest management on the basis of a legal title of the land, recognised customary rights or lease agreements.		A 2.2.2.1 B 3.1		10.104.d.7	
			1	(NEW) Existence of legal labour proceedings and/or public actions in which the company is involved.					
		2		(Previous: There are no significant conflicts and disputes about land use or property rights). There are no significant conflicts, disputes or significant claims on property and use rights.		C. 1.11.2 C.15.1.4			
		3		(Previous: Communities' use rights to the FMU area [such as rights of way, use of common land, and usufruct rights] are recognised and upheld). Land use rights of stakeholders involved and impacted by the FMU area are recognised and upheld.		B.3.1.3 A. 2.2.2.2.2	11 12	7.105	
			1	(NEW) Rights of way					
			2	(NEW) Use of common land					
			3	(NEW) Usufruct rights					
			4	(NEW) Non-timber forest products					
		4		Between the FMU and local population, agreement is reached (in a representative and legitimate fashion) on all operations of mutual concern.				8.102	
			1	(NEW) Court cases pending					
			2	(NEW) Legally based claims or reports by groups registering a complaint					
			3	(NEW) Incidence of physical violence					
				(DELETED: There are no significant conflicts and disputes about land use or property rights.)				10.104.d.12	
		5		Damages to resources of local population or FMU are compensated		B.3.1.5.2		8.109.b	6.11

P	C	I	V	Description	DDB	ITW	LEI	SOI	SMW
				in a manner which is perceived as satisfactory and just by the victim.					
	2			<i>(Previous: Income and security of life conditions are perceived as acceptable by all forest actors).</i> Income and security of life conditions are mandatory preconditions for all parties involved in the forest management unit.					
		1		Wages and other benefits (health care, retirement, compensation, education, housing, food) at least fulfill legal requirements and are equal to or better than prevailing local and regional standards.		A. 3.1.2.1			7.1
			1	<i>(Previous V1: Wages and allowances are appropriate for the tasks)</i> <i>(Previous V2: Wages and allowances are at least the government minimum)</i> <i>(Previous V3: Wages and allowances are paid fully and on time)</i> Wages and allowances appropriate for the tasks, meeting at least the government minimum, and are paid fully and on time		(15.7.2.1) (15.7.2.2) (15.7.2.3) 15.7.2.1			
			2	<i>(Previous V4: Sufficient breaks in the working day to prevent accidents)</i> Sufficient breaks in the working day to prevent accidents and holidays are at least the legal minimum		15.7.2.4			
				<i>(Previous: V5: Holidays are at least the legal minimum)</i>		(15.7.2.5)			
			3	<i>(Previous V6: Health care is at least the legal minimum)</i> <i>(Previous V7: Safety measures are at least the legal minimum)</i> Health care and safety are at least the legal minimum		(15.7.2.6) (15.7.2.7) 15.7.2.6			
			4	<i>(Previous V8: Housing for staff is appropriate)</i> <i>(Previous V9: Housing for staff is at least the legal minimum)</i> Housing for staff is appropriate and at least meets the legal minimum.		(15.7.2.8) (15.7.2.9) 15.7.2.8			
			5	<i>(Previous V10: Transport for staff is well maintained for safety)</i> Transportation for staff is comfortable (according to legal norms) and is well maintained for safety		15.7.2.10			
		2		Worker safety fulfils legal requirements.					7.2
				<i>(Deleted V1: Protective helmets)</i>		(12.9.1)			
				<i>(Deleted V2: Earmuffs or hearing defenders)</i>		(12.9.2)			
				<i>(Deleted V3: Protective clothing)</i>		(12.9.3)			
				<i>(Deleted V4: Safety shoes)</i>		(12.9.4)			

P	C	I	V	Description	DDB	ITW	LEI	SOI	SMW
				(Deleted V5: Warning colours)		(12.9.5)			
				(Deleted V6: First aid kit)		(12.9.6)			
				(Deleted V7: Protective gloves)					
		1		Existence of SIPA or internal system of prevention of accidents, according to existing legislation		12.9.1			
		3		Training corresponds to necessary skills required for type of work.			10.2	5.303	
		4		Temporary workers' labour rights and benefits are respected as required by law.				8.301	
		5		There are assured compensation benefits in cases of accident.				8.307	
		1		(NEW) Compensation for high risk and unhealthy/risky work					
		6		(Previous: Workers are allowed to organise.) Workers have the right to organise guaranteed.				8.304	
		7		Workers have the right to collective negotiations.				8.304	
		8		(Previous: Necessary dialogue between workers and management is institutionalised.) Channels of dialogue do exist between workers and managers of the FMU.				8.305	
		9		(NEW) The existence of "slave labour" relationship					
		1		(NEW) People are at liberty to come and go					
		2		(NEW) People are not subject to economic coercion					
		3		(NEW) Child labour is not used					
		10		FMU shares responsibility for fulfilment of existing labour laws and norms when using third party contractors.					
		1		(NEW) The workers have access to the list of companies or persons contracted by the FMU					
		2		(NEW) The legal histories of the companies and individuals contracted by the FMU					
		3		(NEW) The number of employees of the company and its legal history					
		4		(NEW) Receipts of payment of social benefits to workers					
		5		(NEW) Origin of workers and length of service					
3				(Previous: Forest actors' rights to monitor, control, and negotiate are strengthened with special attention to disadvantaged groups.)					

P	C	I	V	Description	DDB	ITW	LEI	SOI	SMW
				<i>Stakeholders' rights to monitor, control, and negotiate with the FMU are guaranteed, with special attention to disadvantaged groups.</i>					
		1		Communication and information between FMU and local population is perceived as sufficient by all involved parties.			5.2.1.1	8.108.d	6.2
		2		(Previous: The right of forest actors, especially the local population, to report infringements....) The right of stakeholders, especially the local population, to report infringements of laws, norms and rules is guaranteed by forest management, local population and authorities.					
		3		(Previous: Forest actors - especially those reporting infringements - must be informed in a timely manner on the status of the action on the report.) Stakeholders, especially the local population, and their representatives - especially those reporting infringements - should be informed by the FMU on the status of the action on the report upon request.					
		4		(Previous: Conflicts are resolved in a rational manner giving voice to all involved parties, including the possibility of neutral arbitration acceptable to all.) Conflicts are resolved in order to facilitate the participation of all relevant stakeholders, and includes mutually acceptable neutral arbitration.		B.3.1.5.1	14.2.1.3		
		1		(Previously I. 5) Conflict resolution is perceived as just and/or satisfactory to all involved forest actors					
		5		Public hearings are held if significant objections are made to forestry plans and practices, by local forest actors or institutions.					6.8
		6		(NEW) Existence of independent auditing of social conditions for workers and their representatives as appropriate to the scale of the enterprise, performed in regular intervals.					
		7		(NEW) Workers' representatives have access to workers' living and working sites.					
		8		(NEW) Local populations are guaranteed the right to participate throughout the entire process of the management planning.					

P	C	I	V	Description	DDB	ITW	LEI	SOI	SMW
	4			<i>There are contributions to social and/or economic development of local population by the FMU.</i>	B.2.5		10 7.1.1 8.2.1 8.2.2 7.2.11	8.401 8.403	6.1
		1		FMU supports subsidiary enterprises and small scale industries (e.g. transport, workshops, supply of food, etc.).			8.2.12	8.403.b	
		1		(NEW) A given percentage is set aside, of certified production, for a social fund, controlled by the local population, for their benefit (including social organisation).					
		2		(Previous: Employment is offered with priority to local communities.) Local populations have priority in opportunities for education, employment, training, services and support for community organisation.	B.2.5.1	B.3.1.4.1	8.2.1.3	8.403.c	
		3		(Previous: Where consistent with sustainability requirements, use of roads and other appropriate infrastructure by local communities is permitted.) Use of roads and other appropriate infrastructure is guaranteed to local populations.		15.2.4.2	11		
				(Deleted I. 4: Contributions of FMU are generally perceived as positive and appropriate by local populations.)					
	5			<i>Respect for and protection of cultural and religious sites of special significance has priority over any utilisation.</i>					
		1		(Previous: Cultural and religious sites of special significance are protected by the FMU in co-operation and co-ordination with local populations, institutions and authorities.) Cultural and religious sites of special significance to local cultures, traditions and religions of Indians are protected by the FMU in co-operation and co-ordination with local populations, institutions and authorities.				8.201.d	
		2		When archaeological sites or artifacts are located during operations, all relevant authorities must be notified immediately and the sites recorded prior to further disturbance.				5.307	

P	C	I	V	Description	DDB	ITW	LEI	SOI	SMW
	6			<i>(Previous: The people involved with the forest show a concern for sustainability.)</i> <i>Stakeholders demonstrate an ethic of sustainable land use.</i>					
		1		Destructive activities are not in evidence - cross ref. to environmental C&I.					
			1	(NEW) Fishing with explosives					
			2	(NEW) Excessive use of chemicals					
			3	(NEW) Cultivation on steep slopes					
		2		Examples of sustainable practices exist - cross ref. to forest management sections.					
			1	(NEW) Skidding techniques are good					
			2	(NEW) Vines are cut before tree harvesting					
			3	(NEW) Shifting cultivation cycles are adequate					
			4	(NEW) Suitable agroforestry techniques are in evidence					
		3		<i>(Previous: Awareness/extension efforts exist at the local level.)</i> Awareness and local knowledge pertaining to forest management exist at the local level.					
				[to include verifiers--too tired, 9:20 PM]					

ANNEX 2

REPORT ON TESTING ECOLOGICAL CRITERIA AND INDICATORS FOR SUSTAINABLE FOREST MANAGEMENT

Rita de Cássia G. Mesquita

INTRODUCTION

The objective of CIFOR's project in Belém and Santarém, Brazil, was to select a minimum set of criteria and indicators (C&I) necessary to assure the sustainability of forest management, with focus on upland Amazonia, where field testing was conducted.

This report presents results of the analysis of ecological C&I, and is divided in three parts. The first briefly summarises the procedures and decisions regarding the selection phase, both pre- and post-field work; the second contains the results of a final workshop where selected C&I were presented and discussed with invited local and international experts on the subject; the third part presents suggestions to improve CIFOR's procedures for selecting C&I.

PART 1: SELECTING AND TESTING CRITERIA AND INDICATORS

The conceptual framework

The one principle guiding the choices of ecological C&I to be tested in the field was that a **sustainable forest management can only be reached if the ecosystem's integrity is maintained**. There are two main aspects to integrity: first, that critical functions and processes of the ecosystem are maintained; second, that the ecosystem's ability to recover is assured. The ability to recover will depend on the scale of disturbance, its intensity, size and interval. Damage control initiatives can reduce impact extent. Changes in structure and species composition can affect the ability to recover, and will also influence the system's maintenance of critical functions. Because these factors are all interconnected, sometimes the boundaries between them are not clearly defined.

The selection of criteria and indicators

From a pool of 1,100 C&I, 299 were found to be "ecological" (including those overlapping or related to other areas). Each one had been evaluated by all five team members ("specialists" in ecology, management, policy and planning, and social issues). The evaluation considered four aspects, namely that the C&I

1. were closely and unambiguously related to the assessment goal;
2. were easy to detect, record and interpret;
3. provided a summary or integrative measure; and
4. had an adequate response range to stress.

During this first analysis, C&I were either accepted or rejected by each team member for further evaluation. The results were grouped and averaged. All C&I which had received unanimous acceptance were kept for the next step. C&I which received at least one acceptance were evaluated independently by me and either accepted or rejected (about

10 percent was rejected). During the next step, the accepted C&I were organised in groups and sub-groups. At least three attempts were made to create a framework which was meaningful and could represent in a logical and connected manner the variety of ecological aspects influencing sustainability. This was probably the most difficult task. Finally, the accepted framework had the following grouping:

1. C&I important for the maintenance of critical ecosystem's functions and processes;
2. those important for biodiversity maintenance;
3. those aimed at minimising impacts of logging; and
4. those related to maintenance of environmental quality (mainly soil and water).

Aside from the difficulty in determining an acceptable framework, other problems encountered were related to the vagueness, poor formulation, and redundancy of a number of C&I. At the end, an attempt was made to include only those which were objective enough to allow field testing (granted that they also should be inexpensive, integrative, and sensitive).

Field testing of criteria and indicators

Any logging activity results in impacts to the forest. Therefore, the main focus of the field test was on the detection of impacts of logging on the forest (see schedule of field activities below). Another relevant aspect related to impact assessment are the damage control and impact mitigation initiatives. A first step was a critical analysis of the management plan, which did exist and was made available to us. The amount of information available in terms of planning and monitoring was, then, relatively easily assessed. It also provided information on logging history, which then could be related to recovery in logged plots. Impacts on biological and physical components of the ecosystem were evaluated.

Direct physical impacts: These involve a) the amount of soil disturbance (observations of erosion, compaction), amount of skidder tracks, amount of stream damage in terms of water pollution, flow blockage, and logging along river edges; b) structural changes such as the amount of canopy disturbance, possible evidence of edge effects (fire and consequent tree mortality).

Direct biological impacts: Effects on biodiversity were also evaluated through rough quantification of changes in species dominance and diversity in logged areas, number and species of trees harvested, observations of evidence of fauna present in the area, evidence of hunting, existence of fauna surveys.

Impact mitigation initiatives: They include administrative guidelines on species protection, chemical uses and disposal, silvicultural treatments to reduce damage to the forest, protection areas, existence of fire breaks, etc. The bulk of this information came from direct observations and interviews with forest managers and employees. During field testing, and as information on the management situation was uncovered, it became clear that the rejection of some C&I should be reconsidered. These were re-incorporated in the accepted pool. Field testing helped to fine tune some criteria, which had been accepted with minimal changes, but actually needed a new, more substantial re-writing. Most accepted C&I were, in one way or another, present in the original listing of C&I. Field testing showed that some C&I could be easily tested, and provide an integrative measure of logging impacts, while others were vague and difficult to measure.

A BRIEF ANALYSIS OF THE FIVE SETS OF CRITERIA AND INDICATORS

Five sets of C&I were analysed during the project in Brazil. These sets were from the following institutions: Rainforest Alliance (Smart Wood Program, SMW), Soil Association (Responsible Forestry Standards, SOI), Institute Tropenwald (ITW), Dutch Working Group (DDB) and Lembaga Ekolabel Indonesia (LEI).

LEI: In general their C&I addressed all relevant aspects, but they would need more explicit formulation. A lot of them were made of few unconnected words. Also, the text should benefit and improve a lot if problems with the English translation are corrected. I think most indicators were actually verifiers, and some terms used frequently, such as "ratio", were not clearly defined.

ITW: It is the most exhaustive set of C&I, but leaves almost no room for flexibility. The excess of detail in the guidelines, particularly in the Checklists, may become a problem when trying to apply this set of C&I to countries other than Germany! It could, probably, be trimmed down without losing its content.

SMW: This set has some prescriptive C&I which are conflicting, for instance, with the Brazilian environmental law (e.g. 5.5, 5.13 or 5.14). Therefore, I think that a more general phrasing would make it applicable to a larger range of situations. At any rate, it is a good selection of C&I. It is the closest to a **minimum** set necessary for sustainability.

SOI: It was the main contributor to the final set of selected ecological C&I. It is somewhat prescriptive, but more in the wording than in the spirit. These C&I are a good representation of all the components and linkages relevant in forest management. However, and such is reality, many important C&I are very hard to be verified in the field. I think the SOI set is more of an ideal set that should guide further research to generate verifiers.

Dutch: It is heavily policy-oriented. For this reason, none of its C&I were included in the ecological grouping, as we had a separate group to deal only with policy and planning (see Dr. Virgilio Viana's report). It obviously is concerned with a different level, focusing more on the country than the FMU level. Several of its C&I, however, could be more explicitly phrased to avoid ambiguity.

PART II: WORKSHOP REPORT

During November 15-17, 1995 a final workshop was held in Belém, when the sets of C&I selected by the specialists of each area were presented to a bigger audience representing a wide range of interests and expertise. The attendants, after being introduced to the objectives of the overall project, and the procedures during C&I selection and testing, were divided into four groups. Each group had the task to discuss in detail the selected C&I, to propose, when necessary, changes to the set already present, and to identify possible missing C&I and incorporate them in the final set. The experts present were asked to offer their experience in the Amazon and with the subject discussed to improve the outcome of CIFOR's project in Brazil. The final output consists of "recommended generic and regionally relevant C&I incorporated within a system to evaluate the sustainability of forest management".¹⁰

¹⁰ CIFOR, 1995. Testing Criteria and Indicators for the Sustainable Management of Forests. Briefing Book: Test Brazil October 23-November 19, 1995.

The set of ecological C&I submitted to the working group for discussion is presented in Annex 2.1. The working group had eleven participants: Luis Meneses, Alexandre Dias, Andre Dias, Andre Villas-Bôas, Jurandyr Alencar, Paulo Oliveira, Rodrigo Pereira, Paulo Amaral, Anna Fanzeres, Paulo Kageyama, and Ruth Nussbaum.

Group dynamics

The procedure used in the working group was to first explain the definition of FMU used when selecting the C&I. Then, input for each C&I was asked: Is it relevant, integrative, cost-effective, necessary? Does the wording need change? Basically, we discussed all proposed changes until the recommendation was accepted by consensus. We were able to finish the whole set on the first day of the workshop. Therefore, on the next day, and with a holistic view of the set, we proceeded to make changes to the framework, and to determine verifiers for the indicators. The group considered the fact that several verifiers were already present in the forest management group, but voted to keep these redundancies in the list, to point out that the verifier had linkages with other sets of C&I. After the final plenary session, and given that some problems regarding the overlap of C&I were brought up, an extraordinary meeting was held, to which five members (P. Kageyama, P. Amaral, A. Dias, Alexandre Dias, L. Meneses) were present. In this meeting a new verifier was proposed and another was split in two. Both were incorporated in the final version (Verifiers 2.4.2 and 2.4.3).

Group recommendations

There were several recommendations by the working group regarding the framework and selected C&I. From an initial total of 25 C&I, only five did not undergo any change in wording. The final version had 34 C&I and verifiers. Some of them were created by splitting previous C&I. The majority of new acquisitions were verifiers. More specific changes were:

1. The fourth criterion, which dealt with soil and water quality, was merged within the first criterion, on maintenance of critical ecosystem's functions and processes. The group felt, quite correctly, that soil and water quality were critical to assure maintenance of important processes, and therefore, should be part of this section and not a separate one.
2. On the second day of the workshop an effort was made to briefly suggest verifiers for the selected set of C&I. Several indicators in the original version were converted to verifiers of other indicators. However, we could not identify verifiers for some of them, if we were to consider cost-effectiveness, sensitivity, etc. Some examples are verifiers for maintenance of biodiversity, viable plant and animal populations, habitats of difficult recovery (prior to the impact).
3. One perception regarding the cost of some verifiers was that certification is not obligatory, and has some intrinsic advantages to the FMU. If the FMU wants to be certified, than it should comply with all requirements (a minimum set necessary) for a sustainable activity, even if now we still do not know of inexpensive ways to measure some of the critical C&I (for instance, those dealing with biodiversity).

Points of conflict

The conflicts identified were of a conceptual nature. We had discussions on the definition of FMU, the limitations of the selected set of C&I to a specific situation in Amazonia and the objectives of this selection (e.g. for certification, research agenda, etc.).

1. The group recommended that all documents coming out of this project should make clear that the selected set of C&I was focused on a private property in an upland forest of Amazonia, and not to be generalised to other forms of land holdings or types of forest in the Amazon basin. For instance, in the case of the ecological aspects, several important aspects of flooded forests (varzea and igapo) were not dealt with in the set of C&I.
2. There was a lot of discussion on the definition of the FMU with unanimous agreement that the definition we worked with was not sufficient to fully encompass all relevant aspects, at least in ecological, social and political terms. A broader definition is required (see comments in Part III) and several suggestions for amendments were made. A critical point here refers to indicators considering law fulfilment and who the subject is (e.g. the timber producer is also the processor, but is physically away from the defined FMU area). However, the group accepted to continue the discussions bearing in mind this constraint.
3. The ad hoc meeting, after the final plenary session, pointed to some areas of conflict regarding the management of a silvicultural unit versus a natural forest unit. There was general agreement that although some indicators and verifiers seemed to be redundant among the forest management and the ecology sets of C&I, in spirit they were quite different. A more precise definition should make these differences clear, but in the sketchy form they were presented, it was impossible to pick these, not necessarily subtle, disagreements. For instance, both sets have maps of adequate scale as verifiers, but what is adequate? The ecology group felt that the FMU is responsible to situate itself within the regional landscape, with regards to its location concerning catchment areas, mining operations, potentially polluting usines, national parks, etc. The management group did not seem to have the same qualification on "adequate".

PART III: FINAL CONSIDERATIONS AND SUGGESTIONS

CIFOR's selection procedure

A computer disk with a spreadsheet containing the whole set of C&I should accompany the briefing book. A short, keyword-type description of each C&I should be provided. It would be helpful for the job of going through the whole set several times. If the key-wording is consistent, it also would allow immediate cross-linkages with C&I of different sets (e.g. ITW, LEI, SOI, SMW, DDB), instead of flipping through poorly numbered pages of the briefing book. The process was very tedious. More time should be allocated to filling in Form 2. This was a very important chance for the specialist to make his/her considerations, particularly from field notes, but there was never enough time to do it! I suggest that two extra days be added at the end of the final workshop for careful documentation on the process of change, testing and creation of C&I; alternatively, these forms could be sent in at a later date. A fair amount of information could be added to Form 2, given time.

The definition of forest management unit

A better definition of FMU should take into consideration law enforcement. Who is the legal unit upon which responsibility for good stewardship will fall? That is the FMU. Limitation of the physical boundaries is important. For instance, in the case of CEMEX, they have units in Espirito Santo, southern Brazil, and maybe even other Amazonian states. These should be left out. But at a local scale, I do not think that their impact on third party private land, or the sawmill activities can be overlooked. Even the farms in land contiguous to the FMU, which are owned by CEMEX, should have been included. While recognising the difficulties to establish who is legally responsible, given that land titles and ownership are so confusing in Brazil, ultimately the entity who holds the forest management plan is what defines FMU.

ANNEX 2.2

ECOSYSTEM INTEGRITY CRITERIA AND INDICATORS

P	C	I	V	Description	DDB	ITW	LEI	SOI	SMW
I				A sustainable forest management can only be reached if the ecosystem's integrity is maintained.					
	1			Maintenance of critical ecosystem functions and processes is secured at all stages of forest management (spatial and temporal).					
		1		Water and soil quality is maintained to secure ecosystem's sustainability.			9		
			1	Ponds and swamps are not formed by improper logging techniques or poor drainage		15.5.9			
			2	Exposure of bare soil is minimised				5.315c	
		2		Areas of ecological importance (for example, watershed and soil protection, areas with high biodiversity, high degree of endemism, occurrence of rare/endangered species, habitats of difficult recovery) are identified, reported, and adequately managed or protected.		7.17		5.102 8.201c	
			1	Maps of adequate scale					
			2	Appropriate inventory methods					
			3	Identification of endangered, rare, endemic, or indicator species					
		3		Corridors of uncut forest based on streambanks with links up slopes and across ridges to connect adjoining catchments and forest areas which will not be harvested are retained.		15-1-2-4		5.108b	
		4		Shape, location, and design of forest compartments attempt to minimise current and future edge effects due to forest fragmentation.				5.311	
		5		The management plan recognises the natural variability in the forest and differences in rates of recovery (stand productivity and vegetation structure), and has monitoring mechanisms sensitive enough to detect these differences.	a.3.3 a.2.2	15.5.14	3	5.108a 5.107	
			1	Continuous ecological monitoring (not silvicultural)					
		6		Producers and processors respect the environmental laws.				5.001	
			1	No timber harvesting is taking place in highly erodible areas or within areas designated by law as permanent protection areas		15.5.12		5.313b	5.13
	2			Forest management recognises the importance of biodiversity services.			7		
		1		Endangered plant and animal species are protected according to CITES agreement or national legislation on endangered species.		15.5.1.2		5.106	
		2		Hunting, even when legal, is controlled and, with the exception of subsistence hunting, discouraged by the management administration.					5.21
		3		Enrichment planting or restoration of degraded areas is performed with indigenous, locally adequate		15.5.4.3		5.512a	

P	C	I	V	Description	DDB	ITW	LEI	SOI	SMW
				species.					
		4		Interventions, if applied, are highly specific to the individual tree level, instead of to species or whole stands.		o		6.109b	
			1	Girdling and other silvicultural treatments are only implemented immediately around species to be harvested and when a negative impact on their growth is clearly established or anticipated during field observations		15.3.2.1			
			2	Vine cutting is implemented only when it is physically associated to trees to be harvested in the next cutting cycle or when a negative impact on their growth is clearly established or anticipated during field observations					
			3	In the case of large gaps dominated by vines, vine cutting will only occur to foster regeneration of other species		15.3.2.1			
		5		Minimum diameter at cutting considers age of reproductive maturity or maximum size reached for a given species.				5.105	
		6		Animal species which are negatively impacted during logging retain their ability to recover and exist as viable populations in the area.		15.3.4 15.5.11		5.105	
		7		Plant species which are harvested, damaged or negatively impacted during logging retain their ability to regenerate or recover and exist as viable populations in the area.		15.3.4 15.5.11		5.105 5.103	
			1	Presence of trees of commercial species in the reproductive stage		15.5.11			
	3			Forest management minimises impacts of logging on forest's structure and biodiversity.			8	4.2 5.101	
		1		Large canopy openings are avoided.		15.3.2.5 15.5.6 15.5.5			
			1	Size of canopy gap					
			2	Amount of typical pioneers					
		2		There is no chemical contamination (quantities above the level established by pertinent legislation) to food chains and ecosystem.		15.6.4.2.2		5.603b 5.603c	
			1	Quantities used or present of toxic, bio-accumulative and persistent substances					
			2	All non-biodegradable waste (including oil) is removed from the forest, appropriately packaged and disposed of		15.6.1 15.6.3		5.605	5.22
			3	Biodegradable waste (e.g. sewage, biomass burning) are under the limits set by national legislation controlling soil, water and air pollution					

ANNEX 3

REPORT ON TESTING FOREST MANAGEMENT CRITERIA AND INDICATORS FOR SUSTAINABLE FOREST MANAGEMENT

José Natalino M. Silva and Johan Zweede

1. OBJECTIVE

The objective of testing criteria and indicators (C&I) for sustainable forest management (SFM) in Brazil was to identify the minimum set of C&I that would permit a safe and low cost evaluation of the sustainability of management under existing conditions within the forest management unit (FMU) studied.

2. DEFINITIONS

For better understanding of the text, some concepts and definitions utilised in the current study¹¹ are presented here:

Sustainability

This term refers herein to the sustainability of the forest management. In this sense sustainable management may be understood as the series of objectives, activities and results consistent with the maintenance of the ecological integrity of the forest and the contribution towards the well being of the populations that depend on it. Within this context, the evaluation of sustainability begins with two basic premises:

- the integrity of the ecosystem is ensured/maintained;
- the well being of the local populations is guaranteed/improved.

Principle

The definition of Principle adopted in this study comes from the Concise Oxford Dictionary, which is presented as '*a fundamental truth or law that is the basis for reasoning or action*'.

Criteria

Criterion here is defined as '*principle or standard that a thing is judged by*'.

Indicators

An indicator, in the context of this study, is '*any variable or component of the forest ecosystem or the relevant management system used to infer attributes of the sustainability of the resource and its utilisation*'.

3. PROJECT TEAM

The multidisciplinary team consists of:

¹¹ CIFOR, 1995. Testing Criteria and Indicators for the Sustainable Management of Forests. Briefing Book: Test Brazil October 23-November 19, 1995.

Mr. Johan Zweede, Forester, team leader - management
 Dr. José Natalino M. Silva, Forester - silviculture
 Dr. Jan Kessin, Sociologist - social aspects
 Dr. Rita Mesquita, Biologist - ecology
 Dr. Virgílio M. Viana, Forester - policies and institutional aspects

The support team comprises:

Dr. Ravi Prabhu, Forester - Project Co-ordinator
 Dr. Carol Colfer, Anthropologist
 Mr. Tasso Rezende of Azevedo, Forester
 Mr. Marco Antonio Malagodi, Agronomist

4. PROCEDURES AND RESULTS OF THE C&I EVALUATION

For the purposes of this study, C&I from five certifying entities were considered: Woodmark from Soil Association, Responsible Forestry Standards (SOF); Smart Wood Program from Rainforest Alliance (SMW); Initiative Tropenwald (ITW); Lembaga Ecolabel (LEI); and Dutch Standards (DDB).

4.1 First filtering of the C&I (Form 1)

As the first task, each expert was asked to make a critical analysis of the C&I from the above mentioned entities. Form 1, which was utilised for this activity, contained 1,085 certifying C&I. This first selection was to be based on the following questions:

1. Are the C&I intimately related with the objectives of the survey?
2. Are the C&I easy to detect and record?
3. Are the C&I integrated, that is, do they concentrate on different items of information?
4. Do the C&I adequately cover a wide range of situations?
5. Are the C&I important, and, therefore, selected?

The result of this first filtering is presented in the table below:

Source	C&I accepted	C&I rejected	% rejected	Total
Smart Wood	60	6	9.0	66
ITW	396	211	34.8	607
Soil Association	228	8	3.4	236
LEI	78	49	38.6	127
Dutch	49	0	0.0	49
Total	811	274	25.3	1085

Table 1: Number and percentage of C&I rejected after the first filtering

Of the total C&I analysed, roughly 25 percent were rejected during the first filtering. The greater percentages of rejections occurred in the ITW and LEI sets. At first, all the national and regional C&I were rejected since the test would be carried out at the FMU level, that is, the local level. In the LEI set, a large percentage of the rejections was because their C&I had been developed for the concession system, which is not utilised in

Brazil. None of the C&I from the Dutch set was rejected. However, as shall be seen later, this set did not contribute to the final set of C&I chosen.

4.2 Second filtering

During the first week of work in Belém, several meetings were held by the project co-ordinator with members of the multidisciplinary team, to discuss and fine tune the methodology and to prepare the round table discussion of the institutional policies C&I, which was held on 26 October 1995.

Once the C&I had been selected by the team of specialists, the project co-ordinator cross referenced the lists, separating the C&I that were chosen unanimously, or accepted by the majority. In addition, the C&I were classified by type or area of specialisation, that is, policies, management, ecology and social aspects. After cross referencing, the specialists' selection (Form 1) contained about 900 C&I. This number was very close to my personal filtering that reduced it to 811 C&I (Table 1).

All the C&I on management as well as others common to management-ecology or management-policies, were passed on to Natalino Silva and Johan Zweede for one further filtering. There was agreement amongst the specialists that the ecology C&I presented a certain overlapping with management and were passed on to Rita Mesquita, the C&I on non-timber products were passed on to Virgilio Viana.

The C&I were evaluated again, this time together with Johan Zweede, which, from the consensus of the two specialists, reduced the C&I to approximately 600.

The next phase consisted in grouping the C&I according to subjects, generating the first outline of the conceptual framework for the C&I for operational management. Thus the C&I were grouped according to larger themes or key words, such as management plan, objectives and justifications, forest inventory, annual operating plan, etc. In this first version of the conceptual framework, 74 C&I were selected. These were then transcribed to Form 2 for field evaluation.

5. FIELD PROCEDURES (TEST OF THE C&I WITHIN THE FMU)

In the field phase, we sought to test the chosen C&I from the conceptual framework. Interviews were held with the company managers in Santarém, the forest engineer responsible for elaborating and conducting the management plans of the company, the field foreman responsible for the management activities and the person responsible for forest harvesting.

In the first place we sought to understand the land use and tenure system. This was to verify the applicability and conformity of the chosen indicator to the security of land tenure that says "*the clear proof of the security of land tenure (legal title, acquired rights, etc.) is presented in the management plan*". This indicator was tested during the analysis of the management plan of the company itself. Brazilian forest legislation requires presentation of the legal document of land tenure and an authenticated copy of this document was part of the set of documents presented in the management plan.

In analysing the company's management plan (in Brazil called *management project*), we had an opportunity to test another selected indicator that states "*a long term, written*

forest management plan exists in accordance with environmental and all pertinent national laws". It should be noted that just the existence of a management plan itself is not sufficient. For example, the FMU management plan, or rather, all the plans (four plans were analysed) were poorly formulated and poorly written. Thus it is important that the verifiers on the management plan are fulfilled (see C&I selected in Annex 3.2).

The field test of the criterion "*the annual operating plan exists, for guiding all forest operations*", (verifier 1 of criterion 3) was very easily carried out, as the company did not possess one.

Thus, several excursions into the forest were carried out by the management specialists to test the applicability of the selected C&I. Some of these excursions were done together with other specialists in ecology and social aspects, thus facilitating interdisciplinary work.

During the field work we sought to understand the operation systems of the company, especially the forest harvesting system, the construction and maintenance of the infrastructure, the system of continuous inventory and the silvicultural treatments adopted and applied. We were thus able to verify the suitability of the chosen C&I and whether it was necessary to create other C&I not yet present in the sets analysed. For example, after visiting the logging operations, we felt it necessary to add an indicator that would guarantee the non-existence of illegal logging outside of the FMU area, and indicators that would guarantee the commitment of the contractor to sustainability, when logging is contracted out.

Observations, when pertinent, were introduced in Form 2 to aid the reader in understanding the problems faced during field testing of the C&I, or to reinforce the justification of the choice of the determined C&I. This was done in the H field of the referred form. The rest of the information on Form 2 was filled in at the office, including the interdisciplinary tasks (fields J to N). Natalino Silva was in charge of evaluating all the C&I selected by all the experts regarding geo-political aspects and Johan Zweede was responsible for the temporal aspects.

6. THE CONCEPTUAL FRAMEWORK

The first version of the conceptual framework of the C&I regarding operational management was presented for consideration by the multidisciplinary group during the field phase. Based on the group discussions and field tests, some indicators were included and others excluded. The suggestions presented were introduced to the conceptual framework, that was established as follows:

PRINCIPLE: Sustainable yield forest management is assured.

CRITERION 1: The long term security of the forest management is assured.

Indicator 1

Verifier 1

Verifier 2...

Indicator 2...

CRITERION 2: The forest management is clearly committed to sustainability.

Indicator 1

Verifier 1

Verifier 2...

Indicator 2...

CRITERION 3: All the forest operations are guided by an annual operating plan, in accordance with the owner's commitment to sustainable forest management.

Indicator 1

Verifier 1

Verifier 2...

Indicator 2...

CRITERION 4: An effective control and monitoring system audits management's conformity with planning and promotes improvements of operations towards sustainability.

Indicator 1

Verifier 1

Verifier 2...

Indicator 2...

In its semi-final form, that is, in the form submitted for consideration by the management working group during the workshop, the conceptual framework of management was composed of 1 principle, 4 criteria, 15 indicators and 41 verifiers.

7. C&I ANALYSED IN THE WORKSHOP

No major changes were made to the C&I presented. Basically, some modifications of wording and a few key words were introduced. The report of the management working group is presented in the section 9. Annex 3.1 reports on the group meetings to evaluate the C&I, while the set of C&I that resulted from the group discussions is found in Annex 3.2. The modifications introduced to the original C&I are underlined.

8. EVALUATION OF THE TESTING METHODOLOGY

8.1 Sets of C&I selected

My only comment and criticism of the sets of C&I chosen is that, the wording in the LEI set made it very difficult to understand and analyse the proposed C&I. Besides this, the set is biased toward application in forest concessions, a modality of forest utilisation which is not yet found in Brazil. In the case of DDB, the set is concise, but overly generalised. The indicators and, principally, the verifiers, need to be much more specific and detailed, likewise in the case of ITW and SOI. A selection of C&I more applicable to Brazilian conditions would be more appropriate.

8.2 Forms 1 and 2

The analysis of Form 1 was a very tiring exercise, the result of which, in my opinion, was not very productive. Only after developing the conceptual framework were we able, in fact, to more carefully select our C&I. Much of our time, during the first week, was spent grouping the C&I, which generated the first version of the conceptual framework. The conceptual framework should be developed first, then the C&I can be gathered according to that structure.

I agree with the testing methodology in not passing on the results of the former tests, so as not to influence our own results. However (and I do not know whether this in

fact did not occur), methodological advances generated during the former tests should have been introduced into the Brazilian test, to increase its efficiency.

Form 2 should have been ready before going to the field. This, unfortunately, was not possible. The methodology on understanding the entire operation of the company inside and outside of the FMU, however, was very positive, in the sense that it was not difficult deciding the importance of the C&I selected.

Both in Forms 1 and 2, questions 3 and 4 were particularly difficult to interpret (see item 4.1). Many times, due to the nature of the C&I, it was difficult to answer these questions. For example, the indicator '*a management plan exists*' does not make it very clear whether it would serve as an adequate response to a varied range of situations, and so forth.

Even though the co-ordinator had explained, using examples, there was still many problems in interpreting which situations these questions applied to, there should be an option to characterise when some of the questions did not apply. Only "yes" or "no" did not seem adequate.

8.3 Field phase

It is of fundamental importance that the group arrived with Form 2 already filled in at the beginning of the field test. Work during this phase would also benefit from more co-ordination by dedicating two or three days for the entire group to become acquainted with the company's mode of operation (all the specialists together) and afterwards, devoting the rest of the time to testing the chosen C&I, either individually or in small groups, by areas of specialisation, e.g. management and ecology.

A lot of time was spent investigating irregular operations of the company. Although by introducing some C&I helped tackle this problem, I believe that too much time was used in this investigation.

Although the field phase could have been better organised, the final results (developing the conceptual framework and testing C&I) did not suffer unduly, at least in terms of operational management.

Good logistic support is essential principally in the field phase, where conditions are sometimes unpredictable. The hiring of vehicles, accommodation and purchase of provisions should have been done earlier. It is also very important to contact institutions with experience within the region where the test will be carried out, as the experience and understanding of regional or local problems facilitate the testing and decrease its costs.

8.4 Time allocated to the test

I believe that the time allocated was sufficient, however better use should have been made of the time available. For example, the initial work that was done at the home base should be incorporated into the field phase. With this arrangement, all the specialists would have been confined to the hotel and would have dedicated 100 percent of their time to analyse the C&I. Instead, some specialists had not completed filling in Form 1 at the beginning of the test. It is very important that the co-ordinator was present to guide and clear up doubts in this initial phase.

8.5 Workshop

The workshop was very important, but was poorly organised in terms of choosing key people to contribute to the analysis of the selected C&I. In the case of the management group, important people who should have been invited were not. The specialists were not consulted early enough for suggestions of resource persons to be included in the workshop. An attempt was made to correct this oversight during the week of the workshop itself, but there was not enough time. As a result, the management group missed out on the opportunity for better input. Again, the organisation of the event should not have been delegated to an institution situated so far from the region where the test would be carried out.

9. SUGGESTIONS FOR IMPROVEMENT AND GENERAL CRITIQUE

Although, the test in Brazil had its problems, the general opinion was that it was well thought out and capably managed. It was obvious that CIFOR had opportunities to make changes in the procedures from the past experiences on three continents. As part of the expected "outputs" of the test, suggestions for improvement and critiques are presented below.

Criteria and indicators for testing

The five sets of C&I used for the test obviously had to be consistent for the four regions tested. However, at least three of these sets were inappropriate for the Brazil test because of the differences in the nature of forest ownership, i.e. private ownership and not national or state forests.

In general, a set of C&I becomes more practical after being tried out. From our past experience, C&I can be developed at a desk or conference table. However, prior to actual implementation and application, they tend to be either cumbersome or somewhat ambiguous. It is also obvious that many sets of C&I focus mainly on concessions and public lands, and not on private lands or national laws, as was evident from testing the forest management C&I. Some comments on the various sets of C&I are as follows:

1. **SMW:** This set of C&I is concise and has obviously been field tested. At the expense of increasing the size of the C&I listing and subjects for testing, we would suggest that indicators and their verifiers should not overlap or cross their boundaries so as to avoid confusion. If the criteria were proposed according to their respective elements instead of subject matter, the testing and or evaluation would be simplified.
2. **ITW:** The most systematic of the sets tested, it is also quite complicated in not allowing much room for flexibility in situations do not fit the original parameters of the set. In addition, this set is not cost effective in many regions especially in the tropics. ITW could benefit by being more generic and less repetitive. This would increase its applicability and reduce its evaluation costs.
3. **SOI:** In general this is a good set of C&I. It has obviously been field tested to some degree. It is more complete than the SMW set but displays even more overlapping due to the division of subject matter. The C&I received more attention from ecologist than operational foresters. In some cases it could also benefit from more generic and less situation specific criteria.

4. **LEI:** Unlike the SOI and SMW sets, LEI is too generic. It is also very situation specific, making it hard to use with the private land ownership as is the case in Brazil. Its incoherent language caused confusion to the testing of forest management C&I. This set seems to suffer from the desire to satisfy both environmental and social pressures.
5. **DDB:** This set of C&I is rather difficult to use in the field since it reflects mainly political and policy standards and does not quite get down to the FMU level. On the evaluation side, the C&I are too broad and need to be more specific.

Evaluation of criteria and indicators

Prior to the actual convening of the team in Belém, Form 1 was to be reviewed and filled in by the individual team members. This was an arduous task and, without the benefit of interdisciplinary communication among team members, only 25 percent of the 1,085 C&I were discarded. The task could be simplified if there was team interaction during this phase. This would also have helped in the early formation of a cohesive multidisciplinary team. The Form 1 filter should have a mechanism for drastically reducing the total number of C&I to a more concise set which could then be used for Form 2.

Understandably, to maintain impartiality in testing the sets, the development of the conceptual framework did not precede these two exercises. Nevertheless, it is necessary either to have more team interaction prior to Form 1, or to allot more time for team interaction prior to the selection of C&I for Form 2. It was soon obvious that yield and damage controls could not be separated distinctly, and thus the two respective team members had to work together throughout the test. It worked out extremely well. Surely, the concept of the test was to allow the whole team to have this in-depth interaction, but unfortunately time did not allow for it.

The introductory workshop

The introductory workshop on policy and planning was not productive for the whole team for two reasons. First, the level of input from outside sources was not very good. This was partially due to a change in governmental policy regarding the CIFOR test. Second, a whole day was spent on this workshop which instead could have been used for team interaction among the various disciplinary groups and for understanding the regional framework for the work.

Field work

This part of the test was hampered by insufficient support. At times, individual team members had to step in and provide help instead. In addition, despite short operational team meetings every night and some lengthy meetings every third night, interaction among team members was still not enough.

Team members' grasp of the situation, both at the regional and FMU levels, differed greatly. Each team member did his/her best upon arrival at the test site. Ideally the team as a whole should have had some time together for orientation. The team leader, who had a large task, did not take enough time to interface with some of the other team members who were less familiar with the FMU and the regional realities. If more time had been spend on this, possibly less confusion would have resulted later on, in particular during the workshop on the FMU and CEMEX as the choice of the location.

Field work was frustrated by the actual situation of the FMU which, although typical in Brazil, did not lend itself to standard testing of many of the selected C&I. Therefore, in many cases the "expert" team members had to rely on their experiences to pass their judgement. After the conceptual framework was developed by the members, many of the C&I fell into place.

While in the field there was not enough interaction among team members, which in part was caused by the amount of administrative activities associated with the test and criteria selection.

Workshop

The preparation for the workshop was a little frantic and lacked time for interdisciplinary discussions among team members. The workshop itself was successful despite the unequal strengths of the participants who attended the management working group. This was partly due to the Brazilian government changing its policy on the Ministry of Environmental Affairs in supporting the CIFOR test, and in part due to the selection of individuals invited to the workshop. The composition of the working group was not well balanced between people with regional experience and those from outside, between operational personnel and institutional representatives. Most of the individuals requested by the forest management and silvicultural team members were either not contacted at all or contacted too late. The selection of participants attending other working groups apparently suffered from the dilemma and timing.

Final report and work consolidation

After the workshop, the team did not have sufficient time to work together and consolidate the final reports, even in a draft form. One suggestion is to take a one day break after the workshop and reconvene for the next three consecutive days to tie up the loose ends and draft the final reports. This would also allow time for the more precise interdisciplinary task of filling in (fields J-N of) Form 2.

ANNEX 3.1

REPORT OF GROUP MEETINGS TO EVALUATE THE CRITERIA AND INDICATORS OF SUSTAINABLE FOREST YIELD

First Group Meeting

Date: 16 November 1995

Time: 2:00 p.m.

Place: Belém-PA, Brazil

Presented by: Natalino Silva - Forest consultant - CIFOR

Johan Zweede - Forest consultant - CIFOR

Moderator: Jorge Yared - Embrapa/CPATU

Secretary: Edson Vidal - AMAZON

Participants: Natalino Silva - Forest consultant - CIFOR

Johan Zweede - Forest consultant - CIFOR

Jorge Yared - Embrapa/CPATU

Edson Vidal - AMAZON

Armin Deitenbach - REBRAFE

Pedro Moura Costa - Consultant

Ian Thompson - Embrapa/CPATU - ODA

Carlos M. Garcia - SBS

Antenor Gonçalves - Sikel (Timber industry)

Fernando Jardim - FCAP

Paulo Kageyama - Esalq/USP

Igor Mousasticoshvih - ISA

Ravi Prabhu - CIFOR

For the purposes of this document the following is used: P= principle, C= criterion, I = indicator and V= verifier.

The moderator began the meeting by asking those presenting to speak on how the evaluation of the C&I was to be carried out. The consultants told the group members that the C, I and V for this particular group were based under the fundamental principle that "Sustainable yield of the forest is assured".

Each P, C, I and V was presented to the group and following any questions on any one of them, they would then be evaluated. A form was given to each member for filling in their evaluation of the C, I and V. A scoring system of 1 to 5 was used for the evaluation, besides noting down whether they agreed with the C, I or V. In the case of any disagreement with the C or I, they were to write down their suggestions. Johan Zweede instructed the group on how to fill in this form. The work was progressing rather slowly, so after the coffee break, the group unanimously agreed to change the procedure and decided to first read the C&I straight through and then review the necessary comments from the group afterwards. Each member would write down his or her suggestions on the form handed out. The group was unable to come to an agreement on three points.

1. Dealing with the owner's long term commitment in using the managed area. What does "long term" mean? A period of one cutting cycle, two cutting cycles, 30 years, 60 years, etc. Should it be dealt with in terms of cutting cycles or years of use? (Criterion 1, Indicator 1).

2. Must the general inventory of an area include regeneration? (Criterion 3, Indicator 1, Verifier 1).
3. Is it possible, after harvesting, to recover the original structure and floral composition of the forest, or only to maintain the processes? (Criterion 2, Indicator 1, Verifier 10).

Second Group Meeting

Date: 17 November 1995

Time: 8:00 A.M.

The group finished reviewing all the C&I and turned to address unsettled issues. After much discussion, an agreement was reached. The group then participated in the plenary session where the procedures utilised by each group to carry out their evaluations were presented.

Third Group Meeting

Date: 17 November 1995

Time: 10:30 A.M.

This meeting basically dealt with the remaining unsettled points and the winding down the group's work.

RESULTS OF THE GROUP'S EVALUATION

Only amendments to the Indicators and Verifiers were made. No Criterion or Indicator was included or excluded, only a few were expanded and some wording problems with the translated Portuguese version were dealt with.

Of the sixteen Indicators, three were altered and five presented wording problems in Portuguese. Of the 41 Verifiers, eight were altered and seven had wording problems in Portuguese.

Next, changes suggested by the working group and accepted during the final plenary session are shown below:

Indicators

Criterion 2, Indicator 3: Forest management encourages the utilisation of lesser known tree species and non-timber forest products seeking their highest and best use.

Criterion 4, Indicator 2: Documentation of source and destination for all primary forest products are available in the FMU office.

Criterion 4, Indicator 6: Continuous Forest Inventory (CFI) plots are established and measured before harvesting and post-harvest measurements are carried out in accordance with the forest management plan.

Verifiers

Criterion 1, Indicator 2, Verifier 1: The area is legally set aside (“averbada”) by the owner for at least 2 cutting cycles.

Criterion 2, Indicator 1, Verifier 6: Forest inventory obtained through a sampling system of adequate intensity.

Criterion 2, Indicator 1, Verifier 7: A description of the methodology to collect data on growth, yield and natural regeneration giving details of the variables to be surveyed and timing for re-measurements.

Criterion 2, Indicator 1, Verifier 9: Maps at an adequate scale providing detailed information for management activities, such as protection areas, location and access to the FMU, forest types, hydrology, annual coupes, etc.

Criterion 2, Indicator 1, Verifier 10: Cutting cycles, based on reliable growth data, are long enough to recover the volume harvested and to maintain the environmental processes.

Criterion 2, Indicator 1, Verifier 12: A sequence of operations of a suitable silvicultural system is given, describing the timing and type of silvicultural treatments to be applied during the cutting cycle, such as:

- pre-harvest vine cutting on harvest trees if necessary;
- low impact logging;
- post-harvest vine cutting on desirable trees if necessary;
- thinning if necessary.

Criterion 3, Indicator 1, Verifier 1: A pre-harvest inventory performed twelve months prior to the harvest is available and provides the following data:

- full enumeration and mapping of all potential crop trees of commercial and intermediate size classes;
- full enumeration and mapping of commercial harvest trees;
- enumeration and mapping of trees of protected trees;
- notation and mapping of special bio-physical features.

Criterion 3, Indicator 2, Verifier 14 - No harvesting takes place in closed compartments until the next cutting cycle.

Wording Problems

Indicators

Criterion 2, Indicator 1: A written long term management plan, which complies with environmental and all pertaining national laws, is available.

Criterion 2, Indicator 5: Third party contractors must be made aware of the guidelines and specifications stated in the operating plan.

Criterion 4, Indicator 1: Documentation and records of all forest activities are kept in a form that makes it possible for monitoring to occur.

Criterion 4, Indicator 3: ... to the residual stand, and regeneration of desirable species.

Criterion 4, Indicator 4: The FMU owner monitors of all third party activities.

Verifiers

Criterion 2, Indicator 1, Verifier 2: Management is committed to reducing negative impacts on the FMU to a minimum.

Criterion 2, Indicator 1, Verifier 5: A description of the socioeconomic environment within which the forest management unit is located.

Criterion 3, Indicator 1, Verifier 2: Planning of the harvesting systems and equipment applications....

Criterion 3, Indicator 2, Verifier 3: No skidding and log transport takes place when water logging or rutting occurs.

Criterion 3, Indicator 2, Verifier 5: Appropriate water diversions exist to direct runoff into the natural forest.

Criterion 3, Indicator 2, Verifier 9: No evidence of skidders deviating from the pre-defined skid trails.

Criterion 3, Indicator 2, Verifier 11: ...There is no evidence of high stumps, excessive bucking losses, splitting and breakage caused by felling, and felled logs left in the forest.

ANNEX 3.2

SUSTAINED YIELD FOREST MANAGEMENT CRITERIA AND INDICATORS (POST-WORKSHOP)

P	C	I	V	Description	DDB	ITW	LEI	SA	SW
II				SUSTAINED YIELD FOREST MANAGEMENT IS ASSURED					
B									
	1			THE LONG TERM SECURITY OF THE FOREST MANAGEMENT UNIT IS ASSURED.					
		1		<i>Land tenure of the forest management unit is clear and legally secure.</i>					2.1
			1	Clear proof of tenure security (legal title, customary rights or lease agreements) is provided in the forest management plan.					
			2	<i>The land is dedicated by the owners to sustainable long term natural forest management.</i>					2.2
			1	The land is "averbada" by the owner for at least two cutting cycles.					
	2			FOREST MANAGEMENT IS CLEARLY COMMITTED TO SUSTAINABILITY.					
		1		<i>A written long term forest management plan, which complies with environmental and all pertaining national laws, is available.</i>		C.1.3		10.102	3.1
			1	A clear statement of unambiguous long term management objectives for the Forest Management Unit (FMU) is provided.				10.104.c 10.101	3.3.1
			2	Management is committed to reducing negative impacts on the FMU to a minimum.					3.3.6
				THE MANAGEMENT PLAN CONTAINS:					
			3	A description of the main forest types in the FMU.					3.4
			4	A description of protected areas of sufficient size and distribution, in accordance with forest laws, to safeguard basic ecosystem functions which have been designated within the FMU.	B.1.4	C.1.5	A.1.2	5.103	5.5-7
			5	A description of the socio-economic environment within which the forest management unit is located.			A.11.2.1		
			6	Forest inventory data of the FMU, especially: - a list of species occurring in the FMU, - number of trees per ha. per species and size classes, - basal area and volume per ha. per species and size classes.		7.13			
			7	A description of the methodology to collect data on growth, yield and natural regeneration, giving details of variables to be surveyed and timing for remeasurements.					4.5
			8	A description of the FMU in regard to climate, topography, geology, soils and hydrology.		C.1.6		10.104.d .3	
			9	Maps at an adequate scale providing detailed information for management activities such as:	A.3.2.	C.1.6			3.4

P	C	I	V	Description	DDB	ITW	LEI	SA	SW
				<u>protection areas, location and access to the FMU, forest types, hydrology, annual coupes, etc.</u>	3				
		10		<u>Cutting cycles, based on reliable growth data, are long enough to recover the volume harvested and to maintain the environmental processes.</u>				6.103	
		11		The AAC has been clearly expressed in the forest management plan, and is based on reliable published growth data.		C.2.4, C.2.4.1-3.	B.2.1	6.101-2	4.2
		12		A sequence of operations of a suitable silvicultural system is given, describing the timing and type of silvicultural treatments to be applied during the cutting cycle such as: - Pre-harvest vine <u>cutting on harvest trees if necessary</u> , - Low impact logging, - Post-harvest vine <u>cutting on desirable trees if necessary</u> , - <u>Thinnings if necessary</u> .	B.2.3.1	C.1.7			4.1
		13		A sufficient number of qualified forest staff are available to carry out the necessary management activities.		C.5.7, 15.7	A.8.2.2. 3 A.8.2.2. 5	5.303	
		2		Revenue received is sufficient to cover the costs of post-harvest management activities such as road maintenance, silvicultural treatments, forest protection, and growth and yield monitoring to assure sustainability.			A.6.1.1, A.6.1.1. 1A.6.1.1 .2	9.105, 9.103	8.3, 9.1-2
		3		Forest management encourages utilisation of lesser-known <u>tree species and non-timber forest products, seeking their highest and best use.</u>				9.101b	9.1, 9.2
		4		All third party activities on the FMU are covered by a legal contract, which specifies compliance with regulations pertaining to sustainability (social, economic, and ecological).					
		5		Third party contractors must be made aware of the guidelines and specifications stated in the FMU operating plan.					
3				ALL FOREST OPERATIONS ARE GUIDED AND DIRECTED BY AN ANNUAL OPERATION PLAN IN ACCORDANCE WITH THE OWNER'S COMMITMENT TO SUSTAINABLE FOREST MANAGEMENT.					
		1		<i>An annual operating plan is written to guide all forest operations:</i>	B.2.3.2	C.2.1		10.102	3.2
				THE OPERATING PLAN CONTAINS					
		1		A pre-harvest inventory performed 12 months prior to the harvest is available and provides the following data:		C.2.2		10.104.d .2.1	3.3.2

P	C	I	V	Description	DDB	ITW	LEI	SA	SW
			a	- full enumeration and mapping of all potential crop trees of commercial and intermediate size classes,		7.2.2		5.104-7	
			b	- full enumeration and mapping of commercial harvest trees,		7.2.3			
			c	- enumeration and mapping of protected trees,		7.15.4			
			d	- notation and mapping of special bio-physical features (e.g. streams, climber tangles, etc.).		new			
			2	Planning of the harvesting systems and equipment applications are specified to match the forest conditions in order to reduce harvesting impact, e.g., animal traction or manual road building and simple truck with cable loading system, to fully mechanised harvesting systems.				5.304	
			3	Planning of primary roads, secondary roads, log decks, and stream crossings is based on the following considerations: - They are permanent infrastructure in the FMU. - They have pre-established written specifications either in accordance with national forest regulations or other recognised guidelines, e.g., FAO's forest infrastructure guidelines. - These structures should not occupy more than 2.5% of the productive forest area. - The design and layout of this infrastructure is matched to the chosen harvesting systems. - Timing of road construction should be a minimum of 12 months prior to use for the proper consolidation.		C.3.1			
			4	The planning and layout of primary and secondary skid trails is based on the location of the commercial harvest trees from the pre-harvest inventory and topography.		13.4, 13.9.2,3, 5,7		5.3, 5.315c,f	5.18, (5.19), 5.20
			5	Harvesting planning which never allows skid trails to cross stream beds.		C.3.1, 11.1, 11.7.1, 11.7.3		5.203, 5.201-2, 5.203- 10, 5.212b-	5.10-12
			6	Harvesting plans consider seasonality and weather variations in the design of the annual coupe, e.g., - log decks with shorter skidding distances, - areas with better soil drainage, - shorter truck haul distances.					
			7	Pre-harvest vine cutting is prescribed and specified when the forest structure indicates high damage impact from tree felling. - when pre-harvest vine cutting is prescribed it takes place at least 12 months prior to actual tree felling and only commercial harvest trees are treated.		13.8.1, 13.8.2-5, 13.8.7		5.3.10, 5.3.12	5.14-17

P	C	I	V	Description	DDB	ITW	LEI	SA	SW
			8	Planning of directional felling in order to reduce the damage to potential crop trees and to favor skidding.		13.8.4, 13.8.1-3, 13.8.5, 13.8.7		5.3.10, 5.3.12	5.14-17
			9	A harvesting map is produced, which consolidates all information of protected areas, forest infrastructure, tree mapping, felling direction, and skid trail layout at a scale of 1:1000.	2.2	9.2.7			5.10, 3.34
			10	Planning of silvicultural treatments for the annual coupe are well defined.	B.2.3.1	2.9, C.1.7			4.1, 4.4, 4.6
			11	A FMU protection plan for: - Avoiding in-migration, - Fire protection, - Control of hunting according to the law, - Illegal extraction of non-timber forest products (NTFP), - Illegal harvest inside FMU and illegal use of "Authorisation of Forest Products Transportation" (ATPF) pertaining to the FMU.					
		2		<i>The operating plan is followed in the field:</i>					3.2
			1	Tree marking is carried out in accordance with the pre-harvest inventory: commercial harvest trees (which includes the felling direction), potential crop trees and protected trees are distinctly marked.		13.5			
			2	All forest infrastructure are adequately maintained.		11.7.3			
			3	No skidding or log transport takes place when water logging or rutting occurs.		13.11, 13.9.7, 13.2-5		5.3, 5.315c,f 5.209	5.18-20
			4	Erosion control practices are utilised in the construction of all FMU infrastructure to avoid: - lateral erosion in cuts and on fills, - silting of stream crossings, - water cutting of road side ditches on steep grades, - formation of sand traps in low spots.		13.2		5.209	5.11
			5	Appropriate water diversions exist to direct runoff into the forest.		C.3.1, 11.1, 11.7.1, 11.7.3		5.212d, 5.201- 210, 5.212b,c	5.10- 5.12
			6	Water bars are installed when roads are abandoned.		11.7.1			5.12

P	C	I	V	Description	DDB	ITW	LEI	SA	SW
			7	Prescribed felling directions are followed whenever possible and proper felling techniques such as proper undercuts, hinge height and angle, wing cuts, buttress cuts and the use of wedges are practised.		13.8.4			
			8	All mechanical skidders (wheel and track) must be equipped with winches and winching is used whenever impact can be reduced.		13.9.2, 13.4, 13.9.3, 13.9.5, 13.9.7		5.3, 5.315c,f	5.18-20
			9	No evidence of skidders deviating from pre-defined skid trails.		13.9.2			
			10	During mechanical skidding, the front end of the log is raised off the ground either by the use of a winch or grapple.					5.18
			11	In all phases of the harvesting operations wood waste is minimised. There is no evidence of high stumps, excessive bucking losses, splitting and breakage caused by felling, and felled logs left in forest.					
			12	Training must be adequate, incentives for good practices appropriate and supervision competent.				5.303	
			13	Silvicultural treatments based on the operating plan are adhered to without evidence of blanket silvicultural treatments.					4.4
			14	No harvesting takes place in closed compartments until the next cutting cycle.		13.12			
4				AN EFFECTIVE MONITORING AND CONTROL SYSTEM AUDITS MANAGEMENT'S CONFORMITY WITH PLANNING AND PROMOTES IMPROVEMENT OF OPERATIONS TOWARDS SUSTAINABILITY.					
		1		<i>Documentation and records of all forest management activities are kept in a form that makes it possible for monitoring to occur.</i>					10.1
		2		<i>Documentation of source and destination for all primary forest products are available in the FMU office.</i>	B.2.3.3	C.4.7, chklst 10	A.11.1.1		10.3, 10.1
		3		<i>The monitoring system covers the most important forest management activities, including environmental and social impacts. It includes, amongst others, the quality of water resources, soil compaction, damage to the residual stand, and regeneration of desirable species.</i>		C5, chklst 15	A.3.1.2	10.206a, b, 10.201	4.3, 4.4
		1		Continuous environmental monitoring takes place.					
		4		The FMU owner monitors all third party activities.					
		5		Monitoring is effected through direct supervision, internal auditing, and external sources.					
		6		CFI plots are established and measured before harvesting and post-harvest measurements are carried out in accordance with the forest management plan.					4.5

ANNEX 4

REPORT ON TESTING POLICY AND PLANNING CRITERIA AND INDICATORS FOR SUSTAINABLE FOREST MANAGEMENT

Virgilio M. Viana

I. POLICY AND PLANNING EVALUATION SUMMARY

Introduction

This is the final result of the component "Public Policies, Institutional Framework and Planning" of the project on "Test of Criteria and Indicators for the Sustainable Management of Forests" carried out by the Center for International Forestry Research (CIFOR).

A preliminary version of this report was presented at the final workshop, held in Belém, on 15-17 November 1995.

Objective

The objective of the research was to identify criteria and indicators (C&I) that best describe whether a policy, planning and institutional framework is conducive to sustainable forest management (SFM).

Methods

The methods used were developed by CIFOR during previous tests conducted in Germany, Indonesia and Côte d'Ivoire. It is basically a method to filter some 1,100 C&I elaborated by five international institutions: (i) Rainforest Alliance (EUA), (ii) Institute Tropenwald (Alemanha), (iii) Soil Association (Inglaterra), (iv) Lembaga Ecolabel (Indonésia) and (v) Dutch Working Group.

These C&I were selected following six phases: (i) a home base desk analysis of all C&I by all team members to exclude those C&I considered to be definitely irrelevant to the specific case in consideration, (ii) an introductory workshop held in Belém which discussed limiting factors to forest management in the Amazon, (iii) a merging of team members' selections, (iv) field research at CEMEX (a timber company based in Santarém), (v) a series of interviews with key stakeholders, and (vi) a final workshop held in Belém on 15-17 November 1995.

The objective of the introductory workshop was to identify key themes to explore in the field research. The field work was carried out between 31 October and 11 November 1996, and involved not only analysis of field conditions at CEMEX but also interviews and visits with key governmental institutions (e.g. IBAMA, INCRA), other timber industries, non-governmental organisations (NGOs), social movements and researchers in Santarém. Key stakeholders were also interviewed in Belém before and after the field work. The final workshop provided a forum to revise criteria, indicators and verifiers produced during the field research. Results were discussed in a plenary session and a working group.

A questionnaire was used for the interviews in the field, in which respondents were asked to provide a hierarchy of importance for different C&I. Based on these responses, all

indicators were ranked according to their importance. Criteria and verifiers were not ranked. Another questionnaire was used to request feedback from participants of the final workshop. These questionnaires provided a useful source of information, in addition to notes taken during field work, interviews and workshops.

Although this research was based at CEMEX and the institutions directly related to its forest operations, there was no attempt to evaluate either CEMEX or those institutions. The objective was simply to use them to provide the necessary realism to the process of identifying C&I relevant for the region.

In the process of identification of relevant C&I, two forms developed by CIFOR were used (Form 1 and Form 2) which provided a framework, including ten parameters to analyse existing C&I which were then either (i) accepted, (ii) rejected or (iii) modified. In cases where gaps were identified, new criteria, indicators and verifiers were formulated.

Results and Discussion

Research results indicate that the decision of forest producers on how to manage their resources is highly influenced by factors outside the management unit. These factors are directly linked with public policies and can be grouped into: (i) environmental policies and institutions, (ii) multi-sectoral (non-environmental) policies and institutions, and (iii) land use planning. Each of these groups was consolidated under different criteria, within which appropriate indicators and verifiers were identified.

The criteria, indicators and verifiers went through a series of revision. Approximately 20 percent of the version submitted to the final Belém workshop were amended as a result of the workshop itself. These were mostly word changes and additions of new verifiers. No principle, criteria or indicator was rejected by the workshop. This version that came out from the workshop then formed the base for the final results presented in Annex 4.1. This final version accepted practically all suggestions made at that workshop, with only minor changes to improve the final report. All changes made from one version to the next are identified in bold or underlined.

Research results corroborate the findings of Hummel¹² who recently reviewed the current status of forest policies in the Amazon. The long and bureaucratic process of approving management plans by Federal or State institutions represents a major disincentive for the producer potentially interested in practising forest management. The lack of an efficient and non-bureaucratic system of monitoring and control that is realistic and accessible to the forest sector is a fundamental factor for the decision of producers on how to manage (or not manage) forest resources.

In the case of non-environmental and intersectoral policies, and institutions responsible for their implementation, several significant factors on how to manage forest resources were identified. The lack of land tenure, economics, science and technology, agricultural, industrial and transportation policies and the institutional framework in tune with the ideal of SFM represent a key issue to forest producers. These policies and institutional framework have often been underestimated in the analysis of the forest sector despite their significance and importance. For example, land tenure policies implemented by federal or state institutions usually require deforestation in order to open a process of land titling even in areas that are not suitable for agriculture. In addition, these institutions

¹² - Hummel, A.C., 1995. Situação atual do monitoramento da atividade madeireira na Amazônia. Documento não publicado. IBAMA, outubro de 1995.

require a long time to issue definitive land titles. The result is that forest operations often take place in areas with uncertain land ownership. This represents a disincentive for long term investment in forest production by rural producers and investors, and a high risk of social conflicts. Another example related to science and technology policies is the limited access of producers to research results. Consequently, there is a discredit of the viability of natural forest management by several key stakeholders, despite the fact that most of these doubts have no scientific basis.

In the case of regional land use planning and zoning, the lack of a land use plan effectively implemented and agreed through a participatory and transparent process of decision making is a fundamental problem to formulating sectoral and intersectoral policies. Without a proper land use plan, agricultural activities tend to promote a continuous process of deforestation even in areas not appropriate for agriculture. In turn, this has a direct impact on non-sustainable timber production through supply of low cost timber from land clearings, thus providing a disincentive to forest management. Deforestation in areas adjacent to forest management units also results in increased fire risk and edge effects that can jeopardise the prospects of sound forestry.

Conclusions

The results of this research indicate the great importance of factors external to the forest management unit (FMU) on the decision making process of forest producers and on how they manage, or not manage, forest resources. The division of these factors into (i) planning and zoning, (ii) environmental policies and institutions responsible for their implementation, (iii) multi-sectoral (non-environmental) policies and institutions responsible for their implementation, provide a clear and logical framework to group criteria, indicators and verifiers. However, it should be noted that these elements interact in a dynamic and complex fashion. A holistic and integrated approach is fundamental for an effective analytical model to assess the sustainability of forest management in the Amazon.

The methods used were appropriate for the objective of this research. The use of a case study provided a realistic framework to the analysis made, despite the fact that the forest operation in question was not necessarily representative of all situations of forest operations in the Amazon (ecological, social, economic, institutional, political, etc.). The research conducted was limited by the short time available and the complexity of the issues dealt in the case study (e.g. land tenure). The results of this research represent a modest contribution to the larger challenge of developing a method to assess how conducive public policies and the institutional framework in a particular area are to SFM. Given the great importance of these factors for the future of sustainable forestry in the Amazon, it is recommended that the final version of the C&I be tested in similar conditions (replicates of this test) and different conditions (diversity) to increase the scientific rigour and representativeness of the results obtained.

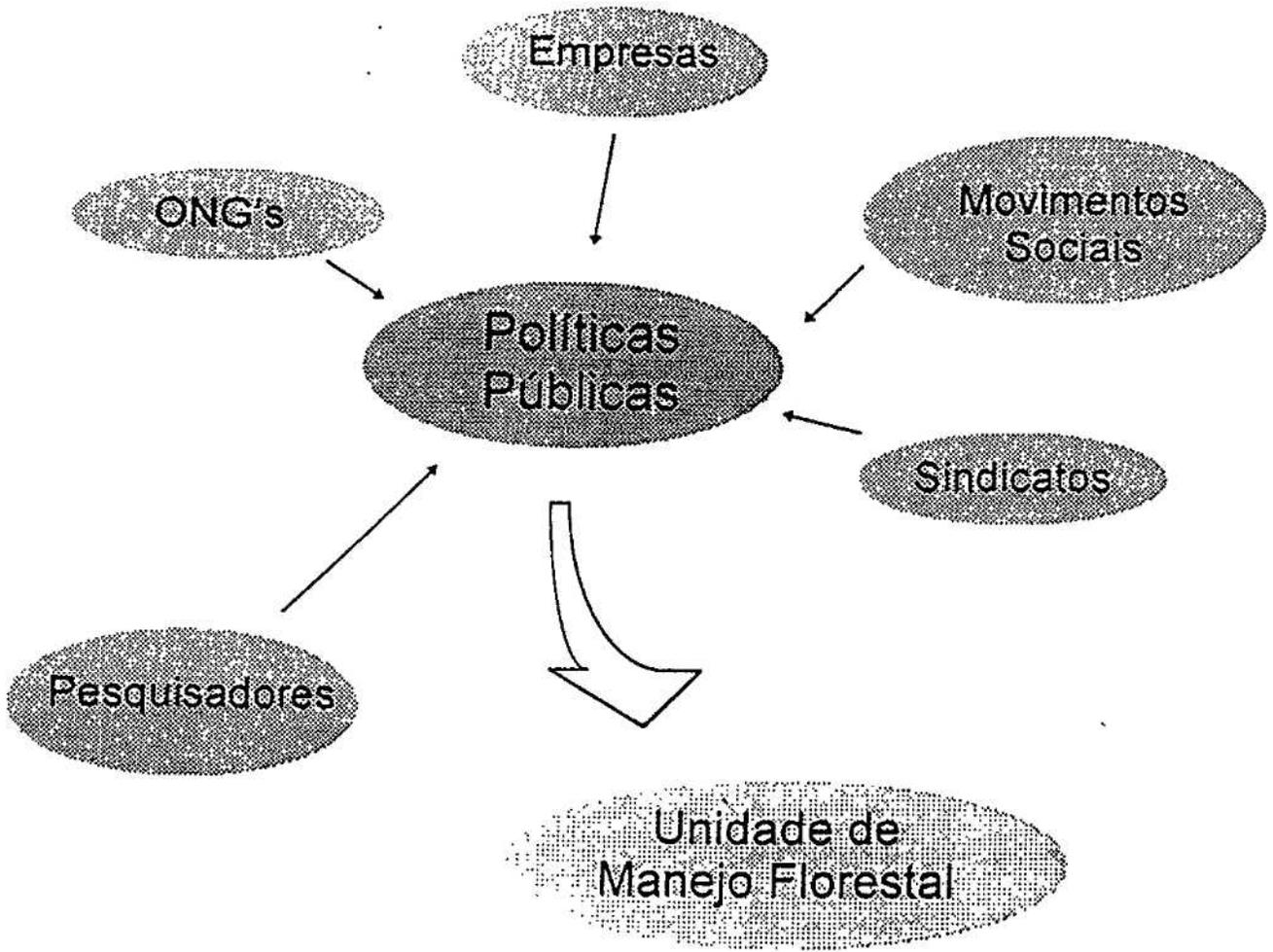
II. CONCLUSIONS OF THE INTRODUCTORY WORKSHOP ON FOREST POLICY AND PLANNING

1. The objective of the workshop was to discuss key policy factors that limit or provide incentives to SFM. The discussions were based on a systems approach to assess sustainability at the FMU (Figure 1). The main elements were identified according to the various "spheres of influence" of the management unit (Figure 2).

Figure 1:



Figure 2:



2. The workshop used a modified Zopp method to identify (i) major objectives of forest policies, (ii) main instruments of forest policies, (iii) problems of policies and institutional factors, and (iv) C&I (elements) related to forest policies relevant for the FMU. A summary of all sections is included in the Portuguese version of the report.

3. Regarding the level of analysis of the C&I, there was strong agreement that the focus of C&I should be at the FMU level, not at the country level. Therefore, country level preconditions at the policy level for assessment of SFM are considered irrelevant for the objective of this project. This also conforms to the guidelines specified in the 'Introduction of the Briefing Book for the Brazilian Test', i.e. "The test concentrates on the forest management unit level."

4. The conceptual framework is illustrated in Figures 1 and 2.

List of Criteria and Indicators Identified by Participants of the Workshop

This is the original version that came out of the plenary session.

Compliance to national, regional and local legislation

1. Land Use Planning

- 1.1 Agreement of proposed land uses described in the management plan to the regional level zoning approved by government institutions. This agreement should consider the scale and the parameters used for the zoning.
- 1.2 There should be a micro-level zoning to include preservation areas and a mosaic of forest management units, varying in size, shape and management system; maintaining stream sides, etc.

2. Participation of Local Societies

- 2.1 Clearly established land tenure systems in the region, without a recent history of conflicts.
- 2.2 Mechanisms for participation of local populations in the planning, implementation and evaluation of the forest management plan.
- 2.3 Existence of independent unions or associations, with good relations with the forest owner.

3. Economic Viability

- 3.1 Economic and trade policies that result in prices of forest products sufficient to pay for forest management costs.
- 3.2 Percentage (% R\$/m³/year) of revenues invested in forest management.
- 3.3 Existence of satisfactory mechanisms to protect the permanent forest state in case of bankruptcy of forest companies.
- 3.4 Probability of fines and other sanctions by governmental authority.
- 3.5 Value of fines and other sanctions applicable to those practising non-sustainable forestry

4. Forestry Research and Extension and Professional Qualifications

- 4.1 Percentage (% R\$/m³/year) of revenues invested in research funded by the forest owner and those carried out in research co-funded by other institutions, carried out in the forest management unit. Such research must be geared towards human well being and maintaining forest functions and processes (integrity).
- 4.2 Percentage of revenues invested in training of workers in the forest management unit. Such training must be geared towards promoting human well being and maintaining forest functions and processes (integrity).
- 4.3 Level of support of the governmental forest extension service.
- 4.4 Salary paid to professionals in the forest management unit in comparison to the market.
- 4.5 Level of qualification of professionals in the forest management unit.

5. Legal and Institutional Factors

- 5.1 Payment of all taxes due.
- 5.2 Approved and implemented forest management plan.
- 5.3 Publication and dissemination of information on the results of governmental or third party monitoring of the forest management unit.
- 5.4 Formal mechanisms to monitor the implementation of recommendations made by governmental or third party monitoring of the forest management unit.
- 5.5 Involvement of forest owner with corruption of government officials, as documented by existing legal actions.
- 5.6 Frequency of governmental monitoring of forest management units in the region.
- 5.7 Frequency of legal units and other evidence involving **competies** of government offices directly linked to forestry activities.
- 5.8 Enforcement of long term commitment through registration in public notaries (“averbação em cartório”), as required by law.

III. CRITICAL ANALYSIS OF RESEARCH METHODS

This is a short analysis of the research methods used in the project.

1. Field Site

The choice of the field site was hotly debated in the final workshop. I think the selection was good. Given the few choices available and the heterogeneity and size of the Amazon, it is quite unlikely a site that is representative of all dimensions of forest management (social, ecological, silvicultural, economic, political) could be found.

The field site had several positive aspects, which included: (i) easy access to a major town, where several agencies (IBAMA, INCRA) and NGOs (Union of Rural Workers, Projeto Saúde e Alegria, GDA) were present, (ii) willingness of owners to provide logistical support and free access to field sites and documentation, (iii) representativity of “terra firme” management and land tenure characteristics of the Brazilian Amazon.

The field site had some negative aspects, which included: (i) lack of representativeness of some social issues (indigenous people, violent conflicts), (ii) lack of professional forestry administration, and (iii) limited quality of management itself.

2. Research Methods

2.1 Home-base review and Form 1

This is a very important component of the research method used. The field work suffered because several team members had not completed this part when they arrived in Belém.

Form 1 should have been provided in a computer format (in Excel) to facilitate the work, production of outputs and analysis.

2.2. Introductory session and Form 2

This part is critical and should be maintained and improved. Explanations of the methods could have given more emphasis on how to use Form 2, giving examples and highlighting the importance and usefulness of each section. The result was that Form 2 was under-utilised during the research process, and the sequence of completion was not according to what was planned.

Form 2 should have been provided in a computer format (in Excel), to facilitate the work, production of outputs and analysis. This would have made our work much more efficient and productive.

2.3. Introductory workshop

This workshop was very good and should be maintained. It could also focus on other areas in addition to policy and planning so as to provide an introductory feedback to all experts.

2.4. Field work

The field conditions were rough but manageable; they did not jeopardise the quality of the work.

Group meetings were productive although too long. This was partially a result of a very complex situation faced in the field as compared to previous tests. This was specially true regarding the complexity of the definition of the FMU.

The conceptual framework that was conceived (FMU as formal CEMEX "properties") did not prove adequate for the case study. It was unfortunate that we were not given the flexibility to revise this issue at an earlier stage of the research process. As some team members had anticipated and advised the project co-ordination, this issue came up in the final workshop and was a weak point in our research. In my opinion, the FMU should include logging done by CEMEX in its "properties" and adjacent private farms.

2.5. Final workshop

The final workshop was very good. It resulted in significant improvements of all components. In my particular case, there were no major changes: no principle, criteria or indicator were rejected. However, there were changes in several verifiers and indicators and several new verifiers were added. I basically accepted all the recommendations of the workshop. Only final word changes were made to improve the quality of the work. In my group, all points were decided by consensus and no issues were overly controversial.

On a different note, the plenary session that discussed public policies was not as successful. Valid concerns were voiced from participants about the reason for not having a working group on public policy. This raised "procedural questions" that could have been avoided if the structure I suggested to the CIFOR project co-ordinator had been accepted. This created more political sensitivity towards "policy indicators" than if a working group had been incorporated in the structure of the workshop. Despite repeated arguments prior to the final workshop, my opinion was not accepted and this created a negative image for CIFOR and the expert team. After the working group was approved in the plenary, we faced a difficult (but fortunately successful) task of creating a positive attitude towards the themes being discussed. This could and should have been avoided. For future tests, a more open and flexible decision making process is recommended and due consideration of the opinions of national experts be given.

2.6. Final preparation

The final preparation phase of the workshop was very useful. However, an extra one or two days, ideally separated by one "rest day" (team members and support staff were quite exhausted) would have been very good to improve the quality of output.

3. Team Dynamics

Team members had good interactions. Team field trips were very positive and should have been more frequent. Evening meetings were very positive but often too long. It is recommended that the meetings should be shorter and held more often instead of having such long ones.

4. Logistics

The IPEF support staff (Tasso and Marco) were very good; they managed to overcome all the difficulties, which are normal in the kind of field conditions at CEMEX, that came up.

5. Sets of Criteria and Indicators Selected

The five sets of C&I selected were quite different: (i) Smartwood's is a rather practical, clean and straightforward guideline for evaluations at the FMU level; (ii) ITW's is a detailed and comprehensive set of elements, ranging from national/regional to the FMU level; (iii) Soil Association's, similar to Smartwood's, is a rather practical and straightforward guideline for evaluations at the FMU level, with a greater emphasis on social C&I; (iv) Lembaga's, similar to ITW's, deals with indicators that range from national/regional to the FMU level, with a focus on the Indonesian situation; (v) the Dutch set is more general in nature and deals primarily with national level C&I.

In my opinion, the sets selected could have been different to encompass a broader range of C&I that are in use by certifiers. I also think that it would have been very good to use Tratado de Cooperación Amazónica's C&I and Forest Stewardship Council's principles and criteria. Nevertheless, I believe that using other sets of C&I would not have changed substantially the output of the work carried out in Brazil.

6. Suggestions for Improvement

- a. Forms 1 and 2 should have been provided in a computer format (in Excel) to facilitate the work, production of outputs and analysis;

- b. Planning of field work and workshop should allow more flexibility of project coordination and greater participation of national experts;
- c. Better introduction on how to use Forms 1 and 2, and their usefulness;
- d. More frequent and shorter evening meetings for team discussions.

ANNEX 4.1

POLICY AND PLANNING CRITERIA AND INDICATORS

Explanatory note: This is the final version produced by the team member, after the Belém workshop. Changes from the version that came out of the workshop (5.1) are underlined>. Indicator 6 of criterion 1 of this version was previously numbered as indicator 9 criterion 2 in version 5.1.

Table 1 - Forest Policies and Institutions

P	C	I	V	Descriptions	SMW	ITW	SOI	LEI	DDB	RANK	Observations
				Environmental and non-environmental policies and planning create an environment conducive to sustainable forest management.							- external factors to the forest management unit are decisive to producers.
	1			Environmental policies are conducive to sustainable forest management.		A.A. 2	10.2 01				
		1		Environmental institutions (e.g. IBAMA, SECTAM) provide an effective structure for the implementation of forest policies, specially monitoring and control.	1.8, 2.2	A.1.4 2.2					- enforcement of forest law at all levels is critical; - staff training programmes; - qualification; - bureaucracy; - complexity and usefulness of paperwork required to apply for permits; - irregularities; - staff motivation; - infrastructure; - decentralisation; - difference in management plans and reality of forest operations.
			1	Average time used to process applications to legalise forest management plans, after submission of all required documentation							
			2	Percentage of documents required to approve management plans that are costly to producers and not fundamental for the analysis process (e.g. deforestation authorisation vs. management plan)							
			3	Percentage of management plans not processed in relation to the total number submitted per year							
			4	Percentage of management plans with annual field inspections after official approval							
			5	Percentage of management plans suspended after field inspections							
			6	Percentage of approved management plans with independent auditing							
			7	Percentage of management plans effectively implemented							
			8	Percentage of approved management plans with internal auditing							
			9	Formal mechanisms to ensure public access to management plans							
			10	Percentage of timber coming from conversion areas in relation to managed forest areas							

P	C	I	V	Descriptions	SMW	ITW	SOI	LEI	DDB	RANK	Observations
			11	Number of forestry professionals denounced by environmental institutions (e.g. IBAMA, SECTAM) to professional associations (e.g. CREA) for improper professional conduct							
			12	Percentage of management plans with field inspections for control of effective use of "authorisation of transportation of forest products" - ATPF (volume/species extracted)							
		2		There is an environmental law that is in harmony with the goal of sustainable forest management and with the reality of users.	1.10	A.1.3 A.3.1				3	- legal framework for forest management is critical; - realism; - consistency with SFM.
			1	Existence of local regulations to deal with heterogeneous field conditions							
			2	Flexibility of local regulations to deal with heterogeneous field conditions							
			3	Existence of local legislation appropriate to the different socio-economic categories (e.g. traditional communities, settlers, farmers)							
			4	Flexibility of local legislation appropriate to the different socio-economic categories							
			5	Cost of preparation of management plans is accessible to producers							
		3		Forest extension agencies (e.g. EMATER), NGOs or consulting firms effectively provide technical support and disseminate results of promising experiences of natural forest management.						8	- critical role of forest extension.
			1	Ratio (percentage/year) of forest producers visited by forest extension agencies							
			2	Level of demand to extension agencies (number of requests/year)							
		4		Effective instruments secure long term commitment to forest management in cases where enforceable land use plans do not exist.		2.2					- effective "averbação em cartórios e reposição"; - cases of bankruptcy.
			1	Percentage of forest management units in private lands that were registered in public notaries and subsequently required changes in their land use status, to deforest							
			2	Percentage of forest management units in private registered in public notaries, where land use was changed, without regard to legal commitments to long term forestry							
			3	Existence of effective informal mechanisms (e.g. community							

P	C	I	V	Descriptions	SMW	ITW	SOI	LEI	DDB	RANK	Observations
				agreements) for protection and use of forest areas							
		5		Environmental policies have instruments to pay forest producers for the value of forest goods and services from sustainably managed forests.	3.6					2B	- services, non-timber products and timber from managed forests are not properly valued in the market.
			1	Timber products							
			2	Non-timber forest products							
			3	Game							
			4	Fish							
			5	Carbon							
			6	Biodiversity							
			7	Watershed protection							
		6		Environmental policies promote effective protection of representative ecosystems, endangered species and watersheds.							- conservation units complement environmental benefits of SFM.
			1	Percentage of permanent forest areas adjacent to conservation units							
			2	Percentage of area of states occupied by conservation units							
			3	Effective protection and management of conservation units							
		7		Environmental impact assessment laws are used as effective instruments to regulate and monitor forest activities and related infrastructures (e.g. roads, settlement areas), depending on the size of the operation.			P.4		A41	13	- large scale timber management may have significant social, environmental impacts.
			1	Percentage of forest operations with area greater than 2000 ha that have EIA/RIMAs as prescribed by law							
		8		Existence of mechanisms to ensure that forestry operations incorporate the participation of populations, specially forest peoples, according to the scale of operations.							- minimise conflicts; - equitable benefits.
			1	Effective mechanisms for participation in the process of evaluation and approval of licences							
			2	Effective mechanisms to ensure socio-economic benefits to local populations							

Table 2 - Multi-sectoral Policies and Institutions

P	C	I	V	Descriptions	SMW	ITW	SOI	LEI	DDB	RANK	Observations
	2			Non-environmental policies and institutions are conducive				B.I.			

P	C	I	V	Descriptions	SMW	ITW	SOI	LEI	DDB	RANK	Observations
				to sustainable forest management.				2			
		1		Intersectoral policies are integrated and in tune with the goal of promoting sustainable forest management.	2			B.1. 2			- need for co-ordination, contradictions between different policies.
			1	Effective action of development agencies (e.g. SUDAM) in the co-ordination of intersectoral policies							
			2	Financial institutions of regional development promote effective co-ordination for intersectoral policies.							
			3	Existence of a data base that integrates information and allows cross checks that are effectively used by public institutions (e.g. IBAMA, INCRA) and with open access to the public							
		2		Land tenure policies provide clear and legally secure land tenure (e.g. land title, "occupation title") that encourages long term commitment to forestry.	2.1			B.1. 3		2A	- secure land tenure is critical for long term investment in SFM, appropriate values are needed.
			1	Existence of an explicit policy to deal with the forest sector, consistent with SFM							
		3		Land tenure institutions (e.g. INCRA, ITERPA) have an efficient structure for the implementation of policies.						10	- bureaucracy, irregularities, INCRA.
			1	Time required to process application and issuing permanent land titling							
			2	Percentage of legalised forest management units with clear and secure land title (e.g. land title, "occupation title")							
		4		Economic policies to encourage SFM through effective instruments to long term forest investment.	8.1	8.3.1 .1		B.2. 3, B.4. 3		6	- long term investments in forestry are often not economically attractive in the short run; - exchange rates are also important.
			1	Percentage of credit actually used for long term forestry investments							
			2	Differential interest rates for the forestry sector							
			3	Percentage of tax incentives effectively used by the forest sector (e.g. ITR, IPI, ICMS)							
			4	Value paid as compensation for environmental services effectively provided by forest operations							
		5		Science and technology policies of public (federal, state and local) and private (international and national) are effective in improving technical level of forest management and policy design.		.4, .4.2				17	- poor technical level is not conducive to SFM; - forestry research is often not in tune with the reality of users, specially forest management and processing of timber and non-timber products.
			1	Percentage of resources allocated to forestry research							
			2	Percentage of resources allocated to policy research							
			3	Percentage of resources allocated to research on processing of timber and non-timber products							

P	C	I	V	Descriptions	SMW	ITW	SOI	LEI	DDB	RANK	Observations
			4	Demand for research results by user groups							
			5	Percentage of forest research carried out outside experimental stations (in private properties)							
		6		Agricultural policies do not encourage deforestation in areas with clear suitability to forestry activities (e.g. hilly topography).						4	- agricultural policies have significant impacts on forest conversion and logging.
			1	Percentage of incentives given to promote agricultural systems that result in deforestation in areas with clear suitability to forestry activities and not suitable for agriculture							
		7		Agricultural policies encourage sustainable agricultural land use systems, reducing the pressure for deforestation.						14	- low productivity shifting agriculture and increasing population size increases for conversion; - agroforestry systems have a key role; - pastures are particularly critical.
			1	Percentage of incentives given to sustainable agroforestry systems							
			2	Productivity of pastures (kg/ha/year)							
		8		Transport policies take into account their positive and negative impacts on SFM and existing land use plan.	1.17, 5.10, 5.21		5.20 1			20	- access to low priced timber in new frontier may be a counter stimulus for SFM; - reduction in transportation costs may provide an incentive for either SFM or timber mining.
			1	Mechanisms to ensure that approval of transport infrastructure (e.g. construction of new roads, paving existing roads, railroads, ports) take into consideration their impacts on SFM							
			2	Mechanisms to ensure that construction of transport infrastructure is preceded or followed by measures to mitigate their negative impacts on SFM							
			3	Mechanisms to ensure that construction of transport infrastructure is preceded or followed by measures to take advantage of their potential positive impacts for SFM							
		9		Industrial policies encourage efficient resource utilisation and minimisation of waste.	9.1, 9.2		9.10. 3	B.4. 1, B.3. 1, B.4 .2		12	- high waste production increases demand on resources and pollution; - socio-economic benefits of increased efficiency.
			1	Percentage of incentives given to technological modernisation of processing plants (e.g. saw mills, palm heart factories)							
			2	Efficiency of processing plants (e.g. m3 of final product/m3 of gross products)							
			3	Level of local value adding to forest products							
			4	Quality level of final products							
		10		Legal instruments to enforce legal rights of indigenous and traditional peoples, including cultural integrity, are clearly	1.20, 6.3,	B.3.1	7.10. 1,	B.4. 5,		7	- equitable benefits; - ethnobiological knowledge.

P	C	I	V	Descriptions	SMW	ITW	SOI	LEI	DDB	RANK	Observations
				established and enforced.	6.7		7.10	B.2			
		1		Effective judicial system for conflict resolution			.2,	.5			
		2		Percentage of indigenous lands affected by illegal extraction of forest products			8.10.				
		3		Frequency of conflicts between local communities and illegal extractors of forest products			8.20.				
							1				

Table 3 - Regional Planning and Zoning

P	C	I	V	Descriptions	SMW	ITW	SOI	LEI	DDB	RANK	Observations
	3			Regional development planning creates a broad framework for the design and implementation of environmental and non-environmental policies that are conducive to sustainable forest management.		A.1.1			A.3. 3, B.1.1		
		1		There is a regional land use plan which indicates different types of land use and recognises forests as valuable land uses.		A.1.1 A.4.1 .1,	5.40. 1		A.3. 3, B.1. 1	11	- need of a clearly established permanent forest state (e.g. national forests, long term private forest states).
		1		Land use plan that indicates protection and production forests		A.4.1 .2					
	2			A regional land use plan is effectively implemented.		A.1.1				18	- effective institutions; - appropriate legal framework.
		1		Percentage of current land uses consistent with existing plan							
		2		Rate (ha/year) of forest conversion in areas designed as permanent forest areas							
	3			The process of formulation and evaluation of the regional land use plan guarantees effective participation, transparency and consideration for multiple forest products and services.	6.1, 6.2			B.1. 1	A.4. 1, A.3. 3		- top down policies are inefficient; - transparency; - non-timber forest products, services, subsistence and cultural needs; - valuable information, cultural integrity, empowerment; - conflicts are minimised; - equitable benefits; - population growth, migration, carrying
		1		Transparent mechanisms for participation of key stakeholders, specially local communities							
		2		Mechanisms to ensure public access to information							
		3		Evidence of consideration for multiple use of forests							
		4		Evidence of consideration of ethnoecological knowledge of traditional populations							
		5		Respect for the rights of traditional and indigenous communities							
		6		Fair distribution of costs and benefits among							

P	C	I	V	Descriptions	SMW	ITW	SOI	LEI	DDB	RANK	Observations		
				various forest users							capacity; - sustainable development.		
			7	Consideration to pressures caused by increasing population density and the balance of human use and ecosystem resilience									
			8	Consideration for cultural diversity									
		4		Planning of location of production forest lands is based on up to date information on current production systems, stocks and potentials of multiple forest products (e.g. non-timber products, timber, fish, game) and services (e.g. carbon, watersheds).	3.6	A.2.2 .1, B.2.2	9.10. 1	B.5. 5			- historical lack of attention and poor understanding of forest production potential, specially non-timber forest products, game and fish.		
			1	Date of last inventories and surveys at regional level									
			2	Evidence of effective use of inventory information on multiple forest products and services in the planning process									
		5		Non-governmental organisations play a key role in giving transparency to the planning process through independent monitoring and promoting public access to information.	6.10						- transparency; - participation of multiple stakeholders checks and balances; - democratic structures; - staff, funding levels, activities.		
			1	Existence of legal framework to safeguard the activities of independent environmental and social NGOs									
			2	Existence of active NGOs with adequate institutional capacity, recognition and legitimacy to have active roles with forestry issues									

ANNEX 5

TESTING CRITERIA AND INDICATORS FOR THE SUSTAINABLE MANAGEMENT OF FORESTS TERMS OF REFERENCE FOR CONSULTANTS FOR THE TEST IN BRAZIL

OBJECTIVES:

Identify criteria and indicators that are objective, cost-effective and relevant to the sustainable management of forests, based on tests of existing sets of sustainability criteria and indicators. These sets are the criteria and indicators of Woodmark (Soil Association, Responsible Forestry Standards), Smart Wood Program (Rainforest Alliance), Initiative Tropenwald (ITW), the Green Label of the African Timber Organisation (ATO), Dutch Working Group and Lembaga Ekolabel Indonesia.

BACKGROUND INFORMATION:

Criteria and indicators for sustainable management of forests will be evaluated on their cost-effectiveness, plausibility, acceptability and feasibility in a series of tests, within the framework of a consultative process with participating countries in Asia, Africa, Latin America, and Europe. The final output of the project will consist of recommended generic and regionally relevant criteria and indicators incorporated within a system to evaluate the sustainability of forest management. It is important to note most if not all criteria and indicators to date have been designed to test whether management is potentially sustainable and not sustainability itself. Hence they constitute perceptions of best management practices or good forest stewardship. Evaluation of these criteria and indicators will need to take this into account.

The test in Brazil will be the fourth of these tests. The first test was carried out in Germany (Bovenden) in November 1994. The second test took place in Indonesia in March 1995 and the third test took place in Côte d'Ivoire in June 1995.

It is important to note that we are trying to identify a minimum set of reliable and cost-effective criteria and indicators focusing on CEMEX as the case study. We are not attempting to define a definitive set of criteria and indicators for the whole of Brazilian Amazon forests. Although criteria and indicators are important for the certification process, certification is only one of several prospective utilisers of criteria and indicators. This project concentrates solely on criteria and indicators for sustainable forest management and does not deal with certification.

The criteria and indicators recommended by the expert panel will serve as an instrument for improving the methodology and means of testing or developing reliable criteria and indicators, and will be compared and analysed in the light of results from other tests conducted under this project for this purpose. They will also serve as a platform for discussion during the workshop.

BASIC REQUIREMENTS:

Consultants are expected to

1. Be well informed on all developments pertaining to sustainable forest management in their fields, as they will act as the resource person for the team on their subject(s) of specialisation.

2. Have a good understanding of current debates on evaluation of sustainability and certification.
3. Be ready to work in a multi-disciplinary team under the co-ordination of the team leader and the CIFOR project co-ordinator.
4. Comply with the procedures set out for the test.
5. Have a good working knowledge of the Portuguese and English languages.
7. Inform himself/herself of forestry conditions in the Brazilian Amazon, especially of management practices in the lower Amazon.
8. Report back to his/her home institution/organisation on the results of the test as applicable.

METHODS TO BE USED:

I) Team concept

The team is to act as a cohesive multi-disciplinary unit to evaluate the selected criteria and indicators. To achieve this team members must:

1. Maximise exchange of information. This will take place both on an informal basis and more formally during designated daily 'debriefing' periods, team discussions and workshops.
2. Carry out operations both within and outside their areas of specialisation.
3. Take an active and creative role in all discussions and workshops.

II) Evaluation of Criteria and Indicators

- a) 'Office'. For the test in Brazil, institutional, policy and administrative data will be evaluated for a period of 2 days (see Schedule). Data collection will take the form of interviews, discussions and study of files.
- b) Field. Field evaluation of bio-physical and social criteria and indicators will be carried out for a period of 12 days.
- c) Internal reviews: Six days during the field phase will be dedicated to internal reviews and discussions.

When evaluating the validity of criteria and indicators either during the office or field phase, the consultant must consider the following:

- Is this criterion/indicator important for the assessment of sustainability?
- What is the moving spirit behind the criterion or indicator? Is this being respected during the evaluation?
- Is there a better way of expressing the criterion or indicator?
- Is it possible to suggest upper or lower limits for the criterion or indicator concerned?
- Does this criterion/indicator merit recommendation?

Furthermore, it is very important to

- Keep in mind the comparative nature of the test and the objectives of the research program.
- Give preference to simply measured, easily understood criteria and indicators over more complicated ones.
- Be prepared to formulate new criteria and indicators where deficits have been recognised.
- Keep in mind the need to identify a minimum set of criteria and indicators.
- Seek a small number of integrative rather than many detailed, dissective criteria and indicators.

Evaluation of criteria and indicators will take place iteratively in two major steps:

- 1) **Simple evaluation of all criteria and indicators** based on responses to a limited number of questions contained in Response Form No.1. The first review of all criteria and indicators will take place during the preparation period at the consultant's home base. Subsequent reviews will take place during field testing and discussions using the concession as a focus.

The consultant will use the comprehensive evaluations to develop with other team members a subset of priority criteria and indicators (see Schedule: 2). The subset will represent the consultants' view of what constitute the most important criteria and indicators for assessing sustainability of the ecosystem, the management and social systems, based on the existing sets of criteria and indicators.

- 2) **Detailed evaluation of the subset of criteria and indicators.**

The team will divide responsibilities along the lines of specialisation and experience of team members for the subsequent investigation of the validity of criteria and indicators. Each team member will lead a detailed evaluation of a subset of such criteria and indicators (Schedule: 3). The subsequent investigations will be carried out in a flexible and innovative manner, which will include for example the formation of small interdisciplinary task-oriented teams. The field exercise will be used to test the viability of the selected criteria and indicators. Response Form No. 2 will be utilised as a basis for this evaluation, however the consultant is encouraged to develop additional evaluation methods and materials as needed.

For the purpose of these investigations, consultants are encouraged to bring with them reference literature important to their areas of specialisation.

The results of the investigations will be reviewed and synthesised in a series of group discussion sessions by the team (Schedule: 4b,4d). These discussions will provide a basis for the report to be presented at the closing workshop (Schedule: 5).

III) Workshop

The consultant will attend two workshops during the course of the test.

Initial Workshop. The aim is to make the methodology of the test clear to all team members. Suggestions for modification of the methodology may be made. During this workshop team members will select the priority set of criteria and indicators, from the existing sets. Each selected criterion or indicator is to be cross-referenced (as far as possible) to similar criteria and indicators in the remaining sets.

Final Workshop.

To discuss:

- 1) methods.
- 2) the recommended criteria and indicators with respect to their cost-effectiveness and usefulness as evaluation tools.
- 3) justifications for the selection of the recommended set of criteria and indicators - each team member will be expected to provide justification for the criteria and indicators selected by her or him.
- 4) relative importance of the selected criteria and indicators (weights).

EXPECTED OUTPUTS:

- A) **Report on initial evaluation of all selected criteria and indicators.** This report will consist of completed Response Form No. 1.
- B) **Report on evaluation of criteria and indicators recommended by the consultant.** The consultant will be expected to provide detailed justification for his/her recommendations, essentially on Response Form No. 2.
- C) **Report on evaluation of methodology.** The consultant will give a concise report on his/her evaluation of methodology under the following headings:
 - a) Data collection methods
 - b) Sets of criteria and indicators selected
 - c) Response forms
 - d) Time allowed for tests
 - e) Workshops
 - f) Suggestions for improvement
- D) **The final report of the test will summarise the results of all other reports and the closing workshop.** It will be prepared by the team leader.

OTHER:

Additional documents such as the briefing book, schedule of operations, procedures for data collection, procedures for evaluating criteria and indicators, and the criteria and indicators themselves are to be considered to be parts of the Terms-of-Reference.

TIME AVAILABLE/DEADLINES:

Test duration:	October 23 - November 19, 1995
Reports A) & B) (first iteration) completed by:	23.10.1995
Reports A) & B) (final) completed by:	14.11.1995
Reports C) & D) completed by:	19.11.1995
Report D) completed by:	15.12.1995

Schedule of test in Brazil:

<u>Activity (in chronological order)</u>	<u>Time</u>	<u>Venue</u>
1) Preparation	5 days	Home-base
<i>Arrival in Belém on October 22 - Field Phase</i>		
2) Introductory workshop to discuss methods, to effect initial selection of priority criteria and indicators and set tasks	2 days	Belém, October 23-24
3) Preparation	1 day	Belém, October 25
4) Discussions of National & Regional criteria and indicators with IBAMA, EMBRAPA, TCA, Ministries, FSC, NGOs etc.	2 days	Belém, October 26-27
5) Internal review of progress	2 days	Belém, October 28-29
<i>Transfer to CEMEX</i>	<i>1 day</i>	<i>October 30</i>
6) CEMEX parallel investigation of management, bio-physical and social criteria/indicators at the forest management unit level	12 days	October 31-November 11
<i>Transfer to Belém</i>	<i>1 day</i>	<i>November 12</i>
7) Preparation for closing workshop	2 days	Belém, November 13-14
8) Closing Workshop	3 days	Belém, November 15-17
9) Internal review	<u>2 days</u>	Belém, November 18-19
Total:	33 days	

RESPONSIBILITIES OF THE TEAM LEADER:

The leader of the evaluation team will have the following additional responsibilities:

1. Ensure that the objectives of the test are achieved.
2. Plan day-to-day activities in conjunction with the CIFOR project team.
3. Ensure team functions as a multi-disciplinary unit.
4. Report to the workshop on the activities of the team, explaining the methodology by which criteria and indicators were selected.
5. Submit the final report in English (in three copies) for the test in Brazil, by December 15, 1995.

ANNEX 6

AGENDA OF THE CLOSING WORKSHOP

WEDNESDAY, NOVEMBER 15

08:00-08:30 Registration of participants

Morning Session

08:30-09:00 The CIFOR research project on testing criteria and indicators for sustainable management of forests. *Ravi Prabhu (CIFOR)*

09:00-09:30 The Brazilian test. *Tasso Rezende de Azevedo (IPEF)*

09:30-10:00 Break

10:00-12:00 Panel discussion on the utilisation of criteria and indicators

12:00-13:30 Lunch (hosted by CIFOR)

Afternoon Session

REPORTS OF THE EXPERT TEAM

13:30-14:00 Methods followed to evaluate criteria and indicators, introduction to the context. *Johan Zweede (team leader)*

14:00-14:30 Approach adopted to evaluate criteria and indicators related to production. *Natalino Silva (team member)*

14:30-15:00 Approach adopted to evaluate ecological criteria and indicators. *Rita Mesquita (team member)*

15:00-15:30 Break

15:30-16:00 Approach adopted to evaluate social criteria and indicators. *Jan Kressin (team member)*

16:00-16:30 Approach adopted to evaluate criteria and indicators related to the policy, planning and institutional frameworks. *Virgilio Viana (team member)*

16:30-17:30 Open forum discussion on reports of the expert team

17:30 Close

THURSDAY, NOVEMBER 16

Morning Session

08:30-09:00 'Who counts most in Forest Management?' *Carol Pierce Colfer (CIFOR)*

09:00-10:00 Presentation of policy and planning criteria and indicators (*plenary*)

10:00-10:30 Break

10:30-12:30 Discussion of policy and planning indicators (*plenary*)

12:30-14:00 Lunch (hosted by CIFOR)

Afternoon Session

14:00-15:30 First working group session

I) Working Group on Management Criteria and Indicators

II) Working Group on Ecological (Bio-physical) Criteria and Indicators

III) Working Group on Social Criteria and Indicators

IV) Working Group on Policy and Planning Indicators

15:30-16:00 Break

16:00-17:30 First working group session contd.

17:30 Close

FRIDAY, NOVEMBER 17

Morning Session

08:30-09:00 *Presentation on a topic of general interest*

09:00-10:00 First reports of the working groups

10:00-10:30 Break

10:30-12:30 Second working group session

I) Working Group contd.

II) Working Group contd.

III) Working Group contd.

12:30-13:30 Lunch (hosted by CIFOR)

Afternoon Session

13:30-15:00 Reports of second working group session (*plenary*)

15:30-16:00 Break

16:00-17:30 Wrap-up session to discuss findings of the workshop (*plenary*)

17:30 Close

ANNEX 7

LIST OF PARTICIPANTS

Alexandre Dias de Souza

Parque Zoobotânico - PZ -Projeto Arboreto
Eng. Florestal
 Adress/Ender: Campus universitario, km Q4,
 BR 364, cep 69915-900
 Rio Branco - AC
 Phone/tel: 068 - 226 1641
 Fax: 068 - 226 164, 226 1162

Ana Cristina Barros

IMAZON
Pesquisadora
 Adress/Ender: Rod do coqueiro,
 conj. Pau d'Arco n.9
 Belém - PA
 Phone/tel: 051- 235 4214, 235 0122
 Fax: 091- 235 42141, 235 0122

Andre Villas Boas

Instituto Socio Ambiental - ISA
Antropólogo
 Adress/Ender: Av. Higienopolis 901
 cep 01238-001
 São Paulo- SP
 Phone/tel: 011-825 5544
 Fax: 011 - 825 7861
 Email: socioamb@ax.acp.org

Antenor Gonçalves Bastos Filho

CIKEL - Comercio e Industria Keila s/a
Eng. Florestal
 Adress/Ender: R.21 de marco, 333,
 cep 65926-000
 Açailândia - MA
 Phone/tel: 098 - 738 1212
 Fax: 048 - 738 1841

Armin Deitenbach

REBRAF
Eng. Florestal
 Adress/Ender: R. Dr. Guilherme D.
 Villares 1136, bl.8, ap.112
 São Paulo - SP, cep 05640-001
 Phone/tel: 011- 846 2064
 Fax: 011 - 846 2064
 Email: rebraf.sp@mandic.com.br

Carol Colfer

CIFOR
Antropóloga
 Adress/Ender: Jl. Gunung Batu 5,
 Bogor, Indonesia
 Phone: 62-251 34 3652
 Fax: 62-251 32 6433
 Email: c.colfer@cgnet.com

Amantino de Freitas

IPT / FSC Member or Board of Directors
Eng. Civil/Madeira
 Adress/Ender: cx postal 7141
 São Paulo - SP
 Phone/tel: 011 - 869 3131, 210 2885
 Fax: 011 - 819 5730
 Email: dfreitas@dce03.ipt.br

Andre da Silva Dias

Projeto Saude & Alegria
Eng. Florestal
 Adress/Ender: Tr. Dom Amando, 697,
 cep 68000 000 Santarém - PA
 Phone/tel: 091- 523 1083
 Fax: 091- 522 5144

Anna Fanzeres

Greenpeace
Eng. Florestal
 Adress/Ender: R. Mexico, 21 - andar 13 - Centro
 cep 20031 -144
 Rio de Janeiro -RJ
 Phone/tel: 021 - 220 9016
 Fax: 021 - 2401690
 Email: anna.fanzeres@green2.greenpeace.org

Antonio Carlos Hummel

IBAMA/AM
Eng. Florestal
 Adress/Ender: R. Paralba G 4,
 bloco 7 ap.202, cep 69057- 020
 Manaus -AM
 Phone/tel: 092 - 237 3721
 Fax: 092 - 237 5177

Carlos Henrique Gascia

Sociedade Brasileira de Silvicultura-SBS
Eng. Florestal
 Adress/Ender: Av. Marselha, 1180,
 B. Jaguaré
 São Paulo- SP
 Phone/tel: 011 - 869 4941
 Fax: 011 - 869 4941

Ecio Rodrigues da Silva

CTA - Centro dos Trabalhadores da Amazônia
Eng. Florestal
 Adress/Ender: Av. Eparinondas Jácome,
 1183 - Bairro Cadeia Velha - cep 69.908-420
 Rio Branco - AC
 Phone/tel: 068 - 224 8231
 Fax: 068 - 224 1249, 241 0866

Edson Jose Vidal da Silva
IMAZON
Eng. Agrônomo
Adress/Ender: Rod. do coqueiro,
conj. Pau d'Arco n. 9
Ananindeua -PA
Phone/tel: 091 - 235 4214
Fax: 091 - 235 4214

Fernando Cristovam da Silva Jardim
FCAP
Professor Visitante
Adress/Ender: AV. Perimetral s/n. Belém - PA
Phone/tel: 091- 246 5004

Igor Mousasticoshvily Junior
Instituto Socio Ambiental - ISA
Eng. Florestal
Adress/Ender: AV. Higenópolis, 901, cep 01238-001
São Paulo- SP
Phone/tel: 011 - 825 5544
Fax: 011 - 825 7861
Email: socioamb@ax.apc.org

Johan Zweede
Consultant
Eng. Florestal
Adress/Ender: cx.postal 13077 -
cep 66040 970
Belém - PA
Phone/tel: 091 - 229 8371, 982 2065
Fax: 091 - 229 S371

Jose M. Vasconcelos
União Europeia - Delegação da Comissão Europeia
no Brasil
Eng. Florestal/Agrônomo
Adress/Ender: SHIS O17, Lote A. Lago Sul
Brasília- GO
Phone/tel: 061 - 248 3122
Fax: 061 - 248 0700

Jurandyr da Cruz Alancar
INPA - Instituto Nacional de Pesquisas da
Amazonia
Eng. Florestal, Dr.
Adress/Ender: Alameda Cosme Ferreira, 1756 -
Cx. postal 478
Manaus -AM
Phone/tel: 092 - 642 3430
Fax: 092 - 642 3430
Email: jalancar@cr.am.rnp.br

Erwin Frank
NAEA
Professor Visitante
Adress/Ender: Conjunto Brasileiro,
Bloco B/901 - R. 9 de Janeiro
Belém - PA
Phone/tel: 091- 249 3033

Ian Tompson
Embrapa/CPATU
Eng. Florestal
Adress/Ender: C.P. 48, cep. 66095-100
Belém - PA
Phone/tel: 091 - 226 6622
Fax: 091 - 226 9845

Jan Kressin
Consultant
Sociólogo
Adress/Ender: Muthesinsstr. 14,
12163 Berlin - Alemanha
Phone/tel: 49-30 792 9555
Fax: 49-20 321 3332

Jorge Yared
CPATU/EMBRAPA
Eng. Florestal
Adress/Ender: cx.postal 46 - cep 66095-100 Belém
- PA
Phone/tel: 091 - 226 6622
Fax: 091 - 226 9845

Jose Natalino Silva
CPATU
Eng. Florestal
Adress/Ender: c.p. 48,
cep. 66.095-100 Belém - PA
Phone/tel: 091 - 226 6622
Fax: 091 - 226 9845
Email: natalino@marajo.secom.ufpa.br

Lini Wollenberg
CIFOR
Pesquisadora
Adress/Ender: Po Box 6596
JKPWB -10065, Jakarta - Indonesia
Phone/tel: 62-251 34 3652
Fax: 62-251 34 6433
Email: e.wollenberg@cgnet.com

Luiz Menezes Filho
 Parque Zoobotanico / UFAC
Eng. Agronomo/Professor
 Address/Ender: C.P. 500
 Rio Branco-AC
 Phone/tel: 068 - 226 1641
 Fax: 068 - 226 1162

Marco Antonio Malagodi
 Projeto FLONA Ipanema
Eng. Agronomo
 Address/Ender: R. Clemente Ferreira,
 55 - cep 13208-740
 Jundial-SP
 Phone/tel: 011 - 434 1315

Patrick Cooper
 Woodmark - Soil Association
Forest Officer
 Address/Ender: 86 Colston street
 BS1 SBB, UK
 Bristol - Inglaterra
 Phone/tel: 0117 - 929 0661
 Fax: 0117 - 929 0661

Paulo B. de Oliveira
 FASE
Pesquisador Senior
 Address/Ender: R. Bernaldo Couto 1329-Umarizal.
 Cep 6655-080 Belém - PA
 Phone/tel: 091 - 222 9994
 Fax: 091 - 241 5310

Pedro Moura Costa
 Consultor
Consultor
 Address/Ender: S. Bishop's Court,
 John Garne Way, OX3 OTX, UK
 Oxford - Inglaterra
 Phone/tel: 44-1865 - 792 682
 Fax: 44-1865 - 792 682

Ravi Prabhu
 CIFOR
Eng. Florestal
 Address/Ender: Jl. Gunung Batu 5
 Bogor- Indonesia
 Phone/tel: 62-251 34 3652
 Fax: 62-251 32-6433
 Email: r.prabhu@cgnnet.com

Rita Mesquita
 INPA (Projeto Dinamica Biologica)
Biologa
 Address/Ender: cx.postal 478
 Manaus - AM
 Phone/tel: 092 - 236 9847
 Fax: 092 - 642 2050
 Email: rita@cr-am.rnp.br

Manoel Pereira Dias
 CIKEL - Comercio e Industria Keila s/a *Diretor*
 Address/Ender: R. 21 de Março 333 Belém - PA
 Phone/tel: 098 - 738 1212
 Fax: 098 - 738 1841

Oriowaldo Queda
 ESALQ/USP
Sociologo/Professor
 Address/Ender: Av. Padua Dias, 11 -
 Cx. postal 9, Piracicaba-SP
 Phone/tel: 0194 - 32 4058
 Fax: 0194 - 34 0250

Paulo Amaral
 AMAZON
Eng. Agronomo
 Address/Ender: Rod. do coqueiro, conj.
 Pau d'Arco n.9 Belém - PA
 Phone/tel: 091-235 4214
 Fax: 091 - 235 4214

Paulo Kageyama
 ESALQ/USP
Eng. Agronomo/Professor
 Address/Ender: Av. D. Lidia 900
 São Paulo - SP
 Phone/tel: 0194 - 336 155
 Fax: 0194 - 336 081
 Email: pykageya@floresta.esalq.usp.br

Peter Saile
 GTZ-IBAMA
Chief Technical Advisor
 Address/Ender: Sede do IBAMA, lote 4- Norte
 SAIN, bloco A Brasilia - DF
 Phone/tel: 061 - 316 1072
 Fax: 061 - 316 1281

Renata Mauro Freire
 Projeto Saude Alegria
Eng. Agrônoma
 Address/Ender: R. Turiano Meira, 1357 Santarém -
 PA
 Phone/tel: 091 - 522 5144, 522 5861
 Fax: 091 - 523 1083

Roberto Hosokawa
 UFPR
Eng. Florestal
 Address/Ender: R. Visconde de Guarapuava,
 4125/701 - Centro Curitiba -PR
 Phone/tel: 041 - 233 1620, 232 9084, 352 2527
 Fax: 041 - 253 2703

Rodney Rooney Salomao Reis
IMAZON
Estudante Eng. Florestal
Adress/Ender: Pass. Sta. Matilde, 80 Belém - PA
Phone/tel: 091 - 243 0732

Ruth Nussbaum
SGS Forestry
Quilmica/Forester
Adress/Ender: Oxford Center of Innovation
Mill Street, Oxford, OX2 JX
Oxford - Inglaterra
Phone/tel: 44-1865 20 2345
Fax: 44-1865 79 0441
Email: sgs.forestry@dial.pipex.com

Sandra Faillace
FASE - Federa,cao dos Orgaos para Assistencia
Social e Educacional
Antropologa Social
Adress/Ender: R. Bento Lisboa, 58 -Catete
Rio de Janeiro - RJ
Phone/tel: 021-285 2998
Fax: 021 - 205 3099
Email: sandra@apc.org

Syglea Rejane Magalhaes Lopes
IMAZON
Advogada/Pesquisadora
Adress/Ender: R. Pau D'Srco, casa 9, Ananindea
Belém - PA
Phone/tel: 091 - 235 4214
Fax: 091 - 235 0122

Ulrich Bick
Institute for World Forestry
Eng. Florestal
Adress/Ender: Leuschnerstr. 91, 21031 Hamburg
Phone/tel: 49-40 73962
Fax: 49-40 73962, 73480

Rodrigo Antonio Pereira Junior
Fundação Floresta Tropical - FFT
Eng. Florestal
Adress/Ender: R. dos Parequis, 2540 -
Apto 602 - cep 13077 Belém - PA
Phone/tel: 091 - 229 8371
Fax: 091 - 229 8371

Sandra Faillace
FASE - Federa,cao dos Orgaos para Assistencia
Social e Educacional
Antropologa Social
Adress/Ender: R. Bento Lisboa, 58 -Catete
Rio de Janeiro - RJ
Phone/tel: 021-285 2998
Fax: 021 - 205 3099
Email: sandra@apc.org

Stefan Schardt
Iniatiative Tropenwald - ITW
Diretor
Adress/Ender: Amkollnischen Park 2,
D-101 79 Berlin- Alemanha
Phone/tel: 49-30 238 6527
Fax: 49-30 279 3728

Syglea Rejane Magalhaes Lopes
IMAZON
Advogada/Pesquisadora
Adress/Ender: R. Pau D'Srco, casa 9, Ananindea
Belém - PA
Phone/tel: 091 - 235 4214
Fax: 091 - 235 0122

Virgilio Mauricio Viana
ESALQ/USP
Eng. Florestal/Professor
Adress/Ender: Rua Padua Dias, 11 -
cep 13419-000 São Paulo- SP
Phone/tel: 0194 - 294 316
Fax: 0194 - 336 081
Email: viinviana@carpa.ciagri.usp br