Criteria and Indicators of Sustainability in Community Managed Forest Landscapes



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Criteria and Indicators of Sustainability in Community Managed Forest Landscapes: An Introductory Guide

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Foreword

This guide is intended to make a contribution to the larger efforts worldwide at improving forest management, human well-being, and the sustainability of natural resources. In order for it to do so, three important points should be noted by anyone intending to use the Guide:

1) As with any such tool, everything in this guide needs to be considered in, and adapted to, the local context in which it is to be used. We consider it not a 'blueprint', but a 'springboard' to appropriate action…

2) Successful implementation of the approach suggested in this guide relies on adequate understanding of, commitment to, and skills in ***participatory approaches and processes***. This does not mean that only "professional participation practitioners" should use it. It means rather that if there is a lack of any or all of these, this gap should be addressed prior to and during the C&I processes (for example, through the readings or contacts suggested in the reference section).

   Furthermore, in relation to point 1 above, as the approach to CMF C&I and processes for monitoring are adapted for use locally, it is extremely important that these adaptations build in and maximize opportunities for shared learning and ownership of the processes. For example, while the guide may offer some ideas for 'structuring CMF C&I', it does not go in depth into the kinds of participatory tools that can be best used in different groups to do this. *We look to the implementers of the guide to bring in the participatory tools and adaptations that will be needed in each context.* We anticipate that across all contexts, this will include such adaptations as:
   - Locally appropriate games to introduce ideas
   - Shifting from written word to pictorial representations or other activities as literacy levels dictate
   - Developing strategies to overcome barriers to participation (such as gender, caste, etc)

3) This is a work in progress! CIFOR and collaborators are continuing work in this area, and we would welcome input and feedback on this guide.

Acknowledgements

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Introduction

In response to a complex and rapidly changing community managed forestry environment, CIFOR has undertaken a programme of research to develop and test suitable Criteria and Indicators (C&I) for assessing the sustainability of Community Managed Forests (CMF).[1] Three tests were carried out, in Brazil, Indonesia and Cameroon, as part of the broader CIFOR project 'Assessing the Sustainability of Forest Management'. Current research builds on this by exploring in more depth the role of C&I in adaptive and collaboration-oriented management by communities and other forest stakeholders.

This guide draws on the results of CIFOR's CMF C&I research to date,[2] and suggests the potential for practical application and further development at the community level. Based on experience at the three CIFOR test sites, we present C&I as a participatory tool for sustainable community managed forests (*i.e.,* community managed forests in which the flow of goods and services from these forests can be maintained without reducing their quality or value for future generations). The objective of this manual is to assist community-based forest managers and/or practitioners and partners to develop an agreed and easily understood set of C&I built around shared knowledge and best practice. This set

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[1] We use the term 'community management of forests' or 'community managed forests' (CMF) rather than 'community forest management' (CFM) in order to keep the frame of reference quite broad. While we do include areas that are under exclusive management of a community or communities, we also are referring to areas managed *in part* by communities, including instances of collaborative or co-management between communities and other stakeholders. We recognise that this latter case of multiple stakeholder management presents many challenges which are not fully addressed here. We plan to continue to explore these through our research and communication with others, and address them more fully in future publications.

[2] Burford de Oliveira (1999) and Burford de Oliveira *et al*. (1999).

of C&I can then be used to provide a framework for monitoring and assessing key changes, to feed information and learning back into the community managed forest system, and thus to guide future action towards sustainability.

C&I may help communities to:

- set goals for sustainable forest management;
- monitor their own performance;
- assess the key information gathered from the application of the C&I;
- learn from the information gathered;
- adapt their management to take account of observed changes;
- make better decisions about future action; and
- communicate effectively about the impact of external factors including forest policy.

This guide summarises our experiences and proposes an option that can be adopted by CMF managers and practitioners. While we have learned a great deal from the field tests and analysis so far, we are still in a research and, more importantly, a learning process. We encourage people to adapt the ideas from this guide to their own circumstances as they see fit and welcome all feedback, especially that based in CMF C&I implementation experiences.

Who should read this guide?

This guide is aimed at those who would like to develop and use C&I as a tool for improving community management of forests. Potential users include:

- extension/development project workers and non-governmental organisation (NGO) staff engaged in CMF activities with local people or in areas with the potential for CMF;
- forestry department officers working with communities on community management or co-management of forests; and
- strongly organised, self-motivated communities actively involved in CMF including, but not only, those interested in certification.

Outline

Part 1 highlights the importance of community management of forests, and identifies some common elements of success, as well as threats to it. It emphasises the need for shared learning in management and for two-way communication between communities and other stakeholders in collaborative management arrangements, and indicates the potential utility of C&I.

Part 2 explains C&I. It introduces how shared wisdom, knowledge and information about sustainable forest management can be structured into a hierarchy of principles, criteria, indicators and verifiers.

Part 3 suggests an approach to the participatory development of a local set of C&I for Sustainable Community Managed Forests (SCMF). Whilst not providing step-by-step instructions, it offers some guidelines and recommendations about key principles from lessons learned in CIFOR's work. It then outlines a possible approach to applying the agreed set of C&I as a tool for monitoring, assessing and evaluating forest management in an iterative way to guide management towards sustainability.

Part 4 is concerned with the content of C&I for CMF. The broad scope of relevant content is illustrated through examples of the C&I generated at the three CIFOR test sites. These can be used as a possible starting point for the development of locally appropriate C&I.

Finally, we give a few key references for some useful supporting documents and manuals which are freely available, including CIFOR's full reports of testing C&I for CMF.

Abbreviations used in the Guide:

C&I: Criteria and Indicators – this is also commonly used as shorthand to represent the entire related hierarchy, *i.e.*, not only Criteria and Indicators, but Principles, Criteria, Indicators and Verifiers

CMF: Community Managed Forest(s)/Community Management of Forests

DFO: District Forest Officer

FMU: Forest Management Unit

NGO: Non-governmental Organisation

PRA: Participatory Rural Appraisal

SCMF: Sustainable Community Managed Forests/Management of Forests

1. Community Management of Forests (CMF)

1.1 Why Community Management of Forests is important

Many rural, and especially indigenous, communities have a long tradition of community forest management, *i.e.*, where the management of forest resources is the responsibility of a local community and the management practices are carried out through co-operative or collective efforts by the community members. They have built up a considerable store of wisdom, knowledge and practical skills which can be drawn on to help ensure the sustainable management of many of the world's forests.

CMF was and is still, in many places, actively practised all over the world, in every continent and every forest type from the tropics to the tundra. The management systems and objectives vary considerably, from reindeer herding in the far north through sedentary agroforestry systems, to integral swidden cultivation in the tropical forests. Such forest management systems are often based on a 'traditional, year-round, community-wide largely self-contained and ritually sanctioned way of life'.[3]

CMF differs significantly from the conventional economic or industrial view of forest management in its breadth of vision. Forest dependent peoples generally see their forest landscape from many different perspectives. They may view the landscape as a space once inhabited by their ancestors, whose influence on the landscape can be traced a long way back. The landscape also exists in people's memories, which are connected to place names, myths and folklore.

The community managed forest landscape is a 'cultural space'.

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[3] From Conklin, H.C. 1957. Hanunoo Agriculture: a report on an integral system of shifting agriculture in the Philippines. Rome: FAO (Forestry Development Paper no. 12).

It is where forest people meet:

- their physical requirements – food, fuel, shelter, medicines and tools;
- their social requirements – individual , family and community space;
- their spiritual requirements – e.g., sacred sites, burial sites and spirit homes; and
- their economic requirements – forest products, raw materials and employment.

Until recently, community management systems were often regarded as anachronisms in a modern age, destructive of the forest, inefficient and unproductive. This view has often resulted in the persecution of such community management systems (and indeed sometimes the communities themselves), resulting in their being all but been eradicated in some parts of the world. Recent research and a greater understanding of 'how and why' these CMF systems operate has led to a growing recognition of the fact that they are viable and valuable, and still critical to the functioning of many rural social and economic systems. Millions of people all over the world still depend on forest resources for their survival, and will continue to do so for the foreseeable future. Equally, given the growing regional, national and international needs to protect water and biodiversity resources, and to limit atmospheric carbon levels, communities are increasingly becoming recognised as key potential allies and resource managers.

There are also a growing number of communities living in forest margins, who do not have the long traditions of forest management described above. While these communities, such as transmigrant or displaced peoples, may not share the same abundance of specific local knowledge or have spiritual connections to the area, the fact remains that, as people who live close to the forest, they are primary actors and may have significant positive or negative impacts on the forest. This, combined with the concrete lessons learned by many governments around the world that

local people cannot forcibly be kept from forests, clearly indicates the practical need for consideration of local communities as local managers to be encouraged and included in efforts for sustainability.

A further practical reason that CMF is increasingly being recognised and addressed, regardless of the composition of the community, relates to the current trend by many governments to decentralise and/or devolve responsibility and management of forests and other natural resources to more local levels, including to communities. This has led to an increased interest among governments, aid agencies, NGOs and ultimately many forest communities themselves to secure and strengthen CMF.[4]

1.2 What helps CMF work?

From analysis of experiences worldwide, a number of factors that appear to be associated with successful community management of forest resources and products have been identified.[5] These include:

- clear community membership;
- clear boundaries to the forest resource;
- the authority to manage (security of tenure, de facto or de jure);
- a shared knowledge of the value of the forest resource;
- a shared knowledge of the functioning of the forest;
- dependence on internal rather than external institutions;
- realistic internally set rules;
- the ability to monitor and enforce rule[6] adherence;

[4] For example, see Poffenberger (1998 onwards).

[5] For example, see Ostrom (1999).

[6] Throughout this text, unless otherwise specified, when we refer to rules, we include both formal and informal rules and regulations (e.g., norms, taboos, traditional agreed practices, etc).

- low-cost conflict resolution mechanisms;
- the ability to monitor the state of the forest resources; and
- appropriate technologies for appropriation of forest products.

1.3 What are the current threats to CMF?

Forest resources, forest communities and their CMF systems in many parts of the world continue to come under increasing pressure from:

- changes to the political and economic environments in which they operate;
- increased demand for the forest resources from actors outside the community;
- the spread of education and global information, including via popular media; and
- growing populations within the community.

This can result in:

- the creation of new market demands/opportunities;
- the creation of competition for the forest resources that the communities depend on;
- the undermining of traditional belief systems which underpin their value systems and guide their management systems; and
- a rise in expectations and aspirations.

Where CMF systems are threatened or undermined, the result often can be unsustainable use of the forest landscape, leading to forest degradation or deforestation.[7]

[7] For example, see Verolme, H.J.H., and Moussa, J. (eds.) (1999).

1.4 Adapting to change

All CMF systems have evolved over time and communities have learned to adapt to changes in their political, cultural and economic environments and, indeed, to changes in their physical environment brought about by their own interventions. This is well illustrated, for example, by many forest-dwelling communities who have evolved systems of incorporation and intensive cultivation of valuable tree crops within the forest, in response to a decrease in available forest land and greater exposure to market opportunities. But there is increasing concern that many communities practising CMF may be unable to adapt positively and quickly enough to the many and rapid changes facing them.

Change is rapid for most of these communities. Much of this change is externally driven as roads, universal education and external information and communication are introduced into their villages and homelands. Whilst much of the change is welcomed it has often proved disruptive of traditional management systems.

Adapting to these changes can be very challenging. It can also be very damaging if the rate of change outstrips the rate of learning about the impacts of change on the community and on the forest resources.

1.5 Adapting to change in partnership

One response to the challenges of rapid change and the need to adapt is for communities to work more closely with other stakeholders, including NGOs and government departments, in forest co-management partnerships.

Among the difficulties sometimes encountered in co-management partnerships is effective communication between non-community partners and the community. The growing recognition by governments, rural development organisations and others of the importance of CMF and the political will to devolve management to communities carries with it the expectation that CMF should be aimed at good stewardship as well as meeting the needs of the community. The meaning of good stewardship to the non-community partners is often informed by wider global and scientifically based considerations which may not be immediately recognised or understood by the community, and which in turn may not adequately understand or represent community interests. Furthermore, multiple barriers exist to communities effectively expressing their own expectations, needs, knowledge and achievements to other partners.

This failure to communicate effectively can often result in a tension in co-management situations, which at the least can be frustrating, and at worst can be socially and environmentally destructive and impede progress towards sustainable CMF.

1.6 How C&I may help

Criteria and Indicators (C&I) of sustainable forest management can be useful learning and communication tools. Generic or widely applicable C&I developed in real partnerships have the potential to create bridges between the communities and the outside world by bringing in information on the knowledge and views of the outside world and carrying out information on the views, needs and achievements of the communities.

At a local level, our experience to date strongly suggests that C&I, developed locally by the principal stakeholders in a participatory and collaborative way, can be a valuable tool for mutual learning between the community and partners, sharing local and scientific and other external knowledge and guiding action towards the sustainable management of forests. They can provide a structure for organising shared knowledge and information about sustainable forest management.

Developing C&I in a participatory way can:

- draw on local wisdom, knowledge, observation and understanding;
- give expression to indigenous knowledge;
- bring together indigenous and scientific knowledge;
- identify knowledge gaps or misunderstandings;
- strengthen community planning, monitoring, evaluation and reporting;
- enhance community ownership of the monitoring process; and
- enhance community voice with respect to other stakeholders.

The resulting C&I can be used by the community as a tool for setting goals for sustainable forest management, guiding actions, monitoring and assessing and learning from the process. Using the C&I in an iterative process can help adapt management towards sustainability.

Employing C&I as a monitoring tool can:

- enable the community to set goals for sustainable forest management;
- help assimilate key information about the effects of management;
- contribute to the assessment and evaluation of progress towards the goals;
- encourage community and partner learning from positive and negative impacts of management;
- encourage communities to adapt management strategies and actions based on that learning; and
- assist communities in communicating their management experiences to other stakeholders.

C&I development and monitoring processes can be as formal or informal as required by the context. We believe they could be compatible with and enhance CMF contexts where there are *formal* (e.g., government recognized CFs with written annual management plans) or *less formal/ more traditional* (e.g., where management plays out through more orally–based, internal community agreements, and/or where there is not yet government recognition) CMF systems. (In the former case, C&I should be seen as *complementing*, not replacing the written management plan.)

2. What are C&I?

C&I literally stands for Criteria and Indicators, but is used in this manual, and generally in practice, as a shorthand for the entire hierarchy of ***Principles***, ***Criteria***, ***Indicators*** *and* ***Verifiers***. C&I provide a means of linking CMF **Wisdom**, **Knowledge**, **Information and Data** in this four-level hierarchy in a comprehensive, coherent and consistent manner that is capable of verification.[8] It is by creating these clear linkages that C&I may become a powerful tool in the pursuit of the overall objective of sustainable forest management. C&I can help organise local and scientific knowledge in such a way that it can be used as a forest and forest management 'health check'.

A well constructed C&I set can be used to:

- **express** what sustainable forest management means for the community;
- **assess** performance against predefined targets;
- **monitor** impacts of management interventions;
- **record** change;
- **provide guidelines** for action towards sustainable management through identifying best practice; and
- **adapt** management strategies based on what is learned from the above process.

[8] See also CIFOR's Criteria and Indicators Generic Template. The related Tropenbos Hierarchy (a similar, but slightly different approach) is well described in Lammerts van Bueren and Blom (1997).

2.1 Defining C&I

Principles

Principles are top-level statements – 'fundamental truths' or 'laws' – which embody human **wisdom** about sustainable community forest management (SCMF). They refer to a function of the forest or to a relevant aspect of the social system that interacts with it, and they form the umbrellas under which all Criteria, Indicators and Verifiers fall.

Principles are usually expressed as statements of ideals.

Examples:
'Ecosystem integrity is maintained'.
'Human well-being is assured'.

Criteria

Criteria are *standards* by which our progress towards meeting the Principles can be judged. They are reflections of **knowledge,** and they add meaning to the Principle and make them more functional by defining the particular state or conditions of the forest or the community that we would expect to see if the Principle it supports is adhered to. Groups of Criteria support each Principle.

Criteria are usually expressed as a state or condition in which an aspect of the forest or country should be, or a process that needs to be in place.

Examples:
'Water sources are protected'.
'Forest products contribute to the well-being of the community'.

Indicators

Indicators are the components or variables of the forest or management system that imply or 'indicate' the state or conditions required by a Criterion. They are given as 'information' or, in other words, as a single, meaningful message about a component or a variable (and they are made up of one or more data elements). (While they do indicate occurrences that would contribute to

Indicators are usually stated as something specific that can be assessed in relation to the criteria.

Examples: 'Vegetation along river banks is being maintained'.
'Household incomes benefit from the sale of forest products'.

meeting the Criterion, they should *not* be understood as a set of mandatory rules or prescriptions.)

Verifiers

Verifiers are the **data** or information needed for assessing an Indicator. They define the specific details that would show whether an indicator is met.[9]

Verifiers are usually expressed as what information needs to be collected.

Examples: 'Existence of continuous vegetation along river banks'
'Proportion of household income derived from sale of forest products'

2.2 Examples of C&I

Box 1 contains an example drawn from the set of CMF C&I developed at CIFOR's Indonesian test site. Its hierarchical structure is drawn in Figure 1. The principle states the wise understanding of the importance of the role of the community's organisations (decision making bodies) and institutions (rules norms regulations etc) in ensuring sustainability. It is an expression of an ideal or a fundamental rule to ensure attainment of the goal of SCMF.

Three criteria are then proposed in support of the principle. They define elements in support of the principle, which set standards which can be measured or assessed by the supporting indicators.

For each criterion, several indicators are given. They specify what information is needed to be able to infer whether the criterion is being met.

For each indicator, one or more verifiers specify what data or information needs to be checked in order to verify the indicator.

[9] In some C&I approaches, verifiers are also defined as the procedures needed to collect the information or data (*i.e.*, the means of verification). For the sake of simplicity, we understand the verifiers to be the information or data needed, and consider the 'means' of collecting this as a 'how to' question addressed in the methods section of this guide (Section 3: Developing and Using a Set of C&I).

NB. *This example set (Box 1) is drawn directly from the working set developed by the Indonesian test site team and community. It is meant to offer an example of how an actual set of P, C, I, and V fit together in a hierarchy, but not act as a 'model' set for implementation by other communities. Not only would the P, C, I and V need to be adapted to other conditions if they were to be used elsewhere (as always), but in this case, readers will recognise areas where the P, C, I and V could possibly be strengthened or clarified to enhance their utility. We have generally not made changes in language or otherwise to the set, in order to respect its original spirit and intent.*

Box 1. An example of a Principle, with its Criteria, Indicators and Verifiers from the CIFOR CMF Indonesian test site.

Principle

Local social institutions (shall) support a sustainable land use system.

Criterion One

Customary law and other regulations ensure a sustainable land use system.

Indicator

There are rules that ensure the sustainable use of the forest.

Indicator

All sections of the community respect the customary law and other regulations on the sustainable land use system.

Verifiers

Adult members of the community know fairly about the customary laws attached to land use systems.

People agree that customary laws are still effective.

There are recent cases where sanctions are used.

Indicator

There are sanctions for those breaking the rules.

Verifier

Specific sanctions attached to specific land use systems.

Indicator

There is a conflict resolution mechanism.

Verifiers

Adult members of the community can tell how conflict on land use is resolved.

There is a consensus on how conflict on land use is resolved.

Recent cases of traditional conflict resolution on land use.

Box 1. (continued) An example of a Principle, with its Criteria, Indicators and Verifiers from the CIFOR CMF Indonesian test site.

Criterion Two

Customary law and other regulations ensure fair access to community natural resources and fair distribution of their products among community members.

Indicator

There are rules that ensure fair access of all stakeholders to forest.

Verifiers

Clear understanding on the composition of stakeholders.

Every category stakeholder has access to forest according to customary law and other regulations.

Stakeholders respect the customary law and regulations on forest resources.

Criterion Three

Local social organisation has the capacity to enforce customary law and other regulations.

Indicator

Meetings are organised on environmental and land use problems.

Verifiers

Recent case of community meeting on environmental and land use problems.

Relevant parties in the conflict are present.

Other members of the community than the conflicting parties are present.

There are decisions made.

Indicator

Women are represented equally in meetings and decision making.

Verifiers

Women are present in meetings.

Women are involved in discussion.

Indicator

There is participatory decision making.

Verifiers

Decisions are made in meetings of adult members of the community.

Participants understand the subject of discussion.

No monopoly of discussion by authority.

Indicator

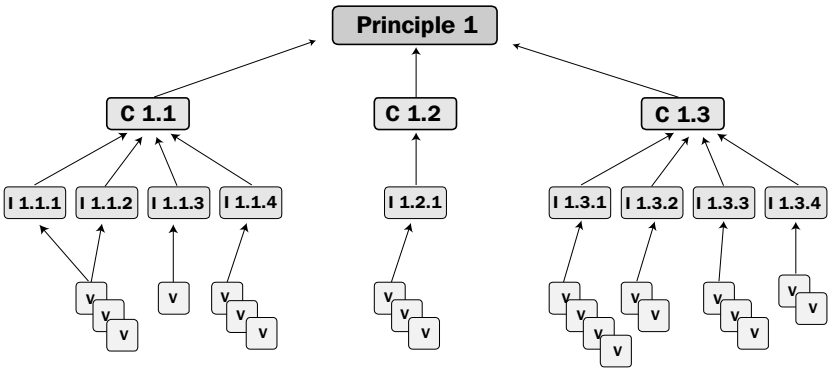
New regulations and sanctions that cope with new development problems on land use and natural resources still being developed.

Verifiers

People can differentiate traditional and new regulation/rules that the community agreed upon.

New regulations/rules are initiated locally.

Figure 1. Hierarchical structure.



Hints about C&I:

- The overall purpose of the hierarchical structure is to create strong links between the upper-level ideals (Principles) and the 'signs' (Criteria and Indicators) right down to the small pieces of information (Verifiers) so that the picture created is meaningful and coherent. There is no problem with adapting this framework, or any other C&I framework, to meet local needs, *as long as this basic function and logic remains intact.*
- Keep it doable. Avoid the temptation to include everything – try to focus on priorities, and look for effective I & V that fit with current or easily adopted information collection practices when possible.
- Indicators often appear to fit under more than one Criterion. Rather than putting them in twice, they can be treated as crosscutting Indicators that will serve more than one purpose. The same goes for verifiers – to keep the amount of information that needs to be collected and assessed to a minimum, some Verifiers can serve two or more Indicators.
- The dividing line between Indicators and Verifiers can be unclear at times. As above, the important thing is to maintain the strong links between P, C, I and V and not to worry too much about the terminology of the hierarchical structure.

More guidance on these points is given in Section 3.4.

3. Developing and Using a Set of C&I

This section is about **the process of developing** a set of locally appropriate C&I. It briefly summarises some of CIFOR's experiences with CMF C&I, explores participation and collaboration as important elements of C&I implementation, then outlines a possible approach to using C&I based on CIFOR experience to date.

3.1 Background: CIFOR C&I research in summary

Developing and testing C&I for SFM in (commercial) forest management units (FMU)

This research was undertaken in response to a high demand for consistent, cost-effective C&I for assessing timber management primarily for certification purposes. It began by developing methodologies to test the relevance and utility of some of the more widely applied existing C&I sets developed for timber production in natural forest areas. Five tests of pre-existing C&I sets developed for assessing the sustainability of commercial timber management were undertaken in forest management units in Ivory Coast, Brazil, Indonesia, Austria and Germany.[10] These tests were conducted by interdisciplinary teams, involved field-testing of C&I, and took approximately one month each to complete.

Developing and testing C&I for CMF[11]

CIFOR undertook the testing of C&I suitable for CMF at three sites in Brazil, Cameroon and Indonesia.[12] Like the FMU work, these tests were conducted by interdisciplinary teams, each composed of an ecologist, forest management specialist and social scientist.

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[10] See Prabhu *et al.* (1996).

[11] See Burford de Oliveira *et al.* (1999).

[12] The communities involved were: São Paulo (Arapiuns River) and Cachoeira de Maró (Maró River), Pará, Brazil; Bedigong and Darok, Sanggau District, West Kalimantan, Indonesia; and the villages of Eyek II and Akak/Bitetele, Arrondissement of Endom, Central Province, Cameroon. Any insights provided by CIFOR CMF C&I research, including this manual, would have been impossible without the efforts and contributions of these communities.

For each test, one or two guideline sets of C&I for community forestry or natural resource management were selected as starting points along with one or two of the CIFOR Phase 1 sets of C&I. The base sets used varied between tests.[13] Relevant C&I from existing (or guideline) base sets, together with additional C&I, were subjected to an iterative process of refinement. This consisted of four reviews referred to as filters (see Box 2) and included field testing with participation by the communities. The series of filters helped to provide a new set of opportunities to refine and introduce new statements and to eliminate redundant, comparatively ambiguous and/or difficult or costly to apply C&I.

Box 2. Overview of the CIFOR test teams' CMF C&I 'filtering process'

Filter 1.

At this initial phase the team members individually selected relevant C&I from the Base Sets of C&I given to them and proposed additional C&I they thought important. This first individual filtering process resulted in three preliminary subsets of C&I (one for each discipline: Ecology, Socio-economics and Technical Management).

Filter 2.

This filter was an interdisciplinary team revision of the C&I subsets produced by Filter 1. Team members were aware that sets produced during this filter might not address all the issues critically affecting sustainability at their particular test site and/or issues prioritised by the local community members. They were asked therefore to keep these needs in mind for the next filter (which would take place on site).

Filter 3.

The third filter was the field testing of C&I. This was undertaken by the test teams in consultation with the forest interest groups within the local community over a period of 10-14 days. During the field tests, teams were encouraged draw on their professional experience in Participatory Rural Appraisal (PRA) and other techniques to enable community members to contribute actively to the C&I development and selection.

Filter 4.

The final filter was C&I review by participants in a workshop setting. The workshop participants were asked to assess the applicability of the C&I selected to the test sites' conditions, while bearing in mind the characteristics of other CMF with which they were familiar.

[13] It was difficult to find a range of actual 'base sets' to choose from for CMFs. As such, the teams drew on a number of different resources, which varied in relevance to the different teams and sites. The 'base set' resources are listed in Appendix 2.

Although the test teams encouraged the communities at the test sites to participate in the development and selection of C&I, the final decision about which C&I to accept remained with the specialist team members.

A selection of examples of the C&I resulting from these tests are presented in Section 4 of this guide.

CIFOR's C&I work in progress: Participatory and adaptive approaches

The experience of community participation gained at the three test sites has led CIFOR to believe that the future of developing C&I for SCMF should necessarily be based on a fully participatory process. The communities involved not only demonstrated a significant amount of wisdom and knowledge about their forests, but they also showed a deep awareness of the cause and effect of trends and their impacts on the forest and on the community itself. This knowledge and awareness can be found in most communities practising CMF. Building on this in a process of knowledge sharing, learning and awareness raising, both within the community and between the community and partners from outside the community, can lead to a fuller understanding and agreement of what is needed to ensure the sustainable management of the forest resources. Furthermore, the goal of developing C&I is their implementation and use in decision making; if communities are to take ownership of C&I in a way that allows them to implement and use them in decision-making, then they must be key players in the entire process including early development.

In the CIFOR context, this approach to C&I is being considered within a framework of seeking enhanced *adaptiveness* and *collaboration* in forest management.[14] In brief, this framework emphasises the potential for methods and tools such as C&I to enhance information flow and shared

[14] This is housed in the CIFOR Programme 'Devolution, Local People, and Adaptive Co-Management'. Please contact CIFOR for more details.

learning among forest stakeholders, in such a way that enables improved and more equitable decision making.

In the next few pages we suggest some guiding principles for managing a participatory process that draw on lessons learned in the CIFOR CMF C&I tests.

3.2 Preparing to develop and use C&I: Questions to ask before you begin

Before setting out on the process of developing a set of C&I it is important to address some questions such as those below, and to feel comfortable with your answers to them.

Who will initiate and who will be involved in the process?

Since participation is the cornerstone of the process it is important to be very clear about what groups (or 'categories') of people make up the community (e.g., ethnic groups, categories of wealth, women and men, etc.) – this point is addressed further in Section 3.3 – and to identify the main groups of outside stakeholders who need to be involved.

In terms of a "team" to initiate and/or facilitate, a community initiating its own C&I process may choose to work independently (e.g., having a community group organise and facilitate the process), or it may choose to round out the information and/or skills available by inviting other people or institutions to support it. Outsiders may be brought in to offer, for example, facilitation skills, stakeholder identification skills, or scientific or other knowledge.[15]

[15] The approach used by CIFOR in developing and testing C&I was to rely on a team of 'experts' in different disciplines – often this involved a forester, a social scientist or anthropologist, and an ecologist – who initiated the C&I selection, then worked briefly with communities. However, this was possible because it was initiated by CIFOR (who had easy access to these people) and was desirable at the time because of the nature of the initiative (it was a 'research initiative'). This approach may be difficult in many community-initiated processes, may be too costly and may not be necessary *or even desirable because it is not essentially community-driven*.

If an outside person or institution is the initiator – perhaps an extension worker or District Forest Officer (DFO) – they might work with community members to develop and use a set of CMF C&I, as long as the community strongly backs the initiative. If knowledge gaps are identified by the community, the facilitator could seek to involve specialists in this area of knowledge to help fill these gaps.

An alternative scenario is possible where there is already, or there would be, clear benefit to having collaboration with/significant involvement by third parties in a forest management area, for example, in a protected area with community, parks authorities, DFO or NGO involvement. In such situations, the group developing and using C&I could include, as well as the community, key players from the other management partners (or potential partners) who can bring a range of appropriate and complementary knowledge and skills. While there are potential drawbacks, such as difficulties in reconciling different stakeholder perspectives, this approach holds the potential benefit of enhancing collaboration through a shared C&I framework, and is likely to be much more cost effective for communities.

Hint: If possible, it may be beneficial to include a member of another community who has already been involved in development and use of CMF C&I – they may be able to contribute insights about the process from a community perspective.

Where will the process be carried out?

If you are not a community member planning to use C&I in your *own* area, but are interested in supporting their development somewhere (e.g., a forestry officer's or NGO's situation), then selecting a site for implementing C&I as a management tool is another key issue, particularly if this is the first time the process is being tried. It is important to work where success is fairly likely. Is the community likely to be enthusiastic? Is there good practice to build upon? Are the forest resources reasonably intact? Are there incentives for community involvement?

What are the local conditions?

What are the local languages in the community and is the whole C&I facilitation/initiation team able to work in these languages? If not, how will interpretation be managed? What are the literacy levels in the community and have appropriate participatory methods been identified for these levels? Are there seasonal constraints on when to carry out the process (busy times of year for the community, times when access is difficult, etc.)?

Does the initiating group have a 'good attitude'?

It is vital that the initiating group (whether all community-based or from outside stakeholders or joint) accept that this is a *knowledge-sharing* exercise. It is not uncommon for the 'better educated' and/or scientifically trained to dominate group discussions and to use scientific jargon and concepts not easily understood by members of the community. Instead, it must be remembered and emphasised by the initiating group that high community member participation is desirable, and that all participants will need to fully understand, support and implement the C&I. The C&I should be built around local knowledge, understanding and skills. Are all members of the C&I development process willing to share their knowledge? Are they open to new ideas? Are outsiders respectful of the community and interested to learn from them? Are there power imbalances in the group?[16] Is everyone prepared to commit sufficient time to the process?

[16] See Edmunds and Wollenberg (*forthcoming*) for a theoretical but thoughtful elaboration of the risks to communities of multi-stakeholder negotiations, especially where the approach is to 'neutralise' or de-emphasise the real power differentials between participants during the negotiation process (but not over the long term). This consideration and risk certainly applies to the C&I process as well.

Are you familiar with participatory methods?

Because we are recommending a fully participatory approach, it is worthwhile to either bring in someone with participatory methods skills (*i.e.*, facilitation) or, if you are undertaking it yourself and are somewhat new to participation, to take time to become familiar with a range of participatory tools and methods that can be used during the process. If these are new to you, it may be a good idea to try them out in a familiar environment, with supportive colleagues, to build up facilitation skills and to build confidence in managing participation in practice.[17]

Are the objectives of the C&I process shared and clearly understood?

It is vital to be clear at the outset about the objectives of developing a set of CMF C&I. These objectives, at least the main ones, should be shared (within the community and with other stakeholders if they are involved). Based on this, community members should understand the benefits for and the costs to them, and want to be involved in the process. Without a clear understanding of the overall objectives there may be an justifiable unwillingness to participate or confusion, leading to later disappointment. Questions to consider on this point include: Who made the decision to develop a set of C&I? Is there community ownership of this fundamental decision? Is there consensus that it is a good idea, and broad commitment to the process?

The community (and other partners if appropriate) will have to decide from the outset *whose* C&I they are to be. Questions to reflect on include: Are they going to be generated and used by the community themselves (only)? Or are they going to be generated and used by the community in collaboration with other partners (e.g., in a co-management relationship)?

[17] There are lots of good resources for participatory tools and methods. See the reference section. In most regions, training in the use of participatory tools and methods is possible. See the list in the reference section.

In either case, is other assistance (e.g., facilitators, resource people) needed? Who will take responsibility for which parts of the process? Who will do the monitoring? Who gets to use the information and how?

Does everyone understand what is going to happen next?

Before embarking on the development of the C&I all the players need to agree how the process will be organised, how long it will take, how much effort might be involved, and what their roles in the process will be. Communicating proposed plans and being prepared to change them to suit the preferences and constraints of the larger community (and other partners) will help to ensure a workable process.

3.3 Establishing the stakeholders: Who needs to be involved?

Before you begin to develop C&I you will need to establish some common understandings and begin sharing knowledge with and listening to all members of the community. This is a great opportunity to begin as you mean to go on – with full and active participation.

Who are the stakeholders in the community and outside the community?

It is vitally important to identify who in the community has a stake in the forest, including women, minority groups, the young and the old.[18] Often there will be other stakeholders who are not actually members of the community; they should all be at least identified and ideally involved at some stage (even if it just being informed), although how and when will vary. Agreement needs to be reached by those involved and

[18] There are well-developed methods for identifying stakeholders, including those outlined in CIFOR's 'The BAG' (CIFOR Methods Testing Team 1999), CIFOR's 'Who Counts?' manual (Colfer *et al.* 1999) and FAO's Tree and Land Tenure Rapid Appraisal Tools (Freudenberger 1994). See reference section for details.

potentially involved in deciding the stakeholders and how they are to be involved. Who, for example, will be involved in the development of the C&I? Who will be responsible for implementation? Who will be undertaking the monitoring?

What are the local power structures?

Management involves the use of power to enforce decisions. It is important to establish where the power base in the local community lies. Are they committed to the C&I process? Are you able to ensure that the less powerful (e.g., women, minority groups, the elderly) have a clear voice in the C&I development process? Are there other power bases outside the community that need to be taken into account? Some very useful and widely available tools are also available to help in this.[19]

Who does what, where and when?

At the outset of the process it is important to establish the boundaries of the forest landscape and how far the community's influence extends (in many cases this is not clearly defined or agreed upon). It is also important to establish what are the principal activities in the area and who carries them out.

There are lots of well-practised techniques for identifying and mapping the boundaries of the forest resource and establishing who uses the resources, for what, why and when.[20] Participatory mapping exercises and creating calendars of activities can be enjoyable, can involve many people in the process, and can provide an excellent way of establishing a shared understanding of the current situation.

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[19] See FAO's Tree and Land Tenure Rapid Appraisal Tools (Freudenberger 1994), particularly social mapping with Venn Diagrams, for a participatory approach to identifying power structures. See reference section for details.

[20] See, for example, FAO's Community Toolbox, Tool 14 (Case 1990) and FAO's Tree and Land Tenure Rapid Appraisal Tools (Freudenberger 1994), particularly maps, transects and calendars. See reference section for details.

3.4 The C&I starting point: Base sets, standards or visions?

Now that everyone has a good idea of who does what where, how the community operates collectively and who the stakeholders are, how do you begin to develop a set of C&I? There is no single right answer to this question and it will depend to a large extent on your objectives, and will need to be sensitive to the views of the community and other partners. Here we suggest three options that are points on a broad spectrum of possible 'points of entry' into the C&I development process.

1. Start with a set of C&I developed by someone else

This might sound like 'cheating' but it is in fact a well-recognised starting point, recommended by CIFOR in their Guidelines for Developing, Testing and Selecting C&I.[21] Much of the work involved in developing C&I consists of changing and modifying a draft set of C&I so that it becomes ever more appropriate and relevant to the local circumstances. Building on the work of others who have already embarked on this process can save a lot of time, and act as a really good memory aid and source of ideas. It can be helpful to have a good example of what a set of C&I looks like to help everyone to become familiar with the concepts. A useful starting point might be CIFOR's generic set of C&I[22] or the CMF C&I case study examples in Section 4 of this guide.

[21] See Prabhu *et al.* (1998).

[22] It should be noted however, that this set was designed for a commercial Forest Management Unit, and thus approaches sustainability from a slightly different perspective. See CIFOR's C&I Toolbox, Tool No 2 (CIFOR C&I Team 1999).

However, starting from someone else's set of C&I has disadvantages as well. First, the C&I will necessarily require changes because they will no doubt include lots of words and ideas that are very specific to the site where they were developed and are not at all relevant to where you are working (or in the case of the CIFOR generic template – it is intentionally general, and thus needs adapting to the specific). These built-in assumptions or biases of base sets put people off, and may take a lot of work to change or remove. Also, most widely available C&I sets have been developed by 'scientific or technical experts', and are primarily concerned with the commercial management of forests, and thus may not be entirely relevant.

2. Start with a standard

Some countries are developing their own national standards for sustainable forest management, and this may be a useful place to begin. The content of such a standard is likely to be broadly relevant to the site and, if appropriate, could likely be understood at the level of Principles and Criteria. The standard may not be well-oriented to community management of forests, however (particularly if it has been designed to regulate the logging industry or industrial plantation management), and it may not be well structured as a hierarchy.

Other sources of standards are from bodies such as the Forest Stewardship Council,[23] who uses them in the certification of forest products. If the community has possible certification in mind then this might also be an appropriate place to begin. Companies or other organisations who offer certification services, and who assess forest management practices, may be able to supply examples of their standards that

[23] See reference section.

have been modified to take account of local conditions similar to those of the community.

3. Start from a community vision of sustainable forest management

A third approach is to start from a blank sheet of paper and draw up a set of C&I from scratch within the community, by building a shared local vision of sustainable management of the forest and drawing from local knowledge and insights. If more partners are to be involved, then they can also create visions that can be compared and merged to the extent that they are compatible.

CIFOR's experience across all three sites demonstrated quite clearly that local knowledge was both insightful and reliable. Local peoples' intimate and long-term relationship with the forest landscape and their dependency on it made them sensitive to changes and enabled them to identify linkages between different causes and effects. They were also usually acutely aware of the impact of their own interventions and the interventions of third parties.

Starting from a community vision of sustainable forest management can have the advantage of ensuring that the C&I fully belong to the community, are felt to be exclusively the product of their own knowledge and thinking and can be used by the community. In the test of C&I in Cameroon, the team found that it was helpful and stimulating to run a series of meetings in which the community identified, and then ranked, their priorities for their forest in order to identify Principles and Criteria for sustainable management.

3.5 Developing C&I: Some practical steps[24]

(See section 4. C&I Content for practical examples of P, C, I and V.)

1. Do the Groundwork

Once the stakeholders (whether community only or community and other actors) are identified, as in earlier sections of this guide, the groundwork for C&I development needs to be laid. Agreement in general terms is necessary about the goal of sustainable forest management and on commitment to trying C&I as a tool. This can be done through a combination of individual and group meetings, as appropriate.

2. Learn about the C&I framework & concepts

The next step is to make sure that everyone is familiar and comfortable with C&I. A meeting of stakeholders should be held to explore the concepts and definitions of C&I outlined in Part 2 of this guide. Make sure everyone understands the *meaning* behind the different levels of the terms *Principle, Criteria, Indicators* and *Verifiers.* In the three test sites we found that most people had no difficulty in understanding *Principles* and *Indicators*, but it was much more difficult to reach an understanding of *Criteria*.

Explore this thoroughly to get as broad an understanding as possible before the next stage.

[24] It should be noted that CIFOR has not yet fully field-tested this approach, as described here. The approach is built on a compilation of test & field experiences and reflection, drawing both on CIFOR's own work and the lessons of other communities and their partners.

Hint: Remember to focus on making the framework useful and comfortable for the people who will be monitoring and using the C&I. *It is understanding the meaning behind the C&I that is important, not the actual terms used*; if participants find it more useful to think in terms of 'ideals', 'objectives', 'indicators' or 'signs' and 'information', or some other collection of terms, then so be it. The key is that there is a full understanding of the importance of the links between the levels – that things that can be measured or monitored ('indicators') build directly into the standards about the states or processes ('criteria'), which in turn contribute directly to the expressions of the 'fundamental truths' ('principles'). Even changing the structure of the hierarchy to meet local needs is possible, so long as this kind of underlying logic remains intact.

3. Develop the principles

Once the participants are familiar with the differences between Principles, Criteria, Indicators and Verifiers, the next step is to identify the top-level Principles or ideals. This could start with a series of facilitated meetings to envision and establish what sustainable management of the forest means to the different stakeholders.

Points to be raised in the meetings, for example, might include:

- What would we like to see as an ideal future for our community and our forests?
- What are the essential elements of this sustainable management vision?
- What are our priorities for the forest and our community? (So that the C&I set can be kept small.)
- How would we rank these in importance?
- How can we express these as Principles?
- If starting from an existing set of Principles are they agreed? Should they be modified?

It is important to remember the definition of Principles given in Part 2 of this guide. The objective is to arrive at a *small* number of fundamental Principles or ideals (3-4).

4. Develop the Criteria

The next step is to identify a number of Criteria or 'pillars' on which each Principle stands. This can be done at the same or in subsequent meetings, as appropriate.

Points to be addressed could include, for each Principle:

- What needs to be assessed in order to judge if the Principle is being adhered to?
- How would we recognise a sustainably managed forest?
- How would we recognise good community management?
- How can we express these as criteria?
- If starting from an existing set of C&I, do we understand them? Are they agreed? Do they need to be modified?

The answer to such questions might define the 'observable outcomes' of sustainable management practices by describing the desired states or aspects of the forest or the community or the political/economic environment. Other answers might define processes that need to be in place if the forest is to be managed according to the Principles. The objective here is to arrive at a small number of Criteria (3-4) for each Principle.

5. Develop the Indicators

Having identified the essential Criteria that need to be assessed for each Principle, the next step is to continue on by identifying the Indicators that are to be used to judge whether the Criteria are being met. These should be real information that can be measured in some way.

Questions to help develop indicators could include:

- What do we need to know to assess each Criteria?
- Which of these are the most important and measurable?
- How can we express these as Indicators?
- If starting from an existing set of Indicators, which ones can we use? Which ones do we need to change?

The objective is to define a small number of key Indicators (2-3) for each Criterion that can be measured or scored in some way to enable an assessment of the Criteria to be made.

6. Develop the Verifiers

Having identified the indicators, it will then be necessary to identify Verifiers that describe the actual data or information needed for the Indicators.

Consider each indicator, and ask questions such as:

- What are the many pieces of data that could tell us this? What do we need to count, measure, watch and record?
- What are the few minimum key pieces of data that will tell us this?

Your overall aim should be to try to develop a minimum set of key C&I, which is broad enough to cover all the big issues but is small enough to be usable. Establishing good key Indicators will reduce the amount of data that needs to be collected.

Hints:

- If you have identified 4 Principles, each with 3 Criteria, which in turn have 3 Indicators there will be a total of 36 Indicators that will need to be monitored and assessed. This is probably about right for a first attempt. Don't try to cover everything and don't expect to achieve perfection straight away. As you will see below there are further opportunities for refining and improving the set in the light of experience. Keep it simple.
- To keep the extra effort involved to a minimum, keep in mind what information is already available on an ongoing basis, and what activities are already going on that provide information. To the extent that is reasonable (*i.e.*, it will meet your needs and fit logically into the framework), *build on what is already there*!

  (The other side of this point is that this process may reveal that some of the information gathering going on already is not especially useful or efficient. Can this be streamlined?)

7. Develop methods for collecting data for Verifiers

To complete this phase you also need to address how, where and when the data for the Verifiers could be obtained. Some data, for example, may be found through direct observation in the field. Other data may depend on some form of survey or access to existing records. It may be necessary to use a participatory tool or assessment method to get other information. The objective here is to define where the information and data is to come from and how you are going to get it. This not only provides an initial guide for later use, but it will be an early warning flag for Verifiers that may be too difficult or costly to measure.

For each Verifier, questions for methods would include:

- Where can we get the data?
- How can it be collected?
- How often would it need to be collected to be useful?

Hints:

For all steps in C&I development, make sure that:

- the goal of each step is clear;
- people still remember the differences between the Principles, Criteria, Indicators and Verifiers or whatever terms are being used;
- everything gets recorded; and
- someone in the group can keep track of time can keep the group on task, and can make sure everyone feels they are able to participate in the discussion (*i.e.*, having a facilitator can be a very good idea).

3.6 'Filtering' the C&I: Are they the best ones for the job?

The next step is to 'filter' the C&I – this means going through each one with the group to check that they are:

- *key Indicators* – the objective is *not* to gather as much information as possible but to identify the key minimum number of Criteria and Indicators that will give sufficient information to assess progress towards the goal of sustainable management. Will this set tell you what you need to know?
- *easy and affordable to detect, record, and interpret* – it is necessary to be satisfied that applying the C&I and collecting the data is practicable, and that the information can be recorded in such a way that it can be judged or interpreted. Can you do it with the skills you have or could reasonably get? Can you afford the methods? As above, are you minimising extra effort by building on practices or activities that already exist when that is reasonable and useful?
- *reliable* – it is necessary to be confident that the chosen C&I will give reliable and consistent information. Will any two people get the same answer if using the same C&I on the same site?

Because the C&I have been developed for use by the community it is also necessary to check the C&I to make sure that they are:

- agreed upon by as a wide a range of community stakeholders as possible;
- easily understood by members of the community;
- within the skills of the community; and
- time effective.

If the group judges that some Principles, Criteria, Indicators or Verifiers do not adequately make it through the filters, then it is time to search for an alternatives!

3.7 A first test: Carrying out a rapid C&I assessment

Before developing a full monitoring and assessment plan and putting the C&I to use in the field (Section 3.8), one possible next step is to 'test' the utility of the C&I set developed by using it immediately as the basis of a rapid participatory self-assessment. This can have the benefits of:

- introducing the tentative C&I set to a wide range of stakeholders;
- revealing gaps, inconsistencies and misunderstandings about the C&I set; and
- revealing how well stakeholders perceive themselves to be doing before monitoring begins in earnest.

A rapid assessment can be done by listing all the *indicators* on a large sheet of paper and, for each of them, asking 'how are we doing'. Whether the answer is 'good', 'bad' or 'somewhere in between', can be recorded by simple signs such as a full moon for 'good', a new moon for 'bad' and a half moon for 'in between'. Alternatively, this 'scoring' can also be done with sticky paper dots – green dots for 'good', red dots for 'bad' and yellow dots for 'in between'. For some Indicators, which require measurement or monitoring over a period of time, all you can do is to estimate or guess – that's fine. Accurate monitoring comes later. At this stage you are just trying to get an overall 'feel' for the situation.

This is a good opportunity for participation. It may be very revealing if several groups of different people in the community do an assessment like this separately, and then compare their results. *It must be made clear that the purpose of such an assessment is to try to get ideas about how to improve the situation, and therefore that Indicators that do not get a 'good' rating should be seen as opportunities for improvement rather than problems.*

Here is a simple way to get a very general glimpse at your 'sustainability rating':

- Starting with your Rapid Assessment, give full moons a score of 3, half moons a score of 2, and new moons a score of 1.

- For each Criterion add up all the Indicator scores and divide by the total number of Indicators under that Criterion. Assign the results to the appropriate Criterion.
- Add up the scores for each Criterion under each Principle and divide by the total number of Criteria for each Principle. Assign the results to the appropriate Principle.

(You can do this as well at the level of Principle to get a single rating from 1 to 3. Add up the total scores for the Principles and divide by the number of Principles, but with this level of oversimplification it is not especially meaningful. It will, however, give an (over-simplified) indication of how close you are to meeting the overall goal of sustainable management.[25])

The very interesting and important part of this is to compare within the Principles, Criteria and Indicators to highlight those aspects are you doing well, and in those where you see a need for improvement. Are there trends and patterns? Why is this the case?

Immediate action ideas from the rapid assessment

First, build on those trends and patterns you have explored and discuss possible underlying causes that would need to be addressed. *Discuss what actions can reasonably be taken that would move the ratings from new or half moons towards full moons?* (Sometimes good ideas about 'best practices' are in fact built into the C&I – look there for ideas.) For any proposed actions, establish if it is to be done, who will do it and how.

Second, return to your C&I set and consider if the rapid assessment revealed any problems in the C&I themselves, such as terms that are unclear or aspects that cannot be measured. *If so, set about improving on those while the experience is fresh and before you embark on any long-term monitoring.*

[25] A more subtle but complex approach is to weight each element. See the CIFOR Toolbox's publications 'The Score guide', and 'The MCA Manual' for more ideas (Salim *et al.* 1999 and Mendosa *et al.* 1999).

3.8 Monitoring: Putting the C&I to work

The next stage involves actually putting the C&I to work by planning and implementing a C&I monitoring system that feeds back into the management system. C&I are most commonly used by forest product certifiers as the framework for assessing whether the products result from sustainable forest management. These assessments are often formal and are, in some cases, very rigorous, involving the collection and analysis of a lot of quantitative data. They are almost always carried out by external professional certifiers. Here we are proposing something more straightforward and user-friendly, and more importantly, participatory.

Below is a suggested set of steps for using your set of C&I to assist in ensuring sustainable forest management. Not all steps will be appropriate in all situations, but they should provide some ideas for moving forward and making the most of the effort put into developing the C&I.

The steps below form a loop or cycle of planning, action, monitoring, assessment and learning that is carried out by the community in an ongoing (and hopefully, ever-improving) process.

Step 1: Creating a monitoring plan

You will need to create a monitoring plan to organise the next stage and so that everyone involved knows what is going to happen. For each Verifier[26] ask:

- Will it be monitored?
- By whom?
- When?
- How?
- Who is responsible for gathering the results together?
- How are the results to be recorded?
- When is the assessment to be made?
- What resources are required (time, money, tools or other equipment, access to information)?

[26] As mentioned earlier, in some cases, there is a direct overlap between Indicator and Verifier – if this is the case, then obviously this step will occur at the Indicator level as appropriate.

For each indicator try to keep the information requirements as simple as possible. Try to share responsibility for monitoring around the community, and among partners. This involves more people and reduces the workload for all. In our experience, knowledge is not spread evenly among all stakeholders. Find out who has the most knowledge about the different aspects covered by the C&I. Invite them to take responsibility for monitoring the information about which they are knowledgeable.

Don't forget: *As much as possible the monitoring should be built around existing skills and the informal and formal activities within the community.*

Think about the overall timing. When is the first monitoring and assessment programme to be carried out? Are you going to carry out a monitoring exercise immediately? When will the first full set of results be ready? Are you setting in place a monitoring programme that will last for several years?

You must plan for bringing together all of the information that is to be collected. This is vitally important. Who will be responsible for gathering all the results together? Will it be an individual or a group? Does everyone involved in monitoring understand how to provide their information to this person or group? When do they have to provide the information? Is everyone happy to provide the information to this person or group? If not, perhaps you should think again about whom this person should be. Are they community members and, if not, is there really a good reason why not? Community ownership of monitoring is very important. Keeping the focus for the information within the community will make it much more readily available and much more likely to be used than if the information is kept in a distant office. We recommend that no more than one year elapses between the start of monitoring and pulling the information together.

Look at the overall requirements for resources. Are they available or can they be made available? If not, adjust your plans.

It may be a good idea to make up a calendar laying out clearly when the monitoring is to be carried out. Some monitoring may need to be spread over a period. Other elements of monitoring may be clustered together at a particular time. Identify who is to do what, making clear when the information is to be brought together, who is going to collect it all together, and when the next assessment is going to be carried out. Make sure everyone in the community is aware of this.

Step 2: Creating an assessment plan

You will also need to plan for the assessment stage.

- How will the results of the monitoring be used?
- Who will carry out the assessment?
- How will the process and outcomes be kept transparent and accessible to the whole community?
- How will the results be presented to the stakeholders?
- What kind of decisions will be made from them?
- By whom? How can the process be kept equitable and participatory?
- Who will decide on what new actions to take as a result of the assessment?

Step 3: Monitoring

Having agreed on the plan, it needs to be carried out – go for it!

Step 4: Assessing the results

At the agreed time all the results of monitoring should be gathered together. This is another time for reflection. Get the monitors and/or a group of key stakeholders to carry out an assessment and make an accurate record of the results (not just scores, but the key points that emerge from the discussions). Use the simple scoring system used at the first rapid assessment or a modified one based on what you learned from that experience. If a new or modified scoring system is to be used, can you still make a comparison with the previous assessment? This is an important point to consider each time an assessment is made.

An additional possibility at this stage is to carry out another participatory exercise involving a wide range of stakeholders. Get them to score the indicators using the same scoring system as the monitors. (This is like doing a rapid assessment; its purpose is to offer additional perspectives and to give feedback on the C&I.) Compare the results of this exercise with the results produced by the monitoring team. Do they differ? Share knowledge and experience and discuss differences of perception. This may expose problems with the monitoring methods in which case you can change the process in the future.

Questions to consider in the assessment process include:

- How does the overall picture look in terms of sustainability? Generally positive, negative or in the middle?
- Can you see any patterns or trends in where the strengths and weaknesses lie? Why do they exist?
- Is there anything that is particularly critical or worrying? Particularly positive? Why?
- If you did a rapid assessment earlier, how does this compare? What has stayed the same, what has changed? Which has changed for better, which for worse?
- Looking at the level of Criterion or Indicator – why did each get such a rating? (Why has it changed since the last assessment?) What factors contribute to the assessment or change that are under community and/or partners' control? What factors are currently outside community or partners' control? Are the causes of assessments or changes unknown? Is there a way to find out?

Hints:

- **'**Negatives' in assessments are not 'failures' – they are *opportunities to learn.*
- 'Successes' are also opportunities to learn – and don't forget to celebrate them. Is there any way for the community/partners to reward themselves for progress?
- Don't forget to make a clear record of the assessment, one that will make sense to people who were not actually in on the discussion. Circulate this to community members or stakeholders who were not directly involved in the assessment.

One potentially useful way to visually represent and track results of assessments over time is by using 'Spider Web Diagrams' (see Figure 2 below)[27]. This involves creating an image like a spider web, or a (flat sided) bicycle wheel and spokes, and assigning each one of the spokes a theme from the C&I set (usually at the level of Criteria). By considering the very centre to be a zero value (*i.e.*, very poor), and the outside edge to be a value of 10 (excellent), the approximate scores of each Criteria can be

Figure 2. Example of a Spider Web Diagram.



[27] The inclusion of this tool was inspired by the 'Sustainability Polygons' found in Herweg *et al.* (1998) and by the achievements of projects such as the Nepal-Australia Community Resource Management Project and the Nepal-UK Community Forest Project in this area.

mapped onto the 'spokes' or 'spider web'. When a line is traced connecting all the scores, an image emerges which shows the trends of 'strong' and 'weak' areas. This is not only useful in an individual assessment, but is also very useful to give a snapshot of changing trends in sustainability over time if it is repeated each year.

Step 5: New action plan

Creating a new management plan is closely integrated with the previous assessment step – it can even take place in the same meeting or meetings. It should certainly build directly on the learning that emerges from the assessment process. Specifically, it looks at the relationship between past and current management actions taken by the community and other partners and the assessment (*i.e.*, the last bullet point question in Step 4), and considers what adjustments or changes might be made in the future.

Again, at the Criterion level (or Indicator if it works better), have the assessment or management group consider in some detail the assessment of results in relation to management actions (or non-actions). If you have limited time, or an excessive number of C&I, you may need to prioritise those that are most critical in a group discussion.

Some questions to help with the learning process include:

- What management actions (or non-actions) influenced the Criterion or Indicator?
- Were any direct links between actions and effects noticed (*i.e.*, what was the effect of the management activities taken 'positive' or 'negative')? Were there any surprises? Why?
- Are there any gaps in knowledge about why things are happening? How can these be addressed?

- Taking all the above into account, should past local management activities continue or change? Are there new actions that can be taken to address issues that the Indicators show as having low or declining performance?
- Are there any other new ideas for action from the results of monitoring and assessment? How can these be put into effect?
- What else (beyond local management) contributed to the effects? If there are any external influences that are critically negatively affecting sustainability, can they be addressed? If these were previously beyond the 'control' of this group, are they still? Can anything be done to positively shape these external influences?

Step 6: Modify the set of C&I

The original set of C&I is not sacred – it must live and grow and change and evolve to reflect the knowledge of the community and to reflect changes on the land and in the environment.

As a result of all the work to this point, it may have become clear that some of the initial set of C&I are not very helpful. They may be too difficult to monitor, or their results may be ambiguous, or they may address problems that have now been solved. If so, drop them!

You may also find that some new ideas have arisen, which result in good suggestions for new indicators or substitutes. Some gaps may have been identified and indicators suggested to fill the gaps. If so, include them!

Some C&I may need to be slightly adjusted or modified. If so, change them!

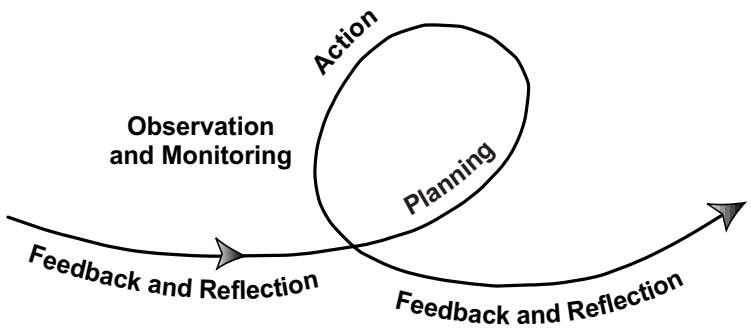
Overall, you may find that you have too many indicators, or too many of a particular type. In this case, consider applying the filters you used during development to reduce the set or carry out some participatory ranking exercises to find out which ones are most important. We have found

that the process of changing a set of C&I is itself a good way of sharing knowledge – it involves a lot of discussion and debate about why the changes should be made.[28]

Step 7: Move ahead to/return to Step 1

C&I are used in ongoing spiral or loop of reflection, planning, action and observation.

Figure 3. The Monitoring Spiral (also known as a 'Learning Loop').



[28] Note that CIFOR has produced a computer-based tool called CIMAT for helping with modification and adaptation of the CIFOR generic set of C&I for FMUs. It has not yet been adapted to a CMF C&I set or been field tested in a participatory process but, if that set is your base set and you have access to computer facilities, you may want to consider trying it out. See the reference section for information.

4. C&I Content

Introducing selected C&I from the three CIFOR test sites[29]

This part of the guide is about the content of C&I developed at the CIFOR test sites. *Selected* C&I from the three tests are presented (*i.e.*, it is a series of related and combined examples, not a single set of C&I). They are intended to illustrate the breadth of issues and related C&I that were considered important across the three test sites. They are presented as a starting point for further development of C&I at the local level – a means to generate ideas for what is appropriate in a specific context. They should not be viewed as a definitive or generic set of C&I for CMF. Many will be applicable to most CMF sites; others will be more site specific but may be adapted to suit other locations. Still others may not be relevant at all and should be dropped, and some that are specific to other sites may be missing. Adapt!

It should be borne in mind that these C&I were developed by teams of scientists who were specialists in the disciplines of Ecology, Forest Management and Socio-economics. While the sets of C&I developed by the teams were modified following consultations with the local communities at the test sites and after taking account of the local site conditions, they are not the product of the fully participatory collaboration that we are recommending in this guide (*i.e.,* CIFOR is learning by doing, and building on experience). As a result, some C&I retained a strong scientific bias and are expressed in language that would be difficult for many members of forest dependent communities to understand. Language aside, they are a good indication of the key issues that are seen as vital to sustainable CMF and a good starting point in terms of C&I.

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[29] A complete list of all the C&I generated at the CIFOR test sites can be obtained from CIFOR. See reference section.

The test teams found some difficulty, if not confusion, in their original plan of clustering their C&I under Principles of Ecology, Forest Management and Socio-economics. For example, similar C&I clustered under Ecology at one site were clustered under Forest Management at another. This may be because strategy of grouping C&I under Ecology, Forest Management and Socio-economic Principles reflected a top-down 'scientific' view of C&I, and one developed originally for the management of industrial forestry. This perspective may not be able to capture the diversity, complexity and inter-relatedness of factors concerning sustainability when dealing with CMF, and may fail to reflect the perceptions of many forest dependant communities.

As a result, for the purposes of this guide and future work with CMF C&I, we have chosen to re-cluster the C&I under broad headings expressed as four guiding principles or ideals for sustainable CMF. These should make sense at the community level, and we suggest that they might be an appropriate starting point for generating locally defined and agreed Principles and their supporting C&I.

The four Principles[30] we synthesised from the field sites are:

- **Community (institutional) well-being is assured**
- **People's well-being is assured**
- **Forest landscape health is assured**
- **The external environment is supportive to SCMF**

[30] These Principles emerged as logical umbrellas from the research and the C&I developed during the CIFOR CMF C&I tests; they are certainly not the *only* way of organizing CMF Principles. As described earlier Principles should derive from participatory processes, and be based on the users' perceptions, needs and preferences.

For each principle, there is a short explanation, followed by several groups of C&I. Each group of C&I is indicated by its header being underlined. Each group contains first a very brief justification for the group, and then a set of example C&I from the test sites.[31]

In the examples given, criteria are in **bold** text. Indicators are *italicised* text. Verifiers are normal text.

Please note.

1) *The point of these C&I is not only to provide examples of actual key CMF C&I, but also to illustrate the commonalities and differences among them in different areas. As such, please remember that we are not presenting a single coherent set of C&I or a single filled-in C&I framework – we offer Principles and several examples of or versions of Criteria on the same theme, each with their own Indicators and Verifiers.*

2) *The numbering of the selected examples of C&I refers to the original field test sets from which they were taken – it does not refer to this compiled set, and thus should be ignored (unless reference is being made to the full sets of C&I generated at the CIFOR test sites[32]).*

[31] It should be noted that some of the C&I in the examples were developed by people using English as a second language and others have been translated into English. For the sake of respecting the original intent and feel of the C&I, they have remained as close as possible to original formulation, even in cases where the English grammar is not technically correct. In other cases the sets are incomplete, or do not follow the suggestions for use advocated in this guide. Again, the purpose here is to illustrate possibilities only and for this purpose the meanings and examples should be adequately clear.

[32] The full set of C&I generated at the three CIFOR test sites can be obtained from CIFOR. See reference section.

Principle 1. Community well-being is assured

In developing C&I for community well-being the primary concern is with the community's capacity to organise and manage the multiple functions, uses and benefits of the forest collectively, so that the individuals, households and other groups share equitably in the benefits and so that the forest resources continue to provide these functions, uses and benefits into the future.

Many recent studies into the success or failure of CMF have highlighted the importance of the capacity of the community to organise and to develop and enforce management rules. This is particularly so in the face of population pressure, reduced resources, degraded resources and competition from outside the community. The capacity of the community to organise, to develop management rules, to enforce these rules, and to have the secure de jure authority to manage, has been identified as a vitally important feature in support of sustainable forest management.

In all three test sites C&I were developed to address these issues. For the purpose of potential future use of the sets as a starting point for other CMF situations, and for comparison across the test sites, we have grouped these under the following headings.

a. **Community organisation/institutions and participation**
b. **Local management mechanisms (*e.g.*, norms, rules, regulations, etc.)**
c. **Conflict management**
d. **Authority to manage (tenure)**

1.a Community organisation/institutions and participation

In order to manage community forest resource 'supply and demand' – including distribution rights and obligations, collaboration, forest protection – most indigenous CMF systems have evolved some form of community organisation. Such organisations are established to help the community to focus on the development, implementation and enforcement of rules through incentives, persuasion or force of sanctions. The existence of a strong, supportive community organisation is therefore seen as vital to the sustainability of CMF. In two of the three test sites (Brazil and Indonesia) broad participation in decision making, including participation by women, was identified as an important issue for the sustainability of local organisations and for reducing possible conflicts.

Brazil

6.4 The community participates and monitors all the planning processes of any management system to be executed within the agroforestry area it impacts on.

6.4.1 Active community participation in the conception and monitoring of agroforestry resource management systems.

6.4.1.a (The perception that) Leadership(s) within the community is representative of all groups and factions within the community.

6.4.1.b The majority of the community's adult population has knowledge of and agrees with the management system.

6.6.1 The community possesses forms of inter- and intra-community organisation.

6.6.1.a Recognition of existence of organisations ('de facto' and legally).

6.6.1.c Individual and collective accounts of the participation of community members in associations, unions and political organisations.

6.6.2 Effective female participation in discussions and decisions concerned with community welfare.

6.6.2.a Existence of forms of associations that contemplate questions concerned with gender.

6.6.2.b The representation of women in intra- and inter-community associations.

Cameroon

7.1 Institutions or organisations exist to cater for the diverse interests of different forest user and interest groups.

7.1.1.1 Village Council of Wisemen or Elders.

7.1.3.1 Representative community-based development groups and associations.

7.1.3.2 Respect/recognition of decisions of development association/ group.

Indonesia

5.3 Local social organisation has the capacity to enforce customary law and other regulations.

5.3.1 Meetings are organised on environmental and land use problems.

5.3.2 Women are represented equally in meetings and decision making.

5.3.2.1 Women are present in meetings.

5.3.2.2 Women are involved in discussions.

5.3.3 Participatory decision making exists.

5.3.3.1 Decisions are made in meetings of adult members of the community.

5.3.3.2 Participants understand the subject of discussions.

5.3.3.3 There is no monopoly of discussion by authority.

5.3.3.4 People agree on the discussion inside and outside the meeting.

1.b Local management mechanisms (*e.g.*, norms, rules, regulations, etc.)

In order to give effect to the management decisions of the community, most enduring CMF systems have developed a suite of management instruments to regulate and control the use of forest resources by members of the community. The term management mechanisms is used here to cover all the formal and informal instruments, including the rules, norms, customs, taboos, regulations, etc., which the community has developed. They are often complex and subtle and, like the organisations themselves, are embedded in the local cultural, spiritual and ecological environments. Mechanisms such as sanctions for dealing with rule-breakers were identified as important in the Indonesian test site (i.e., through the traditional *Adat* system). In both Indonesia and Cameroon, the ability of the community to evolve their rules as an adaptation to changing circumstances was seen as crucial to the sustainability of the community institutions.

Brazil

5.6 The community has developed mechanisms for monitoring and controlling productive activities.

5.6.1 Existence of community mechanisms for patrolling and controlling the various stages of timber extraction undertaken either by community members or outsiders.

5.6.2 Existence of community mechanisms for patrolling and controlling the extraction of NTFPs by the community members and/or outsiders.

5.6.3 Monitoring and control of fishing undertaken by community members and/or outsiders.

5.6.4 The community has mechanisms to control the collection and sale of animals and ornamental plants.

6.2.1.c Community rules on the use, possession and ownership rights over agroforestry resources.

Cameroon

5.4 Access to community forest commons is regulated through collective action and support.

5.4.2 Development of new rules and practices of exploitation in response to perceptible changes in the resource base.

6.3 Local systems exist for the monitoring and evaluation of different forest resources.

6.3.2 Community members effectively contribute to forest resource assessment.

7.2 Community institutions have the capacity of determining and distributing benefits from forest resources.

7.2.1 Community norms and values on the distribution of relatively large animal species function.

7.2.2 Community food taboos function.

Indonesia

5.1 Customary law and other regulations ensure sustainable land use systems.

5.1.1 There are sanctions for those breaking the rules.

5.1.1.1 Specific sanctions attached to specific land use systems.

5.1.2.3 Recent cases where sanctions are applied.

5.1.2 All sections of the community respect the customary laws and other regulations on the sustainable land use system.

5.1.4 Rules that ensure the sustainable use of the forest are respected.

5.1.5 Rules that ensure the sustainability of the service functions of the forest are respected.

5.1.6 Rules that ensure the sustainability of tembawang are respected.

5.1.7 Rules on ladang/shifting-cultivation practices that ensure an appropriate fallow period are respected.

5.3.4 New regulations and sanctions that cope with new development problems on land use and natural resources still being developed.

1.c Conflict management

In all three sites it was recognised that the community needs to have ways of dealing with conflicts when they arise. These may be informal or formal. Consensus about, or respect for, these mechanisms is also needed for them to be effective. In addition, the ability to use external, state or legal mechanisms for resolving conflicts may also be important (see 4.b).

Brazil

6.2 Effective measures and institutions for conflict resolution must exist.

6.2.1 Informal mechanisms exist for the resolution and negotiation of community conflicts, family disputes and complaints about the use, possession and ownership of agroforestry resources.

6.2.1.b Documentation of negotiation and conflict resolution concerning agroforestry resources.

Cameroon

5.1.2 Decisions of conflict resolution are taken by institutions within the community.

5.1.2.2 Number of reported cases of conflict over land claims resolved within the communities compared to those taken to State Law.

7.1.1 Decisions of conflict resolution institutions are respected.

Indonesia

5.1.3 There is a conflict resolution mechanism.

5.1.3.1 Adult members of the community can tell how conflict on land use is resolved.

5.1.3.2 There is a consensus on how conflict on land use is resolved.

5.1.3.3 Recent cases of traditional conflict resolution on land use.

1.d Authority to manage (tenure)

The community requires security of tenure over its resources in order to have the authority to manage them. Equally, without secure tenure people are often hesitant to invest in long-term management efforts. All three sites include Criteria or Indicators referring to state or legal (de jure) recognition of the community's tenure system. Tenure issues may also include reference to the boundaries of common land or community forests, the existence of maps showing these boundaries, and/or recognition of the often complex systems of rights and customary uses that have evolved in the community (see also 2.d and 4.b).

Brazil

6.1 The local population's land usufruct possession and occupation rights are secured in the long term.

6.1.1 Customary land possession rights and concessionary agreements concerning the management of agroforestry are recognised.

6.1.1.a Survey of land use rights, possession and ownership rights.

6.1.1.b Survey of legal and customary rights of concession of land use, possession and ownership rights.

6.1.1.c Existence of customary agreements within the community concerning land use and agroforestry resources.

Cameroon

5.1 Long-term community access rights to land and forest resources are clearly defined, known and respected.

5.1.1 Land appropriation procedures are accepted and respected.

5.1.3 Formal legal frameworks accommodate customary tenure.

5.1.4 Boundaries of community area are known and respected by community members.

Indonesia

4.1 Secure community tenure system is guaranteed by the state

4.1.1 Secure community tenure system is guaranteed in state laws and regulations.

4.1.2 Community property rights is indicated in official land use maps.

4.1.3 Translation and adaptation of the TGHK (Tata Guna Hutan Kesepakatan) into TGLDK (Tata Guna Lahan Desa Kesepakatan).

Principle 2. People's well-being is assured

It is widely recognised that people who make their livelihood from forested land, who are dependent on forest resources and whose well-being is enhanced by their interaction with the forest, have a vested interest in the sustainability of the forest. This Principle captures this ideal. A broad range of Criteria and Indicators from all three sites express the many values of the forest to the local population. We have subdivided our examples of these into four areas broadly, based on the recurring notion that emerged from the sets that people need to be 'healthy, wealthy and wise', and to capture the vital issue of intergenerational security of access to resources. The four subsections are:

a. Health and diet
b. Wealth (livelihoods, distribution of costs and benefits, equity)
c. Wisdom and knowledge sharing
d. Tenure arrangements *within* the community

2.a Health and diet

In both Brazil and Cameroon, Criteria and Indicators were developed to express the idea that interaction with the forest provides direct benefit to people's health and physical well-being. Many of these note the importance of forest products in the diet. In Indonesia, no reference was made to diet or health of local people. This is unusual. In most C&I for sustainable forest management the health of local people is considered an important criterion. In Brazil, the additional idea that the control of population growth and reproduction are important to sustainability was included.

Brazil

6.7 Management activities applied to agroforestry resources have significantly contributed to the biological, socio-economic and cultural well-being of the local population.

6.7.5.b Food consumption by the domestic unit with special attention to agroforestry products.

6.7.5.f Stable and slow population growth.

6.7.5.g Access to and female use of family planning and contraceptives.

6.7.8.c Traditional culinary repertoire linked to the use of a wide range of agroforestry products.

3.1.1 The socio-economic importance of aquatic sources of animal protein to the local community remains significant.

2.1.3 Game meat is still important in the local diet.

Cameroon

1.6 The well-being of the population is assured.

1.6.1 Health is assured by pharmaceutical products gathered from the forest.

1.6.1.1 Evidence of bark, seeds, fruit, foliage gathering and appropriate local consumption.

1.6.2 Most products consumed by the population are taken from the forest ecosystem.

1.6.2.1 Eating habits rely on local forest ecosystem.

1.6.2.2 Evidence of the use of diverse recipes.

3.2 The natural forest's role in community health care is being consciously preserved.

3.2.1 There is a variety of forest products of nutritional value that supplement local dishes and meals.

3.2.1.2 Contributions made by forest foods to local diet.

3.2.2 There is a compendium of medicinal trees, shrubs, herbs, snakes, toads, etc., used by local inhabitants to treat sicknesses and physical disorders.

3.2.3 Watersheds and waterways are protected in the interests of community health.

3.2.4 The use of fire for land clearance is kept to a minimum to prevent respiratory illnesses.

2.b Wealth (livelihoods, distribution of costs and benefits, equity)

In all three sites there were many examples of criteria and indicators referring to local people being dependent on the forest for their livelihood. Issues here include economic benefits gained from the forest either directly or through cottage industries, which add value to raw forest materials through craftsmanship and/or by creating employment. Cameroon and Brazil highlighted the theme of multiple and diverse products of the forest, and the importance of different forest interest groups who complement each other by using different resources. Indonesia emphasised the equitable distribution of forest products (see also 4.c).

Brazil

5.7 The benefits derived from productive activities have served as an incentive to perpetuate those activities in a sustainable manner.

5.7.1 Existence of continual effort to diversify and increase value-adding processing capacity with the aim of increasing the gross aggregate value of the products.

6.7.1 The management activities applied to agroforestry resources produce economic subsidies for the maintenance of small-scale businesses and cottage industries.

6.7.2 The level of dependency on raw materials produced and obtained within the community.

6.7.4 Agroforestry resource management activities economically contribute to the community's access to education, health and other social services.

6.7.5 Existence of effective benefits for the subsistence and reproduction of domestic units derived from the management of agroforestry resources.

6.7.5.a Quantification of the agroforestry production of the domestic unit.

6.7.5.c Inventory of domestic household assets and utensils.

6.7.5.d Domestic unit income fluctuations from agroforestry resource management activities.

Cameroon

5.2 Forest products contribute significantly to the socio-economic well-being of the different age and sex groups of the community.

5.2.1 Importance of forest products in household cash and non-cash incomes.

3.3. Different forest users and interest groups of forest products co-exist harmoniously.

3.3.1 The interest of the various community forest user groups complement each other and do not adversely compete.

3.3.2 Forest benefits supplement diverse sectors of the rural community.

3.3.2.1 Existence of cottage industries that use indigenous skills and encourage the wise harvest and use of forest raw material.

3.3.2.2 Employment provided to villagers by local cottage industries.

3.3.2.3 Existence of locally produced value-added products for local use and sale.

3.3.2.5 Selection of plants and species and standards of craftsmanship result in value added products with a long useful life span (e.g.,. mortars, canoes, etc.).

Indonesia

5.2 Customary law and other regulations ensure fair access to community natural resources and fair distribution of their products among community members.

5.2.1 Rules ensure fair access of all stakeholders to forest.

5.2.2 Rules ensure fair distribution of tembawang products to all stakeholders.

5.2.3 Rules ensure fair distribution of irrigation water where there is sawah.

3.4 Tembawang is capable of supporting livelihoods of people.

3.4.1 Tembawang produces commercial fruits and other subsistence needs.

2.c Wisdom, sustainability ethic and knowledge sharing

A key aspect of sustainable forest management is that the knowledge base of the community is alive and well, and that management is based on the collective wisdom of the community. Intergenerational transfer of knowledge from old to young is thus vital for sustaining this knowledge base into the future, as all three test sites emphasised. In the Indonesian set, for example, the transfer of knowledge through education was expressed as a *Principle*. Brazil and Indonesia also refer to the 'moral' component of indigenous knowledge (local conscience, environmental ethic) which underpins indigenous practice. It appears important for many indigenous peoples' cultural and spiritual identity to be firmly rooted in the forest.

From the sets, it appears that the importance of indigenous knowledge for sustainable forest management cannot be over-emphasised. It not only appears frequently but, as in the case of the Cameroon set for example, appears high in the C&I hierarchy (e.g., the use of indigenous knowledge is a *Principle* of sustainability). Although we have specifically

included knowledge within the Principle of people's well-being, this is a widely cross-cutting issue, and it is likely that 'knowledge of' will be a common phrase throughout an effective set of Criteria and Indicators (see also 4.d).

Brazil

6.8 Local conscience and knowledge of agroforestry resource use and management demonstrates an ethic of sustainable land use and conservation.

6.8.1 Ample local knowledge on the use of agroforestry resources, especially non-timber forest products.

6.8.2 Use of non-timber forest products in local technologies and infrastructure.

6.8.2.a Indigenous classification of agroforestry products used in the manufacture and production of artefacts.

6.8.3 Evidence of symbolic codes and myths that have a regulatory effect that contributes to the conservation of agroforestry resources.

6.8.3.a Observable regulatory effect of narratives of myths.

6.7.7 Transmission and perpetuation (written and oral) of traditional knowledge and mythology.

6.7.8 The cultural identity is intimately linked with the agroforestry landscape, its various uses and its ritualisation.

Cameroon

6.1 Social structure permits the transmission of existing knowledge systems.

6.1.1 Folk-tales and proverbs highlight forest-people relationships.

6.1.2 Different user groups undertake joint forest exploitation trips.

6.1.3 Forest exploitation expeditions include knowledge transmission.

6.2 Knowledge of forest is used as a mechanism to ensure minimum livelihood to community members.

6.2.1 Frequency of forest visits indicates dependence.

Indonesia

3.1.3 Traditional concept for conservation exists.

7.1.3 Non-formal education is functioning.

7.1.3.1 Story telling is still performed by elders for the youngsters.

7.1.3.2 Local history is still handed down to the younger generation.

7.1.3.3 Local knowledge on natural resource management still handed down to the younger generation.

2.d Tenure arrangements *within* the community

In most enduring CMF, the need to ensure equitable access to the forest and other resources has led to the evolution of local tenure arrangements. These are essentially agreements between the individual (and/or household or group) and the community; the agreements are (at least initially) appropriate to the local culture and resource management requirements, and are usually supported by accepted norms and rules. They define in spatial and temporal terms the relationship between an individual (household/group), the community and the resource area, *i.e.*, 'who can do what where'. Well-defined and acceptable tenure relationships are vital to the incentive to invest and protect and to ensure intergenerational commitment. Equitable use rights are important to people's well-being, as emphasised in Brazil. Inheritance and the means of passing on rights to future generations are key aspects of sustainability. This section on individual tenure has strong links to other sections, including community-level tenure or authority to manage (see 1.d), and the distribution issue in the section on wealth (see 2.b). In Brazil and Cameroon, individual resource tenure was a Criterion, but in Indonesia the individual tenure issue was treated as cross-cutting and thus appears as a Verifier in several places.

Brazil

6.3 Access to and the use of common land and agroforestry resources are secured for all community members regardless of their sex, colour, religion or social class.

6.3.1 There are norms for the regulation of agroforestry resource access.

6.2.1.c Identification of internal community rules on the use, possession and ownership rights over agroforestry resources.

Cameroon

5.1 Evidence of access/use rights are demonstrated by community members.

5.1.1 Land appropriation procedures are accepted and respected.

5.1.1.1 History of land use and/or occupation.

5.1.1.2 Property inheritance patterns.

Indonesia

5.2.2.2 Secure communal and private property rights on tembawang.

5.2.2.3 Clear rules on inheritance.

5.2.2.4 Clear rules on rights to harvest tembawang products.

6.1.2.4 Rules on NTFP tenure.

Principle 3. Forest landscape health is assured

This Principle expresses the idea that the whole landscape is in good condition as a result of its management. This is a broadly embracing Principle intended to be general enough to capture the many different ways in which different communities will think about their resources. It includes: the state of the earth and waterways; the health of forest ecology; the condition and management of patches in the landscape used permanently or temporarily for cultivation; and covers 'best practice' in a wide range of possible human interventions with the forest, including NTFP collection (plant and animal), timber extraction, swidden rotations, agroforestry and silviculture.

In most conventional sets of C&I, the issues discussed here are generally divided into at least two sets – ecology and forest management. However, in all three test sites these subdivisions were felt to be unworkable. Is hunting a biodiversity issue or part of forest management? In most indigenous and community management contexts, there is no distinction between 'managed' forest and 'natural' ecosystem. The community manages the landscape ecology as a whole. This broad Principle thus attempts to embrace forest landscape integrity in a more holistic manner. No two communities will divide up their management of the forest landscape into Criteria in the same way, and there were significant differences in C&I structure between the three test sites. We present examples of C&I for this Principle under the following subsections:

a. Planning (zoning and protected areas)
b. Managing ecosystem functions (earth, water and fire)
c. Productive interventions 1 (agriculture and agroforestry)
d. Productive interventions 2 (plant NTFPs)

e. Productive interventions 3 (animal NTFPs)
f. Productive interventions 4 (timber)
g. Forest health 1 (biodiversity)
h. Forest health 2 (structure and regeneration)
i. Landscape diversity (fragmentation and mosaics)

3.a Planning (zoning and protected areas)

This section involves C&I which recognise that the forest landscape is not a homogeneous, and that management needs to be sensitive to different land types or zones. It includes protected areas and sacred places. This section cross-cuts with landscape diversity (see 3.i) and with boundary and tenure issues (see 1.d and 2.d).

Brazil

4.1 The long-term maintenance of reserve areas and reproductive individuals is considered by the community in order to guarantee the survival of exploited populations.

4.1.1 Forest reserves and sanctuaries with an adequate size and distribution within the CMF area are maintained.

5.1.2 Existence of zones (areas defined for different use intensities in accordance with resource potential).

2.1.5 Existence of areas scarcely hunted or unhunted within the area accessible to hunters belonging to the community.

5.2.1 Existence of management plan and annual plan for timber.

5.3.1 Existence of management plans and annual plans for NTFPs.

6.7.6 Respect for and the protection of sites of special cultural significance is prioritised in the allocation of all forms of natural resource use and exploitation.

Cameroon

5.3 Sites of special socio-cultural, historical and touristic values to local communities are known and protected by social control mechanisms.

5.3.1 Mystical sites of socio-cultural significance to communities exist.

3.1 The villagers have sufficient knowledge of the composition and distribution of different forest types.

3.1.1 The forest boundaries and all those with neighbouring villages are known and respected by all concerned.

3.1.1.2 Different types of forest such as swamp and secondary forests indicator species, species rich areas of forest, valuable timber species, shrubs, herbs, the streams, fish species and their locations in the forests are known with a high degree of precision.

Indonesia

2.2 The management of each land use system takes into account characterisation and delimitation of preservation area and areas of different use intensity.

2.2.1 Preservation areas are communally owned and apply low intensity use.

2.2.2 Permanent agricultural lands are individually owned and apply high intensity use.

1.1.1 Areas of ecological importance are recognised and protected.

3.b Managing ecosystem functions (earth, water and fire)

This section recognises that managing the forest landscape involves much more than managing trees. Reflecting the fact that many forest peoples are riverine, using water courses for transport, food, irrigation and health, management of water resources is an issue at all three test sites. Fire management is also important in all sites. The management of soil is significant in the Cameroonian and Indonesian sets. All three issues are intertwined. Water management affects soil through erosion and fire management affects soil through the contribution of ash to fertility. Active management of these core resources enhances sustainability. The approach to assessment of this management differs widely in the three test sites: Brazil opted to assess the condition of the resource (see the Verifiers for water quality), and the other two sites focused on assessing management practices (see Indonesia's fire management Verifiers).

Brazil

1.4 The risk of accidental fires in fallow areas and primary forest is minimised through the use of appropriate fire management techniques.

1.4.1 No occurrence of accidental wildfires.

5.5.4 The community possesses rules and regulations for the controlled use of fire in the preparation of agricultural areas, the cleaning of pastures and in other activities.

1.5 Maintenance of the ecological integrity of all the aquatic ecosystems (rivers, streams, lakes, etc.).

1.5.1 Maintenance of flooding regimes, the productivity of river channels and of natural processes that sustain or subsidise aquatic animals and plants (physical integrity).

1.5.2 Absence of aquatic contamination processes (water quality satisfactory from a chemical and biological standpoint).

1.5.2.1 Transparency, odour and taste of water.

1.5.2.2 Occurrence of algal blooms and abnormal fish mortality.

1.5.2.3 Occurrence of contamination from *E. coli* of faecal origin.

Cameroon

1.7 Water resources are appropriately managed.

1.7.1 There is a well-respected fishing season.

1.7.2 Access to water courses for fishing is regulated and controlled.

1.7.3 The fishing tools and methods assure regeneration of the fish.

1.7.4 Fish breeding ponds are created to reduce pressure on the fish.

1.4.2 Agricultural practices have short-term beneficial effects on the arable land, the soil and the trees.

1.4.2.1 Preservation of fertilising trees during land clearance.

1.4.2.2 Maintenance of relative soil cover after land clearance.

1.4.2.5 Waking dormant tree seeds by the action of fire.

4.2.1.2 Attention paid to climatic and seasonal factors in the timing of agricultural fires.

1.4.2.6 Mineral matter made available from the ash.

1.4.4.5 Making and using compost.

1.4.3 The fallows are sufficiently long to allow soil to regenerate

Indonesia

1.1 Critical ecosystem functions are preserved.

1.1.2 Water sources are protected.

1.1.3 Water and soil quality is maintained to secure ecosystem's sustainability.

1.1.4 Soil erosion is minimised.

2.1 Each land use system is located on suitable soils.

2.1.1 There is adequate local knowledge on soil types and fertility/ fallow vegetation.

3.7.3 Fire management to open ladang is applied.

3.7.3.1 Evidence of a fire break before burning.

3.7.3.2 Burning considered wind direction and its velocity.

3.7.3.3 Evidence of burning from the lowest part to the upper part.

3.7.3.5 Absence of damaged plants caused by uncontrolled fire.

3.c Productive interventions 1 (agriculture and agroforestry)

There is a strong belief amongst team commmunity members that consideration of sustainable management of forests must take into account the agroforestry and cultivated areas in the landscape (see Box 3). Good management of these areas with moves to intensification and optimisation are considered important ways to reduce the impact on the forest resource. At the three sites a broad range of best practice for sustainability was identified, including low-impact methods, methods for increasing yields without expanding cultivation area, optimisation, developing permanent agriculture where appropriate, using correct timing for seasonal practices, and good animal husbandry.

Brazil

5.5 Agricultural practices are undertaken in a manner aimed at minimising their impact on the forest.

5.5.5 Application of low-impact treatments and husbandry methods (in the control of pests and diseases, pruning, etc.).

Box 3. Examples of productive interventions at the three CIFOR test sites.

São Pedro and Cachoeira de Maró villages, Pará, Brazil
These villagers practise shifting agriculture. Cassava is their most important staple crop and is processed into flour, small surpluses of which are shipped to markets. Many resident families have small rubber plantations. The communities' forest includes some widely scattered Brazil nut groves. It is also relatively rich in a number of other useful NTFP species. Small boat-building enterprises use timber, fibres and resins from the forest. These are private concerns of skilled local boat makers who train apprentices. The felling of trees and their conversion into planks is still largely done with axes. Hunting and fishing are both important activities, with many community members specialising in one or the other.

Bedigong and Darok, Sanggau district, West Kalimantan, Indonesia
These villagers are also shifting cultivators. Their main economic crop is rubber grown in small stands. The villages are amongst those famed for their Tembawang Forest Gardens. These gardens are planted on agricultural plots about to be abandoned. They are generally much richer in useful forest species than the natural forest. Their dominant species is tengkawang (*Shorea macrophylla*), a tall forest tree producing commercially valuable oil-yielding nuts, whose local economic importance is second to that of rubber. Other locally important forest products are honey, rattan, shingles and ironwood. In the larger village of Darok, some established tembawang gardens have been converted to irrigated rice paddies.

Eyek II and Akak/Bitetele villages, Central province, Cameroon
These Bantu Bulu villages are located in a previously logged-over forest-rich zone. Two recent attempts by logging companies to access the area were successfully challenged by the communities. The communities came into being in the 1920s, when ancestors of their present inhabitants reached the area after decades of slow migration across the country. Weak infrastructure keeps them relatively isolated from the market economy and reinforces their comparatively high dependence on the forest for subsistence. Shifting cultivators, many families also have small plots of coffee and/or cacao trees. Since the mid-1980s these perennial cash crops have suffered neglect due to falling prices, a consequence of which has also been a reduction in the rate of forest and fallow conversion. The villagers regularly hunt and fish, and gather NTFPs from the forest, such as foods, wrapping leaves, medicines, fibres, building materials and materials for the local manufacture of crafts. NTFPs of special local importance include rattan and raffia, wrapping leaves and several fruits and spices including bush mango (*Irvingia gabonensis*), moabi fruits (*Baillonella toxisperma*) and kernels from *Ricinodendron heudelotii*. Under the authority of the village chiefs, notables and leaders, these villages have developed rules/laws and regulations to mediate the flow of forest-derived benefits.

Cameroon

1.4 Negative effects of agriculture on the forest ecosystem are minimised.

1.4.1 Agricultural activities are localised.

1.4.4 Measures are taken for increasing agricultural yields.

2.1.1.4 Mixed cropping and cropping sequences help ensure food security throughout the year and make provisions for crop failure.

4.2.1 Farm lands are cleared (slashed and burnt) just before the rainy season so that crops are planted at the right time.

4.2.1.1 No signs of bad timing or delays in land preparation such as waste of prepared land and yield loss.

Indonesia

3.7 Low input sustainable agriculture is applied.

3.7.1 Rubber garden is intensified.

3.7.2 Age class distribution exists.

6.2 Optimisation of the local agroforestry system.

6.2.1 Optimisation of Tembawang (forest gardens).

6.2.3 Productivity and quality of the rubber gardens must be increased.

6.2.3.1 Evidence of appropriate technology for tree improvement.

6.2.3.2 Evidence of appropriate technology for post-harvest and processing.

6.2.4 There is policy and activity to rationalise the ladang system.

6.3 Permanent agriculture is developed where the socio-economic conditions allow.

6.3.1 Agreement among stakeholders on the conversion of part of the environment to irrigated agriculture.

6.3.3 There is an appropriate animal husbandry.

3.d Productive interventions 2 (plant NTFPs)

Non-timber forest products (NTFPs) play a huge role for forest dependent communities and a vast wealth of knowledge surrounds best practice in their management and harvesting. Clearly, however, it would be impractical to develop C&I for each specific intervention. At the three test sites some general Criteria for sustainable extraction were developed with some specific Indicators for particular important NTFPs. Indicators for NTFPs are likely to be highly specific to the forest products in the local area. All NTFP issues cross-cut the biodiversity C&I (see 3.g).

Brazil

5.3 The exploitation of non-timber forest products is based in sustainable practice.

5.3.2 There is the application of low impact techniques.

5.3.3 There is the application of silviculture treatments.

5.3.4 Harvesting practices for each species are compatible with the respective species productive potential.

4.2 Practices involving the extraction of oils or saps from tree trunks, do not have an adverse impact upon the demographic viability of harvested species.

4.2.1 Copaifera trees previously subjected to oil tapping do not succumb to higher mortality rate than untapped trees in the same population.

4.4 The extraction of latex and resins from trees is done on a sustainable basis.

4.4.1 Local populations of latex-yielding trees (e.g., Hevea, Brosimum, Couma and Manilkara spp.) are demographically viable.

Cameroon

1.5 NTFPs must be sustainably managed.

1.5.1 NTFPs are known.

1.5.1.2 Knowledge of capacity for regeneration for each species.

1.5.2 NTFP harvesting techniques ensure sustainability.

1.5.2.1 Existence of conservation techniques.

1.5.2.2 Absence of destructive techniques.

1.5.2.3 Attempts to domesticate certain species.

3.1 Harvesting techniques are sustainable.

3.1.1 Destructive harvesting of leaves, suckers, stems, roots, branches, etc. is avoided to ensure their availability at times of need.

3.2 The role of seasonality in the use of forest resources and farming activities is recognised.

3.2.2 Plant parts including bark are collected in appropriate seasons.

Indonesia

3.2 Low impact harvesting is applied.

3.2.1 Harvesting causes minimum disturbance.

3.2.2 Equipment used is adapted to local technological knowledge.

3.2.3 Minimal disturbance of animal habitats.

3.2.4 Only mature non-timber forest products are harvested.

6.1.2 Sustainable extraction of NTFPs under community management.

3.e Productive interventions 3 (animal NTFPs)

Hunting and fishing are important to many forest dependent communities; other animal products, such as honey, can also feature strongly. Note that the fishing topic cross-cuts with water management (see 3.b) and all NTFP issues cross-cut with biodiversity (see 3.g).

Brazil

4.5 The extraction of animal products used in the local economy does not have a negative impact upon the population dynamics of the animals associated with those products.

4.5.1 Methods of honey extraction do not damage bee hives or the trees containing woody cavities with which they are associated.

5.4 Fishing activities are carried out on a sustainable basis.

5.4.1 Existence of rules and norms for low impact fishing.

3.1 The exploitation of fishing resources does not lead to the demographic or economic extinction of fish and turtle populations.

3.1.2 Natural fish reservoirs or nurseries are maintained and serve as sources of immigrants to sections of rivers or streams where fish stocks have been over-exploited.

3.1.3 Individual fish captured intentionally or accidentally are over the critical reproductive maturity size for their respective species.

3.1.5 Collection of turtle (Podocnemis spp.) eggs, young and adult females on beaches is totally prohibited.

2.1.6 No commercial hunting takes place within the community.

Cameroon

1.3 Indigenous strategies aimed at reducing pressure on wildlife are worked out in conformity with the laws and regulations for hunting matters.

1.3.1 Laws and regulations on hunting matters are known to all the participants.

1.3.2 Indigenous strategies exist aimed at protecting certain species.

1.3.3 Anti-poaching methods are valued and applied.

1.3.4 Destructive hunting tools and methods are outlawed.

1.3.5 Extensive breeding of domestic animals allows reduction of pressure on wildlife.

4.2.4 Hunting by trapping and fishing are noticeably reduced during dry season.

Indonesia

3.3 Hunting is practised only for local consumable animals considered pests to the ladangs.

3.3.1 Hunting season is regulated.

3.f. Productive interventions 4 (timber)

Timber management and extraction for domestic use is important to all forest dependent communities, and management and extraction of timber for markets is important for many. This issue was addressed by the Brazilian and Indonesian tests.

Brazil

4.3 Timber trees are harvested sustainably.

4.3.1 There has been no noticeably marked decline in the population density of local timber species.

5.2 Timber exploitation is undertaken on a sustainable basis.

5.2.2 Application of low impact techniques.

5.2.3 Application of specific silviculture treatments (liana cutting, elimination of other competitive plants) in accordance of annual plan of operations.

Indonesia

6.1 There is systematic integration of natural forest into the community resource management.

6.1.1 There is sustainable extraction of timber under community management.

6.1.1.1 People know the regulations.

6.1.1.2 Timber extraction is monitored by the authority.

6.1.1.3 There is organisation under local management that co-ordinate extraction of timber.

6.1.1.4 Fair access to timber resources among the community members.

6.1.1.5 There is a systematic replanting of trees.

3.g. Forest health 1 (biodiversity)

Biodiversity is treated quite differently by communities than by the conventional commercial or 'scientific' approaches to C&I. It cross-cuts with issues of game (see 3.e) and other NTFPs (see 3.d). It is also vital to appreciate and recognise the contribution to biodiversity from agroforestry and other croplands.

Brazil

1.2 The process of habitat fragmentation does not compromise the maintenance of biological diversity at the forest landscape level.

1.2.1 Processes of the fragmentation and conversion of primary habitats must be contained so as not to result in biodiversity erosion and the local or regional extinction of species.

2.1 The abundance of medium and large-bodied game species within the community's hunting range is satisfactory from the ecological as well as the socio-economic point of view.

2.1.2 The rate at which the abundance of game animals increases beyond a critical distance from the source of hunting pressure (e.g., village).

Cameroon

1.2 Biodiversity is conserved.

1.2.1 Spatial organisation which preserves biodiversity.

1.2.2 Useful trees which are becoming rare are known and protected.

1.2.3 Useful and rare indigenous species are planted.

1.2.5 The wild animals feel safe and comfortable.

1.3. The co-existence and/or co-evolution of farming fallow and natural forest management systems maintains or increases biodiversity.

1.3.1 The land use system is integrated, consisting of a diversity of sub-systems that ensure overall biodiversity is relatively high compared to that of any one of the subsystems.

1.3.2 During farm site preparation, valuable trees are protected.

Indonesia

1.2 Impacts on biodiversity of forest ecosystem are minimised.

1.2.1 Endangered plant and animal species are protected.

1.2.2 Commercial hunting is controlled.

1.2.3 Production of non-timber product is sustainable.

3.5 Diversity of agroforestry products in tembawang is maintained.

3.5.1 Species and genetic diversity is maintained.

3.h Forest health 2 (structure and regeneration)

The structure of the forest in the landscape, including agroforestry, is important for maintaining a suitable environment for adequate biodiversity (see 3.f) and for supporting other ecosystem functions such as water quality and soil fertility (see 3.b). Structural concepts include the pattern of primary and secondary forest (highlighted in the Brazilian set – which also relates to the overall landscape mosaic, see 3.i); the horizontal and vertical aspects of structure (highlighted in the Cameroon set); and the ability of forest to regenerate (as emphasised by the Indonesian team).

Brazil

1.1 A continuous and structurally undisturbed forest that offers the most satisfactory ecological conditions for the maintenance of local biodiversity and the sustainable use of forest resources exists.

1.1.1 Proportion of primary and secondary forest within the CMF.

Cameroon

1.1 Natural regeneration is assured.

1.1.1 The horizontal distribution of different plant forms shows a dynamism (diversity) in the structure of the forest.

1.1.1.1 A dense stable forest (climax form) with a structure comparable with that of the original forest of the region.

1.1.1.2 Diverse plant formations (succession) in the zones devoted to agricultural activities develop during the fallow period.

1.1.2 The vertical structure of the primary forest is not disrupted.

1.1.2.1 Trees of different heights contribute to a layering or stratification of the forest canopy (*i.e.*, the tops of the trees occur in different layers).

1.1.2.2 Trunk diameters vary.

1.1.2.3 The upper canopy is continuous.

1.1.2.4 The forest floor is rich with seedlings.

1.1.3 The distribution and frequency of species is comparable to that of the original forest.

Indonesia

1.3 The capacity of forest ecosystem to regenerate naturally is ensured.

1.3.1 All growth phases of groups of species are represented.[33]

1.3.2 Animal habitats are maintained[34] *or restored.*

1.3.3 Species richness is maintained.

1.2.4 Vegetation structure is maintained.

3.5.2 Vegetation structure in tembawang resemble natural forests.

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[33] The wording of this Indicator leaves its meaning fairly open. An interpretation that would make it more precise might be: *All important regeneration phases of the main ecological groups of species (i.e., guilds) are represented across the forest area managed by the community*.

[34] The reference in this Indicator (and others following) to a forest quality being 'maintained' obviously relies on the 'original' state (to which it is being compared) being acceptable. A more accurate phrasing of this type of indicator may include reference to it being maintained '*compared to an acceptable original*' *or 'well-regenerated' level.*

3.i Landscape diversity (fragmentation and mosaics)

In all three sites, the issue of conversion of forest land to other land uses, and the possible resulting risk of forest fragmentation, was considered important. The Brazilian site captures the issue of landscape integrity under a Criterion which recognises the importance of a mosaic of different habitats in the landscape, and the need for conversion to agriculture to be sensitive to the overall mosaic. Indonesia's set addresses this issue in specific terms relating to the local tembawang forest garden system. Cameroon's approach includes an Indicator explicitly addressing the process for handling new migrants into the area, as a sign that conversion of forest is being controlled.

Brazil

1.3 The preservation of a mosaic of natural habitats maintains the natural complementarity of species occurrences.

1.3.1 Among the various types of natural habitats occurring within the region, the rarest (or least extensive) in the forest landscape are strongly protected from conversion to agriculture.

1.3.2 Forests along river and stream banks are protected from clear felling to preserve hydrological functions and for biodiversity conservation. Legal minimum of keeping 50m of forest along rivers and stream, is upheld.

5.5.2 Clearance of primary forest for agricultural land use is being avoided.

5.5.3 The size of annual agricultural land holdings is not increasing.

Cameroon

2.1 Agricultural land clearing is largely confined to fallows and secondary forest.

2.1.1 Fallow periods are long enough to permit recuperation of soil fertility.

2.2 The rate of natural forest conversion is low.

2.2.1 The reduction in area covered by natural forest over a given interval of time.

2.2.2 Provisions are made to resettle new entrants and immigrants into villages without causing undue pressure on the natural forests.

2.2.2.1 Very little or no access consideration is made by the village authorities to settle new entrants and immigrants in the natural forest directly.

2.2.2.2 Number of new entrants who establish farms in the natural forests is known and controlled.

2.2.2.3 Migration trends.

Indonesia

3.1 Natural forests are maintained for their production and environmental values.

3.1.1 Productivity of natural forests is maintained.

3.1.2 Conversion into ladangs is restricted.

3.6 Conversion to tembawang is limited.

3.6.1 Conversion is acceptable for conserving resources.

3.6.2 Conversion is followed by development of tembawang in other areas.

1.1.5 Drastic land cover change is prevented.

Principle 4. External environment is supportive of SCMF

This principle captures the ideal that the community is supported in its sustainable management by external bodies such as the state, its agencies and NGOs. In a co-management arrangement it may be a good idea to include an explicit criterion here that deals with the 'health' of the partnership between the community and its co-management partners. In the three test sites, co-management was not at issue, and in fact the coverage of issues dealing with external bodies was very variable. Here we deal with the issues in four sections.

a. Relationships with third parties
b. Policy and legal frameworks (excluding tenure)
c. Economics
d. Education and information

4.a Relationships with third parties

The relationships with other stakeholders is vitally important to the sustainability of management. In the three test sites, the focus on relationships with third parties was very different (see Box 4). The team in Brazil deals mainly with the relationship with employers of members of the community; the team in Cameroon deals with relationships with the state and NGOs; the team in Indonesia only mentions relationships with other communities. Taken as a whole they demonstrate the need to have good communication between the community and third parties.

Box 4. Relations with third parties: experiences from the three CIFOR test sites

São Pedro and Cachoeira villages, Pará, Brazil

Over the past decade large areas of forest adjacent to the Arapiuns river and its tributaries where these villages are located have been heavily exploited by logging companies. One company's activities profoundly affected São Pedro and had a slight impact in Cachoeira de Maró. The inhabitants of São Pedro experienced a boom and bust in employment opportunities offered by the company and suffered the depletion of timber stocks on their lands. News of this reached communities upstream (in the direction of the major company's planned logging routes) who subsequently united with São Pedro to drive all timber companies out of their region. The Rural Workers' Union and other local NGOs are helping several communities along the Arapiuns river system, including São Pedro and Cachoeira de Maró, develop a proposal for the creation of a legally gazetted extractive reserve.

Bedigong and Darok villages, West Kalimantan, Indonesia

The villages are among the 61 that belong to an intercommunity cooperative organisation set up with the assistance of the Social Forestry Development Project, a collaborative venture between the Indonesian Ministry of Forestry (now Forestry and Estate Crops) and the German government. The cooperative is developing small-scale forest-based enterprises and is about to implement a forest management plan for an area of natural forest which, adjacent to Bedigong, belongs to Darok. The costs and benefits of this will be distributed among participants from all member communities. Management of the cooperative will eventually become the full responsibility of the member communities.

Eyek II and Akak/Bitetele villages, Endom, Cameroon

Inhabitants of both villages belong to the community-based Federation of Village Groups SOLIDAM ('Solidarité pour le developpement des villages d'Akak à Melan'). Created in 1990 SOLIDAM has a membership of about 800 individuals drawn from 11 neighbouring villages over an area of approximately 11 by 35 kilometres. It has received assistance from several Cameroonian NGOs, and more recently from the World Bank GIF programme and WWF-Cameroon, to develop environmental, agricultural, health and income-generating projects.

Brazil

6.5 Workers' rights and conditions are appropriate, and considered (at least) just in agroforestry-related employment relations between community members and external actors.

6.5.1 Salaries and benefits are appropriate in relation to the tasks performed.

6.5.2 Absence of under-payment and the exploitation of child and female work.

6.5.3 Work conditions are appropriate and obey existing legislation.

6.5.4 Absence of slave labour.

6.5.5 The right to class organisation is guaranteed.

6.5.6 The right of collective negotiation between the community, its representatives and external actors is guaranteed.

Cameroon

3.4 Villagers participate with other stakeholders in the protection of timber resources in their communities.

3.4.1 Steps are taken by local communities to actively protect their timber species from exploitation by outsiders who may or may not be backed by the forest service.

5.5.2 State and NGOs assist communities in sustainable forest management.

7.1.3 Community dialogue structures exist for the negotiation/discussion of forest management issues with state service and NGOs.

Indonesia

4.3 There is consensus on property rights between communities.

4.3.1 There is a conflict resolution mechanism beyond community boundaries.

4.3.1.1 Cases of conflict on land between communities.

4.3.1.2 Cases of conflict resolutions.

4.3.1.3 Conflict is resolved by a conflict resolution mechanism.

4.b Policy and legal frameworks (excluding tenure)

Supportive government policies and legal frameworks can provide community managers of forests with the strength to deal with third parties and practical help with handling difficult conflicts. Recognition of community management in law was seen as important by the Cameroonian and Brazilian tests. Participation in planning of development programmes and policies was highlighted by the Indonesian and Brazilian tests. This issue cross-cuts with community authority to manage (see 1.d), conflict management (see 1.c) and individual tenure (see 2.d).

Brazil

6.6 The community exercises the right to social and political organisation.

6.2.2 The application of legal proceedings in the resolution of conflicts about agroforestry resources involving internal and/or external actors (neighbours, timber companies, other communities, patrons, etc.).

6.2.2.a Survey of legal registers of conflicts concerning land use and possession and agroforestry resources, and their resolution.

6.2.2.c The local population is compensated for damages caused to their agroforestry resources by third parties.

6.6.1.e The history of the community's participation in the definition of public policies of local and regional impact.

Cameroon

5.5 Community management of forest resources is compatible with state priority goals on forest management and development.

5.5.1 Capacity of the legal system to include the aspirations of local communities in forest management.

5.5.1.1 Content of forestry policy and regulation.

5.5.1.2 Changes in jurisprudence.

7.1.2.1 Official law courts recognise decisions of traditional legal systems.

Indonesia

4.2 Government plans and development programmes are based on consideration of local tenure and land utilisation systems.

4.2.1 Local land use system is part of any development programme.

4.2.1.1 There is full participation of local community in planning and implementation.

4.2.1.3 Gender equality in all processes.[35]

4.2.1.4 There is participation in decision making on benefit sharing.

4.2.1.5 All categories of the community participate in benefits.

4.c Economics

The external economic environment was included in all three sites, primarily with respect to the existence of known markets for community managed forest products. Other economic issues addressed are subsidies and transport and infrastructure investment (see 2.b).

Brazil

5.7.2 Knowledge of markets for forest (and agricultural) products.

5.7.3 Existence of community mechanisms for the commercialisation of products.

5.7.3.1 Infrastructure and transport accessible to the community (boat, tracks, roads, etc.).

5.7.3.2 Existence of community-run 'cantinas' that sell forest farmers' products and purchase bulk inputs for resale at or near to cost price.

[35] This is an unusually sweeping expressing of the importance of gender equity (i.e., because it is 'equality' as opposed to equity, and 'all' as opposed to 'when possible'). More common expressions of this issue are phrased such as ' Both women and men participate in ….processes' or 'there is gender balance in participation in ….processes'.

5.7.4 Knowledge on the costs of production (depreciation cost of equipment, re-investments, maintenance).

6.7.3 Community dependence on external subsidies provided by NGOs, religious organisations and/or the government.

Cameroon

5.2.1.2 Knowledge of market value of forest resources.

Indonesia

6.3.5 Agriculture support system exists.

6.3.5.1 Agriculture inputs available.

6.3.5.2 Agriculture credit available.

6.2.3.3 Market for rubber exists.

3.4.1.1 Market for tembawang products exists.

4.d Education and information

In Indonesia, education was considered vital and was fully elaborated as a set of C&I. In the other sites education received a minor mention. This issue cross-cuts with wisdom and knowledge (see 2.c). Information sources such as documents, maps and census information are regularly referred to in Verifiers. Availability of information may be an important issue to consider in its own right. Another area that the Indonesian team found important was 'extension' support in the form of training and support in adapting the ladang management system.

Brazil

5.1.2.2 Mapping of the 'principal land uses' with the use of maps and satellite images.
5.5.2.2 Mapping of vegetation cover for different years using satellite images.
6.7.4.c Percentage of school aged children with regular school attendance.

Cameroon

5.5.2.3 Appropriate development education programmes.

Indonesia

7.1 Formal and non-formal education supports sustainability of forest.
7.1.1 Public access to all grades of formal education.
7.1.2 Local content curricula devoted on environment consciousness building.
7.1.2.1 Lessons on environment.
7.1.2.2 Lessons on local land use systems.
6.3.4 There is training[36] *on permanent agriculture.*
7.1.3.4 Training of community members on environmental problems.
7.1.3.5 Training on income generating activities.
7.1.3.6 Information exchange with information sources outside the community.
6.2.4 There is policy and activity to rationalise the ladang system.
6.2.4.1 The use of local knowledge.
6.2.4.2 Mobilising scientific knowledge.
6.2.4.4 Field trials.

[36] Some C&I sets choose to play down the existence of *training* as an Indicator or Verifier because of the extent to which it is only an *input*. In other words, the existence of a training course may or may not actually indicate a contribution towards sustainability – this depends on the quality of the course, who participates – *i.e.*, ultimately if any changes are made as a result of the course. This implies that a more accurate (albeit challenging) Indicator or Verifier may refer more to impacts of training courses/implementation of skills learned, etc.

Call for Feedback

We hope that this guide provides a useful starting point for novel and successful experiences in CMF monitoring for sustainability. We consider this a beginning and a work in progress; if you use this guide we would be delighted to hear from you about your experiences, feedback and suggestions.

Bill Ritchie and **Mandy Haggith** can be contacted at Worldforests.
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References

All the following references are available on request to the publishing bodies (some may involve mailing costs). The addresses of some of these bodies are given at the end of this manual for further assistance. Some of the cited references are also available on the World Wide Web, and where this is the case their WWW-address (URL) is given. There are also many other books, journal papers and reports on community management of forests (many of which are well referenced in the full report of the three CMF C&I tests by Burford de Oliveira *et al.* (1999).

References for the CIFOR CMF C&I Field Tests (on which this manual was based):

Burford de Oliveira, N., Shiembo, P., Tiani, A. and Vabi, M. 1998. Developing and testing Criteria and Indicators for the sustainability of Community Managed Forests in the SOLIDAM zone, Central Province, Cameroon. CIFOR Draft Field Test Report.

Burford de Oliveira, N., Ritchie, B., McDougall, C., Hartanto, H. and Setyawati, T. 1999. Developing Criteria and Indicators of Community Managed Forests as assessment and learning tools : Objectives, methodologies and results. CIFOR Project Report.

Burford de Oliveira, N. 1999. Community participation in developing and applying Criteria and Indicators of sustainable and equitable forest management. CIFOR Project Report.

Mattos, M.M. with Burford de Oliveira, N., Silva, L., Peres, C. and Murrieta, R. Relatorio final do testo do Brasil: Desenvolvendo e testando criterios e indicadores de sustentabilidade para manejo florestal comunitario. 1998. CIFOR Field Test Report. *(In Portuguese only).*

Maryani, R., Sunito, S., Hatta,G. and Burford de Oliveira. 1998. Developing Criteria and Indicators for Community Managed Forests – Indonesian test sites. CIFOR Field Test Report.

References for C&I:

CIFOR C&I Team. 1999. The CIFOR Criteria and Indicators Toolbox Series. CIFOR, Bogor, Indonesia.

(The series is directed towards C&I for commercial forests, and currently contains the following tools:

1. Guidelines for Developing, Testing and Selecting Criteria and Indicators for Sustainable Forest Management
2. The CIFOR Criteria and Indicators Generic Template
3. CIMAT (Criteria and Indicators Modification and Adaptation Tool) *(on CDROM only)*
4. The CIFOR Criteria and Indicators Resource Book Database *(on CD ROM only)*
5. The BAG (Basic Assessment Guide for Human Well-being)
6. The Grab Bag: Supplementary Methods for Assessing Human Well-being
7. Scoring and Analysis Guide for Assessing Human Well-being
8. Who Counts Most? Assessing Human Well-being in Sustainable Forest Management
9. Guide for Applying Multi-Criteria Analysis to the Assessment of Criteria and Indicators)

Herweg, K., Steiner, K., Slaats, J. (eds.). 1998. Sustainable Land Management — Guidelines for Impact Monitoring (Workbook and Toolkit). Centre for Development and Environment, Berne, Switzerland.

Lammerts van Bueren, E.M. and Blom, E. 1997. Hierarchical framework for the formulation of sustainable forest management standards. Principles, Criteria and Indicators. The Tropenbos Foundation, Wageningen, the Netherlands.

Mendoza, G., and Macoun, P. with Prabhu, R., Sukadri, D., Purnomo, H. and Hartanto, H. 1999. Guidelines for applying multi-criteria analysis to the assessment of Criteria and Indicators. CIFOR C&I Toolbox Series, Tool No 9.

Prabhu, R., Colfer, C.J.P. and Dudley, R.G. 1999. Guidelines for developing, testing and selecting Criteria and Indicators for sustainable forest management. CIFOR C&I Toolbox Series, Tool No 1.

Prabhu, R., Colfer, C.J.P., Venkateswarlu, P., Tan, L.C., Soekmadi, R. and Wollenberg, E. 1996. Testing Criteria and Indicators for the sustainable management of forests: Phase 1 Final Report. CIFOR.

Salim, A. and Colfer, C.J.P. with McDougall, C. 1999. Scoring and analysis guide for assessing human well-being. CIFOR C&I Toolbox Series, Tool No 7.

Stevens, P. 1997. Measuring the sustainability of forest village ecosystem concepts and methodologies: A Turkish example. CSIRO, Australia.

Stork, N.E., Boyle, T.J.B., Dale, V., Eeley, H., Finegan, B., Lawes, M., Manokaran, N., Prabhu, R. and Soberon, J. 1997. Criteria and Indicators for assessing the sustainability of forest management: Conservation of biodiversity. CIFOR Working Paper 17.

Also see:

Forest Stewardship Council webpage, especially their section on Principles and Criteria of sustainable forest management (FSC standards). http://fscus.org/fscus2a12.html

CIFOR's C&I WWW-page for the tools in the C&I Toolbox (for commercial forests) and other publications: http://www.cgiar.org/cifor/CimatWeb/ie4/publication_related_1.htm

References for participatory tools and methods:

Bruce, J.W. 1989. Community forestry: rapid appraisal of tree and land tenure. FAO Community Forestry Note 5.

Case, D'A.D. 1990. The Community's Toolbox: The idea, methods and tools for participatory assessment, monitoring and evaluation in community forestry. FAO Community Forestry Field Manual 2.

Colfer, C.J.P. with Prabhu, R., Gunter, M., McDougall, C., Miyasaka-Porro, N. and Porro, R. 1999. Who counts most? Assessing human well-being in sustainable forest management. CIFOR C&I Toolbox, Tool No. 8.

CIFOR Methods Testing Team. 1999. The BAG: Basic Assessment Guide for human well-being. CIFOR C&I Toolbox, Tool No. 5.

Freudenberger, K.S. 1994. Tree and land tenure rapid appraisal tools. FAO Community Forestry Field Manual 4.

Thomson, J.T. and Freudenberger, K.S. 1997. Crafting institutional arrangements for community forestry. FAO Community Forestry Field Manual 7.

References for background to CMF:

Arnold, J.E.M. 1992. Community forestry: Ten years in review. FAO Community Forestry Note 7.

Arnold, J.E.M. 1998. Managing forests as common property. FAO Forestry Paper 136.

Edmunds, D. and Wollenberg, E. *Forthcoming*. (Draft): How should disadvantaged groups of people participate in multi-stakeholder negotiations? (Contact CIFOR for publication details).

Messerschmidt, D.A. *et al*. 1993. Common forest resource management: Annotated bibliography of Asia, Africa and Latin America. FAO Community Forestry Note 11.

Ostrom, E. 1999. Self-governance and forest resources. CIFOR Occasional Paper No. 20. www.cgiar.org/CIFOR/publications/occpaper/occpaper20/OP-20.pdf

Poffenberger, M. (ed.). 1998 onwards. Communities and forest management regional profile series. Working Group on Community Involvement in Forest Management (WG-CIFM).

Thomson, J.T. 1992. A framework for analyzing institutional incentives in community forestry. FAO Community Forestry Note 10.

Verolme, H.J.H., and Moussa, J. (eds.). April 1999. Addressing the underlying causes of deforestation and forest degradation – case studies, analysis and policy recommendations. Biodiversity Action Network, Washington DC. www.bionet-us.org

Warner, K. 1999. Shifting cultivators: Local technical knowledge and natural resource management in the humid tropics. FAO Community Forestry Note 8.

Some useful contact addresses relating to CMF

1. CMF/monitoring references and reports

For reports produced by CIFOR, contact:

CIFOR (Center for International Forestry Research)
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URL: *http://www.cgiar.org/cifor*

For reports produced by FAO, contact:

Forests, Trees and People Programme
Community Forestry Unit, Forestry and Planning Division
FAO (Food and Agriculture Organisation of the United Nations)
Viale delle Terme di Caracalla,
Rome 00100
Italy
Fax: (39-6) 5705-5514
Email: *ftpp@fao.org*
URL: *http://www.fao.org/waicent/faoinfo/forestry/fon/fonp/cfu/default.htm*

For reports produced by WG-CIFM, contact:

Working Group on Community Involvement in Forest Management
The World Conservation Union – IUCN
Rue Mauverney 28
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2. Some other key organisations involved in CMF/ monitoring

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URL: *http://www.ids.ac.uk/ids/particip/infoexch.html*

IISD
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Email: *info@iisd.ca*; URL: http://*iisd.ca/*

RECOFTC
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Appendix 1.

Synopsis of the issues and comparisons between CIFOR CMF C&I test sites[37]

This synopsis is based on the CIFOR field tests and therefore relies on the original (and more conventional 'scientific') four groupings of C&I – Ecology, Forest Management, Social and Community Participation.

Ecology C&I

C&I on ecosystem integrity, biodiversity, watershed management, forest structure and natural regeneration were developed by all the test team ecologists. Stressed by the Indonesian ecology subset are soil considerations and the protection of endangered species. The Cameroonian ecology subset is more detailed on hunting strategies and the impact of agricultural systems (including pest management methods) on forest sustainability. Additionally, it includes quite a large number of C&I for evaluating local fishing practices which, at the Cameroonian test site, are of marked economic significance especially to women.

The largest number of C&I on fishing is, however, to be found in the Brazilian ecology and forest management sets. Hunting is covered in most detail by the Brazilian set, which also includes a comparatively large number of C&I to investigate forest fragmentation patterns and processes, water quality and the conservation role of forest reserves. The Brazilian and Cameroonian C&I approach the assessment of hunting differently; the former dwell on quantification while the latter emphasise methods and processes.

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[37] This section is extracted directly from Burford de Oliveira (1999).

The causes and incidence of forest fires are substantially elaborated upon by the Brazilian ecology and the Indonesian and Brazilian forest management subsets. Complexes of C&I for the assessment of local NTFP harvesting and processing methods occur in the Cameroonian and Brazilian ecology and forest management subsets, and in the Indonesian management subset.

Forest management C&I

C&I of sustained yield harvesting strategies occur in all the management subsets. The most explicit references to matching management methods with resource capacity appear in the Indonesian and Brazilian management subsets – in the Brazilian case the match is examined via the issue of zoning. The Indonesian management C&I highlight locally employed forest technologies, a topic approached from a complementary angle by the Indonesian social subset. References to technologies are comparatively weak in the other country sets. The Indonesian management subset also provides the most detailed C&I of agroforests, presumably because of the widely recognised economic importance of the Tembawang and rubber gardens established at the Indonesian test site communities.

The Cameroonian and the Brazilian management subsets give prominence to the assessment of destructive extractive methods. Setting the Cameroonian management subset apart is a C&I complex on the integration of diverse forest dependent economic activities. This subset also includes C&I on demographic trends and forest conversion to agriculture, as well as a number for assessing the significance of agricultural systems to forest and biodiversity conservation. These issues are addressed from slightly different angles by the Cameroonian ecology subset. The Indonesian management C&I make no references to natural

forest conversion, but inquire into the conversion of agroforests to agriculture. Both the Cameroonian and the Brazilian management subsets provide various C&I on the timing and frequency of forest interventions and harvesting activities.

Several C&I about forest product marketing and forest farmer co-operatives appear in the Brazilian management subset as does a complex of C&I for assessing community forest monitoring and patrol activities. These latter issues are also partially addressed by some of the Cameroonian management C&I about community resistance to the appropriation of their forest resources by external interest groups.

Compared to the other management subsets, the Brazilian one gives special emphasis to the evaluation of timber management, including C&I on issues such as cutting cycles, directional felling, height of tree stumps, liberation treatments and forest roads. It stresses evaluating management strategies in terms of their financial implications. This contrasts with several of the Indonesian management C&I that give more explicit priority to ecological considerations in the assessment of timber extraction. Comparison of the Brazilian and Cameroonian management sets reveals another dichotomy with the content of the former implying a focus on market integration, and that of the latter a focus on the stability of a more closed, traditional economic system based more on reciprocal transactions.

Social C&I

All the social subsets contain C&I on security of land tenure and usufruct rights, forest resource access, decision making processes, conflict resolution mechanisms as well as C&I that either directly or indirectly address forest management cost-benefit distribution patterns. The Brazilian and, to a lesser extent, the Indonesian social subsets include C&I that explicitly relate to communally owned resources. All the social subsets inquire into the significance of local knowledge systems to current forest management methods, including numerous references to the reproduction and evolution of knowledge. Most of the Indonesian social C&I on knowledge relate more to the quantity and content of formal education. They aim to explore whether and how formal knowledge aids the reproduction and evolution of traditional knowledge systems – a line of inquiry perceived as critical since more and more traditional practices are becoming obsolete and traditional knowledge is frequently of limited relevance to introduced new ideas and technologies.

The Brazilian social C&I on workers' rights, working conditions and employment relations provide a good complement to the Brazilian management C&I on market integration. They embrace the history of labour allocation and that of relations with external actors, labour legislation and slave labour. No direct mention of these issues occurs in any of the other subsets. The Brazilian social C&I on community political organisation also represent a focus not found in any other set. It is among the Brazilian social C&I that we find the most explicit references to forest dependence, including direct and indirect modes of dependence, and C&I relating to forest dependence matters as diverse as family planning, food consumption patterns, the protection of cultural heritage sites and the transmission of traditional knowledge. Many of these issues are dealt with by the other country sets, but in different C&I contexts defined by the organisation of issues on the hierarchical framework.

Compatibility of state laws and policies with local management strategies and controls is most thoroughly explored by the Cameroonian social C&I. Some C&I in the Indonesian and Brazilian social subsets do, however, concern similar matters such as how government policies relate to local forms of land use and community participation in the planning of government-supported development programmes.

C&I on Community Participation

The Indonesian set contains the most detailed and explicit C&I for assessing the participation of community members in community affairs and politics and in government community development initiatives. However, several statements relating to collective action and collaboration between community members occur in the Cameroonian social and forest management subsets. The Brazilian social subset includes some C&I on community participation in the planning and monitoring of management interventions. All the country sets include several C&I that refer to diverse groups, for example, groups defined according to interests, age or gender. By contrast, only very few statements single out one particular interest or minority group, and nearly all those that do so focus on women's participation in debates. This created some concern regarding the sets' ability to capture the interests and special needs of minority groups, oppressed groups or poorly represented groups within the community.

Appendix 2.

The base sets and guidelines used by the CMF C&I test teams

The Base Sets and Guidelines on which the CMF C&I test teams drew included the following:

Biodiversity Support Program. 1993. Guiding principles and recommendations for African integrated biodiversity conservation and sustainable development. *In*: Biodiversity Support Program, African biodiversity: Foundation for the future. Professional Printing, Beltsville, Maryland.

CIFOR. 1997. Possible source themes for Criteria and Indicators for Community Managed Forests. Unpublished.

FAO. 1995. Indicators of sustainability. *In*: Resource management for upland areas in Southeast Asia.

Forest Stewardship Council. 1996. Principles and Criteria for forest management.

Lammerts van Bueren, E. and Blom, E. 1997. Hierarchical framework for formulation of sustainable forest management standards. The Tropenbos Foundation, Waginengen, The Netherlands.

Lembaga Ekolabel Indonesia (LEI). The Criteria and Indicators for sustainable natural forest management on Forest Management Unit level. LEI webpage at http://www.iscom.com/~ekolabel.

Pierce, A. 1996. Issues pertaining to the certification of non-timber forest products. A Forest Stewardship Council Discussion Paper, 1 May. Forest Stewardship Council.

Prescott-Allen, R. 1996. Barometer of sustainability. *In*: IUCN, An approach to assessing progress towards sustainability. Tools and Training Materials Series 2-8317-0342-5.

Ravi Prabhu, R. *et al.* 1996. Sets of Principles, Criteria, Indicators and Verifiers resulting from tests conducted in Ivory Coast and Brazil. *In*: Testing Criteria and Indicators for the sustainable management of forests: Phase 1 Final Report. CIFOR.

Smart Wood. 1995. Standards for non-timber forest products certification: The case of Brazil nuts (*Bertholletia excelsa* h.b.k.) and rubber (*Hevea brasiliensis*), Version # 2.0, 16th August Richmond, Vermont.

Stevens, P. 1997. Measuring the sustainability of forest village ecosystem concepts and methodologies: A Turkish example. CSIRO, Australia.

Stortenbeker, C.W. *et al.* 1997. First draft of process of revision of DDB Principles, Criteria and some Indicators. Tropenbos, The Netherlands.

Zimmermann, R. 1992. Provisional assessment guidelines used in connection with smallholder eco-timber projects in Papua New Guinea (November-December). Smart Wood, Richmond, Vermont.

Zweede, J., Kressin, J., Mesquita, R., Silva, J.N.M., Viana, V.M. and Colfer, C. 1995. Final Report – Test Brazil October 22 – November 21, 1995. CIFOR Project on testing Criteria and Indicators for the sustainable management of forests. CIFOR, Bogor, Indonesia.

Community managed forest systems embody a considerable portion of the wisdom, knowledge, and practical skills and management necessary for the sustainability of forest resources globally. These systems, however, are under threat in many ways, including from the rapid rate of change of their political, socio-economic, and biophysical contexts. Adapting forest management sufficiently quickly and effectively to meet these changes is both urgent and very challenging.

This Guide introduces criteria and indicators of sustainability for community managed forest landscapes (CMF C&I) as a potential learning and communication tool that can help meet that challenge. It draws on CIFOR's collaborative research on CMF C&I in Brazil, Indonesia, and Cameroon to propose a flexible step-by-step approach to developing and implementing self - or collaborative forest monitoring systems, and gives examples of C&I developed by communities in these countries. The approach is targeted to communities and their partners in forest management, such as NGOs, government, or development projects, who are seeking strategies to improve local well-being and forest sustainability through more effective learning, collaboration, and decision-making in local forest management.

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