



Testing of Criteria and Indicators of Sustainable Forest Management in Austria within the International CIFOR Project

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Foreword by the Federal Minister Dr. Martin Bartenstein

Especially since the UNCED in 1992 growing concern about the loss of global forest resources has given rise to demands for the introduction of sustainable, environmentally and socio-economically sound forest management in the aim of protecting and conserving the forests in the long run.

A voluntary and non-discriminating certification of timber and timber products from sustainable forest management is regarded as an appropriate means to achieve this goal. Timber certification is carried out on the basis of cost efficient, expressive and operable criteria and indicators for sustainable forest management. Timber certification has gained more and more importance not only with a multitude of national initiatives but also within the international environmental, trade, and forestry policies which aim for the conservation and sustainable development of the global forest resources. One main goal of certification, which will be guided by the mechanisms of the free market, is to provide information to consumers to influence their purchasing behaviour by increasing their environmental awareness. In my opinion this will furthermore make possible to give due consideration to the non-commercial activities in forest management, e.g. the recreational use of forests.

In Austria an intensive working and opinion building process is currently taking place, which involves all the parties concerned within the framework of the Timber Advisory Board.

At the same time Austria actively participates in the process at the European and the international levels. This is mainly done to support and enforce the establishment of a general framework for timber certification on the European and the international levels, which from the Austrian point of view is of utmost importance and requires immediate action. In my opinion, mechanisms preventing the misuse of the timber quality mark in order to avoid distortions of market and competition patterns as well as appropriate measures guaranteeing that the ecological, renewable resource timber is not replaced by less ecological materials are the cornerstones of certification, which have to be ensured at the European and the international level, respectively.

The present results of the project represent an important step towards the creation of a system for the award of the timber quality mark and will serve as a basis for further discussions in the Austrian timber advisory board. The results of the tests carried out in Austria have been incorporated in the international CIFOR project and are considered a substantial contribution to ongoing processes within the European Union and at the international level. I think that this is an opportunity to make people aware of the characteristic features and the specific conditions of Austrian and Central European forestry.

I wish to thank all those who contributed to the successful completion of the project. My special thanks go to the owners and managers who made their forests available for this project free charge.

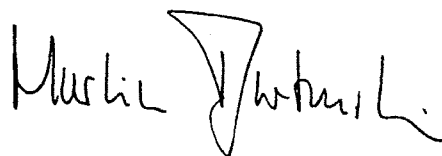


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ENCLOSURE:**Folder:**

The forest - the green core of Austria (Federal Ministry of Agriculture and Forestry)

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Summary

The Centre for International Forestry Research (CIFOR) is running a project testing criteria and indicators (C&I) for sustainable forest management. The objective is to test the criteria and indicators taken from existing sets for their suitability as assessment tools for sustainability in forest management. Furthermore this project aims at developing a methodology for evaluating and establishing criteria and indicators.

On the basis of a law on the creation of a quality mark for timber and timber products from sustainable forest management criteria and indicators for sustainable forest management were tested in Austria. The testing, which was conducted by the Austrian Federal Environment Agency and in close co-operation with CIFOR, was financed by the Federal Ministry for the Environment, Youth and Family, the body responsible for the implementation of the a.m. law.

After a preparation phase of meetings and individual work a team of six experts evaluated a selection of about 280 C&I taken from national and international sets during a practice-oriented field phase of two weeks. The evaluation was carried out by using the CIFOR-methodology.

The objective was to select the smallest possible number of criteria and indicators allowing the best possible judgement as to the sustainability of a forest management considering especially the specific Austrian situation (small forest estates, temperate zone, mountain forests, semi-natural man-made forests), at the same time remaining practicable and efficient.

During a field work phase from October 23rd until November 3rd 1995 different working groups dealt with the subject areas ecology, economy and social economy. In daily internal discussion rounds and an informal meeting with the project support group (experts with practical experience in forestry, from research, interest groups, governmental and nongovernmental organisations (NGOs), who dealt with the problem of implementing the set of C&I to be established and with related open questions) the individual subject areas were co-ordinated, several parts being rephrased, others completely newly formulated. The availability of four test enterprises (a forest administration of the Austrian Federal Forests - 11,000 ha, a large private forest estate - 4,500 ha, an agrarian community - 350 ha, and a farm forest of 12 ha) which are situated in different areas ranging from low-lying floodplain areas to steep protection forests in the foothills of the Alps, allowed to verify the practicability of the selected criteria and indicators. On the basis of the (adapted) forms set up by CIFOR the criteria and indicators were assessed with regard to their efficiency, expressiveness, suitability and range of application. Then the team members selected the most important ones. The results were discussed in the course of a workshop in the end of the testing, improvements were taken into consideration in the final version of the set of C&I or in the form of alternative proposals.

As a result a set of about 140 criteria and indicators (named below „Test set“) was presented, which the test team members consider to be practicable for certification, and, although not simple to fulfil, justifiable. Information is provided on time expenditure and control intervals for certification. Furthermore, methodology and various other questions on certification are (briefly) discussed, open questions identified and proposals on how to proceed further made. In addition, proposals in connection with the CIFOR-methodology are presented.

All results were transmitted to CIFOR and can thus be evaluated together with the results of the other - including future - tests. In addition to the report at hand a detailed appendix is available.

The testing carried out has to be regarded as a single, although important, step within a national and international iterative process.

1 GENERAL ASPECTS

1.1 INTRODUCTION

The legal background for the testing of criteria and indicators (C&I) for sustainable forest management in Austria is the Federal Law on the Creation of a Quality Mark for Timber and Timber Products from Sustainable Forest Management (Federal Legal Gazette 228/1993), passed by Parliament in 1993. The Federal Minister of the Environment, Youth and Family is in charge of defining by ordinance the prerequisites for sustainable forest management. In doing so he shall rely on the advice of a timber advisory board which was created especially for this purpose in defining the criteria mentioned before the guidelines established by competent international organisations have to be taken into consideration.

In the following the cornerstones of Austria's participation in the CIFOR-project are given:

April 1993: Federal Law on the Creation of a Quality Mark for Timber and Timber Products from Sustainable Forest Management

Sept. 1993: Setting up of the timber advisory board

May 1994:

- *Study: "Timber Labelling - a Quality Mark for Timber and Timber Products; a Study of Variants".*
- *Setting up of the expert committee on sustainability (ÖFA = Österreichischer Fachausschuß, Austrian Expert Committee).*
- *First contacts with CIFOR.*

1994/1995: Revision of the international sets of C & I; Establishing of a set of principles and general and organisational prerequisites of a sustainable forest management.

May 1995:

- *Submission of the final report of the expert committee on sustainability.*
- *Final decision in the timber advisory board on testing the criteria and indicators (C&I) in co-operation with the CIFOR.*

June - Sept. 1995: Preparation of the test and the cooperation with CIFOR.

October/November 1995: Practical testing of criteria and indicators for sustainable forest management in Austria.

The expert committee on sustainability (ÖFA), which had been established upon recommendation of the timber advisory board, was especially dealing with the selection and assessment of the various international sets of criteria. From the about 1,000 principles, criteria and indicators which had thus been compiled about 280 were selected (double and multiple quotations were eliminated as far as possible, overlaps condensed, but contents remained unchanged).

This selection served as a working basis for the expert committee on sustainability who subsequently rephrased or, where this was necessary, defined principles and the general and organisational prerequisites. The final test set is the result of a combination of these new formulations and the criteria and indicators which had been adopted without having been changed by the expert committee. (For further details on the establishing of the test set please refer to Annex 2, test set, introduction).

The task of considering existing international guidelines when it comes to evaluating the prerequisites for sustainability was determining the Austrian participation in the CIFOR-project.

The demand for thorough consideration of the existing international sets is closely linked to the task of CIFOR to select and evaluate those criteria and indicators that are most relevant and indicative of sustainability in forest management. This selection is carried out by testing criteria and indicators from the various existing sets in the different countries and regions. This is why, as early as in 1994, when the project was first presented by CIFOR, Austria started considering to participate in this programme. What remained to be decided was the actual form of participation: Financing of or providing own testing results to CIFOR. After careful considerations involving the timber advisory board, it was decided to carry out a testing of criteria and indicators in Austria using the CIFOR-methodology and giving the most possible consideration to the specific Austrian situation. Especially results from the typical small forest estates and from mountain forests were considered a valuable contribution to the results to be elaborated by CIFOR.

The first phase of the CIFOR-project was oriented on tropical areas and large-scale enterprises (concessions), in which the primary goal is timber production from natural forests.

In Austria, however, the situation is as follows: Mostly small private forest estates, centuries-old traditional forms of use and therefore mostly semi-natural man-made forests, climatic extremes ranging from dry areas to areas receiving high rainfall and to high alpine conditions. In the mountainous areas the primary management goal (about one third of the Austrian land covered by forests) is the conservation of the forests to provide for protection against natural hazards (for further information please see the enclosed brochure of the Federal Ministry of Agriculture and Forestry "The Forest - the green core of Austria"). Another important aspect is the existence of a dense net of forest authorities and public and private interest groups of dealing with the management of Austrias forests. These have a long tradition already.

The a.m. differences from the other areas tested within the CIFOR-testing programme made an adaptation of the methodology to the Austrian situation necessary. Details on the necessary changes can be found in the chapter on methodology. Furthermore, in the various chapters information is given on the reasons why and on which changes had to be made in connection with evaluating the criteria and indicators with regard to a certification process (co-operation of authorities and interest groups; first, second and follow-up certification, size of the enterprises/unit of certification). This fact has to be kept in mind while comparing the Austrian results with the other CIFOR tests.

1.2 OBJECTIVE OF THE TESTING

The 280 principles, criteria and indicators (P/C/I) of the test set had to be evaluated as to their expressiveness, practicability and efficiency with regard to assessing the sustainability of forest management. The evaluation of the suitability of criteria and indicators for sustainable forest management of existing international sets in connection with forest management in Austria with its specific rules and overall conditions (e.g. small forest estate structure) was carried out in the aim of enlarging the scope of application of the CIFOR-results in general. This evaluation can be regarded as the first practical application of the CIFOR-methodology (the first test in Germany being considered a prototype) in the context of temperate, Central European forest management, which is partly totally different from the conditions in tropical and boreal forests. The results of this evaluation, which draws attention to necessary adaptations and amendments, were made available to CIFOR.

Primary objective of the testing was to work out a set of criteria and indicators of the smallest possible range necessary to allow the best possible judgement of the sustainability of forest management. The **results of the testing shall serve as a basis for further steps** towards the implementation of the law on the creation of a quality mark for timber and timber products, Federal Legal Gazette 228/1993.

The team had to carry out the following tasks (summary):

- Identification and selection of the most expressive and most efficient criteria and indicators from the test set 2).
- Revision of the points of the test set on the basis of the CIFOR forms 1 and 2, including test procedure, suitability and range of application
- Classification of criteria and indicators with the respective principles
- Expert assessment of the importance of the indicators
- Identification of open questions and missing topics
- Definition of criteria and indicators
- Definition of units of measurement wherever possible.

1.3 METHODOLOGY

1.3.1 Characteristics of the CIFOR-methodology

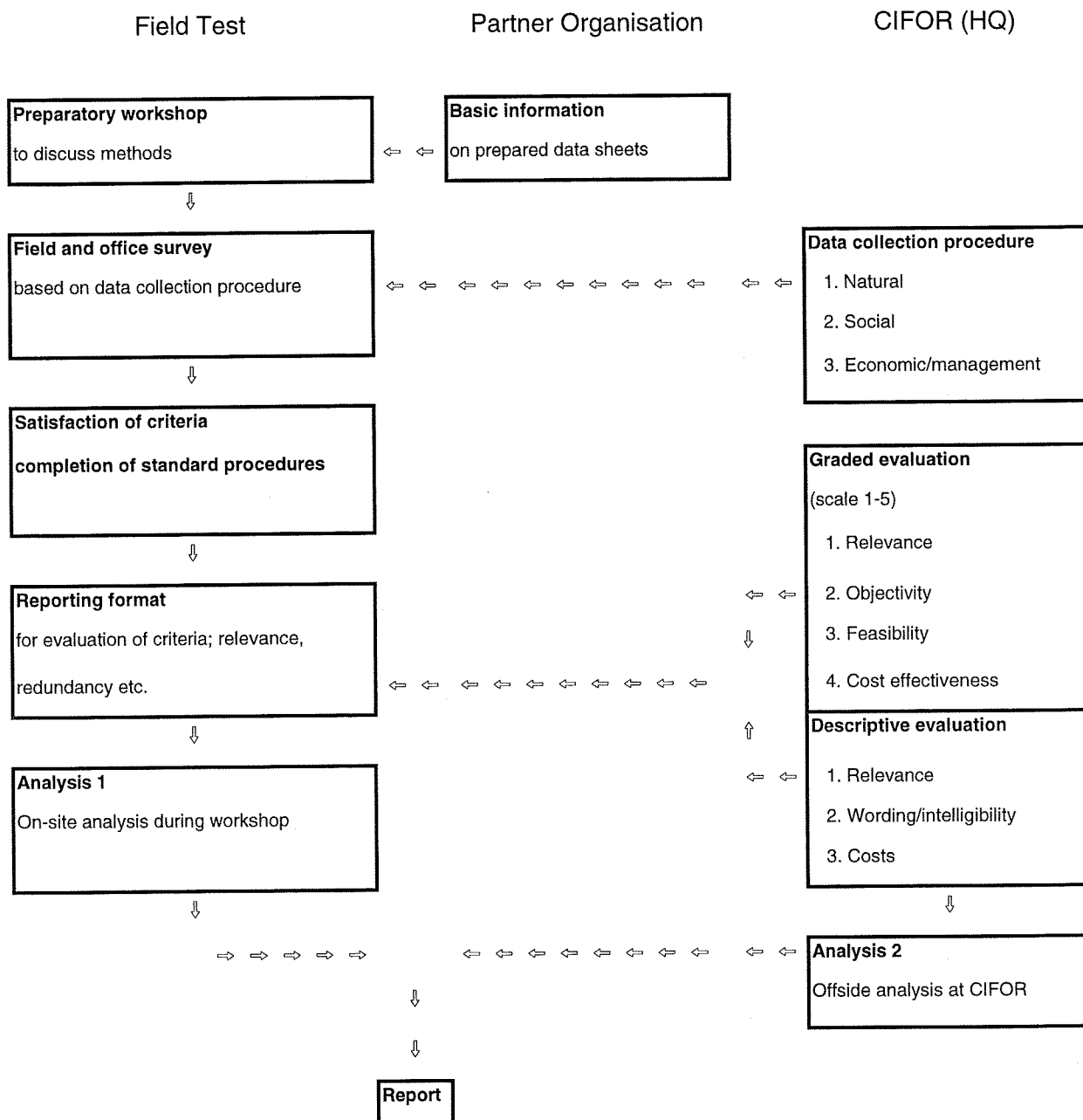


Chart 1: Characteristics of the CIFOR-method (PRABHU 1994)

The first phase of the CIFOR project was mostly orientated on tropical large-scale enterprises for timber production. In order to guarantee the best possible implementation in Austria, the methodology had to be adapted to the Austrian situation.

1.3.2 Adaptation of the CIFOR methodology to the Austrian situation

1.3.2.1 Selection of the criteria and indicators to be tested

Details on the selection process of criteria and indicators are given in Appendix 2 (Test set). Thorough pre-selection of the criteria and indicators reduced the workload of the test team in the first stage of the project. As a consequence the time schedule could be modified as well. The internal field work could be considerably reduced giving the test team members the opportunity of preparing some of the work in individual home work (see chapter 1.3.3 Timing of the testing)

1.3.2.2 Selection of the test areas

In order to give due consideration to the structure of forest ownership in Austria, four test enterprises were selected. The Austrian Federal Forests, a large private forest estate, an agrarian community, and a farm forest.

Brief description of the test enterprises

In general almost all forests in the region are man made forests. This is also true for the test enterprises forests. Most forest stands of the „test“ enterprises are located in a region characterised by decreasing precipitation during the last decade endangering some tree species, even autochthonous ones.

The location of the test enterprises made it possible to test the indicators in enterprises with most diverse preconditions regarding to size and ownership and natural conditions. This was important to do justice to the great variety of Austrian enterprises. Particular emphasis was laid on the inclusion of "problem areas" such as protection forests, oak forests or secondary forests.

a) Agrarian community Vierzigergemeinde zu Langenlois "Vierzigerwald":

- Total size: 35 hectare (ha)
- Geographical location: about 15 km north of Krems on the border between the Waldviertel and the Weinviertel (Lower Austria).
- Topography: hill country of the Bohemian Massif
- Sea level: 450 - 560 m
- Geology: gneiss (*BECK & MANNAGETTA, 1964*)
- Soil: eutric and dystric cambisols, partly with thicker organic layers
- Climate: cool, slightly influenced by boreal climate, not very humid
- Potential forest community: Mixed forest with spruce, fir and beech, oak and hornbeam forest, pine and oak forest (acid soil), pine forest (acid soil), mixed forest with lime according to Growth zone 9.2. (*FORSTLICHE BUNDESVERSUCHSANSTALT WIEN, 1995*).
- Silvicultural system: high forest
- Forest history of the "Vierzigerwald": the forest was dominated by beech and fir and on poor soil the pinetree has always played an important role. From the 14th century onwards this particular area was described as being degraded and without growing stock. This degrada-

tion was caused by the great need for building timber and firewood of the owners of that time. Likewise the forest was exploited by means of litter utilisation and woodland grazing. Furthermore, autochthonous seeds were used only partially for the reforestation with pine trees (the pine provided poles for the vineyards). In the nearby forest districts of the other test enterprises, the same historical development took place. At present, the distribution of tree species is as follows: 1/3 spruce (*Picea abies*) and 1/3 pine (*Pinus silvestris*), 1/4 beech (*Fagus silvatica*), the rest is made up of larch (*Larix decidua*), fir (*Abies alba*) and Douglas fir (*Pseudotsuga menziesii*). The area described is mainly covered by a secondary forest. In the pine stands regularly damaged wood occurs and a clear reduction in the number of fir trees has been observed in recent years.

b) Farm forest

General description see above

- Total size: 12 ha
- Forest history of the farm forest: in former times the number of beech and fir trees was much higher than today and there were no pine trees. At present the forest is characterised by a closed mature stand with medium site quality class. The distribution of tree species is as follows: 2/3 spruce (*Picea abies*) and 1/3 beech (*Fagus silvatica*), the fir trees (*Abies alba*) account for 10 per cent and there are sprinklings of pine (*Pinus silvestris*) and larch trees (*Larix decidua*).

c) Metternich'sche Forstverwaltung Grafenegg

- Total size: 4.500 ha

Investigated stands during field excursion:

- Geographical location: Danube flood-plain forest about 30 km west of Vienna reaching up to Krems; the area around the Mannhartsberg about 15 km north-east of Krems
- Topography: flood-plain forest, hill country of the Waldviertel and the Weinviertel
- Sea level: Danube flood-plain forest: about 200 m, area in the Weinviertel: 250-400 m
- Geology: Danubian sediments with a carbonate content of up to 20 per cent, tertiary and quaternary sediments containing carbonate, at the Mannhartsberg: gneiss (*BECK & MAN-NAGETTA, 1964*)
- Soil: calcareous fluvisols, Mannhartsberg: calci-haplic luvisols mostly made up of loess
- Climate: from cool to dry and warm, slightly influenced by boreal climate, not very humid (on the border between two climatic zones)
- Potential forest communities: Northern foothills of the Alps - Eastern part: flood-plain forest, beech forest, oak and hornbeam forest according to Growth zone 7.2.

Characterised by warm summers, pannonian lowland and hill country: beech forest, oak and hornbeam forest, thermophilic oak forest, mixed forest with lime, maple and ash forest according to Growth zone 8.1.

Oak and hornbeam forest, pine and oak forest (acid soil), pine forest (acid soil), mixed forest with lime according to Growth zone 9.2 (*FORSTLICHE BUNDESVERSUCHSAN-STALT WIEN, 1995*).

- Silvicultural system: high forest

- Forest history of the Mannhartsberg: in the 19th century this area was used for grazing sheep. After this devastation the area was reforested with pine trees for beneficiary purposes. Today the pine (*Pinus silvestris*) represents the principal species with about 75 per cent, the rest is made up of spruce (*Picea abies*), fir (*Abies alba*), larch (*Larix decidua*), Douglas fir (*Pseudotsuga menziesii*) and oak trees (*Quercus petraea*). The secondary pine stands are constantly transformed, with the Douglas fir gaining increasing importance.
- Forest history of the Danube flood-plain forest: in general, these forests are apt to be flooded by the Danube. However, the damming up of the Danube and the sinking of the water level has brought about a considerable loss in the flood-plain forest dynamics. This area is characterised by an artificial flood plain forest with hybrid poplar plantations, with the production of pulpwood and firewood being the operational aim.

d) Forest administration Krems of the Austrian Federal Forests, district „Türnitz“ and „Droß“

- Total size: 11.000 ha

Investigated stands during field excursion:

- Geographical location: „Türnitz“ about 35 km south of St. Pölten, „Droß“ about 10 km north of Krems.
- Topography: mountainous region characterised by protection forests (Türnitz); hill country of the Waldviertel (Droß)
- Sea level: 600 - 1,200 m (Türnitz); 480 m (Droß)
- Geology: carbonate (Türnitz); gneiss (Droß) (*BECK & MANNAGETTA, 1964*)
- Soil: rendzic leptosols (Türnitz); eutric and dystric cambisols (Droß)
- Climate: cool and humid Central-European climate with long-lasting but not very intensive rainfalls, precipitation up to over 1,200 mm and winters with much snow (Türnitz); cool, slightly influenced by boreal climate, not very humid (Droß)
- Potential forest community: Larch forest (basic soil), spruce forest (lower end of the sub-alpine area), montane spruce forest, spruce and fir forest, mixed forest with spruce, fir and beech according to Growth zone 4.2: Northern foothills of the Alps - Eastern part.
Oak and hornbeam forest, pine and oak forest (acid soil), pine forest (acid soil), mixed forest with lime according to Growth zone 9.2. (*FORSTLICHE BUNDESVERSUCHSANSTALT WIEN, 1995*).
- Silvicultural system: high forest
- Forest history of Türnitz: until the end of the 1930s this area was owned by farmers and industrialists. The forest was mainly managed for hunting. The accompanying large game population led to a diminishment of the stand diversity (mainly beech (*Fagus silvatica*) and maple (*Acer pseudoplatanus*) were affected) in favour of coniferous trees (predominantly spruce (*Picea abies*). After this region had become property of the Austrian Federal Forests, the operational goal changed to a generally practiced forest management. Today the entire forest region forms part of a protection forest project. But even today forest regeneration with deciduous trees is hardly possible without costly protection measures against browsing (mainly browsing by chamois during the summer).
- Forest history of Droß: see forest history of the "Vierzigerwald"

1.3.2.3 Test team

The test team members are experts selected from science and/or practical experience in forestry science. All of them are to a large extent familiar with the problems related to Austrian forestry:

- Dipl.-Ing. Dr. Fritz Reimoser (forestry expert and game ecologist)
- Dr. Franz Rest (forest farmer and communication scientist)
- Dipl.-Ing. Dr. Eckart Senitza (forest owner and forest enterprise manager)
- DI Sigi Terzer (forestry adviser and mountain forestry specialist), all Austrian
- DI Georg Willi (forest ecologist and consultant for questions related to landscape ecology), Liechtenstein.

This selection corresponds only partially to the general practice of CIFOR to set up a team of experts from different fields. Due to the high level of knowledge of the problems and overall conditions in the field of forest management, which may be ascribed to the fact that Austria can look back on centuries of experience and research activities and that there are very clear regulatory mechanisms regarding the right of usufruct and possessory right, Austria was able to rely on forest experts with experience in dealing with specific ecological and socio-economic questions.

In Austria, thus, the team was formed by forest experts with specific knowledge of ecology, economy, and socio-economy, whereas in the other testing areas of CIFOR the team was made up of ecologists, economists, and socio-economists with specific knowledge regarding forest utilisation in forest enterprises. The method applied in Austria, i.e. the selection of experts versed in Austrian forestry, proved to be of particular advantage as thus time consuming technical and linguistic co-ordination could be kept at a minimum during the short period of time allocated to field testing.

The test team was completed by an expert for ethnology:

- Mrs Grünberg.

Her participation was in particular necessary because the Austrian law (see above) asks for guidance on SFM for all types of forests. This implies e.g. problems of forest management in connection with indigenous peoples rights. Since there are no such conditions to be found in Austria the experience of Mrs Grünberg was an invaluable contribution to the testing in Austria.

(Although for time reasons Mrs Grünberg could only participate in part in the field testing, her contribution to socio-cultural questions was very valuable, since her non-technical point of view was conceived as an enriching and sort of correcting factor.)

The test set is divided into the following areas

General and Organisational Requirements

Subject areas ecology, economy and socio-economy. Working groups were established for this subject areas:

Ecology	F. Reimoser / G. Willi
Economy	E. Senitza / S. Terzer / F. Rest
Socio-economy	Mrs F. Grünberg / F. Rest

F. Rest acted as a link between the economic and socio-economic sections, thus guaranteeing a maximum co-ordination between the two areas.

1.3.2.4 Amendments to the Form

In order to better reflect the specific Austrian situation, the form had to be extended as well (see Annex 5, form 2). To the evaluation of the individual criteria and indicators the following points were added: "open questions" which could not be answered in the course of the test procedure (Q/A), the required form of verification of whether or not a criterion or indicator is met (method of verification, R/A), suitability with regard to the type of forest (natural forest, semi-natural man-made forests, S/A) and the order of magnitude as well as the assumed range of application (boreal until tropical, T/A). The question as to whether or not to relocate criteria which, by accident, had been attributed to the indicators in the test set, and vice versa, was finally discarded as it had turned out to be unnecessary (G/A).

1.3.2.5 Setting up of a Project Support Group

As early as during the preparation phase of the organisation of the testing it became clear that in the course of the testing a number of problems and open questions would arise, the test team would be incapable of answering due to time constraints. This is why experts familiar with silvicultural practice, from science, NGOs as well as from forestry interest groups were asked to support the test team. Their primary task was to deal with problems arising from the practical implementation of the set of criteria and indicators and with related open questions. Their very critical appraisal of the work of the test team in the course of the workshop was of great help.

Members of the Project Support Group:

Dipl.Ing. Dr. Johannes Schima	Standing Committee of the Presidents of the Austrian Chambers of Agriculture
Dipl.Ing. Dr. Georg Frank	Federal Forest Research Institute - Austria
Dipl.Ing. Felix Montecuccoli	Association of Private Farm and Forest Owners
Dipl.Ing. Peter Ebner	WWF Austria
Dipl.Ing. Dr. Wolfgang Kudjelka	Federal Ministry of Agriculture and Forestry - Austria
Dipl.Ing. Gerhard Mannsberger	Federal Ministry of Agriculture and Forestry - Austria
Dipl.Ing. Friedrich Hinterleitner	Provincial Forestry administration - Lower Austria
Gabriele Loeffler-Obermayr	Federal Ministry of Environment - Austria
Dipl.Ing. Josef Hackl	Federal Environment Agency - Austria

1.3.3 Process of the testing of criteria and indicators

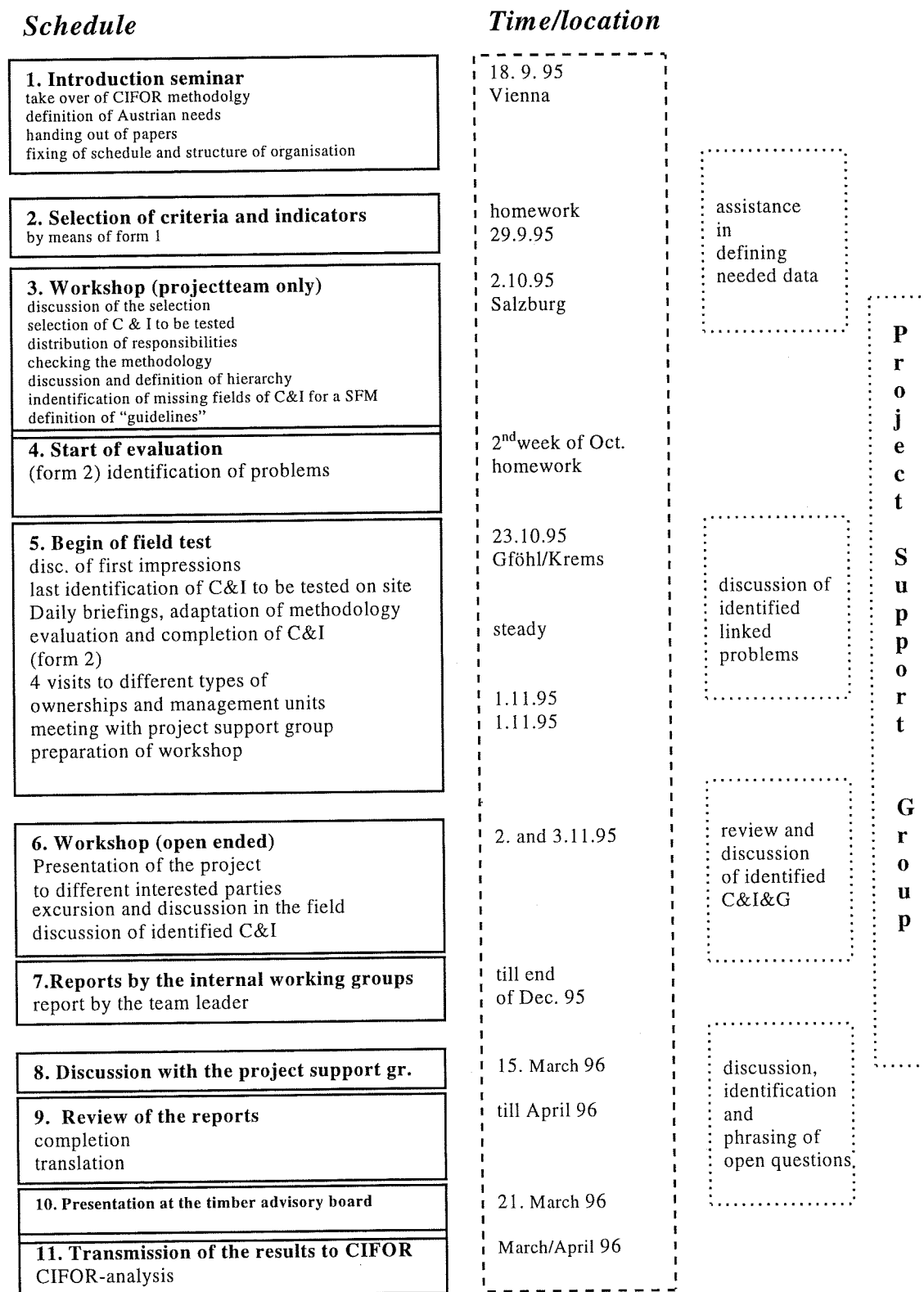


Chart 2: Process of the testing of criteria and indicators

On September 18th, 1995 the test team met for the first time for an introductory seminar in Vienna. Dr. Ravi Prabhu gave a presentation on the CIFOR project and made the team members familiar with the testing procedure.

Then the experts in homework worked on form 1 (annex 3) which was discussed in the course of the follow-up meeting on October 2nd, 1995 in Salzburg, Austria. At the same time first evaluations were made, further steps discussed and three working groups were set up to cover the individual subject areas (see chapter 1.3.2.3).

In preparation of the field testing each member of the team dealt with the presented criteria and indicators of his subject area on the basis of form 2. To this 4 page form developed by CIFOR another page was added which considers questions related to specific Austrian problems (annex 5).

Field testing started on October 23rd, 1995 in Untermeisling (near Krems).

Field testing was finished by November 1st. Extensive studying of the criteria and indicators by the individual experts as well as in group discussions including daily meetings and briefing's within the test team made possible the identification of those criteria and indicators allowing the best possible assessment of the sustainability of forest management. The four excursions to various stands (compare following chart) and discussions with the project support group on October 30th, 1995, provided important inputs for the further work on the set.

date	destination	person to be contacted	size
26.10.	Agrarian community Vierzigergemeinde zu Langenlois "Vierzigerwald"	Dipl.-Ing. Dr. H. Leitner Manager	350 ha
27.10.	Metternich'sche Forst- verwaltung Grafenegg	Dipl.-Ing. Dr. H. Tiefenbacher Manager	4,500 ha
29.10.	Farm forest	Mr Furlinger/ Mr J. Sandler (Owner) / (public advisor)	12 ha
30.10.	Forest administration Krems of the Austrian Federal Forests as part of the above: forester's district Türnitz	Dipl.Ing. Dr. W. Chaloupek Manager Mr Jagersberger Forester	11,000 ha 750 ha

The principles, criteria and indicators of the socio-economic section were furthermore discussed with Mrs Carol J. Pierce Colfer from CIFOR, who participated in the field testing and workshop from November 1st to 3rd, 1995.

The first day of the two days open ended workshop (2/3 November 1995) was characterised by introductory lectures and excursions. In the farm forest of Mr Furlinger, in a part of the Austrian Federal Forests as well as in the Mannhartsberg area of the Metternich'sche Forstverwaltung Grafenegg various problems with the identification of indicators were detected and discussed. The second day was dedicated to general statements and to the discussion of the test results in working groups and in the plenum.

The choice of the schedule was to a certain extent influenced by the availability of experts. It turned out to be almost practically impossible to bring together 5 experts in one place for one particular task for more than one week.

1.3.4 Selection of criteria and indicators

1.3.4.1 Initial situation and preselection

The testing of principles, criteria and indicators was carried out on the basis of a test set, which can be found in annex 2. This annex gives further information on the setting up of the set (e.g. all sets of principles, criteria and indicators which were considered in compiling the test set). The chapter "General and Organisational Requirements" is only relevant for the testing procedure in so far as the information provided may serve as basic data material for the evaluation of the individual indicators. Although consecutively numbered, they do not represent indicators which have been checked during the test but rather give information on some aspects of their practical implementation. Furthermore they provide an overview of the basic data possibly required for certification.

1.3.4.2 Revision of the set of C&I

On the basis of the condensed test set (Annex 2) the structure of the set of criteria was re-examined and revised. As far as possible, double entries, and overlapping of information were condensed and replaced by rephrasing the most important points. For the time being, criteria such as those dealing with conditions characteristic of tropical and boreal areas and which are of little significance in Austria have been left aside.

The *principles* listed were generally recognised as specific objectives of the individual sections and were no longer included in detail in the testing procedure. With a few exceptions they were all included in the final version. Due to time constraints on account of a limited testing period it was not possible to find operable, i.e. requiring justifiable testing and control expenditures, indicators for all principles.

The *criteria* were defined as content-oriented cornerstones of evaluation; their wording does not include any value judgement, though. In the "Ecological Section" they were used as headings. Most of the points referred to as criteria in the test set turned out to be not suitable as criteria according to the definitions. Therefore, especially in the ecological section, they had to be correspondingly rephrased into criteria or indicators before being included in the final version.

Indicators, last but not least, are the concrete objects of evaluation, which are more or less suitable to be tested on the basis of limiting values.

Prerequisites of sustainable forest management (mostly indicators), which are only verifiable by random testing or can only be evaluated in specific situations, were also formulated. These are referred to as guidelines (see also chapter 1.4.2).

1.3.4.3 Elaboration of wording and excursions

In intensive discussions within and also between the working groups about 7 different draft versions of the sets of C&I were elaborated, with each one being further improved and refined both in wording and in structure.

In the course of the excursions to selected enterprises, which represent characteristic enterprises with different site-specific and economic preconditions, most of the criteria and indicators could be checked with regard to their applicability and practicability. Furthermore, the demand for basic data material and the quality requirements regarding the type of enterprise could be determined.

For the final workshop a revised version was presented and put up for discussion.

Preliminary stage:

Discarding of points which the team members after having evaluated form 1 (annex 3) unanimously considered to be unimportant (2.10.95)

1st stage

- selection of suitable criteria, guidelines and indicators
- improvement of the structure of the set (criteria system)
- more precised wording, definitions of the formulations
- identification and completion of shortcomings (formulation of new indicators)

N.B.: Aspects dealing with SFM within the Austrian laws, especially the Forestry Law, were taken into consideration. Laws in general, however, do have one shortcoming: they are rarely operable. This is why specifying of formulations is necessary.

2nd stage

- co-ordination and cross-checks between the working groups
- discussion about the use of doubtful indicators
- presentation of different points of view and elimination of uncertainties
- application tests in the four test enterprises
- discussion with the project support group

3rd stage

Further working on the set of principles, criteria, and indicators (P/C/I- set), incorporation of the results from tests, votes and discussions (same process as stage 1)

4th stage

Filling in of the assessment forms (form 2, annex 5); valuation of the criteria, indicators and guidelines maintained in the set by the test team members and identification of the 30-40 most important indicators (10-15 per subject area). Designation of the basic data/documents required for certification; Estimation of the time expenditure for certification.

5th stage

Open ended workshop including excursions (participants were given the opportunity to submit written proposals for improvements of the P/C/I- set within two weeks time).

6th stage

Final corrections of the P/C/I- set, drawing up of the report.

1.4 RESULTS**1.4.1 General remarks**

As a result of the testing a set of principles, criteria and indicators (chap. 6) was presented which gives due consideration to the specific situation in Austria, but which, at the same time, was formulated in a way allowing it to be considered on the international level as well. Thus, the results obtained can be used in the further CIFOR testing process. Adapting the criteria and indicators to the temperate, and especially to the central European alpine zone required extensive new and re-formulations of the criteria and indicators of the test set which to a large extent had been geared to tropical/boreal areas. The members of the test team are of the opinion that the thorough consideration of the criteria and indicators was well worth its while leading to the setting up of a practicable, operable and practice-oriented set, which can be used for further tests under similar conditions.

1.4.2 "Guideline"

Principles for "sustainable forest management" are normative basic rules/prerequisites which should/have to be met. In the *test* set each rule was formulated as a principle. Already in the preparatory phase it had been determined that only real basic rules had to be referred to as principles. Many of the principles numbered in the set are concrete prerequisites or guidelines. In general, guidelines include important and indicative requirements for sustainable forest management, but are less operable than indicators and/or can only be controlled on an incidental basis. They represent a declaration of intent of the applicant when he gives his consent to the conditions of certification.

1.4.3 The adapted set

The revised and harmonised set, which thus can be considered as a single unit, of principles, criteria and indicators/ guidelines was established with a view to

- being equally valid for all forest areas which are forests according to the Austrian Forestry Law
- being valid only for timber-producing enterprises (primary production) and not for manufacturing enterprises
- the enterprise being the unit to be certified (possible combination of two or more enterprises, parts of an enterprise)
- and taking into consideration that technical support has to be given to the small enterprises at least with regard to collection of basic data required for first certification; this support could be provided by the local authorities or another body representing their interests.

The revised set is set up as follows:

1 GENERAL AND ORGANIZATIONAL REQUIREMENTS

- 1.1 Meeting of General and Legal Requirements
- 1.2 Basic Data on Means of Production and overall conditions
- 1.3 Management concept
- 1.4 Documentation and Monitoring

2 ECOLOGICAL ASPECTS

- 2.1 Quantity and Quality of Ecosystem Components
- 2.2 Vitality, Health, Productivity

3 ECONOMIC ASPECTS

- 3.1 Forest Products and Forest Functions/Services
- 3.2 Profitability
- 3.3 Timber Production
- 3.4 Non-timber Forest Functions/Services

4 SOCIO-ECONOMIC ASPECTS

- 4.1 Design of external relations
- 4.2 Internal Aspects
- 4.3 Non-timber socio-economic forest services (multi-functional forest functions)

Explanations of the working groups concerning the individual subject areas can be found in the respective reports (chap. 2-4); (e.g. documents which have to be provided by the applicant for the quality mark).

1.4.4 Testing in the four enterprises

Verification of the indicators in the four test enterprises did not reveal any major problem with regard to their acceptance or their practical implementation.

1.4.5 Estimate of the expenditure of time and money for the assessment of sustainable forest management on the basis of the adapted set

External costs

The testing phase was too short as to allow detailed comments on the expenditure of time and money for each C&I as this was required in CIFOR's form 2 (and their use for certification respectively). However, due consideration was given to the cost-benefit ratio of each indicator and to the amount of time required for a certification procedure. In particular the time required depends on the size of the enterprise and the data available.

Assuming that the evaluation of SFM needs consideration of the whole set of C & I an estimation of expenditures only makes sense for the whole package of C & I. Cost and time expenditures for each C could thus be rationalised and kept at a lower rate.

The test team assumes that evaluating the data provided by the enterprise including an inspection of the forest (on-site inspection) will take between 0.5 and 3 days. First certifications seem to take slightly longer than follow-up certifications.

Examples of certification costs as points of reference:

- Example 1:
 - Enterprise of about 500 ha forest area, 3,000 m³ annual cut
 - Time needed for certification (certification interval 5 years)
 - First certification: 3 days
 - Second certification: 2 days
 - Time expenditure for certification for 10 years: 5 days
 - Costs of certification at a daily rate of ATS 10,000: ATS 50,000
 - This means certification costs of ATS 1.66 per m³ of timber harvested.

- Example 2:
 - Enterprise of about 200 ha forest area, 1,200 m³ annual cut
 - Time needed for certification (certification interval 5 years)
 - First certification: 2 days
 - Second certification: 1 day
 - Time expenditure for certification for 10 years: 3 days
 - Costs of certification at a daily rate of ATS 10,000: ATS 30,000
 - This means certification costs of ATS 2.5 per m³ of timber harvested.

Internal costs

The internal costs depend on the individual enterprise and in a modern enterprise they should not be excessively high. The most time-consuming task is providing the documents/data required for first certification. It is assumed that for a medium-sized enterprise (200-500 ha) on average three additional workdays will be needed for certification, i.e. 1 day for discussion and inspection, 1 day for administrative affairs and 1 day for collecting data/documents and unforeseen events (this does not include the expenditure for gathering the documents required for first certification). From a mathematical point of view this will not influence the price of the m³ of timber very much.

To sum it up it can be assumed that the costs of certification will not exceed ATS 6.- per m³. Based on this cost estimation, the test team assumes that proof of sustainable forest management on the basis of the set of criteria and indicators at hand under specific circumstances can create the possibility of a profit potential of certified timber on the market outweighing - or at least justifying - the investment.

1.4.6 Check-up intervals

According to the Federal Legal Gazette 228/1993 the right to hold the quality mark ceases after three years. The test team considers this period to be too short, since several indicators of sustainability can only be assessed after a longer period of time, especially those which are measured on a yearly average.

This is why a regular revision of certification is suggested in intervals of 5 to 10 years. This would also reduce the costs of certification. At the same time, however, random tests should be conducted! Time and money could be saved by combining certification with forest taxation which is usually carried out every ten years in Austria. (This applies to enterprises which are legally obliged to establish forest management plans as well as to enterprises which do so voluntarily).

2 ECOLOGICAL SECTION

2.1 TESTING PROCEDURE

The ecological section was treated by Dr. Fritz Reimoser and DI Georg Willi. Dr. Reimoser is working in the fields of game ecological land use planning, biodiversity, forest regeneration and game damage (monitoring systems), sustainable prophylactic forest protection by means of an integrated forest-game-management, and he is involved in a project of the European Union "Grazing as a Management Tool". The scope of activities of DI Georg Willi comprises forestry (forestry and ecology, forest taxation, forest valuation, reforestation and damming projects), ecology and nature conservation (consulting and counselling activities, protection of amphibians,...), landscape architecture, recreation and spare-time (open space planning, landscape conservation, planning of recreational facilities, etc.,....).

In the test set submitted the ecological aspects comprised 123 principles, criteria and indicators. These 123 points were worked on / revised in different steps. The wording of almost all of the presented criteria and indicators had to be modified and/or put more precisely to optimise the required operability. Until the workshop of November 2/3 1995 seven again and again revised versions of the set had been created. The 8th version was established as a result of the workshop discussions. The preliminary final version is attached.

2.2 RESULTS

2.2.1 Revision of the criteria and indicators

The set comprises 28 indicators and 21 guidelines with ecological aspects. Many criteria and indicators of the test set are covered by points of the revised set. Some other points were not being taken into consideration. The reasons for doing so are given in form 2 of CIFOR.

2.2.2 Structure

As far as the ecological aspects are concerned, the set-up of the test set provides for a division into "maintenance of quantity and quality of ecosystem elements" (A) and "maintenance of vitality, health and productivity (B). This division was kept in the revised set with chapters 6.2.1 and 6.2.2. In many cases classifying the different criteria and indicators into the two chapters turned out to be difficult, as one indicator may easily cover various criteria. This holds also true for the subchapters, for example biodiversity. In this case a distinction was made between structural and age class diversity, genetic diversity and protection areas. Indicator 308/new does not only cover genetic diversity but also serves as an indicator for structural diversity. The same holds true for 50/5 since protection areas have a strong impact on the structural and age class diversity of a forest. Thus, in response to the reasons given by Grabherr during the workshop for making an alternative proposal, the set at hand does indeed cover the principle 58/14 (structural and age class diversity).

In the Test set part A (maintenance of quality and quantity of ecosystem elements) comprises the following points: 1 "biodiversity", 2 "soil conservation" and 3 "water protection". The order was changed on account of the reasoning that without soil and water biodiversity is not possible. In the revised set soil is treated in chapter 6.2.1.1, water in chapter 6.2.1.2, and biodiversity in chapter 6.2.1.3.

2.2.3 Priorities within the ecological aspects

- **Chapter "Biodiversity"**

In the course of the workshop the set of indicators was presented and discussed. The results of the discussions were then included in the set (chapter 6). The alternative proposed by Prof. Dr. Grabherr is based on a central indicator stipulating that at least 50% of the forested area of an enterprise have to correspond to the natural forest community. At the same time a proposition with regard to the operationalisation of this indicator was made, requiring a minimum percentage of dominant, subdominant, and tree species added to the forest community. On account of time constraints this proposition could not be assessed with regard to its practical applicability, its objectives and possibilities for those enterprises which do not reach the 50% level. It has to be admitted that different views can be taken with regard to this question, but the authors feel that this alternative proposal does not diminish the functionality and operability of the new set and, with reservation as to other findings, it can thus be regarded as equal.

- **Proportion of tree species**

Limit values (relative to crown-density) for the proportion of tree species laid down in indicators (308/310) refer to the whole enterprise or the total area of the potential natural forest community of an enterprise and not to individual forest stands (possibility of balancing of tree species composition within the enterprise, maintenance of the freedom of choice necessary for economically sound management). Thus the wide natural range of variations in tree species composition between the individual sites is being taken into consideration and the proportional limit values are not too tight. Whether, in contrast to the presented indicator 308, the location of natural forest communities somewhere on 50% of the forested area of the enterprise (compare alternative proposal by Grabherr) really better meet the ecological requirements remains to be determined. According to the experts, control seems to be equally difficult in both cases but nevertheless possible with a justifiable amount of expenditure.

- **Forest Communities**

With regard to ecology, another fundamental aspect with regard to sustainable forest management and certification is the potential natural forest community. For its determination operable guidelines have to be established. According to Dr. G. Frank of the Forstliche Bundesversuchsanstalt Wien (Federal Forestry Research Institute, Vienna) and Dr. G. Koch of the Institut für Pflanzenphysiologie der Universität Wien (Institute of Plant Physiology of the Vienna University) such guidelines are currently being prepared for Austria.

2.3 DOCUMENTS REQUIRED

For the verification of the indicators various basic data (maps, specific forest development plans with operational details for the enterprises) have to be provided by the enterprises. If available, up-to-date aerial or satellite photographs may be used. Depending on the size of the enterprise and on whether it is a first or a follow-up certification, for the ecological section the following documents are required:

Basic data	Size of the enterprise (ha)							
	<50		50-200		200-500		>500	
	1.C.	2.C.	1.C.	2.C.	1.C.	2.C.	1.C.	2.C.
Topographical maps	X		X		X		X	
Maps with skidding tracks (development plans)	X		X		X		X	
Map (sketch) of old trees (possibly aerial photograph)	X	X	X	X	X	X	X	X
Map of potential natural forest communities (areas)	1)		1)		X		X	
Map (sketch) of introduced tree species	X	X	X	X	X	X	X	X
Map (sketch) of forest regeneration areas/species mixture	X	X	X	X	X	X	X	X
Identification of protection areas (on the regional level, if available)	X	X	X	X	X	X	X	X
Map of protection areas (on the enterprise level)					X		X	
Map of natural regeneration areas			X	X	X	X	X	X
Map of deer fences	X		X		X		X	

Chart 3: *Required data for the ecological section*

Explanations for the chart: 1. C. First certification

2. C. Second or follow-up certification

1) Assistance by interest groups or the certifying authorities

The following chart provides information on whether, how and when an indicator has to be verified and whether this can be done by formal verification or only by on-site inspection. All indicators of the new set are included.

Ind. no.	Minimum size of the enterprise for certification (ha)				1.C.	2.C.	Law*
	<50	50-200	200-500	>500			
63	If necessary description in management plan				(F)	(F/O)	
54							x
69						O	
302						O	
301						O	
67					O		partly
77	Topographical map				F/O	O	partly
304					O	O	
102						O	partly
199						(O)	
305	Map of skidding tracks				F	O	
88	Map of skidding tracks/topographical map				F	F/O	
106						O	
111							x
306							x
46	Identification of trees + map (sketch, aerial photograph)				F/O	F/O	
308	Map of the potential natural forest communities, forest regeneration areas - mixture proportions (areal taxation)				F/O	F/O	
49							x
309	Documentary evidence of genetic provenance (bill)					F	
310	Map of potential natural forest communities/map showing introduced tree species/forest regeneration areas (management pl.)				F/O	F/O	
44	Identification of protection areas (regional maps, if available)				(F/O)	(F/O)	
50		Map of protection areas (descr.)		F	F/O		
312		Map of natural regeneration areas (management plan)		F/O	F/O		
136				(F)	(F/O)		
153				(F)	(F/O)		
148					standard form		
149					standard form		
159	fence - map; assessment in the course of follow-up investigations by means of internal evaluation or on-site inspection (guidelines)				F/O	F/O	

Chart 4: Checking of the indicators in the ecological section

Legend:	Ind.no.	Number of the indicator
	1.C.	First certification
	2.C.	Second or follow-up certification
	Law*	Covered by the Austrian legislation
	F	Formal verification
	O	On-site inspection
	(F/O)	Verification only if corresponding regulations exist

2.4 DISCARDED CRITERIA AND INDICATORS

Criteria and indicators which are covered by other indicators (numbering according to the Test set of principles, criteria and indicators for sustainable forest management).

C/I no.:	because covered by:		
		98	304
		99	102
45	50	100	102
47	50	101	102, 304
48	44	103	102
51	43, 50	105	103
52	50	108	44
53	50, 44	109	306
55	50	117	102
56	50	128	116
57	50	129	ad P (water)
65	64	131	102
70	77 partly	132	306
71	66 partly	134	308
72	77	140	59
74	64 partly	141	310, 312
76	66	143	67, 77
79	102	144	46, 50
80	102	145	148
81	102	147	148
82	303	150	149
83	102	151	149
84	103	154	148, 149
85	304	157	301
86	303	161	314
91	102	163	301
92	304 partly	164	305
94	304	165	67, 77
97	102		

3 ECONOMIC SECTION

3.1 TESTING PROCEDURE

The working group "economy" was made up of DI Sigi Terzer and DI Dr. Eckart Senitza, who both brought in a wide range of experience in matters related to protection forests, community forests and also private forest enterprises and their management. Furthermore, both team members went into forest area planning and practice-orientated implementation of forest development plans under consideration of regional interest groups.

In addition, Dr. Franz Rest participated in some of the work phases and brought in his experience regarding agrarian community forests.

The teamwork was an ideal method to combine the most different experience each team member had and to start a mutual verification process and serious discussions.

3.2 RESULTS

3.2.1 Revision of the criteria and indicators

The original set (Test set) consisted of 68 criteria and indicators for the section "economy". In the course of several revisions, about 26 points were basically accepted but had to be rephrased. From the entire group of criteria and indicators 49 points were discarded because they either did not relate to the subject matter or were already included in better defined and more extensive formulations.

In addition, however, 42 new criteria, indicators or guidelines were included which, to a large extent, contain definitions of indicators that are more precise than the original ones and which also consider the various functions provided by the Central European forest management together with the entire stock of "non-wood forest benefits". In this field 14 newly defined points were included, which mainly regulate the interrelation between timber production and the other forest functions (protection, water, hunting, recreation and leisure time, protection against noise and ambient air pollution, nature and landscape protection). The aspects of the multiple forest functions or forest benefits were also considered in all other related criteria or indicators (see chapter 6.3.1.1). As a consequence, they represent a substantial contribution to a well-balanced assessment of economic sustainability, in which the specific conditions prevailing in the densely populated Alpine area are considered.

3.2.2 Structure

The structure of the test set was clearly revised.

Chapter 6.3.1.1, e.g., contains the aspects of identification and quantification of forest services and products as well as conflict-regulating mechanisms and mutual interference.

The efficiency (chapter 6.3.2) of an enterprise forms the basis of economic sustainability and, thus, fulfils the preconditions for a long-term existence of the enterprise as such. This requires a minimum of financial capacity (6.3.2.1) and investment activity (6.3.2.2) with regard to measures for increased productivity and quality improvement in order to maintain or create new potentials which will be productive in the future.

Timberlicences (6.3.2.3) are rarely granted in Central Europe. In the future, they could gain importance, however, in case of small and scattered properties where the individual ownership rights are difficult to determine (e.g. coppice with standards and coppice).

The silvicultural measures (6.3.2.4.1) including forest regeneration, tending and thinning measures (6.3.2.4.2) as well as the conditions for natural regeneration (6.3.2.4.3), forest protection and forest hygiene measures (6.3.2.4.4) will most effectively set the course for long-standing economically efficient and ecologically sustainable forest management, with the orientation towards the "semi-natural silviculture" being a logical consequence.

Harvesting and logging, with the priorities set on the stand and single tree level (6.3.2.5.1), little damage (6.3.2.5.2) as well as waste of products and resources (6.3.2.5.3) and an adaptation and improvement of roads (6.3.2.6) serve as the prerequisite for a sustainable and efficient transformation of growing stock reserves into marketable products.

Detailed aspects of regeneration rates (6.3.3.1), rotation lengths (6.3.3.2), the species composition of the exploited growing stock (6.3.3.3) as well as the introduction of an adequate planning and control system for silvicultural measures and the harvesting of timber (6.3.3.4) provide the framework for cycle-orientated renewal of both structure and quality of the productive stock.

Furthermore, in chapter 6.3.4 some important aspects of the interrelation between timber production and use and the non-wood forest benefits are dealt with, which represent indispensable overall conditions for sustainable timber production in Central Europe.

By including the non-wood forest benefits and other functions of the forest in the economic field, the close link between the economic and the socio-economic sections becomes evident. When demanding economic sustainability, this demand must not be reduced to an operational economic balance between timber exploitation as such and a few non-wood forest services (e.g. hunting). So far, neither the non-wood forest services nor the utilisation of the infrastructure of the forest by the community have made a positive contribution to the operating results. There are already different models of assessment methods in which the value of forest management for the community (protective and recreational functions, impacts on water management and ecology) ranks considerably higher than the value of mere production in raw material. In Austria, the protective function has priority over production at about 30 per cent of the total forest area (in some Alpine regions up to 80 per cent) (Austrian Forest Development Plan, FDP; *ÖSTERREICHISCHER WALDENTWICKLUNGSPLAN, WEP*). Due to this fact it would not be acceptable to restrict the operational assessment only to timber production. Thus, it should be avoided to judge individual enterprises unsustainable in case of a balanced operational efficiency without having included benefits of forest management for society, which is frequently not evaluated or not evaluable from an economic point of view.

3.2.3 Priorities within the economic aspects

The integrative assessment of the individual criteria, indicators, and guidelines by the members of the working group resulted in the following priorities which serve as the cornerstones for evaluation of SFM (for certification) in the economic field:

- Spatial distribution and extent of all forest services and products must be shown in general maps and quantified by means of measurement units.
- The financial efficiency of a forest enterprise can only be maintained if the ratio between income and spending is kept at balance at least intermediately.

- A minimum of investment into technical training and silvicultural measures (afforestation, specific tending measures, stand improvement measures, monitoring, etc.) will guarantee the conservation of the potentials and the resources.
- If the forest services are utilised by licence holders, detailed and controlled regulations for utilisation or franchise agreements regarding silvicultural measures are required.
- Efficient silvicultural systems must bring about a minimisation of expenses for the creation of forest stands and protection and tending measures ("semi-natural" forest management).
- Harvesting activities are orientated along the individual maturity of stands and their marketability or the dominating forest benefits. Here, a maximum level set for damage arising from harvesting and skidding activities as well as for the destruction of existing natural regeneration must not be exceeded. There must be no excessively high losses or impairment of production areas, products or other resources.
- The set-up of an appropriate network of roads requires logging and transport concepts and plans, which are adapted to the individual size of the enterprise.
- The general set-up for the production of timber requires that the period during which active measures have to be taken to ensure regeneration is observed and that adequate planning and controlling mechanisms for the creation of forest stands and for tending and harvesting measures are set up and applied.
- As far as the non-wood forest benefits are concerned, it is of utmost importance to identify specific protective affects and to observe the guidelines set up for protection forests and springwater protection areas.

3.3 DOCUMENTS REQUIRED

The documents which have to be provided by the enterprise for a formal testing of the economic aspects vary with their size.

Fundamentals	size of enterprise (ha)							
	< 50		50-200		200-500		> 500	
	1.C.	2.C.	1.C.	2.C.	1.C.	2.C.	1.C.	2.C.
Forest development plan, forest development plan with operational details for the enterprise	#	#	#	#	#	#	#	#
Map showing risk areas	#	#	#	#	#	#	#	#
General map, property list	X	X	X	X	X	X		
Forest map, age class composition							X	X
Protocols on methods how to solve conflicts (if required)	#	#	#	#	X	X	X	X
Logging and revenue statistics (timber, non-timber)	X	X	X	X	X	X	X	X
survey on income and expenditure of forest operations	X	X	X	X	X	X	X	X
Calculation of the contribution margin or basic documents needed for this (price, costs of logging activities)	#	#	#	#	X	X	X	X
Investment sums (records) according to use	#	#	X	X	X	X	X	X
Licence contract (for licence holder)							X	X
Total expenditure on silvicultural measures in relation to the overall expenses	X	X	X	X	X	X	X	X
Statistic on damages, incidental felling	X	X	X	X	X	X	X	X
Logging plans, outline on roads, length of forest roads	X	X	X	X				
Map for log transport and (road) development measures, small forest roads					X	X	X	X
Annual summary (quantity, assortment), stock book	X	X	X	X	X	X	X	X
Description of enterprise, general set-up plan, rotation length, proof of implementation	X	X	X	X				
Management-plan (rotation length, reasons given for logging yield, planning, proof of implementation)					X	X	X	X
Inventory and control mechanisms							X	X

Chart 5: Required data for the economic section

Explanation for the Graph:

1.C. first certification

2.C. second certification

X = to be provided by the enterprise

= supported by authorities or interest groups

3.4 WORKSHOP

In the final workshop the working group dealing with economy brought up the following criticisms and demands for change, which have been considered to a large extent in the set:

- The table (see above) contains detailed information on who should provide which documents (401, 402). All other enquiries at public authorities, which mainly serve to find out about violations of existing laws by the enterprise in the past, are to be carried out by the certifier (403, 404, 421).
- For the evaluation of the economic efficiency (412) subsidies and grants have to be taken into consideration. Furthermore, operational objectives and a medium-term observation period have to be considered. Enterprises with negative operating results, which are run either for pleasure or for investment purposes and which cannot be clearly defined as start-up enterprises which need heavy investment, must be exempted from the rules. In such enterprises negative operating results can be compensated by means of exceptionally high investments.
- In case of investments (203-205), self-financing has to be taken into account.

- As far as the minimisation of costs for silvicultural, protection and tending measures is concerned (414), enterprises in the process of organisation, re-organisation or transformation are to be exempted. In such a case, it is particularly important to consider their silvicultural objectives.
- Particular problems are seen in determining the damage arising from snow pressure and snow breakage (408) or in checking the height diameter ratios (409). The idea is that during a first survey inadequate nursing due to lacking development activities in the past should be ignored and promising tending measures for the improvement of structure and stability taken as standard for subsequent surveys, instead.
- For the conservation of seed trees rare species should no longer be taken into consideration as this point is already covered in the field of "ecology".
- To the point "With rare species of seed trees..." (411) "site-specific rare species" should be added.
- The field of forest protection and forest hygiene (417 + 418) is sufficiently covered by the Austrian Forestry Law. Problems may arise in connection with browsing damage, which should only be considered in the second certification in order to encourage the removal of damaged trees or to foster the transformation of stands.
- Supplement to the amount of barking damage (419): If the set limiting value is exceeded in the first certification, the stands affected by barking damage must be thinned within a period of 5 years.
- The limiting values proposed for harvesting and skidding losses (420) cannot be observed because the natural range of variations depending on species and assortment is too wide. The indicator must be rephrased into a guideline.
- The network of streets and roads (196) should only be limited by means of upper limiting values.
- As far as the points related to regeneration rates and the ensuring of regeneration (415, 218, 416) are concerned, overlapping with the section "ecology" should be avoided. The periods indicated should be in line with the Austrian Forestry Law (3 years, 8 years in case of natural regeneration; see § 13 FG75). The avoidance of existing laws and ordinances, grants, and, in particular, the differences in the individual federal provinces mainly resulting from the hunting right may cause problems. Therefore, the individual points should be modified or discarded.
- With regard to the rotation length (429) the regulations of the Forestry Law concerning stands which have not reached the maturity for commercial logging (60 years; § 80 FG75) should be considered.
- The size of the enterprise determines the planning and control mechanisms used. A form for small forest enterprises should be drafted and the necessary key data of the enterprise should, if possible, be in line with the reliability of the official site quality assessment.
- Regarding the prerequisites for hunting activity (432) the wording should be restricted to "problem areas" and "game-stock regulating measures".
- Concerning the guidelines for protection forest management (436) the question arose whether the "ordinance on protection forests" could be accepted in its present form. Doubts were expressed because of the very general wording which would not take into account local conditions. These conditions, however, are met by detailed regulations according to §§ 2 and 3 of the ordinance on protection forests (Fed. Legal Gazette No.

398/1977) and measures as applied in the course of projects for the rehabilitation of protection forests.

- Efforts with regard to water protection areas (437) or conservation areas have to be compensated.
- The aspect of CO₂ binding (444) should be left out completely because its controllability by means of forest management is not based on scientific findings.
- The consideration of characteristic landscape elements (445) is going to be rephrased.
- It is generally proposed to replace or complete all points concerning the non-wood forest services in chapter 6.3.2.1 ("Financial efficiency") by "any other revenues from non-wood forest benefits (e.g. water, hunting, ...) are to be included into the overall assessment".

A clear definition of „exotic species and alien species suitable for the respective sites is required, and the advantages and disadvantages are to be considered carefully. A general rejection of „exotic“ species does not seem to be reasonable. This problem was referred to by Dr. Tiefenbacher (forest manager and well-known forest geneticist) in a well- founded and understandable way.

3.5 DISCARDED CRITERIA AND INDICATORS

This list also includes those criteria and indicators which have been formulated in the course of the various stages of reworking and reviewing the set, but which, eventually, were discarded because they had been integrated in other criteria/indicators or to a large extent rephrased.

C/I no.	reason		
		166/14	not relevant
		167/14	not relevant
193/9	in 412/C	1775/	in 406/C
186/8	in 412/C	171/5	in 406/C
184/5	in 412/C	176/5	in 406/C
185/3	in 412/C	192/5	in 190a/5/C
181/5	in 412/C	194/1	in 190a/5/C
183/8	in 426/C	231/1	in 195a/5/C
203/5	in 426/C	199/1	in 102/2 (ecology)
201/5	in 426/C	198/5	in 198/5/C
204/5/C	in 426/C	197/5	in 425 C
204/5	in 426/C	218/1	not relevant
205/5/C	in 426/C	427/C	not relevant
205/5	in 426/C	428/C	not relevant
200/4	in 426/C	209/5	in 208/5/C
202/5	not relevant	230/2	in 208/5/C
178/14	in 189/1/C	211/5	in 210/5/C
214/11	in 189/1/C	213/2	not relevant
215/1	in 189/1/C	217/8	in 219/8/C
182/5	not relevant	217/8C	in 219/8/C
179/5	not relevant	220/8	in 219/8/C
188/5	not relevant	222/5/C	in 219/8/C
187/5	not relevant	232/1	in 219/8/C
168/5	in 172/5/C	223/5	in 223/5/C
173/5	in 172/5/C		

Explanation: not relevant: The working group came to the conclusion that the state of facts was not convincing or not important

in: This point is covered by another one

4 SOCIO-ECONOMIC SECTION

4.1 TESTING PROCEDURE

The socio-economic aspects were covered by Mrs. Mag. Friedl Grünberg and Dr. Franz Rest. Mrs. Grünberg is an expert for ethnology. Franz Rest works as communication scientist at Salzburg University and manages a farm of 8 ha grassland and 39 ha mountain forest in the Gastein valley. As chairman of an agrarian community in the province of Salzburg he is furthermore responsible for the management of additional 98 ha of forest and 48 ha of pasture. In addition, he brings in some experience from his participation in development programmes of NGOs.

Mrs Grünberg was only available in the beginning and shortly before the conclusion of the test procedure as well as for a couple of days during the final workshop. Thus Franz Rest had to go through various stages of the tests on his own. His considerations and the results he obtained were however discussed in regular intervals with all the other members of the test team in interdisciplinary discussions. During various stages he worked in close co-operation with the working group on economic aspects, to give due consideration to the close link between the economic and the socio-economic sections. Above all with regard to the non-timber forest services and the special functions the forests fulfil for our society especially in the alpine regions, the assessment of sustainability in the economic context must not be reduced to timber production, but has to take into account the socio-economic benefits of forest management which can not be recompensated by money. This co-operation furthermore allowed experiences from private forest estates and agrarian community forestry to be included in the current discussions.

4.2 RESULTS

4.2.1 Revision of the criteria and indicators

The test set of C&I contained 44 to a large extent numbered criteria and indicators for the section "Socio-economy", some of the indicators listed being already a subsumption of a number of indicators. In the course of several revisions most points were basically adopted but had to be partly rephrased, newly attributed or split into various indicators.

In the course of this process 23 new guidelines, criteria or indicators were included, which contain elements of but are more precise than the original ones, which had been discarded from the originally presented set. The set at hand includes 32 indicators, out of which 10 were adopted with slight modifications from the original set. All the other indicators were considerably modified or rephrased.

4.2.2 Structure

The original subdivision into "design of external relations" and "internal aspects" was retained but further subdivisions were made in the course of the systematisation process. Education and further training, a topic only briefly touched upon in some of the indicators was made into a subdivision of its own right comprising a total of four indicators. According to the unanimous view of the test team members this was done to give due consideration to questions relating to education and further training, which are considered to be of great importance, and to recent

findings in the field of sustainability. Sustainability is not only a current state of knowledge on the use of proven management systems but, being a process in itself, it is subject to continuous further development. This can only be achieved if continuous information and further training are provided. As far as working conditions and safety provisions are concerned, the conventions of the International Labour Organisation (ILO) proved to be an important basis.

4.2.3 Priorities within the socio-economic aspects

Within the socio-economic aspects the test team members selected the following indicators as being of high priority on the basis of a 5 point scale (1 = low priority, 5 = high priority): (included in the listing because all team members rated them four or five)

- Recording, clarification and documentation not only of the formal but also of all traditional and customary land and usufruct rights as well as of the intellectual property of the local, traditional and especially of the indigenous population (principle 234/13/F, indicator 246/8/F, and principle 236/14/F, indicator 608).
- Jobs are mainly offered to the local population and appropriate opportunities for qualification provided (252/5).
- Definition and observation of adequate minimum wage standards (501).
- Guaranteeing minimum social security standards (503).
- Existence and observation of appropriate safety regulations for silvicultural work (504).
- Qualification of the persons in charge of planning and control (507) as well as of those persons who are in charge of supervising or carrying out silvicultural work (508).
- Continuous further training (509).

4.3 DOCUMENTS REQUIRED

Ind. no.	Size of enterprise (ha)				1.C.	2.C.	Law*
	< 50	50-200	200-500	>500			
246/8/F	Survey field sheet, possessory title, contract				F/O	F/O	
601	Contract, agreement				F	F	
602	contract, tape recordings if necessary				F	F	
260-1/2/F	Minutes					F	
603	Contract, agreement				F	F/O	
241/12/F	Management plans, contracts				F	F	
604					O	O	
605			Possessory title, certificate of non-objection		F	F	
238/3/F		Contract, agreement			F	F	
606		Minutes				F/O	
240/1/F		Contract, agreement			F/O	F/O	
607		Contract, agreement			F/O	F/O	
608		Contract, agreement			F	F	
249/1/F	Documentation				F(O)	F/O	
610	Documentation				F(O)	F	
611			list			F	
612			Notes		F/O	F/O	
613					F	F	
614				Minutes		F	
262/8/F				Minutes		F/O	
501							x
502			Working contracts			F/O	
503							x
504							x
506							x
507	documentary evidence #	Certificate			F	F	partly
508	documentary evidence #	Certificate				F	
509	Attestations (#)					F/O	
513					O	O	
271/5/E							x
510							x

Chart 3: Required data for the socio-economic section

Legend: Ind.no = number of the indicator

1.C. = first certification

2.C. = second certification

Law* = covered by Austrian laws

F = formal verification

O = on-site inspection

= with help of authorities or interest groups

4.4 WORKSHOP

In the course of the discussions of the final workshop the following comments, critics and demands for change relating to socio-economic aspects were brought forward:

- I 604: In the case of small forest stretches a permanently visible marking of the boundaries does not seem to be feasible on account of the high expenditure involved.
- P 235/14b/F and I 605: Since unresolved conflicts over land titles in general preclude certification and certification is suspended until the situation is entirely clarified, any obstructive neighbour might thwart certification by provoking a boundary conflict. As this paragraph was meant above all to protect the non formalised customary rights of the traditional or indigenous population, it was rephrased to rule out misinterpretation.
- I 506: The general ban on child labour would also forbid the traditional, temporary help of children with their parents farm forests. The indicator was rephrased to allow this kind of work, which is in line with the corresponding ILO convention (and the Austrian law on child and youth labour, 1987).
- I 507: With regard to farm forests the demand for an appropriate technical training was perceived as not always being reasonable to expect. As an alternative, it was suggested to make it compulsory to seek technical advice from competent professionally trained authorities.
- As far as the requirements for further training are concerned doubts were raised as to the feasibility and the high financial expenditure involved in ensuring further training of a high number of forest workers. A demand was made for voluntary rather than obligatory further training. Rephrasing this paragraph only partly responded to the doubts raised, as the test team members unanimously agree on the high priority of further training for sustainable forest management and therefore oppose the demand for non continuous further training. It is obvious that this point needs further discussion.

4.5 DISCARDED CRITERIA AND INDICATORS

This list also includes those criteria and indicators which have been formulated in the course of the various stages of reworking and reviewing the set, but which, eventually, were discarded because they had been integrated in other criteria/indicators or to a large extent rephrased.

C/I no.	reason		
257	covered by 256	257/8	covered by in 235 and 604
256/8/F	included in 246/8/F	258/5	covered by 235 and 604
247/2/F	included in 246/8/F	259/5	covered by 235 and 604
248	covered by 246	260/2	covered by 235ff.
261	covered by 260	261/2	covered by 235ff.
238/3	included in 234, 235/a, 235/b and 236	263/3	covered by 235ff.
239/1		264-268	put aside and discarded. Although their general relevance for sustainability was not doubted in the course of the discussion, their inclusion in the set of criteria for certification of sustainable forest management seems doubtful. (264/5;265/2;266/3;267/2;268/2)
240/1			
241/12			
242/2			
243/2			
244/8			
245/8		272/3	random event and therefore not significant
246/8		274/5	random event and therefore not significant; see 504
247/2	included in 234		
250/2	included in 249/1/F	275/2	covered by 503
251/2	included in 234	276/8	covered by 503 I and 504
252/5	subsumed in 607/F	505	covered by 255/3, 503 and 504, and therefore discarded
253/2	subsumed in 607/F		
254/2	subsumed in 607/F	273/2	covered by 503 and 504
256/8	covered by 235 and 604	273/2/E	covered by 503, 504 and 513

After long discussions the non-timber socio-economic forest benefits (multifunctional forest services) were transferred to the economic section and have been treated there.

5 CONCLUSION

5.1 DISCUSSION

5.1.1 Testteam's understanding of sustainability

In connection with forest ecosystems, the term sustainability has been and still is subject to heated discussions. Without wanting to add another definition to the already long list of existing ones, the basic framework of sustainable forest management that was guiding the testcrew during the testing the C & I shall be described hereunder:

- Principle I: Ecological sustainability
 - A: Conservation of quantity and quality of ecosystem elements
 - B: Conservation of vitality, health and productivity
- Principle II: Economic sustainability
 - A: Optimum and efficient use of the various forest products while at the same time conserving the forests utilisation potential and ensuring sustainable and diversified supply of timber and other forest products
 - B: Exploitation ensuring the preservation of the forests
- Principle III: Socio-economic sustainability
 - A: Constructive and consistent design of the external socio-economic relations
 - B: Constructive and consistent design of the internal socio-economic relations

Keeping in line with this basic framework has required many criteria and indicators of the original set to be adapted by modifying their wording (further details are given in the reports on the various subject areas, especially in the economic section).

The dimension of time within sustainability which manifests itself in all areas clearly shows that sustainability is not about a state within a process, but a process in itself. (Consequently, it does not make sense f.e. to qualify the SFM at single cutting areas and/or certify such areas or timber derived thereof.)

5.1.2 Discussion of the verification of sustainability and specific remarks to certification

Based on the general overview of the revised criteria, indicators and guidelines sustainability can be tested as follows:

- Together with verifiable limiting values, clearly defined key conditions more or less form the cornerstone of the test procedure.
- A multitude of qualitative features, which are frequently contained in guidelines that are verified only randomly, make up the multifarious, adjustable and at the same time limiting structure of the test procedure. As the initial situations vary with the geographical conditions and the kind of the enterprise, a fair, flexible and at the same time verifiable test procedure can only be guaranteed if there is made use of a network of several criteria, indicators and/or guidelines. For this reason, a reduction and limitation to a few cornerstones may have a coarsening and distorting affect on the final results.

The general overall conditions for assessment with respect to certification particularly in the economic field are as follows:

The object of certification is the forest management in the stricter sense of the term and not the enterprise in itself!

External impacts which cannot be influenced by the enterprise (e.g. ambient air pollution, etc.) are taken into consideration when evaluating those indicators which are clearly affected by these impacts.

5.1.3 Range of application of the indicators

The identification of the indicators was made very difficult by the fact that they were considered from a variety of different angles. One reason for doing so lies within the particular importance attached to Austrian forest management in the international context. Thus, criteria and indicators had to be evaluated from an international (including boreal/tropical areas) as well as from an Austrian point of view. This is one of the reasons why no agreement within the test team could be reached with regard to indicator 54/13 (maintenance of the forest area). On the international scale, the maintenance of the forested area is given absolute priority within sustainability; in Austria, however, the conversion of parts of the forested area for agricultural use may be useful on the regional level with a view to recapturing large areas by forest (increase of biological diversity).

Upon the request of the project support group, measurement units for the tested indicators were constantly evaluated.

Some of the specific points are already covered by existing laws. With regard to these indicators certification is to be carried out by the respective authorities who see to it that the laws are observed.

5.1.4 Unit of assessment regarding certification

The testing was designed assuming the unit to be certified being the forested area of an enterprise. It would be also possible to certify a combination of enterprises or parts of an enterprise provided it was managed autonomously. A region could only be identified as certification unit if it was possible to manage and calculate it as a unit. This is why the total forested area of Austria could never be considered a unit of certification.

5.1.5 "Sins of the past"

The way the indicators have been designed allows focusing on the future development of the enterprise in assessing SFM and in checking the requirements for certification. Consequences from former mismanagement shall be treated in a tolerant way and from a certain limit onwards, which is necessary to outrule the illegal circumvention of the required mixture of tree species in the future timber stands (I 310), not be considered an impediment to certification. A certain "period of probation" seems to be necessary to prevent certification at a mere declaration of intention. Therefore it is suggested that enterprises which are willing to get certified but do not already meet the requirements of sustainability have to prove a corresponding conversion of their enterprise according to the indicators within a period of 5 years (following prior application).

5.1.6 Protection Areas (indicator 50/5, alternative 314/new)

Although more than 10% of the indicators and criteria of the ecological section of the test set concern protection areas, no other question gave rise to a similar amount of contradictory views. For enterprises of a size exceeding 200 ha it was proposed to set aside 5% for total protection areas or forested areas in which only specific management measures may be carried out (cf. the feasibility study "A label for sustainable forest management in Switzerland": 10% of the area have to be protection areas, out of which at least 5% are subject to total protection unless at least 10% within the canton have already been put under protection by public law. 5% are set aside as special forest reserves). Presuming that 5% are set apart as total protection areas, Grabherr, Koch and Kirchmeir in their alternative proposal suggest that only 30% - as opposed to a minimum of 50% which had been originally required, - of the total area must be stocked with natural forest communities.

The major arguments against the setting aside of protection areas are:

- a) The designation of protection areas should be decided on a regional level
- b) Renunciation of the rights of use only against compensation
- c) The 200 ha limit contradicts the principle of equal competition
- d) Parameters are in part difficult to quantify.

Concerning these arguments the test team is of the following opinion:

ad a) The designation of protection areas should be decided on a regional level

Forest reserves have to be institutionalised on different levels. Extensive protection areas have to be designated on the regional level. Their impact has to be extended to the enterprise level by complementary measures like small-sized conservation areas and old growth islands. Especially recent research has revealed that xylobiotic insects show bad reproductive patterns and therefore increased efforts have to be made to ensure their conservation. Lack of light and of old growth stands are the main factors endangering the survival of many forest inhabitants. With indicators 50/5 and 46/2, the latter as a further step towards interlinking the enterprise and the regional levels, measures are proposed that could guarantee sustainability even in biodiversity.

Ad b) Renunciation of the right of use only against compensation

In general, forest owners should get compensation for additional performance. In the case at hand, however, additional performance is rather small. In the mountainous areas the identification of corresponding areas will not present great difficulties, since there are many geographical locations in which timber extraction is not very profitable or even deficitary. In areas more favourable for logging activities measures may be chosen which only entail minimum economic losses. These should be - the existence of a market for such products being a prerequisite - compensated by additional profits from timber production from sustainably managed forests. In addition, under such conditions the competitiveness of the mountainous regions could be improved as compared to valley locations (equal competition).

Ad c) The 200 ha limit is in contradiction to equal competition

From an ecological point of view an association of reserves should be aimed for, the basic form of use being semi-natural forest management, extensive reserves (see ad a)) interlinked with medium-sized ones and small biotope areas. With this approach small enterprises could never meet the "value requirements" of medium-sized protection areas, i.e. provide the same set of ecological benefits. Furthermore practice has shown that, compared to extensively used areas, small habitats (whether they are agriculturally or silviculturally used does not matter) generally show a higher diversity of species, which at the same time are exposed to greater threats of extinction. This is due to the high number of fringe biotopes.

From an economic point of view, bigger enterprises allow stronger rationalisation and economically more efficient harvesting due to the size of the area. Nowadays there is a tendency towards bigger enterprises with all their detrimental if not disastrous consequences for the small enterprises. This does not only apply to the economy in general, but also to agriculture and forestry. If the socio-economic aspects are taken into consideration, indicator 50/5 does not impair equal competition. On the contrary, it creates a balanced competitive environment for both small and large private forest owners.

Ad d) Parameters which are partly difficult to quantify

The parameters which have to be quantified in indicator 50/5 are to a large extent based on spatial taxation; their assessment does not present any difficulty. The fact that the effects of the measures to be taken and recorded could only become visible and, if need be, controlled, in 20, 30 or even more years is due to the longevity of the forest and must not be misused as an argument for a lack of practicability. A further major concern with regard to the designation of protection areas is increasing awareness for environmental problems (relative to biodiversity, in the case at hand). (MEYER-ABICH, K.M., 1990) "The environment is degrading and going to waste where the faculty of perception, the interface between realisation and action is not being cultivated".

5.1.7 General remarks

In this chapter you will find some brief comments from an economic point of view, with regard to all other sections and this primarily because there is an interrelation between "ecology" and "economy" and because frequently only the combination of the individual criteria brings about a balance between the aspects of sustainability.

Thus, the aspects of nature protection (see 50/5; chapter 6.2.2.3.3) can only be considered without separate payment in so far as the renunciation of the rights of production and usufruct or the additional costs at least equal or lie below the additional revenues to be expected from certification. If this limit is exceeded, the economic stimulus for a voluntary certification is lost.

Large and supraregional protection areas cannot be the object of certification but can only be used for the identification of protection areas. Small units of natural forests or other objects of nature protection, which are to be defined and limited clearly, can be made into "marketable products" in the sense of contractual nature protection. This would include omissions or expenditure for tending and protection measures and information services. Hence, they form one category of many possible forest products with which a contribution to economic sustainability is made. Within the framework of certification guidelines only accompanying nature protection measures can be provided without charge. If costs arise, they must be justifiable economically such as tending programmes for forest edge and old trees ("woodpecker trees"; 46/2, chapter 6.2.2.3.1), extensively used forest stretches, etc.

5.2 TIMBER PLANTATIONS

The suggested set of indicators covers the forested area of Austria as defined in the Austrian Forestry Law. This does not include timber plantations situated outside the forested area, which, consequently, were not tested.

On an international scale, plantations are supposed to complement semi-natural forests, but not to substitute them. They should be created where they serve to relieve the pressure exerted on semi-natural forests. For further information on the criteria and indicators please refer to the publications of the FOREST STEWARDSHIP COUNCIL 1994 and THE INTERNATIONAL TROPICAL TIMBER ORGANISATION 1991.

5.3 COMMENTS ON AND DISCUSSION OF THE CIFOR METHODOLOGY IN THE LIGHTS OF THE EXPERIENCE OF THE AUSTRIAN TESTING

The time limit for the testing was very tight, including 2 days of preparation, a field testing phase of 10 days and a 2 day workshop. Without preselecting and condensing the great number of criteria and indicators taken from the various source sets, together with the enormous amount of time the test team members invested in this project by working at home, this work would never have been achieved.

Important inputs for further steps to be taken with regard to the P/C/I set came from the practical experience gained from the test enterprises. The good results obtained are due to thorough preparation and careful selection of the test enterprises. Towards the end of the field testing first signs of wear and tear and general fatigue began to show. In addition, scheduling the workshop at the end of the field phase made further discussion of the questions raised and of the proposals for improvement impossible. Therefore it should be considered to interrupt the field phase (probably in connection with a homework phase) or to provide for a period of revision of about 2 days after the workshop.

It seems to be essential to set up clear definitions of the principles (as an objective), the criteria (as an evaluation object) and of the indicators (as a concrete "physical" and quantifiable evaluation characteristic) and to be consistent in their further use. This step was carried out by the entire working group to separate the P/C/I clearly.

In order to improve work efficiency it has been absolutely necessary, and practicable, to preselect and condense the enormous amount of criteria and indicators contained in the source sets.

Evaluating the Test set of P/C/I on account of the questions of form 1 (annex 3) enabled the test team members to make a first screening of unsuitable criteria and indicators, to set priorities and to identify shortcomings and problematic areas. The form includes five questions which have to be answered for each of the principles, criteria and indicators. The question whether a principle, criterion or indicator was to be treated as important and as a priority is addressed in question number 5 (Evaluation of question 5 in annex 4).

In addition, the summary of the results of form 1 may help to reveal priorities (uniform points of emphasis) and problematic areas (contradictions between the team members) and to discard inadequate criteria.

Contrary to other tests of CIFOR it was planned to evaluate the criteria and indicators by working through form 2 first in individual homework followed by a testing phase.

The form comprises 4 pages plus boxes A to P (compare annex 5). In general, it is based on a two-stage evaluation:

- Evaluation of the original wording of the (P)/C/I (box D)
- Evaluation of the final version (box O).

Overlapping and for this reason eliminated indicators are given in box G. Correlations with other areas, criteria and indicators are listed in box N.

Working with the forms revealed difficulties which forced the test team to deviate in certain respects from the CIFOR methodology. The most important problems were the following:

- ad A:
 - The importance of some of the questions was interpreted in a different way by the various test team members. This may be partly due to the fact that the questions were formulated in English, and it was not always possible to find an appropriate (exact) translation into German.
 - Evaluation of the original (D) and the final version (O): After revision carried out via form 1 there was no doubt about the extensive necessity of changing or improving the wording of the test-criteria and indicators and their connection to the original version ([D], [O]). The improved version was, however, reached only gradually in the course of the teamwork and could finally be incorporated into the forms. The final version of C and I after phrasing often differed that much from the original version (above all due to the addition of the units of measurement) that comparing the two would not have made much sense. Also, there was not enough time for a double assessment.
- ad B:
 - The test team was charged with identifying and selecting those criteria allowing the best possible judgement of the sustainability of forest management. According to the opinion of the members of the test team assessing the costs of evaluation for each indicator was hardly possible at this stage and it is not practice-oriented to evaluate a great number of indicators simultaneously when an integrated assessment would be much more efficient. What was considered, however, was the time expenditure/cost expense ratio for each indicator. On the basis of a five point scale (from 1 to 5) this ratio was evaluated under "other" in box A (5 = high cost efficiency, 1 = low cost efficiency). For all team members, however, the individual assessments seem to be hardly understandable and it is feared that if the same persons answer the same questions several times, the answers will differ widely. Furthermore, it is doubtful whether a purposeful evaluation of these assessments can be carried out.
- ad C:

In many cases, tolerance values could be given; it is much clearer, however, to take them from the wording of the indicator itself than from the purely statistical information.
- ad D and O:
 - Hand-written filling in of the forms turned out to be disadvantageous and time-consuming. Since the P/C/I set was further treated on a PC, Mr Senitza in addition developed a PC version of the form, which allows a better evaluation.

- The questions concerning time and geopolitical application can be answered, those of functions 1 and 2, however, are to be regarded as a more or less inadequate and unnecessary hindrance in the elaboration process due to lacking definitions, due to the hardly repeatable assignment and the entirely vague definition of the variables (singular/multiple choice, logical variable, variable which can be evaluated by a point scale).
- ad I (Daily Diary):
 - The usefulness of this box was questioned. Much more information could be derived from a comparison of the various versions of the set, all dating from different periods, and from how they developed in the course of the testing process (the ecological section, for example, was modified seven times until the present final version).
- The indication of overlapping and, thus, excluded indicators [G], the linkages to other sections [N] and the arguments for their choice [E] did not create any problems, either. The assessment of the questions concerning "Attributes" [A] and "Time" up to "Function 2" ([J]), [K], [L], [M]) by means of a point scale should be queried; there were also troubles with interpretation.
- Evaluation of the final version:
 - A final evaluation can only be carried out after the workshop, at a point in time when the field phase is completed
- Setting up of the form 2:
 - Some Austria-specific additions were made during the preliminary discussions ([Q]-[U]), which are more practice-orientated. All in all, it seems that the benefits drawn from the elaboration of form 2 do not necessarily outweigh the expenditures. In spite of data input and data management backed by a data bank system, only few features can be evaluated in the form of a chart. In part the questions (especially box A) are too much focused on scientific topics and therefore less significant as far as the social context is concerned or the relevant questions are not sufficiently represented in the form. Beyond form 2, all team members, for the purpose of further condensation, carried out an assessment by means of a point scale with regard to the general importance or the priority of individual indicators in the fields "ecology" and "economy" and determined a mean value. The resulting values give a quick overview of the most important cornerstones of certification (see table "evaluation overview"). Finally, full completion of form 2 within the allocated time would have been impossible due to the enormous expenditure of time required.

Proposals for improvements:

- Reviewing forms and methodology with a view to obtaining results which can be more easily compared. Both forms and methodology should be better balanced.
- Provide more detailed information/explanations on the forms in order to improve the reliability of the evaluation results.
- Better co-ordination of the timetable within the testing procedure with regard to the filling in of the forms (for the timescale of the testing procedure see above).
- Establishing a PC version of the forms.

5.4 ISSUE FOR FURTHER DISCUSSION AND OPEN QUESTIONS

Objective of the testing was the identification of principles, criteria and indicators for sustainable forest management. In the course of the testing procedure a number of questions were raised which for time constraint reasons could not be dealt with by the test team (results of the workshop), or do not fall within their scope of duties or their (exclusive) competence. In connection with the evaluation of the principles/criteria/indicators the following questions remain to be answered:

- Alternative proposal concerning the P/C/I- set

Mr G. Grabherr took the opportunity to submit a written proposal for improving the set of principles, criteria and indicators by presenting an alternative proposal to chapter 2.2.2 on biodiversity. There is no doubt that this proposal has to be given due consideration, best by testing.

- Statement of the environmental organisations (Greenpeace & WWF)

The statements of Greenpeace and WWF mostly concerned the ecological aspects. A number of points were included in the revised set, others are being dealt with in the individual reports. According to the test team's opinion they do not impair the set worked out.

- Influence of forest management on further timber processing industries

Forest management and especially the further treatment of the logged timber (sold where/to whom/why) does have a quite important impact on the local economies and the socio-economic environment. In testing the sustainability of forest management in the context of the Austrian situation this set of questions seemed to be too complex and thus too difficult to evaluate and was therefore considered as impossible to be dealt-with on this project. But there is no doubt that this complex of questions has to be considered in further discussions on the international scale.

- Documents/data

For certification the applicants have to provide different documents/data. It is possible that there will be a considerable lack of information with regard to applicability and the additional expenditure of time and money required for the compilation of these data, depending on the various possible different starting positions of the enterprises. Relevant tests shall be carried out. At the same time it should be verified to what extent data available at authorities or other institutions might be used.

- Request of documentation

Several indicators require documentation of different units of measurement. The use of standardised forms would be very useful to make the certification process less time-consuming and easier to see through.

- Use of the set for certification

At present, it still remains to be determined which method should be used to combine the individual criteria and indicators in each field and how this method could be practically applied. In general, it seems more reasonable to give priority to a "knock-out system", which means that all indicators have to be met for providing a comprehensive assessment and for certification. Exceptions would be possible for single indicators provided that the enterprise can provide sound reasons. The principle of sustainability, however, must not be

jeopardised by this. It is recommended to avoid applying this special regulation on possible exceptions to the key indicators identified for each subject area. Thus, a combination of "knock-out" points, alternatives including an assessment of sums (e.g. investment rate), and possible point scales for particular sections would have to be developed and verified.

In each case, a "mechanically" reproducible certification does not seem to be possible. From the point of view of the enterprise, the certification procedure requires quite a number of problem analyses and integrative skills. After experience with field testing, a small team made up of experts with different experience will most quickly assess the situation and, after thorough discussion, they will arrive at a well-balanced overall evaluation where extremely odd results are compensated mutually. This does not mean that the results are watered down but that the best possible compromise is reached between verifiability and reliability as well as the necessity to consider a multitude of interwoven features of sustainability.

Furthermore, in order to consider the guidelines for certification itself with regards to the Austrian legal background, all evaluated points have to be checked on as to whether they are covered by existing control mechanisms of the competent authorities. It is required to select all criteria and indicators which are included in the current Austrian legislation or in international agreements and whose implementation and supervision is guaranteed. This will definitely reduce the amount of time and money needed for certification.

5.5 FURTHER STEPS TO BE TAKEN (RELATED TO CERTIFICATION)

Concerning certification the test-team and the project support group identified the need to further develop the following items.

- For the creation of a cost-effective process of certification additional documents have to be elaborated:
 - Formulation of the tender for certification
Which criteria have to be met to make application for the quality mark possible?
 - Application form
Which information has to be provided when applying for the quality mark?
 - Guidelines concerning the actions to be taken
Which guidelines have to be established with regard to the provision of documents for certification (e.g. information on the identification of potential natural forest communities)?
 - Standardised forms
Which notes have to be taken after the award of the quality mark (and/or in the course of the conversion period)? Drawing up of standardised forms?
 - Checklist
Which course of action has to be followed with a certification? What has to be remembered? (Including the executive and control mechanisms already in place on account of the Austrian rules and regulations in force and international agreements).
- Further tests shall be carried out in various enterprises in order to get information on the following topics:
 - Applicability and practicability of certification by means of the newly created set of C & I
 - Detailed information on time and cost expenditure for certification
 - Information on the additional time and money required for compiling the documents/data necessary for certification.

6 SET OF PRINCIPLES, CRITERIA AND INDICATORS

Explanation

- In the present set the comments made in the course of the workshop discussions from 2./3. November are included.
- Description of the numbering:

The numbering of the new set is based on the original set according to which the testing was carried out. The latter shows a numbering from 1 to 278 and is divided in the following sections: General and Organisational Requirements (1-42), Ecological Principles (43-165, plus 277/278 concerning plantations), Economic Principles (166-233), and Socio-economic Principles (234-276). Although most of the used points had to be rephrased, the original numbering was retained. But since the new set has been enlarged to include aspects which had not been considered in the original set, the existing numbering had to be modified accordingly:

- Ecological Sector: For new points numbers >300 (and >400) were used
- Economic Sector: For new points numbers >400 (and >500) were used
- Socio-economic Sector: For new points numbers >500 were used.

The test set consists of principles, criteria and indicators which were compiled from different national and international sets of criteria. The origins of the criteria or indicators are given by means of the number after the slash (compare introduction to the test set).

As far as the economic and the socio-economic sector as included in the new set are concerned, number and source of the criterion/indicator may be followed by a C, E, or F. These letters refer to the group or the member of the team responsible for the rephrasing of a point, C standing for working group on economic aspects (Dr. E. Senitza, DI S. Terzer)

E for Dr. F. Rest and

F for Mrs F. Grünberg

For example:

Indicator 246/8/F means: the indicator in question is based on indicator 246/8 of the original test set of criteria and indicators as it was presented at the beginning of the testing procedure and was only slightly modified. The extension "F" refers to the test team member (code F) responsible for rephrasing the indicator. This should allow to recontact the person in charge to answer future questions e.g. as to how the decision came about. It furthermore makes the modification more transparent. In the chapter "internal aspects" rephrased indicators were numbered from 501, the chapter on the design of the external relations starts with number 601.

- Definitions of special terms of the ecological sector can be found at the end of the respective chapter.
- Those indicators which the test team members considered to be the most important ones are given in boxes.

Box: Indicates the most important indicators
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- In the case of principles (P), guidelines (G), and indicators (I), the „C“ for criterion was put before the headline or the text.

External impacts which cannot be influenced by the enterprise (e.g. ambient air pollution, etc.) are taken into consideration when evaluating those indicators which are clearly affected by these impacts.

Used sets, abbreviation and respective version:

- FPC: Forest Practices Code of British Columbia June 1994
- FSC: Forest Stewardship Council June 1994
- GP: Greenpeace March 1994
- Hels.: Helsinki June 1994
- Ind.: Indonesia September 1993
- ITTO: International Tropical Timber Organisation December 1991
- ITW: Initiative Tropenwald February 1994
- KSZE: Konferenz für Sicherheit und Zusammenarbeit in Europa October 1993
- R.All: Rainforest Alliance October 1993
- SA: Soil Association February 1994
- SCS: Scientific Certification Systems February 1994
- WÖPS: Wald-Ökopunkte-System October 1994

6.1 GENERAL AND ORGANIZATIONAL REQUIREMENTS

PREAMBLE

The principles listed below are designed to be a globally valid set. For their implementation on the regional level, however, adaptations may be useful. All organisational questions have to be resolved beforehand.

6.1.1 Meeting of General and Legal Requirements

6.1.1.1 General Information/Identification

6.1.1.1.1 Identification of the areas subject to management

1/14 The area on which sustainable forest management is carried out has to be determined by clearly defined area units. The description comprises: name, geographic location with details on the course of the borderlines, size.

6.1.1.1.2 Management

2/14 Name and address of the landowner or the applicant

3/14 Name and address of the responsible manager

6.1.1.1.3 Product Identification

4/14 Products from certified enterprises or areas shall be made clearly identifiable by special marks or separate storage.

6.1.1.2 Compliance with Legal Standards

5/14 Within the framework of forest management the landowner or applicant engages to fulfil the respective laws in force and to comply with the principles of the following international obligations (overall conditions): ILO, ITTA, CITES, Convention on Biodiversity.

6/14 Should the requirements laid down in the set go beyond the regional standards, the applicant has to commit himself to fulfilling these requirements.

7/14 On the national level the following rules and regulations have to be observed:

- a) Forestry law
- b) Land use planning
- c) Property rights
- d) Other ecological rules and regulations
- e) Other economic obligations
- f) Social rules and regulations

6.1.2 Basic Data on Means of Production and Overall Conditions

In order to guarantee transparentness of the sustainability of forest management information on the means of production as well as the general management conditions, including information on how these data are compiled, are necessary.

The expenditure of data gathering is adapted to the size of the management unit as well as to the intensity of management [check list].

6.1.2.1 Necessary ecological data

6.1.2.1.1 General description of the area

[orders of magnitude: see criteria and indicators]

8/14 Climate, topography, geology, soil, anthropogenic influences, water cycle, regional land use planning (conurbation's, percentage of forested area, agricultural use ...)

6.1.2.1.2 Biodiversity

9/14 Area data on natural forest communities and current growing stock

10/14 Area data on forest structure

11/14 Description of ecosystem types and their successions

12/14 Abundance and distribution of animal and plant key species, e.g. rare and endangered species, species which are important for the local economy or for the functioning of the forest ecosystem.

6.1.2.1.3 Protection areas and areas designated for specific forms of use

13/14 Legal status, size of the area and subject of protection:

- protection areas for ecosystems/habitats
- areas with a high diversity/endemism
- water catchment areas
- erosion protection areas
- wetland biotopes
- others

6.1.2.2 Necessary economic and production data

6.1.2.2.1 Product diversity

14/14 Information on the kind and extent of the use of the forest products (timber and non-timber) as well as on hunting and other services rendered (this includes traditionally used plants and animals and the exploitation of secondary tree species).

6.1.2.2.2 Forest

15/14 Area data: Total area; production and non-production areas, age/diameter structure, forest maps giving details on forest functions

16/14 Timber supply with regard to assortment and diameter classes

17/14 Available information on regeneration and increment

18/14 Information on logging and log transport

6.1.2.2.3 Personnel, logistics, etc.

19/14 Information on development, logging and log transport

20/14 Information on employees and jobs

21/14 Information on pesticides and wood preserves used

22/14 Information on wages and salaries, unless there are collective agreements.

6.1.2.3 Other data

23/14 Information on chartered and non-chartered forest exploitation rights

24/14 Information on forest sites of archeologic, historical, religious or cultural significance.

6.1.3 Management concept

6.1.3.1 General requirements

25/14 In order to guarantee the sustainability of forest management systems over the long term, an appropriate management concept adapted to the size of the enterprise has to be provided. In this connection, management measures traditionally carried out in coppices, which are often not recorded in writing, are being taken into consideration.

26/14 The legal rules and regulations on which the management concept is based have to be cited.

6.1.3.2 Description of management objectives

27/14 Objectives have to be defined on the basis of the general data requirements listed in chapter B concerning means of production and overall conditions.

28/14 In choosing forest management systems appropriate consideration should be given to ecological, economic and social aspects. Especially possible negative impacts and measures to minimise them should be specified.

6.1.3.3 Ecological aspects

29/14 Measures for the protection of biological diversity (including rare and endangered species), of soil and water bodies have to be specified.

6.1.3.4 Economic aspects

30/14 Keeping of growing stock

31/14 Afforestation and silvicultural measures

32/14 Logging operations and log transport

33/14 Road construction

34/14 Forest protection measures

6.1.3.5 Social aspects

35/14 Rights and obligations towards the population, especially indigenous peoples, with regard to forest exploitation.

36/14 Payment schemes

37/14 Training and job organisation

38/14 Safety in the workplace

6.1.4 Documentation and Monitoring

6.1.4.1 Documentation

39/14 The forest owner/applicant engages to keep all information necessary for obtaining the certificate.

6.1.4.2 Monitoring

40/14 The organisational overall conditions have to guarantee that improper use of the quality mark is prevented by appropriate monitoring.

41/14 For renewed qualification for the quality mark an updated set of data has to be provided.

42/14 The data have to comprise the aspects cited in the above mentioned chapters

6.2 ECOLOGICAL ASPECTS

Subject of assessment (especially for certification proposes) is the forest(ed) area of an enterprise. Non-forest areas (including plantations) as well as their location with regard to the forested areas are not taken into account (this applies to Austria). The latter shall be assessed on a national level with a view to landscape ecology (landuse planning). (For an exact definition of terms see chapter 6.2)

The most important indicators appear in boxes.

6.2.1 Quantity and Quality of Ecosystem Components

P: The abiotic and biotic elements of forest ecosystems have to be preserved and negative impacts from forest management measures have to be kept to a minimum, especially with regard to soil, water and biodiversity.

6.2.1.1 Soil

P(64/14): Forest management has to be carried out in a way so as guarantee that local (natural) soil conditions (quantity, quality) will not be adversely affected, not even in the long run.

63/7...I: The **location of sensitive** soils, and the **measures** required to ensure that the physical, chemical and biological conditions essential for maintaining the long-term productivity of those soils are protected, maintained or enhanced, are documented in appropriate plans and descriptions (FPC).

6.2.1.1.1 C: Forest area, forest fertilisation, soil tillage

54/13...I: The **forest area** is not diminished in size. Forest losses through authorised deforestations by the enterprises have to be compensated by the afforestation of adequate areas.

69/14...I: No **fertilisation measures** aiming exclusively at an increase of increment. Exep-tions: Initial fertilisations for young plants as well as fertilisation aiming for forest soil rehabilitation in order to stabilise the ecosystem (ÖFA).

302/new...I: In areas exceeding 100 m² no **soil tillage** deeper than 20 cm. (Exception: Justified stand conversions and rehabilitation measures.

6.2.1.1.2 C: Growing stock, size of cuttings, logging and log transport

303/new...G: The impact of **logging operations** on soils must be minimised especially with regard to clearcuttings, earth moving for road construction (82/3), bare soil exposure (86/3) (SA)

68/14...G: Minimisation of the **input of pollutants** (e.g. chemical substances, oils) by the enterprise and of the **removal of nutrients** (e.g. foliage, branches, roots).

301/new...I: After timber harvesting **roots** and **branches** (of less than 3 cm diameter) are left on the logging site.

66/14...G: Maintaining a degree of **stocking** which protects the soil against extensive erosion. (ÖFA)

67/14...I: No complete or extensive **tree felling** (covered area by the crowns less than 40%) exceeding an area of 0.5 ha, which would leave top soil bare and sensitive to erosion, i.e. widths of felling area shall not exceed 15 meters or in case of adjacent timber higher than 20 m more than the half of the added dominant heights on both longitudinal sides of the logging area. Exception is made with incidental fellings; subsequent or removal cuttings may be carried out only after at least 2000 trees per ha have attained a height of more than 1 m or at least 70% of the area are covered with a tree layer of more than a 0,5 m height. (Exceptions can be made where justified).

77/8...I: No complete or extensive **timber harvesting** (covered area by crowns less than 40%) exceeding an area of 0.2 ha on slopes exceeding 35 degrees measured over 100 meters, which would leave top soil bare and sensitive to erosion (width of felling area more than 15 meters). Exception: incidental fellings; subsequent cuttings or removal cuttings may be carried out only after at least 2000 trees per ha have reached a height of more than 2 meters. (Exceptions may be made in the case of justified reasons).

304/new...I: There are sufficient and intact **drainage facilities** on all roads to prevent soil erosion.

102/2...I: There are engineering **standards** for the planning, design and use of **roads** as well as for the making of **skid trails** - alignment, slope width, total surface area, stream crossings, culverts, drainage lines and water bars, use in bad weather, treatment after logging activities. These standards are adequate and appropriate for local conditions. These standards are observed.

199/1...I: There are **guidelines** concerning the equipment and use of **harvesting machinery** with a view to minimising possible damages from logging and log transport activities, e.g. skidding vehicles, cable yarding equipment. These guidelines are observed.

78/10...G: Minimising **soil damage** i.e. soil compaction through the use of tyred vehicles and skidding. (WÖPS)

305/new...I: **Distance between skidding tracks** no smaller than two tree lengths (tree length relative to the height of the adjacent stand). No perceivable soil damage due to driving off roads and skid trails.

88/3...I: **Skid trail gradients** must not exceed 25% (R.ALL), unless there are special local regulations.

6.2.1.2 Water

P: Forest management shall not impair water quality nor have negative impacts on the hydrologic cycle.

6.2.1.2.1 C: Drainage facilities, shoreline design

106/14...I: No introduction of new **drainage facilities** in the forest off roads and tracks, existing drainage facilities are not technically improved (ÖFA).

Exception: Prevention of landslides.

111/2...I: There are regulations for the protection of **riparian reserves** along streams, water courses and stream heads, along shorelines, and around lakes. These regulations are observed (Ind.).

6.2.1.2.2 C: Logging and log transport

112/3...G: **Harvesting machinery** must not enter streamsides except at designated and designed stream crossings. The number of such crossings must be minimised (SA).

114/3...G: **Lop and top** are not being pushed into streamsides (SA).

6.2.1.2.3 C: Road Construction

P: The impact of road construction on water quantity and quality must be minimised.

115/3...G: Minimising the number of **stream crossings** (SA).

116/3...G: Keeping valley bottom roads and tracks as far as possible away from streams (SA). (Limit values according to local regulations).

119/8...G: No **road filling materials** are introduced into stream courses (R.All).

6.2.1.2.4 C: Forest Protection

P: Forest management must prevent contamination of water by herbicides and pesticides by, inter alia, the following measures (CSCE):

306/new...I: There are **regulations** concerning planning, implementation, control and documentation of the use of chemicals in order to prevent water contamination: these regulations are observed.

120/3...G: No **application of chemicals** within 10 m of watercourses and 30 m around reservoirs and lakes (SA).

121/3...G: No **application** when heavy rain is expected, during wet weather, on frozen, snow-covered ground or soil which has been baked dry during a drought (SA).

122/3...G: No **burying or disposal of chemicals** in watercourses or lakes, no washing of equipment in watercourses (SA).

123/3...G: No **soaking of seedlings** treated with chemicals in drains or watercourses prior to planting (SA).

124/3...G: **Locating fuel tanks and storage sites** so that spillage's from damage, defects or refuelling will not enter watercourses (SA).

6.2.1.3 Biodiversity6.2.1.3.1 C Structural and Age-class Diversity

P (58/14): Forest management shall guarantee a diversity of various types of ecosystems, stages of succession and structures in accordance with the local conditions.

46/2...I: Dead standing trees and woodpecker's trees should be left unless they are a considerable security risk. On an area of 10 ha at least 10 **old trees** of the upperstory (e.g. woodpecker's trees and eyrie trees) are left without being exploited until their natural decay after their death (with management units smaller than 10 ha at least 1 ancient tree per ha, no requirements for units of less than 1 ha). These trees are identified and recorded (This indicator is not valid if third party damage claims are to be expected).

6.2.1.3.2 C Genetic Diversity

P (59/14): Forest management activities must be geared to guarantee the **conservation of local, native plant and animal species** (regeneration, migration) in the long run.

307/new...I: All **tree species** of the potential natural forest communities which comprise at least 50 ha shall be represented.

308/new...I: The ecologically most important **characteristic tree species** of the potential natural forest community are - either by individual trees or by clumps - sufficiently (on average at least 100 potential crop trees per ha) represented in the respective regeneration areas, representing at least 30% in old growth stands. If there is more than one characteristic tree species each of them shall be proportionally represented (e.g. three character tree species shall be represented by 10% each).

49/4...I: There are regulations controlling inappropriate, i.e. threatening the existence of the respective animal or plant population, **hunting, fishing, trapping and collecting**. These regulations are observed (FSC).

P (60/14): Forest management maintains the **genetic variability within all species** and allows the exchange of genetic material within the species.

309/new...I: With seeding and (re)afforestation the **genetic provenance's** of seeds and planting stock have to be suitable for the local conditions. There has to be documentary evidence of the respective genetic provenance's.

62/14...G: The growing of **species and genetic provenance's outside their potential natural distribution area** is carried out only after careful assessment of all positive and negative aspects. Negative ecological impacts have to be avoided.

310/new...I: **Introduced tree species** (tree species outside their natural distribution area) account for maximum 40% of the whole forested area and do not exceed 20% of the total regeneration area.

311/new...G: No **wild animal species** must be released outside their natural distribution area.

61/4...G: In general no **genetically modified organisms** must be released in forests.

6.2.1.3.3 C Protection Areas

44/14...I: It is guaranteed that applicants when harvesting timber do not do any damages to legally stipulated **protection areas**, which had been agreed upon with the owner.

50/5...I: With forestry enterprises of more than 200 ha at least 5% of the total wooded area are entirely dedicated to **protection measures in order to promote rare and endangered animal and plant species and their habitats** (e.g. breeding and feeding sites, forest communities). These may be total protection areas or protection areas in which special measures are carried out. If in the forested area in question no such area can be designated in co-operation with nature conservation or forestry authorities, adequate measures have to be taken on 5% of the total forested area. For example: deliberate increase of the percentage of standing dead trees and fallen logs (only one selective cutting for timber extraction within a decade during which no more than 10% of the timber volume may be harvested); increase of the rotation length by at least 30 years with regard to the surrounding stands, identification of areas with light demanding trees and pioneer species, of small wood on forest edges (forest edge tending), coppice with standards systems or forest pastures with controlled grazing on areas which are nowadays or have formerly been used as such (rare, old forest management systems). These measures and the respective areas are recorded.

6.2.2 Vitality, Health, Productivity

6.2.2.1 C Stability, Resilience, Natural Regulating Mechanisms

P: In forest management the maintenance and improvement of the functional capacity of ecosystems, their dynamics as well as their vitality and stability have to be guaranteed.

- Maintaining the capacity of ecosystems to react upon external impacts and processes.
- Especially forest stands adapted to the local conditions must be maintained and supported in order to profit to a maximum from natural control mechanisms.

135/14...G: Exploited forest areas are regenerated within ecologically appropriate periods by means of **tree species and planting stock of provenance's** which are suitable for local conditions making maximum use of the natural regeneration potential.

312/new...I: At least 20% of the **regeneration** area are regenerated by natural regeneration (without afforestation). This does not apply to enterprises of less than 50 ha forested area and to enterprises in which there are no seed trees which are suitable for local conditions.

6.2.2.2 C Forest Protection and Preventive Measures

313/new...G: Preventive **pest control measures** are preferable to therapeutic measures, and adequate biological measures are preferable to chemical measures.

136/5...I: There are **regulations** relative to **pest** and pathogen **control** and these are adhered to (e.g. consideration/ incorporation of inevitable epidemics in pest control measures and their documentation, financial provisions and future protection measures; SCS).

153/3...I: **Contingency plans** detailing action to be taken in the event of pollution by chemical substances or natural disasters like forest fires (SA). These regulations are observed.

152/3...G: All **equipment** for the transport, storage and application of chemicals are maintained in a safe and leakproof condition (SA).

6.2.2.3 C Stress Factors and Risk Assessment

146/9...C: **Stress factors:** Insects/disease/weather, air quality, fire, climate, competition, topography, utilisation (CSCE)

148/6...I: **Documentation** of serious **damage** caused by biotic and abiotic agents (Sustainability Monitoring):

- serious damage caused by insects and diseases with an assessment of the seriousness of the damage as a function of (mortality or) loss of forest (Hels.)
- annual area of forest destroyed by forest fires, landslides, etc. (Hels.)
- annual area affected by storm damage and volume harvested from these areas (Hels.)
- proportion of regeneration area seriously damaged by game, other animals or by grazing (Hels.).

149/5...I: Documentation of the **frequency** and **effectiveness** of pesticide use: stated reasons for their use (SCS), locational accuracy of application, appropriate timing, efficacy chemical measures by vegetative results (SCS), use of targeted and/or broadcast aerial insecticide spraying.

159/9...I: The **impact of big herbivores (hoofed animals, etc.) on forest vegetation** does not reduce tree species diversity (comparison of reference plots - see method of assessment); exception: reserves for big herbivores. Method of assessment: comparison of **nature** and **abundance** of regeneration in controlled areas, some of which are easily accessible for herbivores, others fenced in (CSCE). Minimum size of reference plots: 5 x 5 m; there is at least one pair of reference plots per 50 ha of forested area with a distribution corresponding to existing potential natural forest communities. There is at least one pair of reference plots in enterprises smaller than 50 ha. (Guidelines for the establishment and control of reference plots have to be defined on a regional/national level.

Exemption: As far as guidelines (G) and indicators (I) are concerned, exceptions to the regulations may be made for individual enterprises provided that only a single guideline or indicator is concerned and the enterprise provides justified guaranteeing that an exception in this particular case does not jeopardise the maintenance of sustainable forest management.

APPENDIX

Definition of Terms

Characteristic Tree Species: Tree species characterising a specific potential natural forest community, and which are inevitable for maintaining forest community-specific processes and ecological functions. In a spruce-fir-beech wood, for example, the characteristic tree species would be spruce, silver fir, and red beech. The characteristic tree species of a given potential natural forest community have to be defined.

Forest Regeneration Area: Forested area (clear-cut areas and sheltered areas) which at the time of assessment are subject to either natural (seed trees) or artificial (re-afforestation, seeding) regeneration, up to a young forest stand height of 2 m. In the case of a waiting period before qualifying for the quality mark (e.g. a "probation period" of 5 years) the regeneration area emerged during this period will be considered.

Guideline (G): Basic requirements, however less operable than indicators and thus can only partly be controlled.

Plantations: According to FAO, an artificially created forest, either on formerly non-forested areas or by substituting existing forests by new and essentially different species or species compositions. Plantations are characterised by management measures similar to those used in agriculture, such as extensive soil cultivation, mechanical tending, monocultures, fertilisation, chemical plant protection and/or mechanical total harvesting as well as short rotation periods. For Austria: only those areas stocked with trees in the a.m. sense shall be regarded as plantations which are not considered as forest under the Austrian Forestry Law.

Potential Natural Forest Community according to WÖPS (*FRANK-HINTERLEITNER, October 1994*): Assumed vegetation of a specific site which after the cease of human impact would correspond to the actual site potential. This concept serves to represent the natural potential of a specific site or a landscape in the sense of "potential natural forest communities as they exist nowadays". The tree species forming such a potential natural forest community have to be defined. This does not include introduced tree species (i.e. tree species outside their natural distribution area). Practicable guidelines for the assessment of potential natural forest communities have to be established.

6.3 ECONOMIC ASPECTS

6.3.1 Forest Products and Forest Functions

P: The various forest products - wood and others - shall be exploited in the best possible and most efficient way. One specific form of use must not impair another potential in the long run.

P: Forest management shall guarantee a sustainable and diversified supply of timber and other forest products

6.3.1.1 Spatial Distribution and Extent

174/2/C C: Spatial distribution of forest products and functions: e.g. timber production, (protection)/closed forest, amenity and recreation (e.g. bridle paths, cycle tracks, keep-fit trails, nature trails, etc.), water (springs and water protection and conservation areas), hunting (including hunting reserves) and fishing, pasture, secondary benefits such as resin, dwarf pines, Christmas trees, etc.), other secondary estate uses in forests.

401/C I: General identification maps are available (BUNDESMINISTERIUM FÜR LAND- UND FORSTWIRTSCHAFT): for instance FDP (general forest development plan), specific forest development plans with operational details for the enterprises, maps identifying areas allocated to specific forms of use and which are thus subject to special conservation measures, identification of danger areas, areas for which specific management goals have been set, forest function planning, game ecological land use planning, regional land use planning.

402/C I: There are quantified data concerning the use of the forest services provided: e.g. harvest levels (yield/ha), cutting size, population statistics of protected settlement areas, number of visitors/turnover, spring runoff/profits, hunting bag statistics/payment for hunting ground, large animal units relative to forest pasture area, profits from secondary uses.

403/C I: There are adequate procedures to settle conflicts in the case of conflicting interests regarding the use of forest products and services. These procedures are applied and recorded and negative impacts of the different forest functions on each other are identified and recorded.

404/C I: No obvious negative impacts definitely caused by forest management on adjacent areas and regions. (Forest and non-forest areas).

421/C G: Satisfactory use has to be made of existing procedures giving interested parties or individuals a say in decision taking processes in order to minimise or prevent in general negative impacts (e.g. possibility of interested parties to officially voice their opinion, hunting societies, etc.).

6.3.2 Profitability

P: Forest management has to be carried out in a way so as to preserve forests in at least the same condition for economic exploitation by future generations.

P. Prices for timber and other forest products have to be determined with a view to being an incentive for long-term forest management, taking into consideration the ecological, social and operational production costs.

6.3.2.1 Financial Productivity

180/5/C C: Financial capacity allowing the operational survival of an enterprise and guaranteeing a minimum of silvicultural tending measures and the maintenance of a minimum of infrastructure.

412/C I: An on average at least balanced income - expenditure ratio over a period of at least 10 years. In this connection income comprises all money returns from wood sale and profits from non-timber forest functions (cf. chapter 6.3.4) including compensation payments and financial grants. Expenses cover silvicultural, tending, harvesting, material and administrative costs.

In this connection basic reference data could be: Contribution margin or a sufficient earned income evaluated on account of business records and /or local reference values (assortment yield, diameter, prices; logging and log transport costs, costs of silvicultural measures, administrative expenditures) including any compensation for non-timber forest services and grants.

Exception: **Start-up enterprises** where high investment (including own capital funds) coincides with negative operating results.

Remarks: arithmetic approaches for not financially compensated non-timber forest services may be taken into account if beneficiary and forest owner are identical or closely related to each other (e.g. community forests in mountainous areas). There are problems in the case of a high amount of positives external affects which are neither paid-off nor compensated by means of grants. Forest enterprises which fail to cover their expenses, i.e. on a negative balance, and which do not have a designated beneficiary, cannot „survive“ in the long run, unless their existence is ensured by continuous outside capital investment. This implies, however, that these forest enterprises are operated out for pleasure and from an economic point of view they cannot be considered as being sustainably managed.

6.3.2.2 Investment of Capital and Personnel

426/C C: appropriate and sufficient investment in stand improvement measures and/or improved (here: more efficient) logging and log transport techniques and/or in personnel training.

203/5/C I: There is a minimum of investment in or commitment to further professional training for managerial and non-managerial staff (e.g. 1 day/year) (cf. 505-507).

204/5/C I: Investment rate or annual expenditure in improved harvesting and log transport techniques (relative to e.g. a five year-period). This includes the application of special harvesting and log transport techniques by the enterprise.

205/5/C I: Investment rate or annual expenditure in re-afforestation, forest tending measures aiming at an increase in value or quality (e.g. pruning), vegetation control, stand improvement programmes, monitoring, resource protection programmes (including all investment in resource maintenance, e.g. garages for maintaining machinery,...) or others. This also includes corresponding investment of own capital funds.

6.3.2.3 Utilisation's / management contract

189A/I/C C: Long-term determination of management measures if forest owner and management company are not identical or closely related to each other.

189/1/C I: The owner of the forest and the management company or the applicant, respectively, have signed a utilisation / management contract stipulating the legally binding rights and obligations of the contracting parties. This contract furthermore includes the overall conditions for long-term management (exceeding one forest or tree generation) of the forest (ITW). This must include an appropriate stand regeneration rate and a sufficient amount of tending activities.

6.3.2.4 Silviculture and Forest Protection

6.3.2.4.1 Silvicultural Systems

413/C C: economically efficient silvicultural systems and regeneration measures in accordance with the dominant forest services and functions.

414/C I: Expense ratio between the expenses for artificial formation of stands, protection and tending measures and the total expenses of the forest enterprise (harvesting and skidding costs, administrative costs) depending on the dominant natural forest community and the respective region. Limit value: e.g. on average <15% over the last five years (could be also assessed on account of the growth area on the basis of the operational test net. Exception: after natural disasters, companies which are being restructured or converted and (run-down) start-up enterprises needing heavy investment (comp. 412/C)

6.3.2.4.2 Regeneration and Tending Measures

172/5/C C: Extent and efficiency of stand formation measures, young growth tending and stand release treatments in order to guarantee at least the dominant required forest services.

170/5/C I: New stands are established on areas which are suitable for or in need of regeneration without leaving gaps >400m². In doing so all possible advantages of the local site conditions are being made use of and there are sufficient young stand treatment measures including regulation of species mixture to achieve the growing-stock objective (according to natural forest communities and the silvicultural objective as laid down in the forest management plan.

407/C I: The degree of thinning does not lower stocking density under the critical level, i.e. until an obvious decrease in increment can be observed, nor to a level at which the functional stability would be impaired. With thinning measures crown-density must not be reduced under 0.6. Exception: stand conversions.

6.3.2.4.3 Seed trees

410/C G: In the future a diversified tree species mixture shall be maintained, or achieved, respectively, in order to obtain a range of products as diversified as possible to meet non-predictable market demands as well as with regard to other possible future products (e.g. genetics, pharmaceutical industry, etc...)

175/3/C I: In the case of natural regeneration a sufficient amount of seed trees of a sufficiently diversified species mixture has to be maintained to guarantee regeneration of the tree species in question depending of the specific potential natural forest community and the abundance of the individual tree species (compare chapter Ecology).

411/C G: Seed trees of rare native species should in any case be maintained as long as possible, in order to guarantee/allow the maintenance and regeneration of these tree species in the long run.

6.3.2.4.4 Forest Protection and Forest Hygiene

417/C G: In order to prevent forest damages which might threaten the existence of a whole stand, trees infested with potential primary pests have to be removed immediately and on a regular basis. For forest protection reasons, however, inconspicuous dead trees should be left to an extent as mentioned in para 46/2. (see para 4/2).

418/C G: With forest protection nature and abundance of the methods applied have to be chosen with regard to an economically efficient cost-benefit ratio over the middle term (e.g. putting up of fences <-> single tree protection; protection against barking damage <-> killing, game enclosures, feeding; use of herbicides <-> soil utilisation).

Preventive measures with regard to rare calamities (such as forest fires, pest infestations, storm damages) have to be taken in an economically sound way carefully assessing possible area and yield losses (e.g. decoy trees, firebreaks, etc.). Furthermore the risk frequency evaluated on the basis of long-term statistics or risk assessment models has to be taken into consideration.

419/C I: Not more than 10% of the thicket and pole stems are affected by barking damage (total of old and new damages).

6.3.2.5 Harvesting and Skidding

6.3.2.5.1 Harvesting Priorities

169/5/C C: Harvesting priorities on the single tree and the stand levels taking into account the specific quality and increment situation and assortment distribution. Another reason for the setting of harvesting priorities is the improvement and maintenance of the functional stability.

406/C I: Harvesting activities are to a large extent limited to small areas and are carried out in accordance with the maturity of the individual stands and merchantability of the growing stock. Furthermore attention is paid to the state of the forest with regard to the predominant forest function. Exception: Forest conversions and incidental fellings (compare 171/5)

6.3.2.5.2 Damages from Harvesting and Skidding

190/5/C: Use of soil and stand conserving harvesting and skidding methods.

190a/5/C I: A maximum of 10% of the upperstory stems, i.e. the future crop trees of the residual stand are affected by harvesting and skidding damages from stand thinning measures or the removal of individual trees.

An adequate growing stock is maintained in the lower story, especially in the case of natural regeneration. This is the case when the destruction of site-appropriate natural regeneration is limited to a maximum of 20% of the regeneration area.

6.3.2.5.3 Product Wastage

191/5/C C: Wastage of Products and Resources

420/C G: There are no excessive losses through harvesting and skidding activities, which could have been avoided.

422/C I: The existing infrastructure (e.g. roads, equipment) is kept in good condition and properly maintained, thus guaranteeing the best possible long-term use of these resources.

423/C G: Operating methods are chosen on account of their economical and efficient use of energy. This applies especially to the use of fossil energy.

424/C I: There are no unproportional losses or lasting damages done to production areas, products or other resources by forest management, e.g. damages on account of building activities in stands situated in lower-lying areas, destruction of springs or biotopes.

6.3.2.6 Transport: Road and Skidding Track Network

195/5/C C: An economically sound (density and construction according to local site conditions) network of roads and skidding tracks which are in line with the general requirements of the enterprise's forest development and logging plan considering the logging systems to be applied.

195/A/5/C I: There are at least rough outlines of a logging and log transport scheme especially adapted to the enterprise's needs, citing the most appropriate (according to the state of the art) logging techniques for the individual stand sites.

196/5/C I: Average density of road and skidding track networks corresponding to the logging systems applied in the various management units. Limit values: forest roads 20-25 m/ha, skidding tracks 0-60 m/ha.

198/5/C I: There are no indications that management goals as laid down in the respective forest management plans are not reached because of limited accessibility, especially in the case of overexploitation of easily accessible areas at the same time.

197/5/C G: The construction of new roads is in an ecologically and economically sound ratio to the newly developed forest area.

425/C I: Road/skidding track construction costs can be covered within a period of 10 years by the timber of the pilot tracks and improvement of the contribution margins or a mathematical approach considering improved forest functions or services including grants.

6.3.3 Timber Production

206/5/C P: Management of the current (merchantable) growing stock in the aim of maintaining a diversified, assortment and varieties rich set of tree species of the best possible quality of even structure and composition.

6.3.3.1 Stand Regeneration

207/5/C C: Comparison of regeneration rates and stand development data with the volume of timber and the area of timber harvested, respectively.

415/C I: Regionally applied and recognised minimum standards concerning stand-conserving regeneration intervals (especially with regard to browsing damage, but also to weeds) are being adhered to. In the absence of such standards, the following requirements should be met:

a) In the case of natural regeneration at least 2000 plants growing on clear-cut areas must have obtained a height of more than 1m over a period of time corresponding to the natural regeneration of the natural forest community.

b) In the case of reforestation at least 2000 plants must have obtained a height of more than 1m within a maximum period of 15 years. Above 1500 m altitude this may take up to 20 years, above 2000 m up to 40 years.

218/1/C I: Stands are only exploited if regeneration (reforestation or natural regeneration) can be expected within reasonable and - depending on the site - economically sound regeneration intervals or over a period of 5 years.

416/C I: With natural regeneration measures in the case of doubt in areas where hunting has no predominant economic importance, enterprises may be required to prove that regeneration intervals inside and outside of game-control fences do not differ by more than 5 years. (see 314/A new)

6.3.3.2 Rotation Period

208/5/C I: Rotation lengths are determined in relation to the age of the stand with the maximum mean annual increment (increase in value, in the stricter sense of the term).

429/C I: Comparison of planned and actual rotation lengths by means of recognised growth charts (in Austria: yield tables) for the main tree species.

430/C G: In the case of continuous forest management systems appropriate production periods or targeted growing stock volumes according to appropriate limiting value, defined and observed.

6.3.3.3 Species Diversity

210/5/C: C: Comparison of species and assortment composition by annual volume of timber harvested and annual exploitation area, respectively, with the logging objective (i.e. the calculated logging volume); exception: incidental fellings.

447/C I: Volume and assortment yield and the annual harvested area, respectively, quantified by a special control system correspond to the planned logging volumes.

6.3.3.4 Planning and Control Mechanisms

222/5/C I: Setting up and implementation of an appropriate planning and control system for silvicultural measures and timber harvesting

219/8/C I: There is a planning and control mechanism for the establishment of stands, tending and harvesting measures in which the reasons for the planned activities are given. Implemented measures are continuously recorded and controlled and their impact on the development of the stand and regeneration is assessed.

This planning and control mechanism has to be adapted to the size of the individual enterprise. A corresponding form has to be set up for small (private) forest estates.

223/5/C I: No unfounded deviations of more than an average of +/- 10% between annual harvest level and yield and the planned volumes over a period of more than 5 years nor exceeding or falling short of production periods by more than 20 years.

229/1 I: Planning of the annual harvest levels is transparent and based on recognised methods of yield estimation/calculation. Control of growing stock and increment data, method of calculation, assumed growing stock (ITW).

221/8/C I: Increment, growing stock and stand regeneration are continuously monitored by means of a forest inventory and control system (adapted to size and management intensity of the enterprise).

6.3.4 Non-timber Forest Functions/Services

431/C C: Safeguarding of non-timber forest functions

432/C G: If vegetation makes hunting difficult forest management measures should allow for an improvement of the preconditions for sound hunting and for game population control measures (e.g. firing aisles, trees for raised hides, an appropriate road network).

433/C G: Forest management shows consideration for sustainable hunting practices, especially with regard to hunting facilities and places of special game ecological importance (feeding sites, winter shelters, eyrie trees, capercaillie biotopes).

435/C G: If hunting practices can be regulated on the company level management measures have to be taken guaranteeing that in the long run profits from hunting remain at a reasonable ratio towards forest protection expenses and tacit losses (e.g. losses of tree species) and that they do not at the same time jeopardise other required forest functions.

434/C I: Forest areas with specific protective functions for human habitation and settlement areas including infrastructural facilities are identified and documented. The beneficiaries are identified and appropriate compensation for additional expenditures in forest management is laid down in public or private law.

436/C I: There are guidelines for the management of forest areas with a specific protective function against the wearing-away powers of wind, water and erosion. Silvicultural measures aim primarily at maintaining and improving stability with regard to the specific protective functions.

437/C I: If the supply of water and especially drinking water is of special regional or local importance forest management ensures best possible drinking water protection taking into consideration the long-term availability of drinking water in the best possible quality and quantity. There are guidelines for the silvicultural treatment of water protection areas. Compensation for services provided by forest management is laid down in public or private law.

440/C I: There are guidelines for the management of important recreation and amenity forests paying special attention to these functions (wayside design, viewpoints,...).

441/C I: Recreational facilities are provided in important recreation forests. These services are appropriately compensated or compensation for additional expenditures in forest management is laid down in public or private law. At least the establishment of recreational facilities is made possible after fixing appropriate compensation.

442/C I: Forest areas with **special noise abatement and/or ambient air pollution abatement functions** are identified and recorded. If polluters and beneficiaries are identified compensation of additional expenditures in forest management is either laid down in public law or regulated by private-law agreements.

443/C I: There are guidelines for the treatment of these forest areas to ensure or enhance their noise abatement and/or ambient air pollution abatement functions.

445/C G: Forest management considers the forests **landscape protection function** by conserving or improving characteristic landscape elements (e.g. forest edges, tree monuments).

446/C I: In the case of specific local or regional needs regarding forest areas which have predominantly **nature protection functions** (e.g. old trees, biotopes) forest management is geared to conserving these areas and their protective functions after prior settlement of compensation issues with public or private institutions (non governmental organisations, associations). The establishment of information, monitoring and infrastructure facilities is made possible.

6.4 SOCIO-ECONOMIC ASPECTS

Comments and Definitions

Formal rights are rights based on international and national laws and agreements recorded in writing.

Customary rights are rights of individuals or groups founded upon customary, long continued (e.g. 30 years in Austria; 20 years in Paraguay) practices and usage.

Traditional rights are rights of indigenous and traditional peoples which (up to now) have not been considered in the national and international context or have not (yet) been recorded, and which are based on the legal systems of the individual cultures.

Local population: the current population of a specified geographic area, including indigenous and traditional population groups as well as population from colonisation's and spontaneous settlements.

Traditional population: ethnic peoples and population groups within a nation whose traditional legal system is not the basis of national law or their language (except ethnic and linguistic minorities) is not the official language of the state. They may even be the majority population of the specific nation. Culture and especially the territories, rights and economic systems of traditional populations have to be especially respected.

Indigenous population: ethnic peoples or population groups who are the autochthonous population of a geographic area, or a nation-state respectively, and, who, in a historical process, were in the course of colonisation or similar processes directly or indirectly (also because of the growing population pressure from neighbouring traditional and indigenous peoples) expelled or reduced in number. In most cases they are minorities or small (i.e. small in number) people. Culture and especially the territories, rights and economic systems of indigenous peoples have to be especially protected.

Both population types can in the broader sense be considered as indigenous. But on account of historical, political and other differences in their specific living conditions within the nation-states in which they are currently living, a differentiation between "traditional" and "indigenous" in the stricter sense of the term does make sense. Whether a population is considered as

indigenous or traditional has in the last instance to be decided by the population group concerned.

Leading Forest Authority: person charged with overall planning and control of forest management.

Very small forest: Enterprises (management units) with a forested area of less than 50 ha.

Small forest: Enterprises (management units) with a forested area of less than 200 ha.

6.4.1 Design of external relations

P: Sustainable management has to guarantee constructive and consistent socio-economic relations within its external sphere of influence.

6.4.1.1 Rights and Participation of the local/traditional/ indigenous population

P: Clarification of existing rights and obligations towards the population, especially towards indigenous peoples.

P: Clarification of existing formal, traditional and customary land and usufruct rights of the local, traditional and indigenous population.

234/13/F P: As a precondition to forest management the formal, traditional, and customary land and usufruct rights of the local, traditional and especially indigenous population of the area and neighbouring regions have to be fully registered, defined and legally stipulated. Furthermore the boundaries of the estate (management unit) in question have to be physically demarcated. This has to be done in a way consistent with the culture of the concerned populations.

Rights of use include especially: land; water; game; fisheries; pastures; wild plants and fruit, medicinal plants, foods and luxury foods (e.g. honey); natural materials (e.g. firewood, materials for the construction of housings, means of transport, tools, clothing, etc.) and the like, as well as the right of access to these resources.

246/8/F I: There are:

- legally binding surveyed maps indicating the areas the individual population groups of the region claim land titles and rights of usufruct to;
- valid property rights to the individual property areas (in copy);
- lists giving detailed information on geographical extension, contents and amount of the specified rights of use. These rights are acknowledged by all contracting parties.
- Specific measures for the protection of resources which are important for the local, traditional, and indigenous population
- established procedures for the settlement of conflicts over possessory titles and rights of usufruct. These procedures are recognised by all contracting parties.

601: I: Contracts concluded with the indigenous population are controlled and countersigned by a third person who enjoys the confidence of the indigenous population.

602: I: All data are drawn up in the languages of the local, traditional and indigenous population or at least in the respective lingua franca; for illiterate communities tape recordings are provided.

260/2/F I: Regular meetings are planned between the representatives of the contracting parties; these meetings are held and recorded.

603 I: The implementation of the agreements made can be easily verified.

241/12/F I: All agreements and especially those with regard to land titles and rights of use as well as conservation regulations are clearly laid down in the respective forest management plans and they are recognised.

604: I: The clearly marked boundaries of the individual estates are and remain visible (from 50 ha onwards).

235/14/b/F P: In general, unresolved conflicts over land titles preclude certification. Should in this connection a lawsuit be filed after certification, certification will be suspended until the situation is entirely clarified. (from 200 ha onwards).

605 I: There are clear statements of the within the national context competent state authorities, of the representatives of the local, traditional and indigenous population, as well as a written expert statement of a spokesperson of the indigenous population.

235a/14/F P: Local, traditional, and especially indigenous populations holding formal, traditional and customary rights of possession or usufruct maintain full control over forest management measures unless they delegate this control, or parts of it, voluntarily and deliberately to other organisations. In the case of traditional, but especially indigenous, populations, this delegation of control has to be carried out considering the respective cultural norms, conventions and socio-cultural control mechanisms. Contracts with indigenous groups are liable to formal renewal every two years.

238/3/F I: Detailed contracts relative to these agreements are drawn up in a way so that they are understandable for all contracting parties. With indigenous populations contracts are controlled and countersigned by a third, competent person who enjoys the confidence of the indigenous population.

606 I: Regular meetings with the representatives of all parties involved in order to discuss open questions, decide upon new measures to be taken and clarify situations are provided for. These meetings are adapted to the socio-cultural norms/ conventions of the traditional and indigenous population. These meetings are recorded; upon request tape recordings are made.

240/1/F I: There is detailed information on regulations for areas with conflicting forms of use. The implementation of these regulations can be verified. In case of doubt decisions have been taken in favour of the local, traditional and indigenous populations.

607 I: All agreements are concluded in a way allowing verification of their proper implementation.

P236/14/F G: Especially in the socio-economic and ecological context, the intellectual property of traditional and indigenous peoples is formally accepted and appropriately compensated. The same applies to commercialisation's which are directly or indirectly linked to their ethnicity and indignity.

608 I: There are corresponding legally binding contracts, the implementation of which can be verified. Contracts concluded with indigenous communities are controlled and countersigned by a competent third person who enjoys the confidence of the indigenous population. If neither the intellectual property nor the image of the traditional and indigenous population is exploited, there is a corresponding statement from representatives of the population as well as from competent third parties.

6.4.1.2 Cultural Heritage

609 P: Sites of special cultural, historic or religious significance for the local, traditional and indigenous population are clearly identified, recognised and protected.

249/1/F I: Sites of special cultural, historic, and religious significance are identified, recorded and placed under efficient protection. These protection measures are worked out in accordance with the population concerned and their proper implementation can be verified.

610 I: There are protection measures which have been worked out in co-operation with the population concerned and potential competent state authorities.

6.4.1.3 Jobs and integration of the local/traditional/indigenous population

252/5 G: Jobs are in the first place offered to the local population. There are training opportunities enabling those interested to acquire the necessary skills/qualification.

254/2 I: Qualitative and quantitative share of the local population in the workforce (in %?)

611 I: List of planned and implemented measures allowing the best possible integration of the local workforce. (Implemented measures for the best possible integration of the local workforce are recorded).

6.4.1.4 Consultation of the local/traditional/indigenous population

263/3/F C: The primary representative unit of the local, traditional and indigenous population is the self-organised community. The communities may designate representatives for conducting negotiations, consultations and controls.

612 I: The representative communities of the local, traditional and indigenous population are identified.

613 I: The representatives of the communities equally represent the concurrent interests of men, women, and of any fringe groups or minorities.

614 I: Regular meetings are agreed upon and recorded. The implementation of agreements and measures can be monitored.

262/8/F I: Thematically qualified organisations, e.g. NGOs, the local, traditional or indigenous population wishes to consult are involved in the establishment and monitoring of contracts and their implementation. Furthermore they provide information and training programmes.

6.4.1.5 Affects of local timber processing on the regional economy

Effects of local timber processing on the regional economy have been excluded from the Austrian test. This was decided on account of the very complex small scale local interrelationships and the determination of rural development by conditions above the enterprises' responsibility.

Further discussion of a possible inclusion of aspects of regional economy in a set of criteria and indicators for sustainable forest management seems indispensable, especially with regard to extra large concessions in countries where these are guaranteed.

6.4.2 Internal Aspects

P: Sustainable (forest) management has to guarantee constructive and stable socio-economic relations within the enterprise.

P269/14 Management measures should be in line with all applicable rules and regulations concerning health and safety of the employees and their families. This includes

- adequate safety measures
- appropriate safety equipment
- health and accident insurance (including security of existence)
- sufficient education and training facilities and correct use of the working material

6.4.2.1 Working conditions, safety provisions and health insurance

P: Insurance of fair and adequate payment to motivate employees and to guarantee a sound use of forest resources.

255/3 C: Employment conditions (payment, equipment and working hours) are the same for local and non-local employees doing the same job.

501 I: Adequate minimum pay standards are defined and adhered to by the forest owner/applicant.

502 I: The applied (flexible) payment schemes are recorded. They give due consideration to safety techniques and qualified work. They do not prevent sound forest management (intensity, quality, safety provisions).

P/G: Insurance of fair working conditions in order to guarantee sustainable use of forest resources.

511 C: Health insurance, insurance coverage and safety measures

503 I: Minimum social security provisions for the employees and their families are guaranteed. This includes especially the following aspects:

- sufficient medical assistance in the case of disease and accidents including appropriate continuation of payments to sick workers
- sufficient provisions for the surviving dependants in the event of death
- sufficient unemployment benefits provided for an appropriate period of unemployment on account of an accident not brought about by the worker himself
- adequate old-age pension schemes
- sufficient provisions for workers unfit for work or incapable of earning a living at all due to an occupational disease or an accident at work, including provisions for the surviving dependants
- adequate invalidity benefits.

These provisions/benefits are at least granted to the extent stated in the ILO agreement no. 102. In the absence of appropriate legal state or other public social security systems the forest manager/holder of a supra-regional concession applying for certification has to ensure adequate insurance provisions within the enterprise.

504 I: There are safety measures and regulations for forest work (including protective clothing) and for the correct use of machinery and equipment. These measures and regulations are adapted to the individual climatic and working conditions and they are observed. Corresponding instruction of the employees as well as the proper implementation of these rules and regulations are documented. In countries where there are no corresponding legal safety regulations and control mechanisms, relevant instruction is also documented with external contract crews.

506 I: Labour of children under 12 years is forbidden (does not occur). Children over 12 years are only called upon to do light labour corresponding to their age (e.g. collecting of non-timber products) and only for a limited period of time. Exempt from this prohibition of child labour is sporadically and temporary help in the enterprise of parents, step parents or foster parents (up to the third degree), provided that their legal representative/guardian gives his consent.

6.4.2.2 Education and further training

P: The sensitisation to sustainable management as well as education and further training of forest managers and their employees has to be guaranteed. In this connection the ecological, economic and socio-economic sustainability of forest management has to be taken into consideration.

512 C: Education and further training

507 I: Those persons who are in charge of planning and control of forest management have received an adequate professional training:

*In enterprises of more than 500 ha which constitute an economic unit, even if not spatially coherent, the person in charge of planning and control has at least 3 years of a professional training in forestry. One single forestry authority may be in charge of a number of enterprises, provided that the total area of these enterprises does not exceed 2000 ha and that the location and accessibility of the total forested area allows sound combined management. In enterprises of more than 2000 ha, the person charged with planning and control has a professional training in forestry of at least 4 years.

* In enterprises of 200-500 ha at least a professional training in agriculture and/or forestry is required.

* In small forests (enterprises smaller than 200 ha) proof of several years of practical experience in agriculture and forestry is regarded as being equivalent to a corresponding professional training.

If these requirements are not met, at least proof is furnished of regular consulting of an advisory service.

508 I: Adequate professional training of the persons supervising and managing the silvicultural activities including the correct use of safety equipment, machinery and tools is ensured. With enterprises smaller than 500 ha several years of practical experience (e.g. of farmers working on contract, logging companies) are regarded as being equivalent to a corresponding professional training.

509 I: Further training of forest managers and /or the persons responsible for forest management of at least 3 days within 5 years (in the case of extension of the certification) is documented by participation in training events (courses, lectures, excursions, individual consultations, group discussions).

513 I: There are sufficient education and training opportunities to obtain the necessary qualification. If there are no general education and training opportunities available, the forest manager/holder of the license provides the necessary training facilities (Only for large-scale enterprises of more than 5000 ha).

6.4.2.3 Freedom of organisation of the employees

P: The right of the forest workers to organise themselves into unions and to negotiate with the employers upon request is to be respected.

271/5 C: Statement of employment policy and labour relations

271/5/E: The forest workers have the right to organise themselves into interest groups and into work councils and to negotiate with their employers if/whenever they wish to do so.

510 I: Employees are adequately protected against any infringement of their right to unionise in the professional context. Labour relations are legally stipulated or - in case this is not sufficient - laid down in written agreements.

6.4.3 Non-timber socio-economic forest services (multi-functional forest functions)

These aspects are to a large extent treated in chapter 3.4. In the present chapter on socio-economic aspects they are only cited for completeness's sake: e.g. hunting; protection (against eroding forces) of human habitats and cultural areas; groundwater and spring protection; amenity and recreational functions; protection against noise and ambient air pollution; carbon dioxide absorption and reduction of the greenhouse effect, landscape and nature protection, conservation of forests as settlement and living areas - especially of indigenous peoples.

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ANNEX

Annex 1: Assessing criteria for sustainable forestry by Ravi Prabhu 1994

Annex 2: Test set (set of C & I tested in Austria)

Annex 3: Form 1

Annex 4: Evaluation of form 1

Annex 5: Form 2

Annex 6: Example of a filled form 2

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Annex 1

Assessing criteria for sustainable forestry by Ravi Prabhu 1994



Testing Criteria and Indicators for Sustainable Management of Forests

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Fact Sheet

Objectives: 1) Identify criteria and indicators which are objective, cost-effective and relevant to the sustainable management of forests, based on evaluation of existing criteria and indicators in forests under different local forest conditions. These may be of a generic or a site-specific nature. The focus will be to identify minimum reliable sets of such criteria and indicators. Current sources for these criteria and indicators are: Lembaga Ekolabel Indonesia (LEI), Woodmark (Soil Association, UK), Smart Wood Program (Rainforest Alliance, USA), the Criteria and Indicators of the ITW ('Tropenwald', Germany), Dutch Working Group (DBB, Netherlands) and the Green Label of the African Timber Organisation (ATO).

- 2) Develop a methodology for the objective evaluation of criteria.
- 3) Develop a system to evaluate the sustainability of forest management as a whole, based on the recommended criteria and indicators.

Duration: 18 months, 01.08.1994-31.01.1996

External Collaborators: Ministry of Forestry, LEI (both Indonesia), SODEFOR (Côte d'Ivoire), IBAMA, IPEF (both Brazil), Institute of World Forestry, Initiative Tropenwald, GTZ (all Germany), Soil Association (UK), Rainforest Alliance (USA), African Timber Organization (Gabon), ITTO (Japan), Forest Stewardship Council (Mexico), European Commission, Directorate General for International Cooperation (DGIS, Netherlands).

Funding: Financial support to the project is being provided by the European Commission, Deutsche Gesellschaft für Technische Zusammenarbeit GmbH (GTZ), African Timber Organization, DGIS and CIFOR.

Sites: Forstamt Bovenden (Germany), PT. Kiani Lestari (Indonesia), Haut Sassandra and Bossematié (Côte d'Ivoire), Brazil, Cameroon

- Expected outputs:**
1. Methodology to evaluate criteria and indicators (Report).
 2. Recommended criteria and indicators for the evaluation of sustainable forest management (Report).
 3. System for the evaluation of forest management (Guidelines/Software).

CIFOR Scientists involved: Dr. Ravi Prabhu (Project Coordinator), Dr. Eva Wollenberg, Dr. Dennis Dykstra, Dr. Neil Byron, Dr. Carol Pierce Colfer, Mr. P. Venkateswarlu

Relevance to other CIFOR research programs: Global Benchmark Sites for Biodiversity Assessment', Dr. A. Gillison; Reduced Impact Logging; Income generation and incentives for forest management amongst forest villagers, Dr. Wollenberg; Effective in situ conservation of tropical forest ecosystems: development of methodology, Dr. T. Boyle.

Current Status: The first test was completed in November 1994 in Forstamt Bovenden, Germany. A team lead by Mr. John Palmer (U.K.) tested the methodology developed for the project and the selected criteria and indicators. The team's recommendations on the

methodology for the project was subsequently discussed at an international workshop in Göttingen attended by representatives of organisations from seven countries. This workshop resulted in modifications to the methodology. Analysis of the team members evaluation of the criteria and indicators is currently underway. Other members of the team were: Mr. Lukito Daryadi (Ministry of Forestry, Indonesia), Mr. Peter Boateng (African Timber Organization), Mr. Per Rosenberg (WWF Sweden) and Mr. Eberhard Panitz (Forest Service, Lower-Saxony).

An International Project Advisory Panel (IPAP) has been constituted to advise the project on policy and technical matters. The IPAP currently consists of representatives of all external collaborators. The IPAP has met twice. The first meeting was held in Bogor, Indonesia on December 8, 1994 and the second meeting took place on May 9 in Abidjan, Côte d'Ivoire. The project is also assembling a group of eminent scientists to form a Scientific Support Group, which will provide scientific inputs to the project team. The first meeting of this group took place in Hamburg, Germany from July 24-26, 1995.

The second test took place between March 5 and April 2, 1995 and focused on the Batu Ampar concession of PT. Kiani Lestari in East Kalimantan. The expert panel consisted of Mr. Peter Burgess (*Team Leader*, Forester, UK), Dr. P.M. Laksono (Anthropologist, Indonesia), Dr. Elias (Forester, Indonesia), Dr. Wan Razali Wan Mohd. (Forester, Malaysia), Dr. Dick Watling (Ecologist, Fiji). This test closed with an international workshop held in Samarinda from March 30 to April 2.

The third test took place from June 2-30, 1995 in Côte d'Ivoire. Members of the test team were Mr. Patrice Mengin-Lecreulx (*Team Leader*, Forester, France), Mr. Charles Huttel (Ecologist, France), Dr. Heleen van Haaften (Sociologist, Netherlands), Mr. Ahui Anvo (Sociologist, Côte d'Ivoire), and Dr. N'Guessan Kanga Anatole (Forester, Côte d'Ivoire). The team concentrated its activities in the Haut Sassandra and Bossematié regions. This test was carried out in close collaboration with SODEFOR and the African Timber Organization.

The fourth test took place in Brazil from October 23 to November 19, 1995. Members of the team were Mr. Johan Zweede (*Team Leader*, Forester, USA), Dr. Natalino Silva (Forester, Brazil), Dr. Virgilio Viana (Forester, Brazil), Dr. Rita Mesquita (Ecologist, Brazil), Mr. Jan Kressin (Sociologist, Germany). Test site were the forests of the CEMEX company between the Tapajos and Curua Una rivers, south of Santarem. The test was organized in cooperation with IPEF, Piracicaba.

The Ministry of Environment of the Federal Republic of Austria carried out an independent test of criteria and indicators based on the methodology developed at CIFOR from October 23 to November 3 at two sites - Gföhl and Krems - in Austria. The team members included Dr. Georg Willi (*Team Leader*, Liechtenstein), Dr. Sigi Terzer (Forester, Austria), Dr. Ekkehard Senitza (Economist, Austria), Dr. Fritz Reimoser (Wildlife Ecologist, Austria), and Dr. Franz Rest (Farmer and Communications Specialist, Austria). Dr. Friedl Grunberg, a social anthropologist who examined the social C&I pertaining to forest people in developing countries, was involved for part of the two week test. Results from this test will be reflected in the final report.

A second phase for the project is currently under preparation. During this second phase the project will seek to develop a 'tool box' approach to sustainability assessment at the forest management unit level based on the conclusions of the first phase. A test in Cameroon is foreseen during this October 1996 of this phase. Among other activities this second phase will evaluate and develop criteria and indicators for forests managed by local communities, develop further the work initiated on social criteria and indicators and initiate new work on indicators on biodiversity and weighting and scoring of criteria and indicators (decision making tools). The two year second phase will conclude in January 1998.

Contact Scientist: Dr. Ravi Prabhu, CIFOR. email: r.prabhu@cgnet.com

30-Apr-96

Assessing Criteria for Sustainable Forestry

CIFOR is coordinating a project that aims to determine the best criteria on which to base the assessment of good forest stewardship

by Ravi Prabhu

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Recent concern about the future of forest resources has led to a call for the introduction of sustainable forest management systems. This has led in turn to a debate about what constitutes sustainable management.

Several definitions have been proposed that converge around basic concerns for a lasting improvement in the well-being of people and for protecting and maintaining the regenerative capacity of forest ecosystems to provide such improvements while minimising losses of biodiversity. Modern definitions of sustainability go beyond the principle of sustained yield which has governed planned forestry for the last two centuries, particularly in Europe. It is important to understand that sustainable management of forests does not mean a flow of goods and services at constant rates. As with any dynamic natural system, outputs from sustainably managed forests will fluctuate. The amplitude of these fluctuations must be controlled to ensure that the system remains stable.

The sustainability principle can only be expected to hold true as an average condition over long periods. Because proof lies in the past and as the future is fraught with uncertainty, predictions of sustainability must remain largely

speculative. This is particularly true over the long production periods in most natural forests where performance data are lacking. The situation is further complicated by the fact that the concept of sustainability itself is subject to change as society's perception of it changes.

Despite these problems, one can assert that pursuance of the sustainability principle leads to the adoption of forest management practices that in sum constitute good stewardship of forests. Good forest stewardship is the best we can do at the moment but is also, I suggest, the short term manifestation of sustainable forest management. It is a snapshot of management along a trajectory that under most conditions offers the best chance of sustainability.

As with biodiversity, there is currently no operational definition of sustainability. In order to at least partly compensate for this, most definitions are accompanied by criteria and indicators for sustainable (or good) forest management. I shall follow Maini (1993) and define a *criterion* as a distinguishing characteristic of a thing that provides policy framework and an *indicator* as any variable that can be measured in relation to a specific criterion. Use of such criteria, it is hoped, will enable current (and past) management practices to be related to an operational concept of good forest stewardship.

The Need for Criteria Testing

Presently, there is no reliable information on the performance of such criteria and indicators for good forest stewardship or sustainability. This is primarily because the relevance of such criteria to good forest stewardship has not been subjected to rigorous and objective testing. There is also a dire need to test their efficiency as assessment instruments.

Objective testing of criteria would help reduce their number to an efficient, minimum set. It would also improve the prospects for their acceptance by practitioners. This is especially true in the case of certification.

CIFOR to Test Criteria

The Centre for International Forestry Research (CIFOR) is carrying out a research project to test criteria for the sustainable management of forests which, as explained earlier, is tantamount to testing criteria and indicators for good forest stewardship.

The project is framed by a cooperative and participative process involving producers and consumers of forest products. The need for such a research project was first identified by the Weilburg Group, an informal group of forestry experts which met in Weilburg (Germany) in February 1994. The idea was subsequently supported by forestry advisors in tropical and temperate countries and commenced officially on 1 August 1994.

Research Objectives

The aim of the project is to develop a regionally adaptable set of criteria and indicators incorporated within a mechanism for objective evaluation for the sustainable management of natural forests. Criteria and indicators selected for testing include those of the Smart Wood Program, Woodmark, Initiative Tropenwald, the Lembaga Ekolabel Indonesia and the Green Label. They will be subjected to comparative studies in managed production forestry in Germany (in collaboration with the Institute of World Forestry and the Forest Administration of Lower Saxony), Indonesia (in collaboration with the Ministry of Forestry) and Cote d'Ivoire (in collaboration with the African Timber Organisation). A similar test is foreseen in Brazil in cooperation with IBAMA. In all these countries, the active involvement of relevant non-governmental organisations is being sought. There is also the possibility of other countries carrying out independent tests using the methodology developed by CIFOR, as for example is currently envisaged in Austria.

Problems Associated with Comparative Testing of Criteria

We anticipate the following problems in assessing the criteria:

- subjective criteria and indicators will be an impediment to comparison of results between tests;
- despite superficial similarity, linear comparison of criteria will in many cases not be possible because either the same aspects of management are not covered, or their focus may diverge between outcomes of forest management and inputs;
- most criteria lack well-defined upper and lower bounds. This usually reflects a lack of relevant research-based information;

The selected methodology will need to allow a flexible reaction to accommodate very different conditions at the test sites. There has to be scope for creative inputs from the experts in the field if we are to arrive at a set of more efficient criteria at the end. The selection process will therefore be dynamic and iterative.

The method of analysis must allow for the inclusion of subjective elements but at the same time must, where possible, provide objective comparisons of the data collected.

In order to incorporate these features, the methodology will be designed around the responses of four teams – one in each country selected for the tests – each consisting of five experienced consultants drawn from disciplines such as forestry, ecology and social anthropology, chosen to reflect different institutional, organisational and national backgrounds. Their varied experience and backgrounds will, it is expected, provide the desired flexibility.

Three points need to be clarified: first, we will be focusing on testing criteria and indicators and not sustainability; second, this focus will be primarily at the level of the forest management unit (eg a forest concession); and, third, we are not interested in establishing the comparative advantages of the different sets of criteria from which the criteria and indicators are drawn.

The Test Procedure

The test procedure is best explained using a flowchart of activities (Figure 1) for each test. The steps involved are:

1. Collection of preliminary (basic) information prior to the arrival of the test team at the site;
2. Preliminary workshop to discuss methodology;
3. Survey of institutional, planning and management documents, and social and economic data;
4. Field survey (prescribed sampling and individual inspections) of the biophysical and socio-anthropological factors;
5. Application of the criteria and indicators to forest management at the test site using forms of the source institutions;
6. Evaluation of the criteria and indicators using a standard reporting format. This format foresees graded responses on the relevance,

objectivity, feasibility and cost-effectiveness of criteria. In addition, the consultants will be required to provide short descriptive evaluations of the relevance and intelligibility of criteria. Costs (time, material) involved in assessing the satisfaction of a criterion will be recorded;

7. On-site analysis of results during a workshop. Important aspects will be the identification of redundancy, generic/regional relevance and preliminary identification of limits and weights. Workshop participants will also be expected to suggest improvements to the methodology. This workshop is designed to deliver a subjective analysis of the results;
8. Off-site analysis will be based on categorical data analysis and testing for sensitivity via modelling procedures including expert systems currently under development. Analysis will take place at three levels: responses to the same indicator/criterion, comparison of responses to similar indicators/criteria and comparison of responses to arrive at relative weights for criteria deemed to be relevant. Towards the end of the tests phase, in October-November 1995, the results of the four or more tests will be compared. The off-site analysis is being designed to deliver a more or less objective analysis of what may be mostly subjective responses.

Expert Groups

There will be two expert groups associated with the project. The Scientific Advisory Group will consist of scientists external to CIFOR who will provide scientific input into the development of methodology, test activities and analysis of results. The International Project Advisory Panel will oversee the project and ensure that the highest possible transparency is maintained. It will consist of representatives of countries where testing operations will take place, representatives of certification organisations that have provided criteria for testing, funding agencies and independent organisations involved in the sustainable management of forests, such as the Forest Stewardship Council and ITTO.

Results Available in 1996

The project will take 18 months to complete. The final report will be delivered in February 1996 and will be disseminated either directly or through such forums as this newsletter.

- the problem of measurement is closely related to the preceding one. However, there is also a dearth of appropriate and practical measurement techniques. Examples are the inability to assess biodiversity losses or degree of social acceptance;
- as most criteria are substantially subjective, there is room for interpretation which is increased with laxity of definition;
- some sets of criteria prescribe rigorous methods of sampling/data collection as a first step towards assessment. Others are vague on this subject;
- many sets of criteria are not weighted (ie they are not ranked in importance). This poses the question of the relative importance of the fundamental linkages between criteria and overall sustainability.

Methodology

For practical purposes, the methodology selected for the CIFOR tests will be a balance between subjectivity and objectivity. Both the nature of the resource being managed and the management process itself require expert professional judgements, more so as research on forest management, especially in the tropics, is generally inadequate. Although subjectivity is therefore unavoidable, to be able to compare results between tests on different sites the methodology will have to be as objective as possible.

The sets of criteria and indicators we will be recommending at the end of this project are expected to be an important contribution towards a more objective and efficient assessment of the sustainability of forest management. The implications for the certification process are also positive, both because of the nature and qualities of the criteria and indicators recommended by the research project and because of the higher acceptance we expect them to enjoy as a result of the tests.

This article is adapted from a paper delivered to the International Conference on Forest Product Certification Systems held in Pacet-Puncak, Indonesia last September.

Certification at a Glance

Timber certification is a process which results in a written statement (a certificate) attesting the origin of wood raw material, and its environmental (or other) status and/or qualifications following validation by an independent third party. It is, however, noted that certification may be used to validate any type of environmental claim made by a producer, or to provide objective, neutral information disclosing facts about a product that would not necessarily be disclosed by the manufacturers.

Timber certification typically includes two main components: certification of sustainability of forest management; and product certification.

Certification of forest management covers forest inventory, management planning, silviculture, harvesting, road construction and other related activities as well as the environmental, social and economic impacts of forest activities.

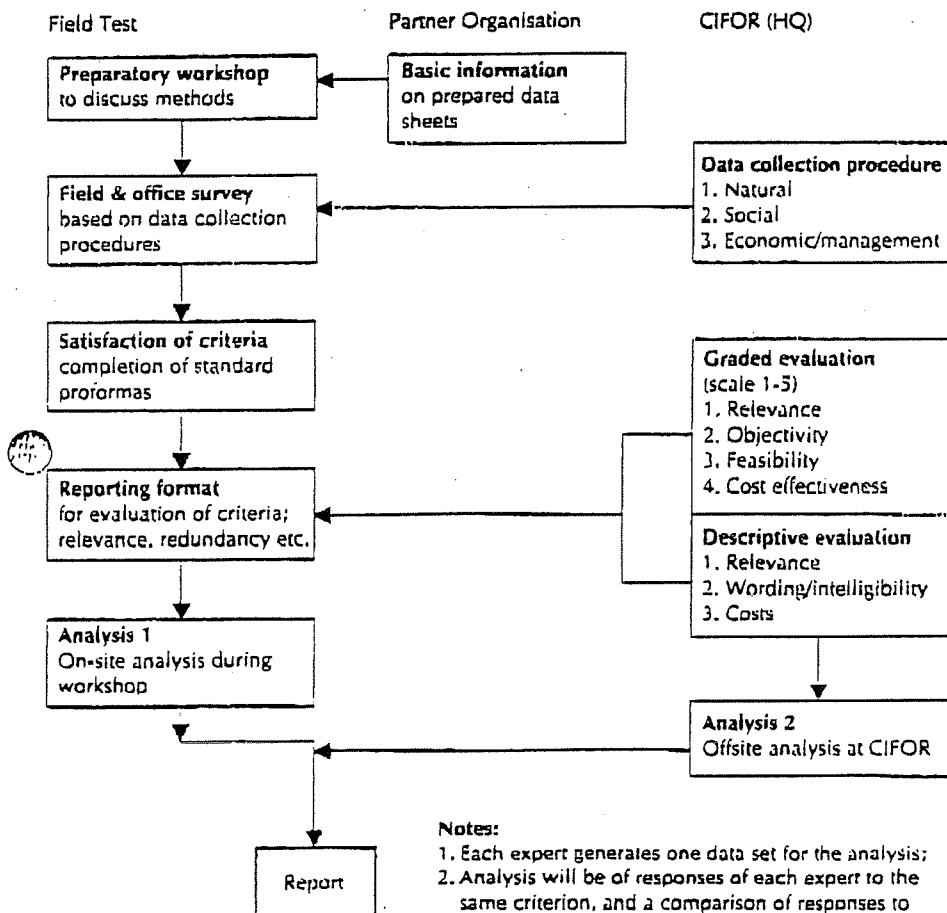
In product certification, roundwood and processed timber products are traced throughout the successive phases of the supply chain (chain-of-custody). This includes log transportation, log storage, primary processing, intermediate product storage, transport of intermediate products, various phases of further processing, transport and distribution between them, and finally distribution of end products.

Certification of forest management takes place in the country of origin while product certification also covers the supply chain in domestic and export markets.

For certification of sustainability of forest management, inspection of forest management is necessary. This involves a review of relevant documentation and carrying out field checks. The field checks may be carried out before, during and after harvesting. This process is sometimes also called forest auditing.

From : ITTO report on certification schemes (see page 5).

Figure 1: Test Methodology



Notes:

1. Each expert generates one data set for the analysis;
2. Analysis will be of responses of each expert to the same criterion, and a comparison of responses to similar criteria (comparison of criteria);
3. Weighting of criteria will follow analysis of variance of responses;
4. Responses of experts on their own fields of speciality will carry higher weights, thereby ensuring both inter-disciplinarity and adequate technical value of responses.

Annex 2

Test-set

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Providing of the test-set - General remarks

The whole project is based on a Federal Law on the creation of a quality mark for timber and timber products from sustainable forest management (Federal Legal Gazette 228/1993). Article 3, paragraph 2 stipulates that the Federal Minister for Environment, Youth and Family is in charge of defining by ordinance the prerequisites for sustainable use after consultation of the advisory board (§4). This advisory board established an expert committee on sustainability and recommended carrying out a series of tests within the framework of the international CIFOR project.

Members of the Committee on Sustainability:

Dipl.-Ing. Günther Siegel (Federal Ministry of agriculture and forestry/chair)
 Martin Frimmel (Greenpeace Austria)
 Dip.-Ing. Josef Hackl (Federal Environment Agency)
 Dr. Günther Lutschinger (WWF Austria)
 Dipl.-Ing. Thomas Stemberger (Standing Committee of the Presidents of the Austrian Chambers of Agriculture)
 Mag. Dr. Ulrike Vorbach (Austrian Federal Economic Chamber)

Substitute members:

Dipl.-Ing. Herbert Kohlross (Standing Committee of the Presidents of the Austrian Chambers of Agriculture)
 Mag. Elisabeth Samec (WWF Austria)
 Dipl.-Ing. Dr. Johannes Schima (Standing Committee of the Presidents of the Austrian Chambers of Agriculture)

In the course of the constituting session of the expert committee it was agreed upon to check the ten sets of criteria and indicators (C & I) included in a study on „Timber Labelling - a Quality Mark for Timber and Timber Products - Options to be Considered“ (RAMETSTEINER 1994) as well as five other lists of criteria for their applicability. The following methods for assessing the sustainability of forest management systems were evaluated:

- 1) Criteria for evaluating and assessing forest enterprises in the tropical forest region (Germany, Initiative Tropenwald)
- 2) Principles of Responsible Forestry (UK, Soil Association)
- 3) Categories and criteria of the African Timber Organisation
- 4) Smart Wood - Certification Program (USA, Rainforest Alliance)
- 5) Scientific Certification Systems (USA)
- 6) Criteria for Sustainability (International Tropical Timber Organisation)
- 7) Environmental and Socio-economic criteria and indicators for the Sustainable development of Boreal and Temperate Forests (CSCE seminar in Montreal)
- 8) Principles and criteria of Natural Forest Management (Forest Stewardship Council)
- 9) Principles of Respectful Human Relationships with Forests (Greenpeace)
- 10) List of criteria and indicators of the Conference of Ministers on the Protection of Forests in Europe (Helsinki Conference)
- 11) Evaluating Sustainable Forest Management (The Netherlands)
- 12) Responsible Forestry Standards (UK)
- 13) A Comparative Study of Evaluation Systems for Sustainable Forest Management (Germany, UK)

14) Indonesian Initiative on Certification/Ecolabelling

15) Criteria for the Evaluation of Sustainable Management of Tropical Forests:

Referring to the criteria established for implementing the Helsinki Resolution H1 the expert committee agreed to use the following criteria for evaluating the a.m. methods/reference works:

- A) Forest distribution (land use)
- B) Biodiversity
- C) Soil Protection
- D) Protection of Water Resources
- E) Forest Condition
- F) Contribution to the global ecological cycle
- G) Legal and institutional infrastructure
- H) Timber production
- I) Other economic services
- J) Public benefits
- K) Participation and indigenous peoples

Following the evaluation of the results of the assessment of applicability carried out by the members of the expert committee (see chart) the criteria included in the international sets of C & I were compiled and compared according to the a.m. evaluation criteria (A-K).

	ITW	Soil A.	ATO	R. All.	SCS	ITTO	KSZE	FSC	Greenp.	Helsinki	Indones.
For. Distribution	II	IIII			I	I		II	I	II	I
Biodiversity	I	III		I	I	I	III	II	II	II	
Soil protection		IIII			I		I	II	I	I	
Water	I	IIII		I	II	I		II	I	I	
For. Condition	I	III				I	II	I		II	
Global ecology		I					II			I	
leg./inst. infra.	III	III			I	II		I	I	I	
Timber prod.	III	III	I	I	II	I			I	II	
other econ. ser.	I	III		I	I		I	II	I	I	
public benefits	I	III			I		II	II	I	I	
Partic./indig.	I	IIII		II	II			III	II		I
	5	6	3	3	3	6	6	6	6	6	4

Legend:

- The assessment of the applicability (especially with regard to the Austrian situation) of the a.m. sets of C & I by the members of the expert committee was carried out according to a three point scale (not suitable - insufficient/satisfactory - good). The entries made correspond to the number of highest ratings (e.g. two members of the expert committee rated the ITW set with regard to point A) Forest supply as "good").
- Abbreviations: ITW - Initiative Tropenwald; Soil A. - Soil Association; ATO - African Timber Association; R.All. - Rainforest Alliance; SCS Scientific Certification Systems;
- Sets which were in no respect rated "good" (no. 11), sets cited twice (no. 12, no. 15) and those sets which were considered irrelevant do no longer figure here.
- Last line: total number of the assessments carried out.

Then Dipl. Ing. Ewald Rametsteiner was commissioned to prepare a basis for discussion for the expert committee. This comprised establishing an adequate structure for the set as well as compiling the principles, criteria and indicators relative to the different aspects according to the assessment of the sets carried out by the expert committee.

Ad set structure:

The structure suggested is more or less a combination of the structure of the Soil Association Set and the list of criteria established by the Austrian expert committee.

Ad Compilation of the principles/criteria/indicators:

Principles/criteria and indicators were compiled as follows: the principles/criteria/indicators cited in the "compilation and comparison of criteria contents of the international sets of criteria" were related to the newly established structure, classified in principles, criteria and indicators and the respective source references given. If the contents needed further clarification, additional points were added from other sets (e.g. indicators for already formulated principles).

Double and multiple quotations were eliminated and overlaps condensed. The syntax of a number of points was modified in order to make them more suitable for classification into principles/criteria/indicators). Contents, however, remained unchanged, and the wordings of points of different sets were never mixed.

The wording of the present set can be compared to the original wording by means of the following document established by the expert committee: "Compilation and Comparison of the Criteria Contents of the International Sets of Criteria".

Used Sets, Abbreviations and respective version:

- FPC: Forest Practices Code of British Columbia June 1994
- FSC: Forest Stewardship Council June 1994
- GP: Greenpeace March 1994
- Hels.: Helsinki June 1994
- Ind.: Indonesia September 1993
- ITTO: International Tropical Timber Organisation December 1991
- ITW: Initiative Tropenwald February 1994
- KSZE: Conference on Security and Co-operation October 1993
- R.All: Rainforest Alliance October 1993
- SA: Soil Association February 1994
- SCS: Scientific Certification Systems February 1994
- WÖPS: Wald-Ökopunkte-System (a system of forest "ecopoints") October 1994

On the basis of this work the expert committee on sustainable forest management defined or redefined the principles and requirements concerning the basic data with regard to general and organisational prerequisites. These rephrased principles and the basic data required together with the criteria and indicators not modified by the expert committee form the set at hand.

As data have been compiled from various international sets of different orientations, approaches and classification schemes, the prepared Test set cannot be expected to be a well-rounded work. In general, principles, criteria and indicators are derived from different sources

and do not exactly relate to each other. In many cases principles have been included without giving the criteria and indicators which can be deduced thereof. Or there are criteria and indicators but not the principle (which can be deduced thereof). This aspect has to be taken into consideration.

Definitions according to CIFOR (BRIEFING BOOK 1995)

Principle

The Concise Oxford Dictionary (COD) defines a principle as „*a fundamental truth or law as the basis of reasoning or action*“. Principles are seen as providing the primary framework for managing forests in a sustainable fashion. They provide the justification for criteria and indicators included in the evaluation system.

Criteria

A criterion is defined as „*a principle or standard that a thing is judged by* (SCHNEIDER, 1992). Most definitions would seem to agree fairly closely with the dictionary definition, as does the FAO 1995 when it defines a criterion as „*identified elements of sustainability against which forest management can be assessed*“. The following attributes of a „useful“ criterion are suggested:

- 1) Unambiguously related to the assessment goal
- 2) Sensitivity to stress on the system
- 3) Predictive value
- 4) Appealing to users
- 5) Clearly defined
- 6) Relevance for policy

E.g. „The resilience of the forest-ecosystem is maintained“

Indicators

The transitive verb „to indicate“ is defined in the Concise Oxford Dictionary as:

- 1) point out, make known, show, or
- 2) be a sign or symptom of, express the presence of. (LANDRES, 1992) provides a useful definition of ecosystem indicators, which is adopted here in a more generalised form as follows: „*An indicator is any variable or component of the forest ecosystem or the relevant management systems used to infer attributes of the sustainability of the resource and its utilisation.*“

Such indicators should have the following attributes:

1. Provide a summary or integrative measure over space and/or time of the bio-physical or anthropogenic system or its components
2. Be closely and unambiguously related to the assessment goal
3. Show an adequate response range to stresses
4. Be diagnostically specific
5. Be precisely defined
6. Be easy to detect, record and interpret

DEFINITION OF CRITERIA AND INDICATORS - TAKEN FROM A NUMBER OF INTERNATIONAL SETS - WHICH HAVE BEEN COMPILED INTO THE SET AT HAND

Principle: Principles of „sustainable forest management“ are normative standards/requirements which have to/should be met.

Criterion: Criteria are controlling aspects allowing verification of the requirements. They are relative to points or aspects on the basis of which the various requirements e.g. of „sustainability“ are assessed. Criteria do not give any judgement on the compliance with these standards/requirements.

Indicator: Indicators are conditions or significant aspects pointing out something different. Indicators specify the aspects/orders of magnitude to be observed which point to the fulfilment of a requirement of a specific aspect (criterion).

Set of Principles, Criteria and Indicators for an Evaluation of Sustainable Forest Management

P = Principle

C = Criterion

G = Guideline

I = Indicator

Legend for numbering of the criteria and indicators

- /1 Criteria for evaluating and assessing forest enterprises in the tropical forest region (Initiative Tropenwald) (ITW)
- /2 Indonesia (Ind.)
- /3 Soil Association (SA)
- /4 Forest Stewardship Council (FSC)
- /5 Scientific Certification Systems (SCS)
- /6 Helsinki (Hels.)
- /7 Forest Practices Code of British Columbia (FPC)
- /8 Rainforest Alliance (R.All.)
- /9 CSCE seminar in Montreal (Konferenz für Sicherheit und Zusammenarbeit in Europa) (KSZE)
- /10 A system of forest "ecopoints (Wald-Ökopunkte-System) (WÖPS)
- /11 International Tropical Timber Organisation (ITTO)
- /12 Greenpeace (GP)
- /13 Ewald Rametsteiner, Paper for the experts panel on sustainability (Diskussionsgrundlage zur Fachausschußsitzung) (Ramet.)
- /14 Austrian experts panel (Österreichischer Fachausschuß) (ÖFA NH)

(...) gives the source of the C or I, the wording of the C & I in the test set often not being identical to the source formulation (see above).

1 GENERAL AND ORGANIZATIONAL REQUIREMENTS

PREAMBLE

The principles listed below are designed to be a globally valid set. For their implementation on the regional level, however, adaptations may be useful. All organisational questions have to be resolved beforehand.

1.1 MEETING OF GENERAL AND LEGAL REQUIREMENTS

1.1.1 General Information/Identification

1.1.1.1 Identification of the areas subject to management

1/14 The area on which sustainable forest management is carried out has to be determined by clearly defined area units. The description comprises: name, geographic location with details on the course of the borderlines, size

1.1.1.2 Management

2/14 Name and address of the landowner or the applicant

3/14 Name and address of the responsible manager

1.1.1.3 Product Identification

4/14 Products from certified enterprises or areas shall be made clearly identifiable by special marks or separate storage.

1.1.2 Compliance with Legal Standards

5/14 Within the framework of forest management the landowner or applicant engages to fulfil the respective laws in force and to comply with the principles of the following international obligations (overall conditions): ILO, ITTA, CITES, Convention on Biodiversity.

6/14 Should the requirements laid down in the set go beyond the regional standards, the applicant has to commit himself to fulfilling these requirements.

7/14 On the national level the following rules and regulations have to be observed:

- a) Forestry law
- b) Land use planning
- c) Property rights
- d) Other ecological rules and regulations
- e) Other economic obligations
- f) Social rules and regulations

1.2 BASIC DATA ON MEANS OF PRODUCTION AND OVERALL CONDITIONS

In order to guarantee transparency of the sustainability of forest management information on the means of production as well as the general management conditions, including information on how these data are compiled, are necessary.

The expenditure of data gathering is adapted to the size of the management unit as well as to the intensity of management [check list].

1.2.1 Necessary ecological data

1.2.1.1 General description of the area

8/14 Climate, topography, geology, soil, anthropogenic influences, water cycle, regional land use planning (conurbation's, percentage of forested area, agricultural use ...)

1.2.1.2 Biodiversity

9/14 Area data on natural forest communities and current growing stock

10/14 Area data on forest structure

11/14 Description of ecosystem types and their successions

12/14 Abundance and distribution of animal and plant key species, e.g. rare and endangered species, species which are important for the local economy or for the functioning of the forest ecosystem.

1.2.1.3 Protection areas and areas designated for specific forms of use

13/14 Legal status, size of the area and subject of protection:

- protection areas for ecosystems/habitats
- areas with a high diversity/endemism
- water catchment areas
- erosion protection areas
- wetland biotopes
- others

1.2.2 Necessary economic and production data

1.2.2.1 Product diversity

14/14 Information on the kind and extent of the use of the forest products (timber and non-timber) as well as on hunting and other services rendered (this includes traditionally used plants and animals and the exploitation of secondary tree species).

1.2.2.2 Forest

15/14 Area data: Total area; production and non-production areas, age/diameter structure, forest maps giving details on forest functions

16/14 Timber supply with regard to assortment and diameter classes

17/14 Available information on regeneration and increment

18/14 Information on logging and log transport

1.2.2.3 Personnel, logistics, etc.

19/14 Information on development, logging and log transport

20/14 Information on employees and jobs

21/14 Information on pesticides and wood preservatives used

22/14 Information on wages and salaries, unless there are collective agreements.

1.2.3 Other data

23/14 Information on chartered and non-chartered forest exploitation rights

24/14 Information on forest sites of archeologic, historical, religious or cultural significance.

1.3 MANAGEMENT CONCEPT

1.3.1 General requirements

25/14 In order to guarantee the sustainability of forest management systems over the long term, an appropriate management concept adapted to the size of the enterprise has to be provided. In this connection, management measures traditionally carried out in coppices, which are often not recorded in writing, are being taken into consideration.

26/14 The legal rules and regulations on which the management concept is based have to be cited.

1.3.2 Description of management objectives

27/14 Objectives have to be defined on the basis of the general data requirements listed in chapter B concerning means of production and overall conditions.

28/14 In choosing forest management systems appropriate consideration should be given to ecological, economic and social aspects. Especially possible negative impacts and measures to minimise them should be specified.

1.3.3 Ecological aspects

29/14 Measures for the protection of biological diversity (including rare and endangered species), of soil and water bodies have to be specified.

1.3.4 Economic aspects

30/14 Timber supply

31/14 Regeneration and silvicultural measures

32/14 Forest protection measures

1.3.5 Social measures

35/14 Rights and obligations towards the population, especially indigenous peoples, with regard to forest exploitation.

36/14 Payment schemes

37/14 Training and job organisation

38/14 Safety in the workplace

1.4 DOCUMENTATION AND MONITORING

1.4.1 Documentation

39/14 The forest owner/applicant engages to keep all information necessary for obtaining the certificate.

1.4.2 Monitoring

40/14 The organisational overall conditions have to guarantee that improper use of the quality mark is prevented by appropriate monitoring.

41/14 For renewed qualification for the quality mark an updated set of data has to be provided.

42/14 The data have to comprise the aspects cited in the above mentioned chapters

2 ÖKOLOGISCHE PRINZIPIEN

2.1 ERHALTUNG DER QUANTITÄT UND QUALITÄT DER ÖKOSYSTEM-ELEMENTE

P: Die abiotischen und biotischen Elemente von Waldökosystemen sind zu erhalten und negative Einflüsse durch Bewirtschaftungsmaßnahmen auf ein Minimum zu beschränken; dies betrifft insbesondere Elemente der Biodiversität, des Bodens und des Wassers.

2.1.1 Biodiversität

2.1.1.1 Biodiversitäts-Schutz

Für anthropogen geprägte und traditionell genutzte Wälder gilt:

P43/14 Die in einem Land vorkommenden Waldgesellschaften sind in einem Netz von Reservaten repräsentativ zu schützen.

P44/14 Bei der Nutzung durch den Antragssteller ist zu gewährleisten, daß die überbetrieblich festgelegten Schutzgebiete nicht beeinträchtigt werden.

Für Primärwälder gilt:

Schutzgebiete sind dem Umfang und Ausmaß der Waldnutzung entsprechend einzurichten.

45/1 K: Schutzgebiete: Ausweisung u. Markierung v. Totalschutzgeb. (ökolog. - sozial) (ITW); Anbindung an großräumige Schutzgebiete durch Korridore; Ausweisung u. Markierung von Boden- u. Wasserschutzgebieten (ITW);

46/2 I: Efforts have been made to identify special areas, sites or individual trees which should be protected from damage because of their biological interest (e.g. areas essential for the range or migration of large mammals, hornbill nesting trees). Such items have been affectively protected (Ind.)

47/3 I: Sensitive areas and all areas with a statutory designation are protected, excluded from production activities, their boundaries are clearly defined; details of protective measures are available (:SA);

48/5 I: No indication of forest management activities except protection efforts e.g. no indication of commercial timber extraction;(SCS)

49/4 I: Mechanisms to control inappropriate hunting, fishing, trapping and collecting are established (FSC) [buffer zones!];

50/5 K: Extent (i.e. total number, acreage, and distribution) to which areas of ecological significance are afforded protection, either as retained reserves or non-managed areas, or through transfer to other ownership's dedicated to preserving those areas (SCS);

- 51/2 K: Percentage of the total area of the management unit set aside as reserves for genetic resources; location and distribution of blocks; areas; representativeness of the forestry types (Ind.)
- 52/2 I: Adequate percentage of reserves; convincing size of blocks and location in relation to other protected areas; representative of forest types; properly protected (Ind.);
- 53/6 K: Changes in the area of: natural and ancient seminatural forest types, strictly protected forest reserves (Hels.)
- 54/13 I: [area is not diminishing] (Ramet.)
- 55/13 K: Räumliche Migrationsmöglichkeiten (Ramet.)
- 56/13 I: [Maintenance of adequate corridors between protected forest reserves]; (Ramet.)

2.1.1.2 Spezifische Bewirtschaftung sensibler Ökosysteme / Arten

- P57/14 Gebiete von besonderer biologischer und genetischer Bedeutung müssen in geeigneter Weise bewirtschaftet werden, um Schäden zu verhindern. Ihre Zugänglichkeit kann beschränkt werden. Es sollen Schutzmaßnahmen getroffen werden, die seltene oder gefährdete Arten und ihre Habitate (z. B. Brut- und Futterareale) erhalten.

2.1.1.3 Erhalt der Ökosystem- bzw./Landschaftsdiversität

- P58/14 Die Bewirtschaftung der Wälder soll eine Vielfalt von Ökosystemtypen, Sukzessionsstufen und Strukturen sicherstellen, sowohl räumlich als auch zeitlich.

2.1.1.4 Sicherung der Artenvielfalt

- P59/14 Die Bewirtschaftung Wälder soll derart erfolgen, daß eine Erhaltung der Arten (Regeneration, Migration, Populationsgröße) langfristig gesichert ist.

2.1.1.5 Genetische Diversität

- P60/14 Die Bewirtschaftung soll die genetische Variabilität innerhalb aller Arten erhalten und den Austausch des genetischen Materials innerhalb der Arten ermöglichen.

2.1.1.6 Gentechnisch veränderte Organismen

- P61/14 Im Wald werden grundsätzlich keine gentechnisch veränderten Organismen freigesetzt.

2.1.1.7 Anbau von Arten außerhalb des natürlichen Verbreitungsgebietes.

- P62/14 Der Anbau von Arten außerhalb des natürlichen Verbreitungsgebietes erfolgt nur nach Abwägung aller Vor- und Nachteile. Negative ökologische Auswirkungen sind jedenfalls zu vermeiden.

2.1.2 Bodenschutz

- 63/7 I: The location of sensitive soils, and the measures required to ensure that the physical, chemical, and biological conditions essential to maintaining the long-term productivity of those soils are protected, maintained, or enhanced, are documented in appropriate plans and prescriptions (FPC);[High risk areas are excluded from utilisation]
- P64/14 Die Waldbewirtschaftung hat so zu erfolgen, daß die den natürlichen Standortverhältnissen entsprechenden Funktionen des Bodens auch langfristig nicht beeinträchtigt werden.
- P65/14 Die Holznutzung in von Menschen geprägten und traditionell genutzten Wäldern soll Ergebnis von den dem jeweiligen Standort entsprechenden Maßnahmen der Waldpflege oder -verjüngung sein.
- 66/14 K.: Erhaltung einer Bestockung in jenem Ausmaß, welche den Boden vor flächiger Erosion schützt (ÖFA)
- 67/14 [K: Keine vollständige oder weitgehende - eine Fläche von 0,5 ha überschreitende - Räumung eines Bestandes, durch die freilandähnliche Bedingungen entstehen (Kalamitätsnutzungen ausgenommen)]
- P68/14 Vermeidung externer Schad-Stoffeinträge und Minimierung von Nährstoffausträgen
- 69/14 K: Verzicht auf Düngemaßnahmen, die ausschließlich der Zuwachssteigerung dienen, nicht jedoch Startdüngungen oder der Waldbodensanierung zur Stabilisierung des Ökosystems (ÖFA)
- 70/8 I: No timber harvesting is taking place in highly erodable areas (R.All.)
- 71/2 I: There is sufficient information to make informed decisions about areas to be excluded from harvesting (Ind.)
- 72/2 I: The Regulations on slope limits are fully implemented (Ind.)
- 73/5 I: frequency and nature of Land Use Regulation Commission violations; (SCS)
- 74/9 K: Soil erosion, soil nutrient status, soil microflora and microfauna, soil quality (KSZE);
- 75/9 K: Rapid mass movements (e.g. debris flows, landslides), other natural hazards, slow mass movements (e.g. soil creep, solifluction) (KSZE);

2.1.2.1 Aufforstung und Waldbau:

- 76/3 I: Existing vegetation is being retained to prevent erosion (SA);

2.1.2.2 Ernte und Bringung:

- 77/8 I: No tree felling is taking place on slopes exceeding 35 degrees measured over 100 meters (exception: cable yarding, degree slope dictated by documented local experience and conditions) (R.All.)
- 78/10 I: Bodenschäden bzw. Bodenverdichtung durch Befahren oder Rückung (WÖPS)

2.1.2.3 Transport:

P: The impact of timber extraction on soils must be minimised

- P79/3 Timing of construction of roads should allow for proper consolidation of the road before use (SA)
- P80/3 Appropriate equipment should be used, operations should be properly supervised (SA).
- P81/3 Road clearing should be of minimum width, but sufficient to allow the road to dry (SA).
- P82/3 Erdbewegungen im Straßenbau sollen minimiert werden.
- P83/3 Road construction in steep, narrow valleys, slip-prone or other unstable areas, natural drainage channels, streambanks and areas of other value should be avoided (SA).
- P84/3 Minimising extraction distances and the area covered by extraction routes and landings (SA)
- P85/3 Construction of roads with adequate drainage to minimise environmental impact (SA);
- P86/3 Minimising bare soil exposure (SA)
- P87/3 Inspection of roads and drains immediately after rain is recommended (SA);
- P88/3 Skid trail gradients may not exceed 25 degrees (R.All.)
- 89/11 K: Extent of soil disturbance (ITTO)
- 90/11 K: The extent and severity of soil erosion (ITTO)
- 91/5 K: Road right-of-way widths (SCS);
- 92/5 K: Condition of culverts, water bars and roadway surfaces (SCS);
- 93/5 K: Conditions of landings and log decks (SCS);
- 94/5 K: Runoff drainage patterns during storm (SCS);
- 95/10 K: Erhebung von Aufschließungsgrad/Hangneigung (WÖPS);
- 96/3 I: Landings are well drained; (SA)
- 97/3 I: Embankments and cuttings are being stabilised (SA).
- 98/3 I: Road have adequate camber and carriageway ruts are being repaired (SA).
- 99/3 I: Steep approaches to bridges or waterway crossings are being avoided; (SA)
- 100/8 I: Topographic maps have been prepared well before logging or road construction, which specify areas which are suitable for all-weather harvesting or dry-weather only (R.All.)
- 101/8 I: Road surfaces are well drained, culverts large enough to avoid ponding, water bars are installed where roads are abandoned (R.All.)
- 102/2 I: There are engineering standards for the planning, design and use of roads - alignment, gradient, width, total surface area, cuverts, bridges, use in bad weather, treat-

ment after logging completed and these standards are adequate and appropriate for local conditions. These standards are observed.(Ind.)

- 103/2 I: There are standards for skid trail - location, alignment, gradient, width, avoidance of drainage lines and stream crossings, avoidance of "side cutting", specifications for making skid trails, cross-drain construction and spacing. These standards are observed. (Ind.);
- 104/2 I: There are specifications for log landings - position, maximum size, total area (Ind.);
- 105/8 I: Specifications in terms of skid trail width and location have been set and are being followed (R.All.);

2.1.3 Wasserschutz

P: Durch die Waldbewirtschaftung soll die Wasserqualität und der natürliche Wasserhaushalt nicht beeinträchtigt werden.

- 106/14 K: Es werden keine neuen Entwässerungen im Wald durchgeführt und bestehende Entwässerungen nicht technisch verbessert, (ÖFA)
- 107/5 K: frequency and nature of Land Use Regulation Commission violations; (SCS)
- 108/11 K: Extent and spatial distribution of riparian and other watershed protection areas (ITTO)
- 109/11 I: Provisions for protection of bodies of water (ITTO)
- 110/8 I: No timber harvesting is taking place within pre-designated buffer zones for rivers and streams, with a minimum protection (or buffer) zone equal to twice the width of perennial stream courses (e.g. if stream is 20 m wide, buffer zone should be 20 m on each side) and with a minimum buffer of 10 m on each side (R.All.)
- 111/2 I: There are regulations for protection of riparian reserves along streams, water courses and stream heads, along shorelines, and around lakes. The regulations are observed. Ind.)

2.1.3.1 Ernte und Bringung

- P112/3 Harvesting machinery must not enter streambanks except at designated and designed stream crossings. The number of such crossings must be minimised (SA);
- P113/3 Natural watercourses must not be altered to facilitate harvesting. If watercourses are accidentally dammed, the impediments should be broken as soon as possible (SA).
- 114/3 I: Log and top are not being pushed into streambanks (SA);

2.1.3.2 Straßenbau:

P: The impact of road construction on water quantity and quality must be minimised

- P115/3 Minimising the number of streamcrossings (SA);
- P116/3 Keeping valley bottom roads and tracks as far back from the stream as possible (SA);

- P117/3 Designing road grades, culvert location and run off so that discard filters through undisturbed forest soil (SA);
- P118/3 Drains do not drain into natural watercourses. Where this is unavoidable, regularly emptied silt traps must be installed (SA);
- 119/8 I: No road fill is placed in stream courses (R.All.);

2.1.3.3 Forstschutzmaßnahmen

[P: Forest management must prevent deleterious contamination of water by herbicides and pesticides by, inter alia, the following measures: (KSZE);

- P120/3 No application of chemicals within 10m of watercourses and 30m around reservoirs and lakes (SA)
- P121/3 No application when heavy rain is expected, during wet weather, on frozen snow-covered ground or ground which has baked dry during a drought (SA);
- P122/3 No disposal of chemicals into watercourses or lakes or by burying; washing of equipment in watercourses (SA);
- P123/3 No soaking of seedlings treated with chemicals in drains or watercourses prior to planting (SA);
- P124/3 Locating fuel tanks and stores so that spillage's from damage, defects or refuelling will not enter watercourses (SA)].
- 125/9 K: water quantity (KSZE);
- 126/9 K: Chemical water quality (e.g. pH, DOC, ionic composition) (KSZE)
- 127/9 K: Biological water quality (e.g. aquatic ecosystem diversity) (KSZE);
- 128/5 K: location and layout of roadways near watercourses; (SCS)
- 129/5 K: effectiveness of design and execution of watercourse buffer policies (e.g. width, canopy retention policies, frequency of entry) (SCS)
- 130/5 K: extent and effectiveness of stream restoration projects; (SCS)
- 131/5 K: effectiveness of design and maintenance of stream crossings (SCS);
- 132/5 I: Existing road bank vegetative management in areas near watercourses (SCS)
- 133/5 I: No observable roadway rainfall runoff into watercourses (SCS);

2.2 ERHALTUNG DER VITALITÄT, DER GESUNDHEIT UND DER PRODUKTIVITÄT

P: Bei der Bewirtschaftung von Wäldern ist die Erhaltung und Förderung der Funktionsfähigkeit der Ökosysteme, ihre Dynamik sowie ihre Vitalität und Stabilität sicherzustellen.

- Erhaltung der Fähigkeit der Ökosysteme, auf externe Einflüsse und Prozesse zu reagieren.
- Insbesondere sind standortsangepaßte Waldbestände zu erhalten und zu fördern, um die natürlichen Regulationsmechanismen optimal ausschöpfen zu können.

- P134/14 Um Waldschäden zu vermeiden und gesunde und vielfältige Wälder zu erhalten und zu fördern, erfolgt die Waldbewirtschaftung standörtlich angepaßt.
- P135/14 Genutzte Waldflächen werden innerhalb ökologisch angemessener Zeiträume mit standortstauglichen Baumarten verjüngt. Natürliche Verjüngungspotentiale sind dabei optimal auszuschöpfen.
- 136/5 I: Pest and Pathogen Management Strategy includes: incorporation of inevitable epidemics in regulation strategy, control measures, financial provisions and future protection (SCS).

2.2.1.1 Prevention

- 137/9 K: Specific indicators of ecosystem component health and vitality (KSZE)
- 138/9 K: Ecosystem resilience, resistance and robustness (KSZE)
- 139/9 K: Ecosystem adaptiveness (KSZE)
- 140/9 K: Species and genetic diversity (KSZE)
- 141/9 K: Regeneration (KSZE)
- 142/9 K: Predator population vigour (KSZE)
- 143/5 K: extent to which silvicultural methods minimise the need for pesticides (e.g. avoidance of clearcutting and other measures designed to limit hardwood incursion) (SCS);
- 144/5 I: explicit efforts to manage for natural pest predators such as bird species, and modification of prescriptions to increase structural diversity that provides favourable habitat for natural predators (SCS)

2.2.1.2 Detection and risk assessment

- 145/9 K: Incidence of insects, disease and abiotic damage (KSZE)
- 146/9 K: Stressors (Insect/diseases/weather, Air quality, Fire, Climate, Competition, Topography, Utilisation) (KSZE)
- 147/10 K: Schäl- und Fegeschäden (WÖPS)
- 148/6 I: Serious damages caused by biotic or abiotic agents:
 - severe damage caused by insects and diseases with a measurement of seriousness of the damage as a function of (mortality or) loss of growth. (Hels.)
 - annual areas of burnt forest and other wooded land; (Hels.)
 - annual area affected by storm damage and volume harvested from these areas; (Hels.)
 - proportion of regeneration area seriously damaged by game and other animals or by grazing; (Hels.)

2.2.1.3 Treatments

2.2.1.3.1 Chemischer Forstschutz

- 149/5 K: frequency of pesticide use and stated reasons for their use (SCS);
- 150/5 K: effectiveness of use - i.e. locational accuracy of application, appropriateness of timing, efficacy of vegetative results (SCS);
- 151/5 K: use of targeted versus broadcast aerial insecticide spraying (SCS);
- 152/3 I: All equipment for the transport, storage and application of chemicals are maintained in a safe and leakproof condition (SA);
- 153/3 I: A contingency plan is detailing action to be taken in the event of pollution (SA).

2.2.1.3.2 biologische und mechanische Forstschutzmaßnahmen

- 154/5 K: effectiveness of use - i.e. locational accuracy of application, appropriateness of timing, efficacy of vegetative results (SCS)
- 155/9 K: Total ecosystem biomass and biomass of specific ecosystem components (KSZE);
- 156/9 K: Population monitoring of selected species (KSZE);
- 157/9 K: Biomass removal/destruction (KSZE);
- 158/9 K: Growth rates of selected organisms (KSZE);
- 159/9 K: Nature and abundance of regeneration in monitored open plots and protected plots (KSZE);
- 160/9 K: Fecundity of organisms (KSZE);
- 161/9 K: Rates of ecosystem disturbance (KSZE);
- 162/9 K: Soil nutrient status (KSZE),
- 163/5 K: management efforts designed to maintain the nutrient capital of managed areas (e.g. woody and green retention's) (SCS);
- 164/5 K: extent of soil damage during harvesting operations - e.g. compaction, rutting, erosion mass soil movements on steep sites (SCS);
- 165/5 I: excessive exposure of soils to harsh micro-climatic stress (SCS);

3 ÖKONOMISCHE PRINZIPIEN

3.1.1 Waldprodukte

P: Die verschiedenen Waldprodukte - Holz und andere - sollen optimal und effizient genutzt werden. Eine Nutzungsform darf das Potential für andere Nutzungsformen langfristig nicht beeinträchtigen.

P: Die Bewirtschaftung des Waldes soll ein nachhaltiges und vielfältiges Angebot von Holz und sonstigen Waldprodukten sicherstellen.

- 166/14 [ad K/I: Einschlagsregulierung, Durchmesser??] (ÖFA)
- 167/14 [K: Preise, Vertragsregeln, normative Inhaltspunkte, Nutzungsdauer etc] (ÖFA)
- 168/5 K: Design and execution of stand treatments and consistency with projected yields (SCS);
- 169/5 K: harvesting priorities at the stand and individual tree level; (SCS)
- 170/5 K: stocking levels and species composition of young stands (SCS);
- 171/5 K: extent to which prescriptions are tailored to individual stand conditions and markets (SCS);
- 172/5 K: extent and effectiveness of pre-commercial and commercial stand release treatments (SCS);
- 173/5 K: adequacy of residual stocking after partial harvests (SCS);
- 174/2 I: Sites or objects of special economic importance (non-wood forest products, hunting, fisheries, etc.) have been identified, recorded and protected. (Ind.)
- 175/3 I: In selection systems a sufficient number of seed trees is being retained to ensure that species composition is not adversely affected (SA).
- 176/5 K: extent to which expedient prescriptions such as diameter-limit harvesting are routinely applied (SCS);
- 177/5 I: Area is fully stocked with vigorously growing high-valued tree species (SCS);

3.1.2 Wirtschaftlichkeit

P: Die Bewirtschaftung des Waldes hat so zu erfolgen, daß er auch künftigen Generationen als mindestens gleichwertige Grundlage für wirtschaftlichen Nutzen dienen kann.

Die für das Holz und andere Waldprodukte bezahlten Preise sind so zu gestalten, daß sie als Anreiz für eine langfristige Bewirtschaftung des Waldes dienen. Dabei sind die ökologischen, sozialen und betrieblichen Produktionskosten berücksichtigen.

P178/14 Dort, wo die Bewirtschaftung des Waldes über Nutzungskonzessionen erfolgt, muß im Wege des Vertrages die langfristige Nutzbarkeit des Waldes gewährleistet sein.

- 179/5 K: cash flow demands of the company, related to factors such as servicing of debt or capital demands of individual owners/stockholders (SCS)
- 180/5 K: accounts payable performance or other financial performance data such as might be available through various sources (SCS);
- 181/5 K: review of company's annual financial statements which provide information such as annual return on investment rates (SCS);
- 182/5 K: management philosophy of corporate officers as revealed through interviews and/or written statements (SCS);
- 183/8 I: Revenue received is sufficient to financially support post-harvest management activities such as road maintenance, silvicultural treatments, and long-term forest health and growth and yield monitoring (R.All.);
- 184/5 K: appropriateness of the end uses (and sale prices) of harvested logs (SCS);
- 185/3 I: The efficiency and economic viability of marketing of forest products (SA);
- 186/8 I: Stumpage paid is sufficient to cover costs of maintaining land as forest (R.All.);
- 187/5 K: ownership structure and vertical integration, if any, where the log requirements of a mill owned by the company might dictate land management decisions (SCS);
- 188/5 K: stability of ownership structure (SCS);
- 189/1 I: Es existiert ein Nutzungsvertrag zwischen Waldeigentümer u. Wirtschaftsbetrieb, welcher die Rechte u. Pflichten verbindlich regelt und die Rahmenbedingungen enthält (ITW).

3.1.2.1 Aufforstung und Waldbau

3.1.2.2 Ernte und Bringung

- 190/5 K: damage to residual stand during partial harvest entries and adequacy of residual stocking after partial harvests (SCS);
- 191/5 K: Product wastage (SCS)
- 192/5 K: frequency of excessive falling damage to harvested and residual trees and other damages (SCS);
- 193/9 K: Vitality and efficiency of timber and non-timber forest production (adequate flow of non-timber products and adequate flow of wood). (KSZE)
- 194/1 K: Rückeschäden (ITW)

3.1.2.3 Transport

[s. auch "Bodenschutz"]

- 195/5 K: Adequacy of the road network and appropriateness of road design (SCS)
- 196/5 K: average miles of haul roads per acre, roughly estimated (SCS);
- 197/5 K: average area accessed per mile of new spur road (SCS);

- 198/5 K: observed circumstances where lack of access has limited desired management descriptions (SCS);
- 199/1 I: Es existieren Richtlinien für den Bau von Erschließungsmittel, für Maschinen- u. Geräteausstattung und für bestandesschonende Holzernte und Holztransport (ITW).

3.1.2.4 Investment of Capital and Personnel

- P200/4 Forest workers shall receive adequate training and supervision to ensure proper implementation of the management plan (FSC);
- 201/5 K: Investment in attracting and retaining competent professionals and in maintaining the currency of their knowledge and skill base (SCS);
- 202/5 K: Investment in large capital items such as roads, harvesting equipment, plantations, stand improvements and resource protection programs (SCS);
- 203/5 K: Expenditures on or commitment to ongoing employee training and education (SCS);
- 204/5 K: Financial support or investment in improved harvesting machinery (SCS);
- 205/5 K: Average annual expenditures on pre-commercial silvicultural prescriptions such as planting, vegetation control and timber stand improvement (e.g. spacing control) (SCS)

3.1.3 Holzproduktion

- 206/5 K: Management of the current merchantable growing stock to prolong its longevity/availability through the conversion period to a sustainable forest structure (SCS).
- 207/5 K: Patterns of regeneration and young stand development that determine future yields and the sustainability of current harvest levels (SCS).
- 208/5 K: rotation lengths, relative to stand ages approaching maximum mean annual increment (SCS);
- 209/5 K: the extent to which current harvest levels are justified by allowable cut affects (SCS);
- 210/5 K: species composition, by volume, of the annual harvests compared to planned levels (SCS);
- 211/5 K: size class distribution of stands, stratified by broad species classes (SCS);
- 212/5 K: current and projected merchantable inventory volumes per acre, particularly in stands that will be scheduled for harvest over the next 30 years (SCS);
- 213/5 K: historical rates of stand type conversation (esp. softwood to mixed stand) (SCS);
- 214/11 K: The duration of concession agreements (ITTO)
- 215/1 I: Die Vertraglaufzeit überschreitet die Dauer des Produktionszeitraumes (ITW).
- 216/1 I: Das Nutzungsverfahren ist festgelegt (Flächen-, Massenteilungsverfahren,..) (ITW);

- 217/8 I: Post-logging assessments take place to assess the impact of harvesting on future crop trees and the forest, preferably within 12 months after harvesting (R.All.);
- 218/1 I: Die Entscheidung zum Holzeinschlag erfolgt nur nach Sicherung einer ausreichenden Verjüngung (ITW).
- 219/8 I: Rationale behind silvicultural prescriptions is well documented, i. e. based on site-specific field data or published analyses of local forest ecology or silviculture, and government regulations (R.All.);
- 220/8 I: Silvicultural prescriptions (pre- during- and post-harvest) are being adhered to (R.All.);
- 221/8 I: Growth rates, stocking, and regeneration are being monitored by a suitable continuous forest inventory system (R.All.);
- 222/5 K: extent to which aggregate harvesting activities are reconciled to the forest plan (SCS);
- 223/5 K: actual yields per hectare as compared to predicted yields (SCS);
- 224/5 K: actual annual harvest levels as compared to planned levels (SCS) ;
- 225/11 K: The number of trees and/or volume of timber per ha harvested (ITTO)
- 226/11 K: Records of annual areas cut over time (ITTO)
- 227/5 K: annual softwood harvest volume as a percent of total annual harvest as compared to softwood inventory volume as a percent of total inventory volume (SCS);
- 228/8 I: AAC is being followed on the forest (R:All.);
- 229/1 I: Die Planung der jährl. Einschlagsmengen ist transparent und beruht auf anerkannten Methoden der Hiebssatzberechnung. Prüfung über Vorrats-, Zuwachsdaten, Berechnungsmodus, Soll-Vorräte (ITW)
- 230/2 I: The length of the felling cycle is justified by growth and yield data (Ind.)
- 231/1 I: Erschließungs- u. Holzernteplanung wird termingerecht durchgeführt (ITW).
- 232/1 I: Richtlinien zur effektiven Inspektion/Kontrolle von Einschlagsflächen existieren (ITW).
- 233/11 I: The presence of clear, official harvesting rules (ITTO)

4 SOZIO-ÖKONOMISCHE PRINZIPIEN

4.1 GESTALTUNG DER AUßERBETRIEBLICHEN BEZIEHUNGEN

P: Nachhaltige Bewirtschaftung hat eine konstruktive und dauerhafte Gestaltung der sozio-ökonomischen Beziehungen im Bereich des außerbetrieblichen Einflußbereiches zu gewährleisten.

P: Klärung von bestehenden Rechten und Pflichten gegenüber der Bevölkerung, insbesondere indigener Völker

- 234/13 K: Als Voraussetzung für die Waldbewirtschaftung müssen die Land- und Nutzungsrechte der [indigenen und der traditionellen/lokalen] Bevölkerung des Gebietes vollständig erfaßt, festgelegt und gesichert sowie die Flächen physisch abgegrenzt werden. Dies hat in einer für die betroffenen Gemeinschaften akzeptablen Art zu erfolgen. Das trifft insbesondere auf indigene Völker zu. (Ramet aus SA, GP, ITW)
- P235/14 Indigene und traditionelle/lokale Gemeinschaften mit rechtlichen oder gewohnheitsmäßigen Besitz- oder Nutzungsansprüchen sollen die Kontrolle über Waldbewirtschaftungsmaßnahmen in einem Ausmaß behalten, das notwendig ist, um ihre Rechte oder Ressourcen zu schützen - es sei denn, sie delegieren diese Kontrolle in freier und informierter Einwilligung an andere Organe. Grundsätzlich stehen ungelöste Konflikte einer Zertifizierung entgegen. Es sollen angemessene Mechanismen zur Lösung von Konflikten über Besitzansprüche und Nutzungsrechte angewandt werden.
- P236/14 Indigene Völker sollen an ökonomischen Erfolgen aus ihrem Wissen über ökologische bewährte Bewirtschaftungsmaßnahmen angemessen partizipieren.
- P237/14 Die Waldbewirtschaftung hat so zu erfolgen, daß die Rechte und Nutzungsmöglichkeiten Dritter nicht nachteilig beeinträchtigt werden.
- 238/3 I: Forestry operations under outside management operating on, or near, lands occupied by indigenous or traditional peoples can:
Provide documentary evidence of the agreements with the local communities under which management is entitled to manage the forests (SA);
Provide information on the identity, location and population of all indigenous and traditional peoples living in the vicinity of the management area or claiming customary rights to the management area (SA);
Provide evidence or statements from the representative organisations of local indigenous or traditional communities defining the extent of their territories, with maps (SA);
- 239/1 I: Berücksichtigung von Nutzungsrechten erfolgt; (ITW)
- 240/1 I: Beschränkung/Ausschluß konkurrierender Nutzungen (ITW);

- 241/12 I: The customary rights of indigenous peoples to own, use, manage and conserve their lands, territories, and resources are being recognised and respected in all forest management plans (GP).
- 242/2 I: The boundaries of the forest management unit have been drawn in full recognition of land rights. (Ind.);
- 243/2 I: Long-term land title, customary rights and lease agreements have been fully registered. These titles, rights and agreements are being fully respected. (Ind.);
- 244/8 I: Local communities traditional right to own, manage or use forest resources have been formally recognised (RAII);
- 245/8 I: Community lands are excluded from commercial concession area (RAII);
- 246/8 I: Traditional and legal rights of communities are documented in written agreements and honoured, with maps showing protected areas and areas of limited harvesting (RAII);
- 247/2 I: Special measures have been taken to identify and protect the water supplies of local communities (Ind.)
- 248/2 I: Special measures have been taken to identify and protect fisheries (and the spawning grounds of fisheries) used by local communities (Ind.);]

4.1.1.1 Kulturerbe

Stätten mit spezieller kultureller oder religiöser Bedeutung für indigene Völker sollen in Kooperation mit solchen Völkern klar identifiziert, anerkannt und geschützt werden.

- 249/1 I: Stätten mit kultureller, historischer oder religiöser Bedeutung sind als Schutzgebiete ausgeschieden (ITW);
- 250/2 I: Sites or objects of special cultural or religious significance have been identified, recorded and protected. (Ind.);
- 251/2 K: Are there established procedures for the resolutions of conflicts and settlement of claims for compensation? Have these procedures been satisfactorily used? (Ind.);
- 252/5 K: efforts to hire from within the local and regional workforce (SCS),
- 253/2 K: Are there opportunities for training for those local people who wish to take it? (Ind.);
- 254/2 K: What jobs are filled by local people? (Ind.);
- 255/3 I: Employment conditions are the same for local and non-local employees doing the same job (SA).
- 256/8 I: Fuelwood needs of local communities are being met locally (RAII);
- 257/8 I: Regulated access given to local communities to forest for timber and non-timber products (RAII);
- 258/5 K: company policies designed to encourage employee participation in community programs (SCS);

- 259/5 K: employee participation in local, state, and regional professional and natural resource organisations and in ad hoc and standing public/private committees dealing with land management and forestry issues (SCS);
- 260/2 K: What arrangements are there for regular consultation with local people on aspects of planning and management which might affect them? Do these represent a fair cross-section of views? What actions have been taken arising from these consultations? (Ind.)
- 261/2 K: What are the arrangements for local community participation? (Ind.);
- 262/8 I: Local non-governmental organisations are involved in legal training, negotiations, monitoring of community concession agreements (RAII).
- 263/3 I: The representative organisations of indigenous and traditional peoples and local communities with which the forest managers are in contact are identifiable (SA).
- 264/5 K: efforts to support local businesses (SCS);
- 265/2 K: Does the Company provide stimulation of the local economy through "cottage industries" based on forest products? (Ind.);
- 266/3 K: The extent to which primary forest products are being processed locally and regionally, and their economic importance to local communities (SA);
- 267/2 I: Arrangements have been made for the establishment of Community Forests. (Ind.);
- 268/2 I: There are arrangements to establish sustainable management of non-wood forest products with the participation of local people (Ind.);

4.2 GESTALTUNG DER INNERBETRIEBLICHEN BEZIEHUNGEN

P: Nachhaltige Bewirtschaftung hat eine konstruktive und dauerhafte Gestaltung der innerbetrieblichen sozio-ökonomischen Beziehungen sicherzustellen.

4.2.1 Arbeitssicherheit und Gesundheit

P: Sicherung gerechter Arbeitsbedingungen (inklusive adäquater Entlohnung) zur Gewährleistung eines umweltverträglichen Umganges mit den Waldressourcen

- P269/14 Bewirtschaftungsmaßnahmen sollen alle anwendbaren Gesetze und Verordnungen in Bezug auf Gesundheit und Sicherheit der Beschäftigten und ihrer Familien erfüllen dazu gehören jedenfalls:
 adäquate Sicherheitsmaßnahmen,
 geeignete Sicherheitsausrüstung,
 Krankheits- und Unfallvorsorge (inkl. Existenzsicherung),
 ausreichende Ausbildung und sachgerechte Betriebsmittel-Anwendung.
- 270/5 K: Statement of wages and salary scales, insurance provision (SCS)
- 271/5 K: Statement of employment policy and labour relations; (SCS)
- 272/3 K: Statement of accidents and deaths of employees and their causes in the last 12 months, and compensation awarded (SA).

- 273/2 K: Does the Company provide reasonable health, education and social facilities, and does it provide assistance to local communities in finding markets? (Ind.);
- 274/5 K: safety records of contract wood crews (SCS);
- 275/2 I: The health and safety conditions are in conformity with national laws and regulations, and they are adequate. (Ind.);
- 276/8 I: Worker safety is considered and conditions are fair and consistent with local norms (RAII).

4.2.2 Für Österreich noch nicht definiert; Grundsätzliches zu: Guiding Principles for Plantations:

P: Plantations should promote the protection and conservation of natural forests in the landscape, both in terms of their layout and management. natural corridors and a mosaic of different aged stands shall be used in the siting of plantations (FSC);

P: Introduced species should not be planted on a large scale until trials have shown that they are well adapted to the site. The use of exotic species in forest plantings shall be carefully controlled to minimise adverse ecological impacts, such as spontaneous or uncontrolled regeneration (FSC);

P: Plantations of mixed species are preferred (FSC);

P: Degraded ecosystems should be restored with significant proportions of native species, according to the scale and intensity of forest management (FSC);

P: The siting of plantations should maximise the conservation of biodiversity e.g. conform to national policies for the conservation of biodiversity. Both general siting and internal design take into consideration affect on the landscape (SA);

P: Plantations must not be established where there are environmental reasons for not doing so. This include the presence of important or sensitive ecosystems; areas of high or unique biological diversity; planned conservation or protection areas or where there are possible adverse affects on an important water catchment area (SA);

P: Planning for plantations must involve careful assessment in order that land is protected against soil erosion and runoff (SA);

277/3 I: Linked areas of open space (at least 10 % of the area) are being maintained in plantations where appropriate (SA);

278/3 I: Retention of areas of natural forest within the boundaries of plantations (SA-Rec.)

a) Aufforstung und Waldbau

P: Planning for plantations must involve careful assessment of the capability of the site to support repeated harvesting, taking account of nutrient budgets and hydrology, in order that land is protected against soil erosion and runoff, soil processes which enhance fertility are favoured and the use of external inputs is minimised (SA).

P: Attention should be paid to matching the species and genotypes chosen for plantations to the local climate and soils, and assessing risks of fire, and of pests and diseases (SA).

P: Planting stock must be suited to site conditions and properly handled and planted for high initial vigour (SA).

b) Ernte und Bringung

P: Harvesting provides an opportunity to enhance the environmental benefits of plantations by modifying their structure and composition. Systems which use small clearfell areas, selective felling and create varied age class must be considered (SA).

Socio-economic considerations:

P: When establishing plantations, existing appropriate land use by local communities must be maintained, unless alternatives are agreed with full consent of the local communities involved (SA).

P: Plantations must not be established where there are social reasons for not doing so. These include local opposition (SA);

P: In plantations, opportunities must be taken to modify the species composition and dimensions to provide for local needs, by planting or retaining trees or other species of plants which are valued locally or by encouraging animals that may be hunted or fished (SA).

Annex 3

Form 1

TESTING CRITERIA AND INDICATORS FOR THE SUSTAINABLE MANAGEMENT OF FORESTS
Response Form No.1: Evaluation of all criteria and indicators
Instructions for users

Purpose of the form

The objective of the response form is to enable a preliminary evaluation of all criteria and indicators to determine, based on best professional judgement, the most important ones for assessing sustainability of the ecosystem, the management and social systems. This first examination should concentrate on eliminating only the most obviously deficient criteria and indicators. The results of this first evaluation will be discussed with other panel members in Abidjan, to determine the sub-set considered by the team to be 'priority' criteria meriting further and more detailed evaluation.

Method

The criteria and indicators are to be evaluated in the context of conditions in Côte d'Ivoire/West Africa.

The task of a system to *evaluate* sustainability is to assess the satisfaction of the following two conditions:

1. Ecosystem integrity is ensured/maintained, and
 2. Well being of people (*primarily local people*) is maintained or enhanced
- These conditions represent the bio-physical, social and temporal elements of sustainability and are discussed in greater detail in the *Briefing Book*. Fulfilment of the above two conditions is expected to take place continuously over long but not infinite periods of time.

The following five questions have been designed as an aid to focus on important attributes of criteria and indicators and enable the elimination of obviously deficient criteria and indicators.

1. **Closely and unambiguously related to the assessment goal?** = directly/obviously/intuitively/logically linked to criterion or to sustainability
 2. **Easy to detect, record & interpret?** = easy to get the information, straightforward?
 3. **Provides a summary or integrative measure?** summarizes/integrates a lot of information, is it information efficient?
 4. **Adequate response range to stresses?** = does the indicator continue to give you useful and meaningful information over a wide range of situations?
 5. **Important and therefore selected as 'priority'?** = Is it relevant and appropriate? Is it useful? Is it worth further investigation during the field phase?
- Please use a scale of 1-5 in answering the five questions listed on Response Form No. 1.
 - Please photocopy the form as required.
 - Please try and record your responses on the attached simple program to record data. Remember to make print outs for safety!

Annex 4

Evaluation of Form 1

Anhang 4

Auswertung von Kriterien und Indikatoren						
No. in doc.	Anzahl der Bewertungen	Summe der Ja	Summe der Nein	Diskussion	Ausge- schieden	Definitiv ausge- schieden
1/14	6	6	0			
2/14	6	6	0			
3/14	6	5	1			
4/14	6	6	0			
5/14	6	5	1			
6/14	6	6	0			
7/14	6	6	0			
8/14	5	3	2	X		
9/14	5	5	0			
10/14	5	5	0			
11/14	5	4	1			
12/14	5	5	0			
13/14	5	4	1			
14/14	5	5	0			
15/14	5	5	0			
16/14	5	5	0			
17/14	5	5	0			
18/14	5	4	1			
19/14	5	4	1			
20/14	5	3	2	X		
21/14	5	5	0			
22/14	5	2	3	X		
23/14	6	6	0			
24/14	6	6	0			
25/14	6	6	0			
26/14	6	4	2	X		
27/14	6	6	0			
28/14	6	6	0			
29/14	6	6	0			
30/14	5	5	0			
31/14	5	5	0			
32/14	5	5	0			
33/14	5	5	0			
34/14	5	5	0			
35/14	6	5	1			
36/14	5	1	4		?	
37/14	5	3	2	X		
38/14	5	4	1			
39/14	6	6	0			
40/14	6	6	0			
41/14	6	6	0			
42/14	6	4	2	X		
P 43/14	5	3	2	X		
P 44/14	5	5	0			
45/1	5	5	0			
46/2	5	3	2	X		
47/3	5	2	3	X		
48/5	4	1	3	X	?	
49/4	5	3	2	X		
50/5	5	3	2	X		
51/2	5	5	0			

Anhang 4

Auswertung von Kriterien und Indikatoren						
No. in doc.	Anzahl der Bewertungen	Summe der Ja	Summe der Nein	Diskussion	Ausgeschieden	Definitiv ausgeschieden
54/13	4	3	1			
55/13	5	3	2	X		
56/13	4	2	2	X		
P 57/14	5	5	0			
P 58/14	5	5	0			
P 59/14	5	5	0			
P 60/14	5	5	0			
P 61/14	5	5	0			
P 62/14	5	5	0			
63/7	5	3	2	X		
P 64/14	5	5	0			
P 65/14	4	2	2	X		
66/14	5	5	0			
67/14	5	5	0			
P 68/14	5	5	0			
69/14	5	5	0			
70/8	5	3	2	X		
71/2	5	1	4		?	
72/2	4	1	3	X		
73/5	5	2	3	X		
74/9	5	4	1			
75/9	5	4	1			
76/3	5	3	2	X		
77/8	5	2	3	X		
78/10	5	5	0			
P 79/3	5	3	2	X		
P 80/3	5	2	3	X		
P 81/3	5	2	3	X		
P 82/3	5	5	0			
P 83/3	5	5	0			
P 84/3	5	3	2	X		
P 85/3	5	4	1			
P 86/3	5	4	1			
P 87/3	5	1	4		?	X
P 88/3	5	2	3	X		
89/11	5	2	3	X		
90/11	5	3	2	X		
91/5	5	2	3	X		
92/5	5	3	2	X		
93/5	5	3	2	X		
94/5	5	3	2	X		
95/10	5	4	1			
96/3	5	1	4		?	X
97/3	5	2	3	X		
98/3	5	2	3	X		
99/3	5	4	1			
100/8	5	2	4	X		
101/8	5	3	2	X		
102/2	5	4	1			
103/2	5	3	2	X		

Anhang 4

Auswertung von Kriterien und Indikatoren						
No. in doc.	Anzahl der Bewertungen	Summe der Ja	Summe der Nein	Diskussion	Ausgeschieden	Definitiv ausgeschieden
106/14	5	4	1			
107/5	5	2	3	X		
108/11	5		4		X	X
109/11	5	4	1			
110/8	5	1	4		?	X
111/2	5	5	0			
P 112/3	5	3	2	X		
P 113/3	5	3	2	X		
114/3	5	4	1	X		
P 115/3	4	3	1			
P 116/3	4	3	1			
P 117/3	4	3	1			
P 118/3	4	2	2	X		
119/8	5	4	1			
P 120/3	5	5	0			
P 121/3	5	5	0			
P 122/3	5	5	0			
P 123/3	5	4	1			
P 124/3	5	4	1			
125/9	4	2	2	X		
126/9	5	3	2	X		
127/9	5	2	3	X		
128/5	5	2	3	X		
129/5	5	2	3	X		
130/5	5	1	4		?	X
131/5	5	1	4		?	
132/5	5	2	3	X		
133/5	5	2	4	X		
P 134/14	5	5	0			
P 136/14	5	5	0			
136/5	5	4	1			
137/9	5	4	1			
138/9	5	2	3	X		
139/9	5	2	3	X		
140/9	5	4	1			
141/9	5	3	2	X		
142/9	5	2	3	X		
143/5	5	5	0			
144/5	5	5	0			
145/9	5	2	3	X		
146/9	5	3	2	X		
147/10	5	5	0			
148/6	5	4	1			
149/5	5	5	0			
150/5	5	3	2	X		
151/5	5	3	2	X		
152/3	5	3	2	X		
153/3	5	2	3	X		
154/5	5	3	2	X		
155/9	5	0	5		X	X
156/9	5	3	2	X		

Anhang 4

Auswertung von Kriterien und Indikatoren						
No. in doc.	Anzahl der Bewertungen	Summe der Ja	Summe der Nein	Diskussion	Ausgeschieden	Definitiv ausgeschieden
159/9	5	2	3	X		
160/9	5	1	4		?	X
161/9	5	2	3	X		
162/9	5	1	4		?	X
163/5	5	3	2	X		
164/5	5	3	2	X		
165/5	5	2	3	X		
166/14	5	3	2	X		
167/14	3	2	1			
168/5	5	5	0			
169/5	5	3	2	X		
170/5	5	3	2	X		
171/5	5	1	4		?	
172/5	5	1	4		?	
173/5	5	4	1			
174/2	5	4	1			
175/3	5	5	0			
176/5	5	2	3	X		
177/5	5	0	5		X	X
P 178/14	5	5	0			
179/5	5	0	5		X	X
180/5	5	1	4		?	
181/5	5	1	4		?	
182/5	5	2	3	X		
183/8	5	4	1			
184/5	5	2	3	X		
185/3	5	2	3	X		
186/8	5	4	1			
187/5	5	1	4		?	X
188/5	5	3	2	X		
189/1	5	4	1			
190/5	5	4	1			
191/5	5	1	4		?	
192/5	5	2	3	X		
193/9	5	2	3	X		
194/1	5	2	3	X		
195/5	5	4	1			
196/5	5	5	0			
197/5	5	2	3	X		
198/5	5	2	3	X		
199/5	5	4	1			
P 200/4	5	2	3	X		
201/5	5	2	3	X		
202/5	5	1	4		?	
203/5	5	3	2	X		
204/5	5	1	4		?	
205/5	5	4	1			
206/5	5	3	2	X		
207/5	5	4	1			
208/5	5	3	2	X		
209/5	5	3	2	X		

Anhang 4

Auswertung von Kriterien und Indikatoren						
No. in doc.	Anzahl der Bewertungen	Summe der Ja	Summe der Nein	Diskussion	Ausge- schieden	Definitiv ausge- schieden
212/5	5	4	1			
213/5	5	3	2	X		
214/11	5	3	2	X		
215/1	5	3	2	X		
216/1	5	2	3	X		
217/8	5	3	2	X		
218/1	5	3	2	X		
219/8	5	2	3	X		
220/8	5	3	2	X		
221/8	5	4	1			
222/5	5	3	2	X		
223/5	5	3	2	X		
224/5	5	3	2	X		
225/11	5	2	3	X		
226/11	5	3	2	X		
227/5	5	2	3	X		
228/8	5	4	1			
229/1	5	5	0			
230/2	5	2	3	X		
231/1	5	3	2	X		
232/1	5	5	0			
233/11	5	3	2	X		
234/13	6	5	1			
P 235/14	6	5	1			
P 236/14	6	5	1			
P 237/14	6	5	1			
238/3	6	4	2	X		
239/1	6	2	4	X		
240/1	6	2	4	X		
241/12	6	4	2	X		
242/2	6	3	3	X		
243/2	6	3	3	X		
244/8	6	3	3	X		
245/8	6	1	5		X	
246/8	6	3	3	X		
247/2	6	5	1			
248/2	6	4	2	X		
249/1	6	6	0			
250/2	6	3	3	X		
251/2	6	4	2	X		
252/5	6	5	1			
253/2	6	2	4	X		
254/2	6	3	3	X		
255/3	6	3	2	X		
256/8	6	4	2	X		
257/8	6	4	2	X		
258/5	6	1	5		X	
259/5	6	1	5		X	X
260/2	6	3	3	X		
261/2	6	3	3	X		
262/8	6	2	4	X		

Anhang 4

Auswertung von Kriterien und Indikatoren						
No. in doc.	Anzahl der Bewert- ungen	Summe der Ja	Summe der Nein	Diskussion	Ausge- schieden	Definitiv ausge- schieden
265/2	6	3	3	X		
266/3	5	4	1			
267/2	4	2	2	X		
268/2	4	3	1			
P 269/14	5	5	0			
270/5	5	4	1			
271/5	5	3	2	X		
272/3	5	2	3	X		
273/2	5	3	2	X		
274/5	5	2	3	X		
275/2	5	3	2	X		
276/8	5	3	2	X		
277/3	5	4	1			
278/3	5	3	2	X		

Annex 5

Form 2

TESTING CRITERIA AND INDICATORS FOR THE SUSTAINABLE MANAGEMENT OF FORESTS
Response Form 2
Instructions for users

1. This form has been designed to record assessments of criteria and indicators selected for more intensive evaluation, after analysis of Form 1. It has also been designed to provide a transparent record of how you reached your conclusions.

2. Filling in the form.

a) The first six unnumbered boxes on page 1 identify which panel member is primarily responsible for the evaluation of the criterion or indicator ('CONSULTANTS INITIALS'), which of the sets it originated from ('SOURCE'), its number or reference as recorded in the source (CRITERIA NO OR INDICATOR), its subject matter ('CLASS') and whether after completion of the field phase it was recommended or not ('RECOMMENDATION').

b) Attributes, Box A:

General: Two entry boxes have been provided for each question in this *and subsequent sections*. The first box (d) refers to the criterion or indicator as listed in Box D, which is the initial selection. If the initial selection has to be modified, this will be recorded in Box O on page 4. This final version must be subjected to a renewed evaluation (o). By comparing evaluations (d) and (o) the reader can assess whether the final version is significantly better than the initial version.

- 1) **Provides a summary or integrative measure?** Does it sum up or integrate a lot of information? Is it information efficient?
- 2) **Closely and unambiguously related to the assessment goal?** Is it closely related to its assessment goal? Is it diagnostically specific? Is the criterion or indicator easy to detect, record and interpret?
- 3) **Adequate response range to stresses?** Is it sensitive to changes in the environment or the system? Does it provide meaningful information over these changes?
- 4) **Diagnostically specific?** Does the indicator (or criterion) tell us something about the criterion it relates to? Or is it more general, relating perhaps to more than one criterion or area?
- 5) **Appealing to users?** Does it appeal? Would a potential user feel invited to use it? Is it cost-effective?
- 6) **Easy to detect, record and interpret?** How feasible is the criterion/indicator? Will it produce repeatable results?
- 7) **Precisely defined?** Is the meaning clear? Is the definition precise? Would two different people understand it the same way? (Test this on your fellow panel members.)
- 8) **Will it produce replicable results?** Is it reliable and repeatable? How robust are predictions based on this indicator or criterion?
- 9) **How relevant is this criterion or indicator?** Your opinion on the relevance of this criterion or indicator to sustainability.
- 10) **Other:** e.g. Is an absolute or a relative measure better?

c) Box B: Provide an estimate of how much it would cost (in terms of person-hours or US\$) what the total cost would be if this criterion or indicator were to be used to evaluate sustainability of a forest management unit.

- d) Box C: Based on your experience, published documents, ongoing research etc. can you suggest a value or a range of values that could make this indicator or criterion more precise?
- e) Box D: Please enter the *original* text of the criterion or indicator, you have selected as being the most worth evaluating from amongst the sets provided. Please refer to relevant Response Forms No. 1 of all panel members, before effecting your selection.
- f) Box E: Justify your selection of this criterion or indicator, giving the main arguments.
- g) Box F: Give bibliographic references to provide additional weight to your justification, if you can.
- h) Box G: Give the references, wherever possible, of similar criteria and indicators from the other sets.
- i) Box H: Record additional notes in this space. If a criterion or indicator is rejected, please provide the reasons here.
- j) Box I: Maintain a daily diary of your efforts to evaluate the criterion or indicator. This will be of help to you in justifying to the workshop your reasons for selecting or rejecting it. It will also be of help to CIFOR staff for the analysis of your recommendations after the field phase. Please feel free to add additional pages if desired.
- k) Box J: The consultant selected as task leader for 'time' will tick the appropriate box to indicate whether a criterion or indicator has a primarily backward looking or historical nature (Past), is a snapshot of conditions as they exist at the moment (Present) or has a predictive character (Future).
- l) Box K: The responsible task leader will evaluate the geo-political scale on which a criterion or indicator operates. Multiple entries are possible, but care should be taken to determine the primary thrust of a criterion or indicator.
- m) Box L: In this box the responsible task leader will determine whether the criterion or indicator belongs to the category of 'human inputs' (e.g. capital, labour) or 'human processes' (as opposed to natural processes) such as the various planning processes or whether it is an 'outcome' of either of the first two categories in the bio-physical or social systems. The difference between a human input and a human process is often a very fine one. an indicator such as "Annual, 5 year and twenty year management plans exist" would be an input resulting out of the process "Management is based on appropriate planning horizons...". Inputs are generally easier to record, predict and interpret. Processes on the other hand are often more revealing of how committed management is to achieving its goals.
- n) Box M: A classification of criteria and indicators according to whether they refer to a 'stress' on the system (bio-physical, social or management), describe its 'state' or how the system 'responds' to stress or strain, is an effective way of looking at causes and effects. Examining whether the major sources of stress, and the systems' responses to these

stresses, have been captured in criteria and indicators facilitates objective conclusions on their effectiveness and reliability.

- o) **Box N:** Criteria and indicators constitute a network or web to capture information. The boxes above have attempted to examine whether the right strands have been woven into this web, and that the mesh is neither too small nor too large for the information we want to capture. In this box we are looking for linkages between criteria and indicators, to ensure that the same or similar information is not collected twice and to ascertain whether the necessary feedback loops exist between criteria and indicators. Examples of important feedback loops in forestry are between regeneration and growth on the one hand and silvicultural prescriptions and cutting cycles on the other. An effective system of criteria and indicators needs to reflect such information loops.
- p) **Box O:** If the criterion or indicator selected in Box D has undergone changes in its definition, the final version of this criterion or indicator should be recorded here. It is assumed that justification for these changes can be found in pages 2 & 3.
- q) **Box P:** The workshop notes will be used to record the most important conclusions of the workshop on the criterion or indicator.

Response Form No. 2: Field responses

CONSULTANTS INITIALS
 A=*Willi*, B=*Reinmoser*
 C=*Seitz*, D=*Teuber*
 E=*Rast*, F=*Grünberg*

CRITERIA NO.

RECOMMENDATION
 Yes
 No

ATTRIBUTES		Please use a scale of 1-5 when answering, where 1=no/bad/unimportant and 5=yes/good/important		A	
	(d)	(o)		(d)	(o)
Provides a summary or integrative measure?	<input type="checkbox"/>	<input type="checkbox"/>	Easy to detect, record and interpret? Feasible?	<input type="checkbox"/>	<input type="checkbox"/>
Closely and unambiguously related to the assessment goal?	<input type="checkbox"/>	<input type="checkbox"/>	Precisely defined? (clear)	<input type="checkbox"/>	<input type="checkbox"/>
Adequate response range to stresses ? (Sensitive)	<input type="checkbox"/>	<input type="checkbox"/>	Will it produce replicable results? (reliable)	<input type="checkbox"/>	<input type="checkbox"/>
Diagnostically specific?	<input type="checkbox"/>	<input type="checkbox"/>	How relevant is this criterion or indicator?	<input type="checkbox"/>	<input type="checkbox"/>
Appealing to users?	<input type="checkbox"/>	<input type="checkbox"/>	Other:	<input type="checkbox"/>	<input type="checkbox"/>

Estimated evaluation cost? Person Hours <input type="checkbox"/>	Suggested Tolerance Value <input type="checkbox"/> Units <input type="checkbox"/> Please justify:	B	C
US\$ <input type="checkbox"/>			

Enter the selected criterion or indicator as stated in the source document in this space:

D

Justify your selection of this criterion or indicator:

E

Provide bibliographic references (if any):

F

Please name (give the ref. of) the criteria or indicators that overlap (come closest) to the criterion or indicator recommended above:

Krit. No.:	<input type="text"/>
Krit. No.:	<input type="text"/>
Krit. No.:	<input type="text"/>
Krit. No.:	<input type="text"/>
Krit. No.:	<input type="text"/>

G

NOTES: Please record your notes on evaluating the criterion/indicator (Box D) here:

H

Daily Diary

I

Date	Action	Remarks

TIME (d) (o) (d) (o) (d) (o) (d) (o)
 Justify: Past Present Future If future then predictive value years

J Task Leader:

GEO-POLITICAL (d) (o) (d) (o) (d) (o) (d) (o)
 Justify: International National Regional Local

K Task Leader:

FUNCTION 1 (d) (o) (d) (o) (d) (o)
 Justify: Human Input Human Process Outcome

L Task Leader:

FUNCTION 2 (d) (o) (d) (o) (d) (o)
 Justify: Stress Stare Response

M Task Leader:

LINKAGES This criterion or indicator has an information value for the following areas/criteria/indicators:

Bio-physical:

Social:

Management:

Other:

N Task Leader: B

Final version of criterion/indicator. state only if different to definition on page 1 (Box D):

O

WORKSHOP NOTES (for office use only)

Did the workshop accept this criterion indicator unchanged? YES NO

Why?

Were revisions called for? YES NO

State revision:

State justification for revision:

OR was this criterion or indicator rejected as being unsuitable? YES NO

State reasons:

P

Q/A: Identifikation offener fachlicher, über die Testung hinausgehender Probleme/Fragen:

R/A: Prüfungsmodus:

- formal/aufgrund v. Unterlagen prüfbar
- im Feld zu testen

Anmerkungen:

S/A: Eignung:

- | | |
|--|--|
| <input type="checkbox"/> für Naturwälder | <input type="checkbox"/> für Kleinstwälder (-50 ha) |
| <input type="checkbox"/> für traditionell genutzte „Kultur“-Wälder | <input type="checkbox"/> für Kleinwälder (50-200 ha) |
| <input type="checkbox"/> generell geeignet | <input type="checkbox"/> für Mittel- u. Großbetriebe |
| | <input type="checkbox"/> für Großlizenzen |
| <input type="checkbox"/> sonstiges (bitte anführen): | <input type="checkbox"/> generell geeignet |

T/A: Anwendungsbereich

- österreichspezifisch (bzw. für mitteleuropäisch-alpine Gebiete)
- vorwiegend für boreale/tropische Gebiete relevant
- generell für alle Gebiete erforderlich/geeignet

Anmerkungen:

U/A: Vorschläge zur Änderung der Zuordnung:

bitte den neu/besser zuzuordnenden Gliederungspunkt anführen:
(z. B.: ad II/A/1./a bzw. dort angeführtes P)

Anmerkungen:

R = Richtlinie (nur zufällige Kontrolle möglich)

A 1: Identifikation nicht oder nicht ausreichend berücksichtigter Bereiche:
(falls möglich, bitte dazu geeignete K+I anführen)

--

Annex 6

Example of a filled in Form 2

CONSULTANTS INITIALS E RECOMMENDATION: YES CRITERIA NO. 255/3/F TYPE: INDICATOR		ATTRIBUTES summary or integrative measure 2 easy to detect, record,.. 3 closely related to goal 3 precisely defined 3 response range to stress 2 replicable results 4 diagnostically specific 2 relevance 2 appealing to users 3 cost efficiency 2		A	
Suggested Tolerance Value 0 Units Please justify C		equal employment conditions			
source text: <i>Employment conditions are the same for local and non-local employees doing the same job (SA).</i> 255/3					
D final version: <i>Es gelten die gleichen Bedingungen für Entlohnung, Ausrüstung und Arbeitszeit für lokale und nicht-ortsansässige Arbeitskräfte, die die gleiche Arbeit verrichten.</i> 255/3/F					
justification: <i>Gleiches Motivationsniveau</i> E		overlapping criteria: G			
J TIME Past [] Present [X] Future [] in 0 years		L FUNCTION 1 Input [X] Process [] Outcome []			
K GEO-POLIT. Intern.[1] National[1] Regional[4] Local [5]		M FUNCTION 2 Stress [] State [X] Response []			
LINKAGES Bio-physical: Social: 270/5, 501, 502 Management: N Chapter No.: 422		PROBLEMS Erfäßbarkeit, Datenschutz, Sachlohn Q			
TESTING METHOD formal [X] field test [X] Notes: Lohnunterlagen R		SUITABILITY natural forest [] forests - 50 ha [] second. forest [] forests 50-200 ha [] general [X] forests 200+ ha [] other [] licences [X] [] general [X] S		RANGE OF APPLICATION Austria / Central Europe [] boreal / tropical [] general [X] T	

CONSULTANTS INITIALS E RECOMMENDATION: YES CRITERIA NO. 270/5 TYPE: CRITERIA		ATTRIBUTES summary or integrative measure 3 easy to detect, record,.. 4 closely related to goal 3 precisely defined 1 response range to stress 3 replicable results 4 diagnostically specific 2 relevance 3 appealing to users 3 cost efficiency 3		A	
Suggested Tolerance Value 0 Units Please justify C		Statement of wages and salary scales			
source text: <i>Statement of wages and salary scales, insurance provision (SCS)</i> 270/5					
D final version:					
O					
justification: <i>Sicherung der Motivation</i> E		overlapping criteria: G			
J TIME Past [] Present [X] Future [X] in 2 years		L FUNCTION 1 Input [X] Process [] Outcome []			
K GEO-POLIT. Intern.[1] National[5] Regional[3] Local [1]		M FUNCTION 2 Stress [X] State [] Response []			
LINKAGES Bio-physical: Social: 501,502,255/3 Management: N Chapter No.: 421		PROBLEMS Datenschutz Q			
TESTING METHOD formal [X] field test [X] Notes: Rechtsgrundlagen, Lohnauszahlung R		SUITABILITY natural forest [] forests - 50 ha [] second. forest [] forests 50-200 ha [] general [X] forests 200+ ha [] other [] licences [] [] general [X] S		RANGE OF APPLICATION Austria / Central Europe [] boreal / tropical [] general [X] T	

