In Search of Common Ground

Adaptive Collaborative Management in Cameroon

Mariteuw Chimère Diaw, Tony Aseh and Ravi Prabhu

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ACM Series

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Books

Colfer, Carol J. Pierce (ed.) 2005 *The Equitable Forest: Diversity, Community and Natural Resources*. Resources for the Future Press/CIFOR, Washington, D.C.

Colfer, Carol J. Pierce 2005 *The Complex Forest: Communities, Uncertainty, and Adaptive Collaborative Management*. Resources for the Future Press/ CIFOR, Washington, D.C.

Diaw, M. Chimère, Tony Aseh, and Ravi Prabhu (eds.) 2009 *In Search of Common Ground: Adaptive Collaborative Management in Cameroon*. Center for International Forestry Research, Bogor, Indonesia.

Fisher, Robert, Ravi Prabhu and Cynthia McDougall (eds.) 2007 *Adaptive Collaborative Management of Community Forests in Asia: Experiences from Nepal, Indonesia and the Philippines,* Center for International Forestry Research, Bogor, Indonesia.

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CIFOR 2007 *Towards Wellbeing in Forest Communities: A Sourcebook for Local Government*. Center for International Forestry Research, Bogor, Indonesia.

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Evans, Kristen, and Manuel R. Guariguata 2008 *Participatory Monitoring in Tropical Forest Management: A Review of Tools, Concepts and Lessons Learned*. Center for International Forestry Research, Bogor, Indonesia.

Wollenberg, Eva, Jon Anderson, and Citlalli Lopez 2005 *Though all Things Differ: Pluralism as a Basis for Cooperation in Forests*. Center for International Forestry Research, Bogor, Indonesia.

Dedication

This book is dedicated to our two respected and missed colleagues: Samuel Efoua and Koffi Diaw, who passed away during the course of this research. During the short time we knew him, Koffi was the lynchpin of ACM's research in Ghana and a champion of its Pan-African connections. Samuel was our companion and friend for nearly 10 years of field research, highly dedicated to and immensely knowledgeable of the forest cultures and peoples of Cameroon. His unique insights on ACM in Cameroon are thoroughly missed in this book. We will always remember them both.

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Acronyms

ACM	Adaptive collaborative management
ADR	Alternative dispute resolution
AFF	Annual forestry fees
AFLEG	Africa Forest Law Enforcement and Governance
ANAFOR	Agence Nationale d'Appui du Développement des Forêts
API	Aménagement Pilote Intégré - forest exploitation project in Dimako
ASB	Alternatives to Slash and Burn (a CGIAR system-wide initiative, coordinated by ICRAF)
ATD	Association Terre et Développement (local NGO)
ATO	African Timber Organization
C&I	Criteria and indicators
CARPE	Central Africa Regional Program for the Environment
CB	Community based
CBFM	Community-based forest management
CBNRM	Community-based natural resource management
CEFDHAC	Conference on the Central African Moist Forest Ecosystems
CF	Council Forest
CFM	Community forest management

CGIAR	Consultative Group on International Agricultural Research
CIFOR	Center for International Forestry Research
CIG	Common Initiative Group
CIRAD	Centre International de Recherche Agricole pour le Développement (International Center on Agricultural Research for Development)
COAIT	Community option assessment and investment tools
COMIFAC	Central African Forest Commission
CPUE	Catch per unit of effort
DRC	Democratic Republic of the Congo
EFL	Experts facilitateurs locaux (Local expert facilitators)
FAO	Food and Agriculture Organization
FCFA	Franc-Communauté Financière d'Afrique - African Financial Community
FES	Forest and environment sector programme
FFMC	Forestry Fee Management Committee
FMBA	Forest Margin Benchmark Area
FMU	Forest management unit
GDP	Gross domestic product
GFW	Global Forest Watch
GICA	Groupe d'Initiative Commune Aquariophile (Aquariophile Common Initiative Group)
GIS	Geographic information system
GMG	Malaysian rubber company
GNP	Gross national product
GPS	Global positioning system
HEVECAM	Hévéa du Cameroon - a rubber company in Cameroon
HFC	Société Forestière de Campo
HFZ	Humid forest zone
HTL	Historical transects of the landscape
IBI	Index of Biotic Integrity
ICRAF	World Agroforestry Centre (previously International Centre for Research on Agroforestry)
IFF	Intergovernmental Forum on Forests

IITA	International Institute for Tropical Agriculture
IPF	Intergovernmental Panel on Forests
IRAD	Institute of Agricultural Research for Development
IRM	Innovative Resources Management
ISC	International Steering Committee
ISO	International Standards Office
ITTO	International Tropical Timber Organization
JIG	Joint Initiative Groups
KNP	Korup National Park
LCCS	Land cover classification system
LIS	Local information systems
MARP	Methode action rapide et participative - Rapid participatory appraisal
MINAGRI	Ministère de l'Agriculture - Ministry of Agriculture
MINDAF	Ministry of State Property and Land Tenure
MINEF	Ministère de l'Environnement et des Forêts - Ministry of Environment and Forests now MINFOF
MINEPIA	Ministry of Animal Industry and Fisheries
MINFOF	Ministry of Forests and Wildlife
MIS	Management information system
NGO	Non-governmental organisation
NIE	New institutional economics
NRA	Natural resource account
NRM	Natural resource management
NTFP	Non-timber forest product
ONADEF	Office National de Développement des Forêts
OPED	Organization for the Environment and Sustainable Development
PA	Protected area
PAR	Participatory action research
PCBRA	Participatory costs, benefits and risks analysis
Pmap	Participatory mapping
PRA	Participatory rural appraisal
REPAR	Network of Parliamentarians for the Sustainable Management of Central African Forest Ecosystems

RRA	Rapid rural appraisal
SDIAF	Sub-Department of Forestry Inventories and Management
SFID	Société Forestière et Industrielle de la Doumé (a logging company)
SMP	Simple management plan (PSG — French acronym)
SNV	Stichting Nederlandse Vrijwilligers or Foundation of Netherlands Volunteers
SOCAPALM	Société Camerounaise des Palmeraies — a previously state-owned oil palm company, now privately owned
SSI	Semi-structured interviews
SSM	Social science methods
TFR	Takamanda Forest Reserve
UNCED	United Nations Conference on Environment and Development
USA	United States of America
USAID	United States Agency for International Development
UTO	Unite technique operationnelle (Technical Operational Unit)
WHO	World Health Organization
WWF	Worldwide Fund for Nature

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ndividuals and organisations alike—in the hamlets, villages and towns of Cameroon's wonderful humid forest belt: you welcomed us, shared your aspirations and challenges and worked collectively with us on an agenda that we learned was a shared one. We hope we have done justice to this shared agenda, any failure to do so is ours alone.

The Authors

Young Bagyeli
dance performer

Chapter 1

Introduction: Theory and practice of adaptive collaborative management

Mariteuw Chimère Diaw

This book explores the relationship between adaptation and cooperation in society as it relates to action, decision and learning. Forests, with the mythologies, conflicts and convoluted passions that characterise them, offer a privileged site for observing this relationship and drawing lessons from it. The authors in this book strive to do that in the context of Cameroon's forests, as an integral part of research on adaptive collaborative management (ACM) across three continents. As both a research programme and a strategy for management, ACM seeks to understand the conditions under which forest stakeholders can learn and collaborate 'to adapt management in a conscious and continuous manner' (CIFOR 1999 p. 2). At the core of this global inquiry is a critical reexamination of the validity of cooperative frameworks for addressing human problems at a time of chaotic changes, unfettered competition for resources and growing poverty.

This book can convey only a fraction of the Cameroon ACM experience. Nonetheless, these accounts of our experience represent the breadth of the ACM concept, as well as the lessons we worked to draw from it. The book's three thematic blocks are shaped by our drive to understand adaptive collaborative processes. Section One presents the foundations of the research on ACM in Cameroon, through analyses of decentralisation policies and collaborative forest management. Though based on local dynamics and national forest policy processes, the experience and insights that have come out of this work have global links and relevance. The analyses of facilitation and action research as tools to manage pluralism —the focus of Section Two— firmly place the Cameroon ACM experience within the action orientation of global ACM research (Hartanto *et al.* 2003; Colfer 2005; Kusumanto *et al.* 2005; Guijt 2007; Fisher *et al.* 2007; Mandondo *et al.* 2008). This orientation raises fundamental issues of knowledge and power in the way science 'acts' to reinforce or weaken adaptation and collaboration in social and environmental processes. Section Three, on managing for livelihoods, discusses experiences that broaden the scope for understanding the forest-based livelihoods that give context to these relationships. This is logical, since ACM is all about transformative processes that can improve people's conditions in specific places.

This chapter introduces the broad collective experience and seeks to link the contributions with each other and with global ACM research. To that end, we present the overarching research questions and follow their thread into the wider debates that energised and gave meaning to various practices of ACM in different sites, countries and conditions. The introduction starts with a short history of ACM as it was developed by our global community of researchers and practitioners. We briefly examine thereafter the theoretical and philosophical underpinnings of the concept. In that process, we acknowledge variants and different understandings of ACM along with the critical views, debates and questions that have characterised ACM's development. We close with an outlook on the following chapters in this book as they disentangle the threads of the ACM research in Cameroon.

Short history of ACM

In 1999, with support from the Center for International Forestry Research (CIFOR) and a few donor organisations, a group of scientists began to research how processes of adaptation, collaboration and learning might make management more effective and equitable in complex forest settings. The process of setting up and implementing this research illustrates the philosophy behind ACM and is partly reflected in this book. Researchers from 11 African, Latin American and Asian countries[1] and from highly diverse disciplinary and cultural experiences (Colfer 2005) convened to discuss its underpinnings and define its conceptual orientations and methods. A network of 30 research sites was set up in collaboration with local and national partners. Despite its diversity and the local context of its research, 'the ACM Group' maintained strong global coordination and conceptual convergence throughout the active phase of the research. This was not, however, an exercise in consensus building; disagreements on theory and methods, as well as on practical research and site issues, were many. The differences were in fact encouraged by the collegial nature of the endeavour and the exploratory nature of the ACM paradigm, which considers any intervention an experiment from which lessons can be

drawn and adjustments made. Within the broad confines of the paradigm and around a cluster of basic concepts and methodological approaches on which all agreed, the country teams were encouraged to innovate and, with their partners, develop their own versions of ACM.

For CIFOR, a highly successful and competitive research organisation that had built its reputation and credibility by delivering systematised research results to global audiences, this freedom to innovate, experiment and adapt in local contexts was sometimes problematic. The ACM researchers' response was to create an independent, critical watchdog—the International Steering Committee (ISC)[2], made up of three internationally renowned experts and a few advisers in some of the core fields supporting ACM: community forestry, social and ecological processes, and various approaches to participation, including participatory monitoring. Supplemented by the competence and research intelligence of the ACM researchers and by the highly self-critical leadership of a few[3], ISC was instrumental in bringing to the fore the major issues of coherence and robustness of the ACM concepts and approach; it also provided a platform on which the validity of the ACM processes could be tested and contested. The lessons on the ACM experience presented in this book and in companion volumes covering Zimbabwe (Mandondo *et al*. 2008) and Asia, including Indonesia, Nepal and the Philippines (Fisher *et al*. 2007), as well as by earlier works in the ACM series and other publications, owe much to this critical process of inquiry and debate over the practice of ACM in various times and places.

Three basic research questions bridged the multicountry ACM Group. Each team developed additional subsets of these questions appropriate to their sites and countries. Following Colfer's (2005) unorthodox but efficient way of distinguishing between personal interpretations and analyses of ACM and the highly collegial, interactive pool of thinking and wisdom offered by the ACM Group as a whole, I will, from now on, shift between first-person singular and first-person plural in this account of our work. At times, I will draw, with proper referencing, on some of the insightful debates and analyses that circulated through cyberspace between

colleagues both within and outside the ACM Group. For the moment, I offer, below, my own simplified version[4] of our basic research questions, reorganised and expanded within two thematic headings:

1. *ACM process conditions*
   - » What conditions can lead to enhanced collaboration and adaptation or, conversely, to collaborative or adaptive failures in forest management?
   - » Does collaboration enhance social learning and adaptation, and is it enhanced by conscious and deliberate social learning?
   - » What kind of approaches, methods and concepts work in catalysing ACM interventions in various conditions?
2. *ACM impact conditions*
   - » What are the effects of ACM processes and outcomes on forest and human well-being?
   - » Is deliberate ACM intervention useful or necessary to enhance forest and human well-being, and if so, under what conditions?

Those two sets of thematic questions are tied into a single, continuous frame of inquiry; together they address the feasibility and validity of ACM frameworks for tackling social and environmental problems. The impact questions aim at verifying the hypothesis that cooperative adaptive frameworks that buttress management have positive effects on people and the environment. These relationships are far too complex to be assessed in three years—which turned out to be the extent of CIFOR's formal ACM research. To demonstrate the related causal links is difficult; to establish them requires more time and greater observational scales than research projects customarily allow. Observational requirements for the 'process conditions' are much less stringent. Essentially, the process conditions refer to what ACM is, how it works and behaves, and what its influence is on social processes. The three process questions highlight what I have come to see, after several years of 'doing ACM', as the three constitutive elements of the brief ACM experience and *episteme*: adaptation, collaboration *and* intervention (Figure 1-1). I believe that the third component—intervention—though central to our whole ACM practice, was neglected in our earlier representation of ACM, which focused on 'adaptiveness' and

'collaborativeness' (McDougall 2000; Colfer 2005). Representations of ACM outside the ACM Group are also predominantly based on these two aspects (Ruitenbeek and Cartier 2001; Plummer and Armitage 2007). This two-part representation of ACM is not 'wrong', in the sense that ACM can, in theory, happen with or without deliberate external intervention or facilitation. This is why the 'intervention' axis in Figure 1-1 is represented as a dotted line.

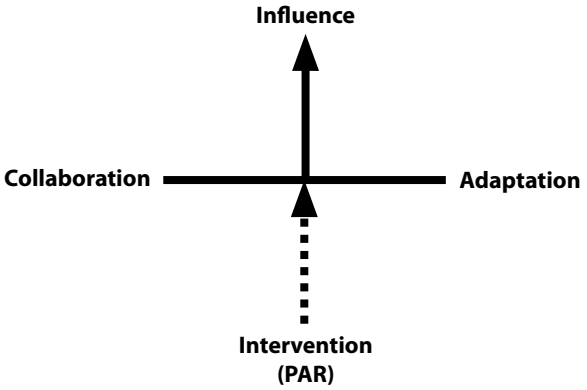

Figure 1-1. Elements of an action-oriented ACM framework

I believe, however, that adding an explicit intervention dimension to our theoretical representation of ACM is a necessity deriving from the scientific and methodological premises of the work presented here and in other writings of the ACM Group. We explicitly sought, as a group, to test the conditions under which ACM could be made to happen. There could be no other reason for the collective decision to use participatory action research (PAR) as the core component and driving force behind our research. Our parallel works on criteria and indicators and decentralisation (Prabhu *et al*. 1996, 1999; Colfer and Resosudarmo 2002; Colfer and Capistrano 2005; Edmunds and Wollenberg 2003; Contreras 2003) had led us to believe that community-based policies in the forest sector were caught in an entropy of wrong assumptions and learning failures. We saw this and the failures of social negotiation and participation as the main factors behind the limited success and adverse effects of the policies. These observations were the origin of a 'problemshift' (Lakatos

1978, 1970 p. 91, 133) in our approach to forestry problems. Multiple interests and incomplete, dispersed knowledge would cause inertia unless there was a deliberate move to unlock the creative forces of cooperation and adaptation in this type of complex system. This we called ACM. As a privileged group of actors studying these questions under a 'public good' ideology, researchers were part of the problem and could contribute to the solutions, notably by shifting from extractive to interactive modes of knowledge generation and transformation (Diaw and Kusumanto 2005).

However, because our thinking about ACM was yet to mature, we did not clearly articulate its relationship with PAR intervention. In particular, we did not see that the heuristic decision 'to do ACM while studying it' was the premise of an action-oriented ACM framework, distinct from alternative, contemplative theories of ACM. I personally did not foresee that such distinct theoretical models of ACM would emerge and offer valuable points of comparative analysis.

Our ambivalence about ACM and PAR put our group under the prolonged crossfire of ISC and the more skeptical critics of ACM. We were pressed repeatedly, and throughout four joint meetings with ISC[5], to clarify whether we were treating ACM as a concept or as an approach, and how we were differentiating ACM from similar participatory or community-based concepts. By our second meeting, ISC was pressing for one of the terms to be dropped altogether:

> Both ACM and PAR are based on similar logic … We suggest that attempts to treat ACM and PAR as distinct processes is a totally unnecessary source of confusion and we suggest that the term PAR be dropped in favour of ACM for operational purposes. This is arbitrary; the term ACM could be dropped instead. (ISC 2000 p. 12)

This contested relationship is the equivalent of an anomaly (Lakatos 1970) or a puzzle (Kuhn 1962) in the language of the philosophy of sciences. According to Lakatos (1970 p. 136), 'even the most rapidly and consistently progressive research programmes can digest their counter-evidence only

piecemeal: anomalies are never completely exhausted'. In our case, the refutation and criticism contributed critically to the 'positive heuristic'—that is, the development of better conceptual variants or models of ACM as a 'scientific research programme' (Lakatos 1978) or 'paradigm' (Kuhn 1962).

As a group of thinkers and practitioners, we did not agree—did not *feel*—that ACM and PAR were the same, but we recognised their similar cooperative and exploratory principles and sometimes used them interchangeably. The criticism forced us to clarify. We distinguished ACM as a generic concept ('a system of management [with] built-in institutional mechanisms for accommodating … multiple interests and for adjusting … through experiential learning') from the approach of ACM taken by CIFOR. The ACM approach sought, through PAR facilitation and social learning, to be 'a catalysing force' in the emergence of ACM conditions 'while studying this process of transformation':

> In other words, PAR is not an integral component of ACM systems, but a tactical choice dictated by our current analysis of collaborative forest management and by the particular position of research in that configuration.
> (Diaw *et al*. 2000).

> There is no confusion between ACM which might be described as an approach or a strategy for management and PAR which is an approach for inquiry and fostering learning.
> (Prabhu 2001 p. 2)

Throughout the first years of our research, therefore, the ACM Group struggled with its action-oriented analysis and the scientific requirement of conceiving ACM as a reality or process that could exist and be observed independently. The fact that theories of ACM subsequently developed independently of any action research framework vindicates the relevance of the strategic distinction between ACM as 'a thing' and ACM as 'a way to get there'. This was highlighted by Ruitenbeek and Cartier's (2001) question about whether ACM was a strategy (something deliberately made to happen) or an 'emergent property'—that is, 'something that can only

appear through a relatively long and natural process of people interacting with each other on a regular basis' (Kaimowitz 2001). There are, in fact, only two possible ways of addressing this question: through (1) long-term observation, possibly supplemented by theoretical models of how and why ACM could emerge naturally, and (2) exploratory facilitation of an active ACM strategy, supplemented by empirical observation and comparative analyses of how and when such strategy is likely to fail or to succeed. Both cases refer to the same, recognisable ACM state (or states), but each anticipates a different way of getting there. In Figure 1-1 the dotted line (mode of intervention) encapsulates the transformative strategies deriving from hypothesis (2), and the horizontal axis (collaboration and adaptation), the anticipated ACM outcomes for both hypotheses.

Our group's approach to ACM was firmly set within the parameters of the second hypothesis, which I call the facilitation hypothesis, and which this book contributes to documenting. Figure 1-1 clarifies this by identifying the components of the facilitation hypothesis in terms of intervention (or strategy) and outcomes. Whether this facilitation would best succeed through PAR or through other approaches or methods was a significant aspect of the research (process question c) and is discussed by Jum *et al*. (Chapter 3), De Koning (Chapter 8) and Nguiebouri (Chapter 10). However, what is more important at this stage is to note the conceptual distinction between the two theoretical models of how ACM can emerge and the fact that our research was set to address the facilitation hypothesis. This clarification makes our analyses and findings on ACM outcomes and intervention, as we observed them, easier to disentangle. It also puts the ACM Group in a better position to answer its research questions, as well as other questions raised by ISC and external contributors, such as Kaimowitz and Ruitenbeek and Cartier.

ACM concepts and philosophy

From a theoretical standpoint, ACM is built on several important bodies of research. These include complex systems, pluralism, equity and

development, noncomparable value systems, social learning, adaptation, adaptive management, cooperation and competition, models of human interaction, the nature of science and the process of facilitating change. The three subsections, below, organise this broad scientific field around the three constitutive components of the action-oriented ACM framework presented earlier. As Figure 1-2 illustrates, this provides a powerful conceptual platform for drawing into meaningful clusters the many ideas and abundant research that populate the ACM scientific field. We must say, at this point, that this converging theoretical florescence is in no way homogeneous. Whether related to ideological oppositions between cooperation and competition or their conflict-resolution ramifications, or to the question of whether societies adjust naturally to challenges or are locked into immutable institutional paths, there is significant diversity of perspectives to recognise and celebrate. As Lakatos (1970 p. 39), following Popper and Feyerabend, says, "theoretical pluralism' is better than 'theoretical monism" in addressing scientific problems and explanation.

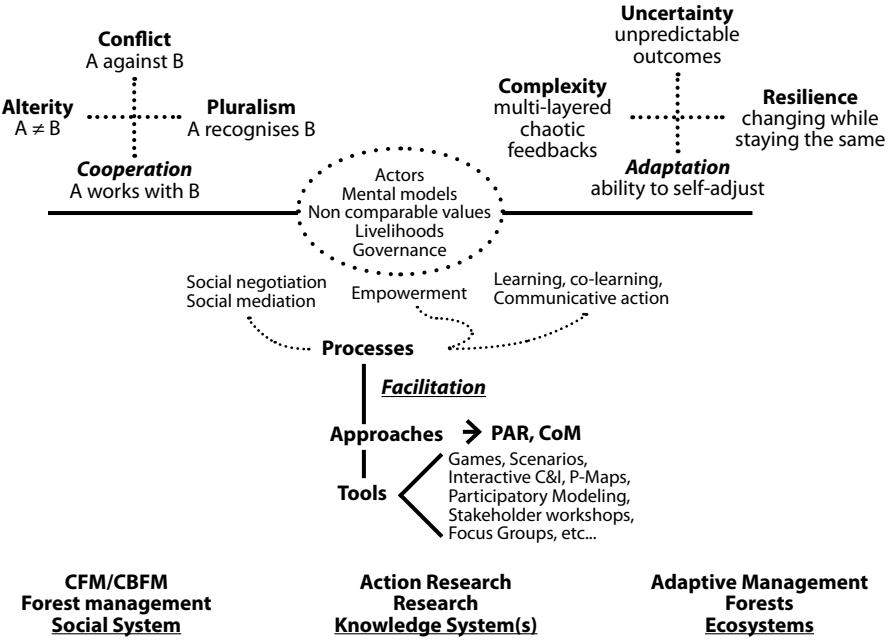

Figure 1-2. A representation of ACM action and change concepts

In this case, starting with cooperation and the array of concepts that relate most closely to it, I highlight ACM's theoretical legacies as well as contentious points that remain open to debate, primarily in relation to our facilitation hypothesis. In doing so, I aim to lay bare some of our assumptions and to offer ground for critical reviews of our practice and results.

Pluralism, cooperation and politics of difference

The top left-hand side of Figure 1-2 represents the first conceptual pillar of ACM and its roots in theories of social cooperation. This cluster figuratively presents alterity, the sense of our difference in relation to others (which, in forest settings, translates into multiple interests and conflicting claims), as the essential basis for the movement of society toward conflict, pluralism and/or cooperation. At the heart of society, indeed, is the question of how to deal with alterity. The numerous epistemologies that have put the problem of cooperation at the centre of their approach to society all deal remotely or intimately with this 'inescapable diversity of our Being' (Diaw 1994 p. 191). The tension between the subjective origin of consciousness and its social nature is reflected in interpersonal and intercultural relations as well as in the complex interaction of interest groups and social systems. We come into the world feeling it through our unique senses but also, in the realm of maternity, through the senses of another being. Our very concept of self is shaped by this alterity *and* sociability. There is a 'togetherness' implied in the sociality of all relations (Gibson-Graham 2006); 'to come into the world is to be in common' (Nancy 1992 p. 373-374).

But societies do not necessarily put cooperation at the top of their tables of values. Modern economic thought, the dominant intellectual force of our time, defines human rationality as a constant drive for self-interest (in the older neoclassical school) or as 'opportunism' or 'self-interest seeking with guile' (in the language of New Institutional Economics; Williamson 1985 p. 47). I was struck once by the radical inversion of these categories in other cultural representations of rationality (Diaw 1994). Among the Wolof of Senegal, Gambia and Mauritania, the words for selfishness—*ñakk xel* ('lack of reason and intelligence') and *gatt xel* ('short reason that

does not see beyond one's personal interests')—portray self-interested behaviour as the archetype of irrationality. Egoism also appears, with the concept of *gatt xel*, as a form of 'bounded irrationality', which parallels the concept of 'bounded rationality' in economic theory[6]. This is further reinforced by a categorical imperative, *nit, xel* ('human, reason'), meaning 'to be human is to think of the other'. Thus, egoism and irrationality are totally fused in everyday language to enable a social construction of rationality that places altruism at the centre of what it means to be human (Diaw 1994 p. 199).

This, in the context of our discussion, does not mean that altruism, egoism or strategic behaviour are absent from any of the societies concerned; rather, it highlights the important fact that the hegemonic definition of economic rationality since the middle of the 20th Century (Gruchy 1972, 1947) is but one cultural representation, one social construction of reality among many others. Despite the discourse of 'economic man' and self-interest, some authors have shown how people can be altruistic even in the West, where alterity is normally submerged. Thus, feminist coauthors Gibson and Graham (2006 p. 81) note with Jean Luc Nancy that 'Western metaphysics, since its origins in Greek city-states, has suppressed the original alterity … the 'being-together' in the concept of Being'. In that light, the framework of economic difference that they develop is a remarkable exhumation of the cooperative networks and vibrant diversity of the economy in the West, which they represent as the submerged part of an iceberg. A similar demonstration can be found in the earlier work of Godbout (1992) on altruistic and solidarity networks in Western societies.

Competitive and cooperative values are inherent in virtually all societies, but their relative ordering and importance can be seen as an evolutionary contingency. At the beginning of the 20th Century, the founders of the old institutional school of economics highlighted the relation between social institutions and these two types of values, which they saw as instinctive. Patten opposed 'acquisitive impulses' to 'co-operative and exploratory impulses' while Veblen differentiated 'selfish' instincts, based on personal

acquisition, from 'social instincts' to protect and advance the community. For Veblen, these orientations are at the origin of either socially useful ('serviceable') or harmful ('disserviceable') institutions (Gruchy 1972). Closer to us, the experimental work of Frans de Waal (1996, 1997, 2001a, 2001b; de Waal and Tyack 2003) and other primatologists has shown the behavioural reality of altruism, sympathy, empathy, consolation, reconciliation, aversion to inequity and other cooperative traits among primates[7]. These traits, though distributed unequally among species and groups, are at least as common as violence, aggression, murder and rituals of dominance and submission in the organisation of social animals.

Walking the perilous path of drawing inferences on the evolution of morality among humans, de Waal (1996, 2006) goes further to criticise what he calls 'veneer theory', the dualistic view of human morality as 'a thin crust underneath of which boil antisocial, amoral, and egoistic passions. This view of morality as a veneer was best summarised by Ghiselin's famous quip: 'scratch an altruist, and watch a hypocrite bleed" (de Waal 2006 p. 5). De Waal shows how this has been actively promoted by Huxley's evolutionary dualism; Freud's fascination with ego, superego, sex and death; Dawkins' (1976) selfish gene; and countless popular writers and scientists in the fields of evolutionary biology, law, economics and political science. According to him (de Waal 2006 p. 1, 5), this view, which saturates 'social contract theory, and Western civilisation with it', flies in the face of overwhelming evolutionary evidence of the thoroughly social nature of humans and similar animal species, but it gives comfort to 'the defenders of egoism and individualism who … pay themselves a compliment; they pat themselves on the back for staring reality squarely in the face. Egoists and individualists are objective, they suggest, whereas prononents of altruism … are trapped by a comforting illusion'.

The evidence from evolutionary biology is that, genetically coded and hardwired into our nervous system, there is a 'capability' for both cooperation and competition, which we share with other close animal species. The rest is a matter of culture. As Madison (2002 p. 2) puts it, 'virtually all, if not absolutely all, complex behaviours are learned and

cultural in origin, even if enabled by biology': Eating is an animal demand for survival, 'but the styles of eating and what we eat is as varied around the world as are styles of dress, housing and entertainment'.

Reflecting the 'conflict-ridden nature of forest management' (Jum *et al.*, Chapter 3), all except four chapters in this book address social conflicts; whether related to broad stakeholder relations (Chapters 1-12), pointed animal-human conflicts (Mbile *et al.*, Chapter 7) or economic priorities impacting conflicting social uses of timber and non-timber forest products (Ndoye and Chupezi, Chapter 15). However, as pointed out by De Koning (Chapter 8), conflicts in human societies happen, and can be understood, in different ways. The massive and growing literature—and experience—on alternative approaches to human conflict (Deutsch 1973; Deutsch and Coleman 2000; Johnson and Johnson 1989; Ury 2000; Morris 2002; Spangler 2003) shares a common denominator with ACM: Conflict is not necessarily bad; what matters is how and when it is resolved. This is why conflict, which is inherent to social diversity, is also central to the morality of pluralism (Kekes 1993).

In Chapter 10, Nguiebouri defines pluralism and goes on to document practical examples of how it was approached and 'managed' in one of the Cameroon case studies. Pluralism can be seen as the existence within any society of a variety of groups with different, autonomous and sometimes mutually conflicting interests, values and objectives (Anderson *et al.* 1999). Clément (1997) links its philosophical doctrine to Sartre's post—World War II existentialist movement and sees it as a middle ground between classic central government and the political anarchism of Proudhon and Bakunin. Kaarhus (1999) considers it diversely inspired by the cultural relativism of the 1920s and 1930s, the general crisis of the social sciences in the 1960s and 1970s and Bernstein's relativism in the 1980s, which suggest an 'irreducible plurality of conceptual schemes, language games, paradigms, or sets of social practices' (Kaarhus 1999 p. 22). But pluralism is not just about coexisting social interests; it implies active recognition of this diversity as a condition for moving beyond a conflict society. As Gibson and Graham (2006 p. 82) say, 'at the heart of society [is] the

question of how to live together'. The long tradition of critical reflection on alterity and interculturality and the alternative epistemologies that followed the downfall of the Aristotelian and positivist myth of neutrality and objectivity in science[8] all contribute to this movement from diversity as constraint and conflict to diversity as the basis for social cooperation.

This movement has been a major change factor in the management of forests. Technical forestry was largely built on the exclusion of people from decision making. Climate-related catastrophes, such as the Himalayan inundations and the Sahelian drought at the end of the 1960s, marked a turning point. Magnified by the lenses of newly globalised media, such events had considerable effect on the popular and scientific imagination. They highlighted the global risk posed by unfettered deforestation and exposed the inability of top-down, command-and-control policies to deal with environmental uncertainty and deliver good forest stewardship. New thinking emerged about the importance of forests for sustaining the environment and the importance of people for conserving forests. This was the beginning of nearly half a century of efforts to reinsert local people into the management of their own forest environment. The recognition of the plurality of social interests, values and objectives in forest systems (Anderson *et al*. 1999) contributed to this change of perspective. Ideas of comanagement, community forestry and joint forest management were developed and implemented, along with the idea that multiple interests in forestry could be 'accommodated' through collaboration, learning-by-doing (Borrini-Feyerabend *et al*. 2000, 2004) and even conflict (Ramirez 1999). ACM extends this critical line of inquiry by assuming that all actors should have a voice and be involved in forest management while acknowledging that not all actors may have equal rights to a particular forest. This is why our original definition of ACM as adaptive comanagement was later changed to adaptive collaborative management (Colfer 2005).

The idea that all actors should be involved is not free of risks and questions. These are partly addressed in Chapters 3, 4, 8, and 10. Earlier, Ramirez (1999) asked whether accommodating multiple interests was 'necessary or desirable'; others (Wollenberg *et al*. 2001; Edmunds and Wollenberg

2001, 2003; Edmunds *et al*. 2003) posit that accommodation frameworks could reinforce unequal relationships and work against the poor. This questioning supported other critiques of decentralisation (Hildyard *et al*. 1997; McKean and Ostrom 1995; Britell 1997). The Cameroon ACM experience addresses it in its lessons from the field (Chapters 6 and 8). For the moment, I would like to draw attention to some of its implications. Kekes (1993) as well as Daniels and Walker (1997) insist on the plural, conditional, incompatible[9] and incommensurate nature of values and objectives in society. For a transformational paradigm such as ACM, this comes with a set of potential operational and theoretical dead ends. For if the values and objectives in a pluralistic society are 'incompatible and incommensurate' and therefore not comparable, on what table of values can we base the common standards, universal natural truths or evaluative criteria (Anderson *et al*. 1999) needed for social cooperation and negotiation? We look at this paradox through the 'dynamic comparability of value systems' (Diaw 1994 p. 201) and Habermas's framework of communicative, strategic and instrumental action (Prabhu *et al*. 2007; Ojha 2005).

As is argued in Chapter 9 and by Diaw and Kusumanto (2005), an analysis of comparative disabilities or handicaps can elucidate a distinction between the static noncomparability of values and interests and their dynamic comparability in history and social interaction. There are thorny questions of legitimacy and power in forest management, and we see, on the basis of field research, that dynamic negotiation of conflictive values and meanings is both possible and necessary for successful adaptation and cooperation in forest management. How are mutual paralysis and path dependency produced in multistakeholder settings, and what are the tactical mechanisms needed to transcend these systemic inefficiencies?

Complex systems

A second pillar of ACM is its roots in complexity and social learning theories. Colfer (2005) and Prabhu (2002) describe how their thinking on ACM was influenced by systems theory and the emergence in the 1990s of complexity science (Nicolis and Prigogine 1989; Waldrop 1992; Lee

1993; Gunderson and Holling 2002; Prigogine 1997; Axelrod and Cohen 1999). Looking at the relationship between ACM and resilience thinking, Plummer and Armitage (2007 p. 64) note the radical difference between conventional, modern science and complexity theory:

> Central to the modernist view is the metaphor of the world as a machine, with the underlying fundamental assumption that the world is knowable and predictable through reductionism and the scientific method … unlike the machine metaphor of the modernist paradigm, complexity science views the world as continuously adapting and changing in response to environmental feedback. … [T]he world is characterised by surprises and discontinuities (Ruitenbeek and Cartier 2001). Systems are self-organising with properties emerging through nested levels via multiple interactions and feedback …

These views of uncertainty, unpredictability and adaptation have been a cornerstone of the ACM literature in all its variants. They shaped the ACM Group's approach of facilitation and learning, as well as policy: 'frozen policy is a route to disaster … Continual learning is crucial to sustainability' (Carpenter *et al.* 1999, cited by Prabhu 2002). Wollenberg *et al.* (2007) took this understanding much further by embracing 'spontaneous orders of cooperation' and 'muddling-through' facilitation as ways of achieving cooperation in time of chaos and 'bounded instability'. I was personally inspired by the conceptual kinship between their ACM experience in Malinau and the Cameroon 'post-ACM struggle'.

One of the challenges of complexity theory has been to bridge various scales of difference between human and ecological systems. In *Panarchy* (Gunderson and Holling 2002), Holling *et al.* (2002 p. 74-76, 98-99) find that these systems fit all their four-phase representation of cross-scale adaptive cycles, which explains resilience and change, collapse as well as rebellion. Borrowing heavily from Giddens' structuration theory[10], they also see three unique human features—'foresight, communication and technology'—that make social systems different and more adaptive. According to Westley *et al.* (2002 p. 108-110, 115), human beings have

'structures of signification' with consciousness, reflexivity and higher-order symbolic communication that permit 'a higher level of self-organisation than that found in ecosystems'; their 'sense-making' and foresight provide 'a third hierarchy, equal to time and space', that allows them to 'flip from one kind of organisation, and back again'. Humans can also 'look forward'.

These optimistic views of humans' ability to adapt, create novelty and deal with 'fundamental questions of innovation, emergence, and opportunity' fit 'nicely' with the processes Colfer (2005 p. 47-49) observed in the 30 ACM sites. At the same time, conflicts in these sites were many and had ramifications beyond the specific localities. Scheffer *et al.* (2002) give several examples of this in what he calls problem domains (the equivalent of collective action problems; see Olson 1965) at local as well as higher scales. In fact, there are significant insights but also potential homogenising biases in the way that concepts of humans, the world, people, and nature are used to integrate social scales in many analyses. There are three aspects to this.

The world is just not one big system dealing with generic uncertainty; humans are not all virtual wizards that 'easily and quickly transcend the boundaries of [their] systems' to 'accelerate cultural change' (Westley *et al.* 2002 p. 110-111). Most do not own a phone, let alone a laptop, and many are drowning in the Atlantic just to get to the other shore. Thus, the different scales at which social change operates often hide major conflicts between social systems, cultures and possibilities. Social scales are not innocuously nested; more often than not, they are conflictive; they overlap and collide at multiple scales, as can be observed in growing global income polarisation, conflictive notions of (de)localised property rights, as well as interregional conflicts over trade, biodiversity and climate change. In social terms, resilience is both an infrastructure and a conflict factory. The naturalist view tends to deemphasise and depoliticise this conflict through the 'nesting of scales' metaphor. The risk is to delete conflicting agencies and social pluralism from our understanding of the world.

Also, the idea that systems self-organise, with properties emerging through 'nested levels' (Levin 1999; Ruitenbeek and Cartier 2001; Folke *et al*. 2002; Gunderson and Holling 2002; Vadtn 2005; Plummer and Armitage 2007), may have problematic social implications. If outcomes are (mostly) unpredictable and self-organisation or self-regulation (mostly) inherent, then most social outcomes become self-regulatory. This may have influenced Ruitenbeek and Cartier's (2001) view that ACM is likely to emerge naturally in tropical forest situations—with 'perhaps a little strategic nudging [to] rapidly move it forward' (Kaimowitz 2001). The question, of course, is, 'How do we know'? In *The Complex Forest*, Colfer (2005 p. 49) illustrates this uncertainty with examples of how the same technical or policy innovation could result in radically different outcomes. This, in her view, 'justif[ies] institutionalising monitoring and learning at all scales'. The ACM facilitation hypothesis is based on the idea that spontaneous self-organisation does not always and necessarily apply to social systems or lead to socially progressive outcomes.

Finally, there may be a difference between natural resilience and social resilience and their ability to accommodate levels of systemic change. A majority of authors describe resilience as the potential of a system to remain in a particular configuration and maintain feedbacks, functions and an ability to reorganise following disturbance-driven change (Holling *et al*. 1995; Perrings 1997; Walker *et al*. 2006; Plummer and Armitage 2007). 'By resilience is meant the system's ability to counteract perturbations from external shocks—i.e., *its capacity to return to its original state*' (Vatn 2005 p. 18, italics added). In contrast, Berkes *et al*. (2003) emphasise the ability of a system to maintain its core attributes, to self-organise, and to learn and adapt as the central features of resilience. These two understandings of resilience—as adaptive equilibrium or adaptive reconfiguration—are in fact quite different and may reflect disciplinary differences between natural and social scientists. The capacity to maintain a certain configuration or to return to an original state seems to describe dynamic equilibrium rather than resilience; it may also express natural resilience. This is not true of social systems. In the social realm, systems that are resilient change their configuration to maintain their structure and contain adjustment

within their fold. A glaring example is capitalism, which is constantly transforming itself. Studying the share system[11] in coastal fisheries (Diaw 1989, 1994) and embedded tenure regimes in Africa and other regions (Diaw 2005), I found that varying ability to absorb external pressures (environmental uncertainty, demographics, markets) while maintaining core attributes was the secret behind the resilience of these systems many considered doomed by capitalism. This type of flexibility widens the range of choices and institutional realignments people can make without necessarily breaking with the structure of enduring social orders.

From the theories of the complex, we thus retain essential headway in our understanding of social and environmental adaptations. Various forms of internal and external uncertainties combine with our own cognitive and heuristic limitations to create unpredictability but also transformative novelty in our interactions with society and nature (Axelrod and Cohen 1999; Homer-Dixon 1996; Stacey *et al.* 2000). On the other hand, our capacity for foresight can fail us and our solutions can create new spinoff problems in time and space (Westley *et al.* 2002). The notion of bounded rationality, found early in Hayek (1945) but mainly inherited by the New Institutional Economics from the work of Herbert Simon (1962, 1976, 1978)[12], captures this situation. People have physical, mental, linguistic, informational and environmental limitations. They cannot integrate all the facets of a complex problem or articulate and communicate everything they know. Uncertainty, contingency and complexity combine with our limited data-processing capabilities to prevent the generation of complete management decision-making trees (Williamson 1975). This is the origin of Douglas North's theory (1990) of path dependency, wherein incomplete information processed through bounded mental constructs leads to persistently inefficient institutional paths.

ACM strategies have been tested in complex socioforestry systems around the globe. The interventions were conducted in parallel or in conjunction with policy and management reforms stemming from past inefficiencies and complicated by ever-newer uncertainties and systemic inertia (Edmunds and Wollenberg 2000; Prabhu *et al.* 2001). In such contexts,

ACM hypothesises that the variation and flexibility introduced by forces of cooperation and social learning[13] in previously inefficient paths can liberate dormant social capital and catalyse the information feedbacks necessary to turn the odds in favour of successful 'path adaptations' of the concerned systems. This can be seen as a middle ground between North's pessimistic construction of path dependency and overly optimistic views of self-regulating social systems. In *The Invisible Wand*, Ruitenbeek and Cartier (2001) raised the question whether ACM was an emergent strategy or an emergent system property (better to be left alone, in the latter case). The case studies presented in this book suggest deadlocks and deliquescence, or decay, as possible outcomes of a *laissez-faire* strategy.

Facilitating change

Most of the authors in this volume and in other publications of the ACM Group focus on action-oriented questions regarding change in multistakeholder forest situations. This is in line with the facilitation hypothesis, the driving force behind CIFOR's ACM research. As De Koning recalls in Chapter 8, we saw participatory action research as 'the heart and soul' of adaptive collaborative management (Colfer 2005) and often used the term ACM/PAR to express this perception. This orientation departed from all previous research at CIFOR (Prabhu *et al*. 2007). The ACM/PAR conflation was thoroughly criticised by ISC, but in fact it embodied both the concept of what we were striving to achieve and the transformational paradigm under which we were operating. It expressed the core belief that our main research contribution to forest management would be not just to assess the usefulness of adaptive collaborative regimes, but also to understand, above all, the process conditions that can free up or hinder their development.

The literature on PAR and other participatory methods is huge (e.g., Lewin 1946; Freire 1972; Chambers 1983, 1998; Molano 1998; Fals-Borda 1998). In ACM's practice and literature, PAR appears mainly as an umbrella for a family of interactive methodologies and strategies meant to rethink participation and produce forms of knowledge directly usable by local people to address local issues. Expressing this, Diaw and Kusumanto

(2005) reframed some of the questions that had emerged in the mid-1990s and asked how truly participatory the participation was, whether methods could be empowering, and how scientific participatory science could be. From the Cameroonian and Indonesian ACM experience, they provided evidence of 'the possibility of a science in action' that met all three criteria. Pokorny *et al.* (2005) raised similar issues in the Amazon; they made a detailed assessment of the wide range of tools and approaches used by the Brazil team to make participatory methods more participatory and empowering and to liberate their 'collaborative potential'. A major strategy they identified was the need to facilitate local autonomy and decision making by 'training local actors [particularly women] in applying participatory methods themselves'. Such a strategy was a salient feature of the Cameroon post-ACM collaborative research with Innovative Resource Management, CIRAD, and large groups of local expert facilitators from Djoum and Gambe-Tikar (Chapter 12); this experience was extended later (2004-2005) by Tiani, Akwah, Mogba and others to the Democratic Republic of the Congo.

In this book, Jum *et al.* (Chapter 3) as well as Akwah Neba (Chapter 2) describe the three broad processes that characterised the ACM action paradigm in Cameroon: (1) horizontal, with regard to stakeholder interactions; (2) vertical, in relation to local policy linkages; and (3) iterative in communication, social learning and collective action. Chapter 8 is particularly interesting: De Koning provides an excellent review of PAR-related ACM concepts, such as social learning, social negotiation, mediation and facilitation, and goes further to highlight nuances in their definitions and practice. An important point he raises is that although social learning seems to have been the main strategy of researchers in Zimbabwe (as well as Nepal, Indonesia, the Philippines, Brazil and Bolivia; see Yuliani *et al.* 2002, 2007; Kusumanto *et al.* 2005; Cronkleton 2005; Colfer 2005), the focus in Cameroon was social negotiation and mediation (Diaw *et al.* 2002; Assembe and Oyono 2004). Despite basic similarities, social learning can take place within a single group's awareness raising and communicative action and does not necessarily imply negotiation of social meanings and interests with more powerful groups.

Overall, therefore, ACM action concepts embody a wide range of strategies and methods under the PAR umbrella. In addition to the above, PAR includes the use and simplification of criteria and indicators (C&I) as tools for social negotiation and collaborative monitoring. This is documented by Tiani *et al.* (Chapter 11) and by ACM teams in other countries. It also involves the use of scenarios (Wollenberg *et al.* 2000), interactive games (Chapter 9; Diaw and Kusumanto 2005), as well as participatory landscape and resource mapping (Chapter 10). Mbile (Chapter 7) and Robiglio *et al.* (Chapter 13) went further in the direction of developing visual techniques by combining participatory mapping and GIS to integrate different social perspectives on a landscape; our overall framework in these efforts, while supporting expert as well as local learning, remained more conventional and extractive. The position of PAR with regards to other approaches, including conventional research methods, is illustrated in Figure 1-3.

It is important, finally, to note that the relevance of this discussion goes well beyond forests. There is, today, a blooming of conflict transformation and alternative dispute resolution schools of thought and practice, which like ACM aim to transform conflict constructively. They indicate useful ways to differentiate between various dispute-processing options (negotiation, facilitation, mediation, arbitration, conciliation, adjudication, advocacy, etc.) and the substantive grounds used to address a conflict. The latter include power-based and rights-based distributive (fixed pie, win-lose, competitive) approaches, with decisions made based on the authority

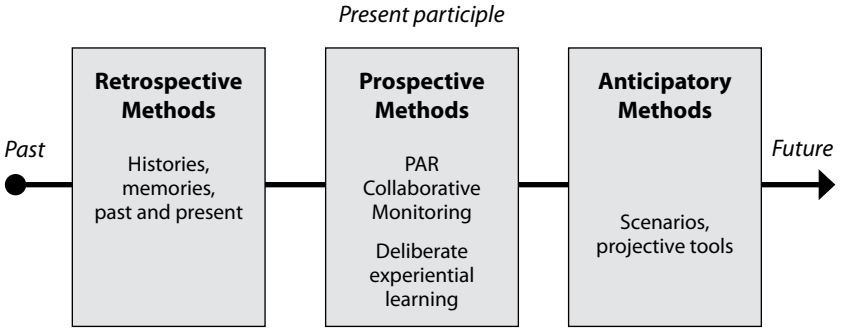

Figure 1-3. Methods in a time field
Source: Diaw and Kusumanto, 2005

or entitlements claimed by the parties. Alternatives are interest-based and relational (integrative and value-creating or dialogical) approaches, in which the pie is seen as expandable and the problem as having more potential solutions than originally thought (Morris 2002; Deutsch and Coleman 2000).

ACM's main dispute-processing approach can be best described as 'facilitative', since the team's main role was to help stakeholders manage tensions, negotiate, move towards shared goals and actions, and learn from this process. Our main substantive lines of intervention were interest-based and relational (narrative and transformative). ACM researchers predominantly sought to 'add value' to existing processes and to facilitate win-win and problem-solving shifts in local perceptions of resources, rights and powers. Such cases are described by Tiani and Noubissie (Chapter 9) and by other authors in this volume. The main parable used in the ACM literature to describe the facilitation and transformative hypothesis is that of a pebble thrown in a pond, with the pebble representing the facilitation and the ripples the movement of stakeholder processes well after the intervention. This we reexamine as part of the ACM lessons and conclusions. As we lay the ground for these lessons, I would like to emphasise that not all ACM interventions fit the description above. At various times and locations, ACM teams were steered into trying to address stakeholder problems through nonfacilitative means, including entitlement-based and direct empowerment approaches, as well as forms of activism, advocacy, conciliation and nonstructured 'flow with the stream' (*mengalir*, in Indonesian Bahasa; Colfer 2005; Wollenberg *et al.* 2007) approaches. Conventional, extractive research was also used in all sites as part of baseline or context studies. The outcomes of these other processes are all relevant to our lessons on the facilitation hypothesis.

A last point concerns the relation between local facilitation and policy feedbacks. This is a major hypothesis behind the ACM action paradigm, but it was not necessarily framed in terms of action research. What we emphasised was the importance of facilitating the development of iterative feedback loops between research, local experience and policy adjustments.

As noted by Kusumanto (2000),

> too often, we see that research that produces policy memoranda, recommendations, and reports have little influence—even in participatory research where stakeholders' or public aspirations are accounted for … this way of influencing policy too heavily assumes that policy makers' minds are open and 'adaptive' enough for making and adjusting policies …

We thus saw the need to pursue a link that had previously been made between social learning and policy making (e.g., Maarleveld and Dangbégnon 1999) and to rethink the very concept of policy making. Rather than seeing it as a monopoly of 'central actors', either nationally or globally, we adopted a generic concept of policy redefined 'as sets of formal decisions taken by groups of actors as to how they and others will behave' (Diaw *et al.* 2000). This meant that we saw policies as being made at various, interdependent levels of society, including at the local level, and that influencing them implied work across these levels. In doing so, we were also framing an ACM response to a long-standing question within CIFOR and the CGIAR system, about how policy-oriented research could really influence social-environmental processes and achieve results on the ground. This approach of policy in the context of the ACM action paradigm was instrumental in the way the Cameroon ACM programme was established and developed throughout the years. To make ourselves 'policy relevant', we identified policy domains similar to Scheffer *et al.*'s (2002) problem domains and used those to establish our sites and partnerships and link up with additional research projects on decentralisation (with the World Resources Institute) and environmental services and rural livelihoods (with the CGIAR Alternative to Slash and Burn programme, ASB). The core of the Cameroon action research effort, which we referred to as Main PAR, was part of a four-country, EU-funded project also involving Zimbabwe, Malawi and Ghana in southern and West Africa. Figure 1-4 presents this site-policy-project framework. Chapters 2 and 18 further discuss the notion of policy domain and its influence on the Cameroon research design.

Figure 1-4. ACM Cameroon's main sites and policy domains:
Campo-Ma'an - biodiversity conservation; Ottotomo - forest reserves;
Akok, Makak - landscape mosaics; Dimako - council forests; Lomie - community forests

Conclusion

At its core, ACM seeks to explore the validity of cooperative and learning frameworks for addressing human wants and capabilities in the face of

conflict, diversity and instability. We started this introduction by discussing the link between the peculiar history and scientific quest of the ACM Group and the basic human demands for meaning, action and adaptability that translate into theories, policies and other ways of inserting ourselves into the flow of things. Following that strand of thoughts, we looked at various components of ACM and highlighted the distinguishing origin of our action research strategies into the facilitation hypothesis. In our quest for ACM, we did not just want to see whether adaptation and collaboration were emergent and useful properties of human systems; we wanted to test the idea that engaged social facilitation based on learning and mediation could facilitate that emergence and give us knowledge about how and when this would be possible and useful.

This introduction thus sets the stage for the diverse contributions presented in this book. Some were directly based on the ACM paradigm and methods; others were not. This reflects the insertion of the Cameroon work in broader partnerships reflecting the context of Cameroon decentralisation policies and regional efforts to better interface forests with other land uses and address deforestation, conservation and livelihoods. There is a need to 'broaden the resource base of village economies' (Ngobo, Chapter 14) and to 'intensify' research, legislative and policy actions that can transform the enormous economic and social value of non-timber forest products into concrete alternatives for the rural poor (Ndoye and Chupezi, Chapter 15). As noted by Brummet (Chapter 16), 'from the point of view of indigenous people, timber may not be the largest potential source of local income', and 'small businesses can produce wider economic growth and prosperity per dollar invested than larger enterprises'. This and current tests of ACM in rural areas, including West African capture fisheries, make 'new knowledge about how and why [it] might be made to work better … encouraging'. Conversely, the connection between ACM governance processes and widespread local economic innovation is essential to addressing the ACM long-term impact questions. The following chapters thus take us further by discussing how various kinds of research and ideas sought to implement or complement ACM process questions in Cameroon. We will revisit some of these questions in the concluding chapter of this book.

Endnotes

[1] Cameroon, Zimbabwe, Ghana, Malawi, Madagascar, Brazil, Bolivia, Indonesia, Nepal, the Philippines and Kyrgyzstan.

[2] The committee was chaired by Don Gilmour (independent expert), with Irene Guijt (Leaning by Design/Wageningen Agricultural University) and Peter Frost (Institute of Environmental Sciences, University of Zimbabwe) as members. We also had two additional advisers: Bob (R.J.) Fisher (RECOFTC/University of Sydney) and Juergen Hagmann (PICO Team). We also had three Asian advisers who attended the ISC meetings in Asia as well as a Policy Monitoring and Advisory Group in Cameroon.

[3] Notably Ravi Prabhu and Carol Colfer, who have been the leaders of the ACM research in CIFOR and a wonderful inspiration in virtually every aspect of ACM science and ethics.

[4] Colfer's (2005 p. 6) simplified version of these questions reads as follows: (1) Under what conditions does the ACM process work? (2) What are the tools, methods and concepts that are useful in catalysing an ACM process? (3) What are the impacts of this process on the forests and on the people involved? As an illustration, a more common version of question 1 reads as follows: Can collaboration among stakeholders in forest management, enhanced by processes of conscious and deliberate social learning, lead to improved human well-being and the maintenance of forest cover and diversity? (Prabhu *et al.* 2002, Kusumanto *et al.* 2005, Mutimukuru-Maravanyika *et al.* 2008).

[5] Bogor, Indonesia; Pokhara, Nepal; Manila, the Philippines; and Harare, Zimbabwe, March 2000-June 2002.

[6] This also comes with the intuition that at the boundary of these two definitions (negative and positive) of egoism there exists the same grey zone of misguided decision making where humans are blinded by their limited information and by the limitation of their mental constructs.

[7] And even rats, in the case of empathy (de Waal 2001b).

[8] The philosophy of sciences, with Kuhn's 'structure of scientific revolution' (1962) and Feyerabend's (1963) defence of the necessary relativity and multiplicity of theories, played an important role in these developments.

[9] Anderson *et al*. (1999) say that compatibility is needed all the same but do not elaborate much on how it can exist or be constructed. They suggest, however, that permanent management of multiple objectives, 'bounded conflicts' and 'restrained dissonance' are the only options possible. We agree, with the caveat that adaptive pluralism involves socially constructed comparability and compatibilities that go beyond a strategy of conflict containment.

[10] Giddens (1984) sees social systems as based on structures 'of legitimation' (norms), 'of domination' (power), and 'of signification' (meaning); this social structure is produced, reproduced and transformed by agency, the situated activities of human agents.

[11] In a share system, fisher workers do not receive wages; rather, capital and labour share production costs and receive proportional shares of the boat's revenues and profits according to complex mathematical formulae.

[12] With some borrowings from game theory (Von Neuman and Morgenstern 1944)

[13] Also known as 'joint learning', 'shared learning', 'collaborative monitoring and learning', 'experiential learning', and 'learning by doing'. All the terms express the *conscious* sharing of ideas, information and practice by social actors, with the purpose of learning incrementally or by iteration to reach common objectives.

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Path in the forest: A rubber plantation

Chapter 2

Planning and monitoring forests in multistakeholder settings

George Akwah Neba

For many years, natural resources management focused on the fate of ecosystems. Today, it is widely recognised that one cannot ignore the social dimension when addressing forest-related issues because the fate of forest people is as important as that of the biological resources on which these people depend. One forest management issue is how to create links between human well-being and ecological sustainability (Colfer and Byron 2001). This concern involves livelihoods, governance, local participation and cultural protection of forest-dwelling people. Many policies across the world attempt to make forest management an engine for rural development. Some African states, amongst them Cameroon, Congo, the Democratic Republic of the Congo, Gabon and Zimbabwe, have carried out policy reforms that favour social as well as ecological sustainability. In fact, forest management in these countries is expected to contribute significantly to social well-being in rural areas by building local democracy and improving social infrastructure, health and education, all while pursuing the overall ecological goal.

The complexity of forest management is in part due to its governance aspects—that is, the way actors organise access to resources and benefits and ensure positive outcomes in a cooperative and iterative manner. It is relatively easy to monitor and evaluate stocks of natural resources and the condition of ecosystems, but the assessment of the social impacts of forest management processes is a more complex undertaking. Social performance indicators are difficult to define because cultural diversity prevents easy standardisation. Social sustainability is far broader than the contribution of forests to a nation's GDP and encompasses such issues as equity, institutional building and cultural protection.

Building on the adaptive collaborative management programme's research, our ongoing experience in community forestry in Cameroon and community-based conservation in the Democratic Republic of the Congo, this chapter attempts to address two important questions: *What principles should guide action to ensure that forest and natural resources management leads to human and ecological sustainability? And what criteria should support decision making in community forestry processes?*

The framework presented in this chapter can serve as a tool for collaborative planning, monitoring and evaluation of local forest management processes. Our premise is that resource users, rather than resource conditions, are the entry point to ecological sustainability. We argue that investing in stakeholder processes—conflict management, cooperative action, resource and benefits sharing—should be the focus of natural resources management efforts. We first present contemporary forest management challenges and describe policy change during the past decade in Cameroon. We then provide insights on research and stakeholder dynamics in Cameroon. A framework for building agreements in multistakeholder contexts characterised by conflicting interests is presented and then used to analyse the Cameroonian experience.

Contemporary challenges facing forest management

Collaboration and adaptation are increasingly recognised as the key to managing complex forest systems (Johnson 1999; Ruitenbeek and Cartier 2001), and this approach is believed to help address the efficiency and equity aspects of stakeholder processes. In Cameroon, these issues are affecting the implementation of decentralisation policies.

Efficiency and equity considerations

Forest actors can be differentiated in terms of proximity to resources, rights, dependence on resources, poverty, knowledge and power, amongst other factors (cf. Colfer *et al*. 2000), and serious conflicts over access to resources, sharing of benefits and distribution of power can arise. The challenge of local governance is to establish functional and trusting ties between often conflicting actors and interests. Mutual acceptance, generalised reciprocity, exchanges and relations of trust, commonly accepted rules, norms, sanctions and connectedness (Blau 1967; Putnam, 1993; Saxena 1997; Fisher and Jackson 1998; Pretty and Ward 2001; Prusak and Cohen 2001) are important determinants of good governance

at the community level. Efforts to establish collective management could indicate the desire for more efficiency. As pointed out by Ruitenbeek and Cartier (2001 p. 19) 'effective cooperative problem solving is most often found where individuals can share comfortably their knowledge and goals, where they trust one another to keep promises, and where there is an acceptable balance of power.'

Organisational efficiency, in this analysis, is the performance of new and existing local organisations with respect to effective exercise of cooperative management. Efficiency reflects the productive capacity of natural resources management organisations and institutions. Indicators for organisational efficiency include the quality of information flow, connections, stakeholder groups, contribution to improving livelihoods, benefits generated by the process, benefit-sharing mechanisms, and the rules, regulations and norms.

Equity of collective efforts relates to achievement of fairness (as locally defined) in access to resources and sharing of benefits. In other words, looking at equity in our case means making sure that forest management processes permanently strive to avoid exclusion of any stakeholder. Indicators for assessing equity include the fairness of access to resources, distribution of financial or other material benefits, and representation and participation of all affected stakeholders.

Decentralisation in Cameroon

During the 1990s, many African states carried out reforms that led to decentralisation of forest management. These policies, based on an efficiency, equity and development argument (Ribot 1996; Agrawal and Ribot 1999), were a response to the complexity of forest systems and the need to combine ecological and socioeconomic perspectives. They attempt to take forest-related decision making and practice to the level of local actors and beneficiaries. Decentralised structures that emerge (created from the top or naturally occurring within local communities) from this process are considered arenas for dynamic and mutually beneficial interactions amongst stakeholders.

This is a major shift from the focus on 'resource depletion … and on ways to rebuild tree stocks …' (Brown *et al.* 2002 p. 1) to a more comprehensive approach that seeks to balance biodiversity conservation and social development needs. Though steps are taken at the national level to create policy conditions for experimentation in multistakeholder approaches to forest resources management, the successful implementation of such approaches remains a major challenge. The Cameroonian example illustrates advances in forest policy as well as its implementation hurdles (Vabi *et al.* 2000).

Cameroon is establishing a social contract that uses forest management as an instrument to promote democracy and well-being. The initiative began in the 1990s, when Cameroon launched a series of reforms in the forest sector and introduced decentralisation, which in contrast to the colonial legacy of hegemonic and logging-oriented management provides a more comprehensive policy that is open to both ecological and socioeconomic perspectives. The ecological goals of the new management policy are to protect 30 percent of the country's forests, which cover up to 47 percent of the national territory, and to improve forest conditions.

The recently established Forest and Environment Sector Programme is designed to strengthen coherence and maintain the objectives of the national forest policy during the implementation process. Despite the national policy's effort to link forest management and socioeconomic development, methods and processes for carrying out the policy and achieving the objectives were not identified. The Center for International Forestry Research's adaptive collaborative management (ACM) work in Cameroon was designed to influence these policy processes and local dynamics.

ACM and governance challenges in Cameroon

Adaptive collaborative management (ACM) is both a programme and a management approach. The main focus of ACM research is the

development and testing of concepts, management principles, tools and policy options thought to be capable of strengthening the ability of forest stakeholders to deal with the challenges and complexity of forest systems. ACM conceives forest management as a dynamic process of interactions amongst stakeholders who iteratively negotiate and build agreements, and collectively implement commonly agreed agendas. In this process, adaptation and collaboration are viewed as strategies for addressing complexity and uncertainty. Three broad processes characterise the ACM work: (1) stakeholder interaction; (2) communication and learning amongst stakeholders; and (3) joint or collective action. These processes are expected to result in adjustments to management that positively affect the amount and distribution of benefits from the forests and the quality of their ecosystems.

In Cameroon, ACM researchers' main goal is to influence, through research and facilitation, the country's forest policy process and stakeholder and partnership dynamics at the local level (Diaw *et al*. 2001). The programme's work is structured around five policy domains.

1. *Community forests.* Cameroon's decentralisation policies have created community forests, managed by the community and designed to enhance community-based forest management; all revenues from their management accrue to the communities. Benefits from community forest management are expected to sustain community development, and the management process itself is conceived as a means for enhancing local democracy and governance.
2. *Council forests.* Cameroon has also instituted council forests, jointly managed by local communities, councilors and government officials. Their management requires a high level of collaboration at the local level. Rural councils manage the revenues from these forests and are expected to use the funds for development that benefits their constituencies.
3. *Forest Management Units and forest revenues.* There are two main types of Forest Management Units, state-managed forest reserves and private logging concessions. They are at the heart of Cameroon's attempt to rationalise forest management planning and to redistribute part of the revenues from logging through taxation and fiscal decentralisation.

The main mechanism designed to ensure the sharing of such revenues distributes Annual Forestry Royalties paid by private concessionaires amongst the state (50 percent), local municipalities (40 percent) and local communities (10 percent) (Bigombe Logo 2003). Fiscal decentralisation is also regarded as a process by which local actors, through cooperative management, can improve local democracy and governance.

4. *Biodiversity conservation.* The challenge for conservation of protected areas is to integrate social development aspects, both as an end for biodiversity conservation and as a strategy for achieving better ecosystem management. Conservation policy in the country remains top-down and marginal in the decentralisation and devolution debate, despite its clear implications for access to resources and equitable sharing of benefits and responsibilities.
5. *Landscape mosaics.* Landscape mosaics are forested landscapes including a mix of agricultural and agroforestry land uses as well as uses of wild natural resources. They represent the basis of the farm household economy across southern Cameroon. Robiglio *et al.*'s mapping of such landscapes (Chapter 13) illustrates their structure and dynamics. Agroforestry systems were introduced in these landscapes to improve both economic development and ecological sustainability and were designed to be major sources of agricultural and food supply. Evidence shows that over the past 50 years, however, they may have contributed to forest degradation (Robiglio *et al.* 2003) in spite of some social gains. Unlike the other policy domains, which generally have a dominant stakeholder, landscape mosaics have no single dominant stakeholder. Decision-making powers are spread amongst communities, lineages, farmers' organisations and other interest groups.

The governance challenges facing those policy domains include (1) adequate local representation in natural resources management; (2) transparent management and equitable sharing of benefits and revenues from community forests; (3) effective utilisation of revenues to support community development; and (4) equitable distribution of rights and management responsibilities amongst stakeholders as well as representation of marginalised people.

The ACM work in Cameroon uses two main components to understand and influence local stakeholder and institutional dynamics. The collaborative monitoring component has analysed and facilitated collaboration amongst major forest actors in biodiversity conservation in Campo-Ma'an (southern coastal area) and Ottotomo (Centre Province), landscape mosaics in Akok (South Province), council forests in Dimako and community forests in Lomié (East Province). The second component—environmental decentralisation—takes a more conventional research approach, analysing local dynamics generated by the reforms that institutionalised decentralised forest management in the country[1].

Framework for analysing management processes

In a framework—a template or filter for processing data—information is organised based on previously held beliefs or patterns of perception and interpretation (see http://www.wsu.edu:8001/~amerstu/smc/glossary.html for a definition by T.V. Reed). The framework presented here consists of variables for our contemporary understanding of successful resource management and sustainable livelihoods (see Annex 1). As with any frame, there is the risk of 'confirmation biases'—that is, a validation-oriented attitude of our subjective expectations, rather than the development of a flexible approach based on experimentation, learning and adaptation. To avoid this bias, we construct the framework as a tool for triggering collective action—a process by which people negotiate values and design commonly accepted rules that govern their daily life.

Field evidence shows that natural resources management at the local level often suffers from inefficiency, inequity, underrepresentation, unbalanced power relations, and lack of transparency in sharing the rights, responsibilities and benefits of forest management. As researchers and facilitators of forest management processes, ACM teams work in dynamic,

multistakeholder settings and attempt to build collaboration between diverse stakeholders who have unbalanced power relations. A conceptual framework for collective action—negotiating and implementing management agreements—in multistakeholder contexts was considered crucial for success.

The framework is a hierarchical model of determinants of forest governance performance that reflect various stakeholders' visions. It is used not for data collection but for data analysis. The data included numerous documents on forest and natural resources management and stakeholders' discourses, perceptions and expectations. Achievements in human and natural well-being are organised into five capital assets generally recognised to capture the idea of sustainable livelihoods: social capital, human capital, financial capital, physical capital and natural capital (the last asset is not treated in this chapter).

Social capital

The main social outcome expected from decentralisation and devolution of forest management, according to local communities, government, and international development and human rights organisations, is the enhancement of local democracy, local actors' mobilisation and interactions. The involvement of local actors could promote adherence to existing rules, spur the design of locally adapted rules, increase cooperation, train local leaders, and strengthen social networks, connections and structures. Paying attention to local social capital will ensure that policy implementation is not diminishing local power or destroying emerging or established management institutions.

Social capital is related to the *interactional* dimension of forest management. Social capital, the frame within which issues of social cohesion should be addressed, comprises several dimensions. Relations of trust, reciprocity and exchange, connectedness, and shared norms, rules and sanctions could be considered the main indicators for social cohesion in forest management processes.

Relations of trust indicators

- » Community or group members have confidence in each other, as apparent in the existence of cooperative arrangements, evidence of personal investment of time, energy and money in other members, very low levels of suspicion and openness to other members.
- » People use existing institutions, rules and norms and share a perception of fairness, faith in institutions and trust in those responsible for enforcing rules.
- » Actors invest in creating and strengthening trust by establishing transparent decision-making mechanisms, sharing information, and organising regular meetings to discuss common matters.

Reciprocity and exchange indicators

- » Collaborative efforts are evident and include a participatory action plan, arenas for collective decision making and shared, in-depth knowledge of existing resource conditions.
- » Actions are taken based upon an agenda agreed on by all actors, who know one another, take part in joint or common activities, understand and endorse the undertaken actions, can describe their common agenda and do not feel imposed upon.
- » The exchange of information or knowledge is simultaneous, which implies that every actor has a good knowledge of other actors' activities and plans.
- » Mutual commitment is apparent and includes agreeing to invest resources to enhance general living conditions and improve the conditions of minority groups, volunteering within the community or group and sharing emotions.

Connectedness indicators

- » The flow of information between networks and groups is two-way.
- » Information flows between different categories of actors.
- » Networks and groups exchange mutual help and loans.
- » Platforms or other multi-actor arrangements for negotiation are functioning.

» Local actors are connected to the external world.
» Different categories of actors engage in partnerships.
» Support mechanisms exist for the disabled or less powerful actors.

Shared norms, rules and sanctions indicators

» People understand, accept and respect existing norms and rules without coercion.
» Infringement of norms and rules is rare.

Human capital

Local involvement in forest management is also expected to considerably improve local people's livelihoods through well-organised educational and information systems and training facilities that can impart the necessary basic skills. Improved health status and job opportunities are also anticipated. The intended providers of these services are mainly the local municipalities—the legal entities that acquire and manage community forests and other civil society organisations, the state, and logging companies. Human capital emphasises the dimension of investment in human well-being and capacity building.

Education and training indicators

» New and additional educational and training opportunities are created.
» Educational infrastructure is built, expanded, and improved.
» Mechanisms for information dissemination are improved.
» Local knowledge is considered important and enhanced.

Leadership development indicators

» Leadership capacities are enhanced through seminars and workshops for individuals and groups, and new leaders emerge,
» Activities are carried out through interactive processes involving both local and external actors, who participate in decision making, implementation and monitoring.

Health improvement indicators

- The community uses forest revenues to invest in health infrastructure, constructing health centres and acquiring medical equipment.
- Health education receives funding.
- Forest revenues fund the construction of water systems and their maintenance.
- Forest managers and health managers establish cooperative mechanisms.

Financial capital

Increases in financial capital availability expected from forest management relates to generation of income from community forestry activities and collection of logging royalties. In fact there is the expectation that improved forest management would lead to a substantial improvement in rural incomes and to more credit facilities, savings, and remittances.

Financial capital indicators

- Local communities receive remittances, thanks to a clear policy of benefit transfer at the local level, direct access to forest revenues and regular delivery of logging royalties from logging companies and the government.
- Forest revenues make a significant contribution to community budgets.

Physical capital

Improvement in physical capital emphasises improved living conditions as a major dimension of forest management.

Physical capital indicators

- Benefits from management are reinvested in the local infrastructure for health, education, roads, communications, energy and water.
- Efforts are undertaken to improve agricultural technology and other production inputs, and to improve household assets.

Analysis of forest management decentralisation in Cameroon

Cameroon's policy reforms of the 1990s came with promises of local democracy and well-being. The ACM team first used the framework as a lens to understand how the decentralisation policy and associated stakeholder processes affected local capital assets. Data were generated through interviews with members of local forest management institutions, observation of interactions amongst the main forest actors during meetings, use of forest revenues for community investments (type, quantity and quality), and views and comments from actors involved in forest management. Based on the reports that were produced by ACM and partners' research, the analysis tried to assess the status of local institutions, trust amongst stakeholder groups, reciprocity and exchange, connectedness and investments in local development.

Emerging new institutions

Decentralisation is increasing local stakeholder dynamics. Many forest management-oriented social movements are emerging, with people expecting to play a greater role in decision making and benefit sharing. On the ACM sites, these social movements take the form of collaboration or joint action between stakeholder groups and actions by some groups to claim local rights or influence ongoing processes.

Local communities are organising to acquire and manage community forests. This has become a popular way of securing forest landscapes for community control in forested areas. The most advanced efforts (in terms of meeting the requirements and taking the legal and administrative steps) were found in Lomié in the East Province (see Chapters 5 and 9 of this volume).

Local communities are also organising to pressure the government, forest management organisations and private logging corporations for greater recognition of their rights. This generally takes place within protected

areas, logging concessions and agroindustrial areas, where access to communities' already exploited resource pools are highly restricted and commonly used resources have become scarce because of outside interventions. For example, communities living around the Campo-Ma'an area have organised to claim their rights; they are competing with the Cameroon rubber corporation (HEVECAM), the newly created Campo-Ma'an National Park, and logging activities.

Joint initiatives are taking place between local communities, the state and other actors for the management of forest landscapes. Council forests, for example, provide an opportunity for collaboration in the management of forest royalties between rural municipalities and the villages that are part of their constituencies. Community forests, similarly, operate under management agreements with the state, and local communities sign contracts with private business people or corporations for timber exploitation. Policy makers expect benefits from both council forests and community forests to be invested in rural development. The managing municipalities and villages (see Chapter 4 of this volume) are investing the benefits from council and community forests in rural development.

Local communities are also organising to manage forest royalties received from the state as their share of logging benefits.

The local initiatives are prompting the emergence of new institutions targeting forest management, in the hope of providing employment and financial benefits needed for development. New institutions include common initiative groups, the main form of rural organisations for community forest management; village development committees, which generally have broad development perspectives and collect and use forest royalties for community development projects; forest royalties management committees, which bring together state representatives, the local communities and municipalities to manage revenues from timber exploitation; and *ad hoc* institutions or structures created for the comanagement of protected areas or other types of forests placed under a state-defined management regime.

Although new institutions are being created, the question of their sustainability remains, as the following sections reveal.

Status of trust

There is evidence (Bigombe Logo 2003) that the current model of fiscal decentralisation has strengthened the power of the more influential actors, such as the mayors, instead of promoting more equity in the sharing of roles and responsibilities, as well as transparent mechanisms of representation of local people in management committees. In addition, village representatives are selected based on networks of influence rather than on their legitimacy and ability to represent their communities. The consequence is that minorities such as Pygmies and women are left behind. Etoungou (2003) reports that the decentralisation process, as it is being implemented, is disrupting local management systems and community-based social capital without necessarily improving the quality of forests or social cohesion. Particularly, legally recognised forms of organisation and the process of acquiring and managing community forests are marginalising traditional authorities that had an important regulatory role within the communities, causing significant social tension.

It appears that there are problems of representation, legitimacy and accountability in the formation and functioning of the emerging institutions for collective action at the local level. Bigombe Logo (2003) concludes that the current decentralisation model and emerging institutions encourage 'upward accountability' rather than the 'downward accountability' necessary for greater local control of forest management processes.

Reciprocity and exchange

The study of the Dimako forest royalties' management committee indicates that powerful actors tend to retain information instead of sharing it. This is typical: in most forest areas, communities are scarcely informed of the availability and amount of their share of forest revenues. There is evidence that local elites and local forest service officials dissimulate information relating to procedures for acquiring and managing community forests. In

some areas local elites seek control of all community initiatives regarding local forest management. The control of a community forest guarantees the control of the benefits that it generates. Municipalities have not been transparent about the forest royalties they receive.

Financial capital

Financial forest benefits have been transferred to local communities since 1998, as reported by Bigombe Logo (2003). Tables 2-1 and 2-2 track money transfers to local communities.

Between 1998 and 2001 there was a substantial flow of money into local communities. However, the effect on rural development is less visible.

Table 2-1. Forestry fees paid to rural local councils, 1998-2001

Province	*Rural council*	*Sums paid (CFA)*			
		1998/1999	*1999/2000*	*2000/2001*	*Total*
East	Dimako	2 500 000			2 500 000
	Lomié	82 628 600	67 149 933	200 046 503	349 825 036
	Mbang	79 138 600	80 096 933	107 922 253	267 157 786
	Messamena	21 216 000	21 216 000	21 216 000	63 648 000
	Yokadouma	454 246 200	351 738 866	619 680 949	1 425 665 949
South	Ebolowa	64 390 000	56 015 000	2 635 000	123 030 000
	Kribi	8 060 000	1 291 667	40 099 200	49 099 867
	Lolodorf	1 250 000			1 250 000

Source: Ministry of Finance 2000 (in Bigombe Logo 2003)

Table 2-2. Forestry fees paid to neighbouring village communities, 1998-2001

Province	*Rural council*	*Sums paid (CFA)*			
		1998/1999	*1999/2000*	*2000/2001*	*Total*
East	Dimako	625 000			625 000
	Lomié	20 657 150	16 787 483	50 011 626	87 456 259
	Mbang	19 784 650	20 024 233	26 980 563	66 789 446
	Yokadouma	113 561 550	87 934 716	154 920 221	356 416 487
South	Ebolowa	16 097 500	14 003 750	656 250	30 757 500

Source: Ministry of Finance 2000 (in Bigombe Logo 2003)

Local development

At the moment it is difficult to assess the real, positive impact that the decentralisation policy and its implementation have had on local development and ecological sustainability. Even though local communities and municipalities have been receiving forest royalties, few investments in rural development have been realised. In Dimako, Lomié and Campo, it has been very difficult to identify how the money was spent. Bigombe Logo (2003) reports that in some villages, people simply shared the money amongst themselves or organised parties. Possibly local communities were not prepared to manage money as a common good.

Ecological sustainability

Contrary to expectations, the lure of financial benefits has led to unsustainable resource use by local actors who see logging as the fastest way to make money, evidenced by the fact that community forest management is dominated by timber exploitation activities.

Conclusion

The objective of the framework presented in this chapter is to serve as a tool for collaborative planning and monitoring. ACM research in Cameroon shows that collaborative management is difficult to implement because of conflicting perspectives and diverse cultural and ideological backgrounds: forest actors generally do not agree on what to do or how to do it. It is relatively easy for a single actor to set goals and work towards achieving them. Things become complicated when a conservation agency has to deal with neighbouring communities and other resource users whose lives depend on access to resources. Investment of forest benefits by a local municipality can cause problems when projects do not meet people's priorities and expectations. In the same way, the contribution of local resource users to management can be jeopardised by an unclear definition of responsibilities and benefits. A framework like the one presented above can serve as a platform for agreement between these multiple interests and

conflicting management approaches that characterise the actors involved, as well as a base for impact assessment. Our experience in ACM shows that a collaborative forest management process should pay attention to various issues at various steps, particularly planning and monitoring.

Collaborative planning implies that everyone's interests and perception are taken into account. First, involved actors need to agree on management goals and design an action plan that clearly defines and shares roles and responsibilities. The following questions are important to ask:

- What does every actor want to achieve (what is his or her conception of successful management)?
- What is common in the different visions, and what is conflicting?
- Can people negotiate on the points that are conflicting?
- What actions should be carried out by whom to achieve the shared goals?

The variables in the framework represent different areas of concern for local management processes. A collaborative action plan reflects negotiated values and objectives. Far from being a key that opens every door, this framework is a template to guide the formation of local collective action.

Monitoring is 'the systematic measurement of variables and processes over time' (Spellerberg, cited by Abbot and Guijt 1998 p. 11). In general, monitoring aims at providing the necessary information for change or adaptation. While the main objective of ecological monitoring, as mentioned by Abbot and Guijt (1998), is to collect, analyse and interpret data on biophysical phenomena in order to predict or determine trends in environmental changes, organisational performance monitoring focuses more on the effectiveness of natural resource management policies and practices: have planned activities been executed as intended and have they achieved the expected goals?

The role of monitoring is to see whether the effects of a policy are positive or negative, and whether intended or unintended changes occur (IFAD 2003). Monitoring is also the best tool to promote learning and

adaptation. If it is relatively easy to monitor biophysical phenomena in the sense that variables are easy to find, the monitoring of governance is more complicated because the variables are difficult not only to determine but also to assess. How do we assess communication, interaction amongst people, well-being and social cohesion? At what degree of achievement in these objectives would governance be considered 'good'?

Though specific to the Cameroonian context, the framework presented above could guide local forest management processes in different settings. It builds on the now-familiar criteria and indicators concept (CIRAD and CIFOR 2000: series 1, 2, 5, 7, and 9; Diaw *et al.* 2001) and is inspired by the well-known 'best practices' approaches. It can be used as a platform for building agreements in multistakeholder contexts and significantly contribute to social and ecological well-being through the continual effort to establish social cohesion, organise fair access to resources and benefits, and improve knowledge, health and general living conditions.

Endnotes

[1] Three reports of the 'environmental decentralisation' component provided governance-related elements for this paper. A report by Oyono (2001) presents a sociological analysis of local organisational dynamics as they relate to the decentralisation process. A second report, by Bigombe Logo (2003), presents a political-economic analysis of the development and implementation of fiscal decentralisation in the country. A third report, by Etoungou (2003), focuses on local dynamics of the process of acquiring and managing community forests in the East Province. And finally, the author's research and facilitation in the Campo-Ma'an National Park area analyses protected area and multistakeholder settings dynamics.

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Annex 1

Relationships between impact monitoring components and elements

RELATIONS OF TRUST

- Members of the community or group have confidence in each other
  - Existence of cooperative arrangements
  - People easily invest time, energy and money in each other
  - The level of suspicion among actors is very low
  - Openness to each other
- People refer to and make use of existing institutions, rules and norms
  - There's perception of fairness
  - Actors have faith in institutions and in those who are responsible for enforcement
- Actors invest in creating/strengthening trust
  - Transparent mechanisms are being put in place
  - Efforts are made in the creation of transparent mechanisms
  - Actors share information instead of keeping it
  - Regular meetings to discuss common matters

RECIPROCITY & EXCHANGE

- There's clear evidence of collaborative efforts
  - Existence of participatory action plans
  - All actors have good knowledge about existing resources
  - Existence of arenas for collective decision making
- Actions are carried out following an agenda agreed upon by all involved actors
  - Different categories of actors take part in joint or common activities
  - All involved actors understand and endorse actions being carried out
  - Involved actors know each other
  - Involved actors can describe their common agenda for action
  - There's no feeling of imposed actions by actors
- Simultaneous exchange of information or knowledge
  - Every involved actor has a good knowledge of other actors' activities and plans
- There's clear evidence of mutual commitment
  - Resources are invested in creating and improving general living conditions
  - Efforts are being made to improve the conditions of minority groups
  - Many voluntary actions are carried out within the community or the group
  - Emotions are shared by actors involved in joint activities

CONNECTEDNESS

- Existence of networks & groups
  - Two-way circulation of information between networks and groups
  - General information flow between different categories of actors
  - Mutual help, provision of loans between and within networks and groups
  - Existence of functioning platforms or other multi-actor arrangements for negotiation
  - Connection of the local actors to the external world
  - Partnership relations among different categories of actors
  - Support mechanisms for the disabled or less powerful actors

SHARED NORMS, RULES & SANCTIONS

- People understand, accept and respect existing norms and rules without coercion
- The rate of infringements of norms and rules is very low

Human capital

EDUCATION & TRAINING

- Efforts are being made to improve knowledge & skills
  - More and new educational and training opportunities exist
  - Educational infrastructure is constructed or improved
  - Information is made available
  - Indigenous knowledge is acknowledged and improved

LEADERSHIP CONSTRUCTION

- Individual and group leadership capacities are being improved
  - Seminars and workshops are organised for groups and individuals
  - New leaders are emerging
  - Indigenous knowledge and skills are recognised and improved
- Activities are carried out through an interactive process involving local and external actors
  - People participate in deciding on what is to be done
  - Local and external actors carry out joint activities
  - People actively participate in implementing and monitoring actions

HEALTH IMPROVEMENT

- There's substansial investment in health
  - Investment in health infrastructure
    - Forest revenues contribute in the building of health centres
    - Forest revenues contribute in providing medical equipment
  - Investment in health education
  - Investment in water projects
    - Forest sector has a substansial contribution in building water
  - Cooperation with health authorities

Financial capital

IMPROVEMENT OF COMMUNITY FINANCES

- There are remittances to local communities
  - A clear policy of benefit transfer at the local level exists
  - Local communities have direct access to forest revenues
  - There's evidence of routine money transfer to communities from government
  - Local communities regularly receive due royalties from logging companies
- Incomes from the forest significantly contribute to community savings

Physical capital

IMPROVEMENT OF LIVING CONDITIONS

- Benefits from management are invested in social infrastructure
  - Investment in health and education infrastructure
  - Investment in communication infrastructure
    - Road networks
    - Media infrastructures
  - Investment in energy and water provision infrastructure
- Efforts are made to improve technology at the local level
  - Improvement of agricultural and other production equipment
  - Improvement of household assets

Working together

Chapter 3

Action research as a strategy for collaborative management in Ottotomo

Cyprain Jum, Martin Abega and François Bengono

During the first decade of the twenty-first century, the need for greater community participation in forest management has increasingly been recognised, both in Cameroon and elsewhere. The paths to community involvement in natural resources management, particularly forest management in Cameroon, have been fraught with difficulties (Vabi 1999; Asanga 2001). There has been very little community consultation and negotiation in a decision-making process that is intended to guarantee people's full cooperation, support and participation.

It was against this background that a research project on adaptive collaborative management (ACM) of forests[1] sought to understand how best to empower local stakeholders as a means of improving forest management and human well-being. The project adopted an action research approach, with action interventions centred on communication, collaboration, social learning and adaptation. In this chapter we explore evidence regarding the use of action research to trigger better collaboration and local initiative and thereby improve forest management. In doing so, we explore the issue of equity as well. Our focus is on research carried out at the Ottotomo Forest Reserve in Cameroon between 2000 and 2001. This forest reserve is an example of a site where local people depend heavily on the forest for their well-being, and it represents one of the places in Cameroon where attempts have been made to achieve conservation through collaborative management. We begin by exploring the theoretical underpinnings of this chapter and describing the context for the research and the methods we used. We then examine some of the main results of this work, especially with respect to issues such as conflict, collaboration, collective action and communication. Finally, we examine our implicit hypothesis—that action research is a useful catalyst of improved collaborative management that leads to positive outcomes for forest-dependent communities and conservation—and consider the conditions under which this hypothesis seems to hold true.

Adaptive collaborative management and action research

Participatory approaches to development have been widely promoted and implemented in recent years (Vabi 1999; Nguinguiri 1999). Vabi (1999) observes that success stories are nevertheless limited in Cameroon, partly because the concept of participation was introduced as a response to donor pressures rather than as a logical outcome of local people's demand. Participatory approaches have the potential of initiating change processes because they bring local communities to the notice of policy makers. Fisher (1995 p. 2) noted that 'collaborative approaches to forest management have clear advantages in their potential to provide benefits to local people in exchange for the costs of conservation'. The conflict-ridden nature of forest management and the widespread feelings of distrust among local populations, state agencies and logging operators imply that building comanagement regimes is a learning process for all parties (Van den berg and Biesbrouck 2000). Comanagement offers a solution to the conflicts that characterise forest management because recognition of conflicting interests is basic to the process of negotiating the rights, regulations and duties of local populations and state agencies (Hilhorst and Aarnink 1999). In Cameroon, resource management systems have been a central focus of local land claims negotiations (Fisiy 1992; Diaw *et al.* 1997; Ngwasiri 1998; Sikod *et al.* 2000).

Adaptive collaborative management, an approach developed at CIFOR, has three dimensions (Colfer *et al.* 2003; see Chapter 8 of this volume). The horizontal dimension attempts to catalyse collaboration between forest communities (or subgroups within communities) and other stakeholders. The rationale is that the divergent management goals of different stakeholders interfere with effective forest management unless there is a conscious effort to harmonise them. The vertical dimension attempts to strengthen the voice of the members of forest communities in their interaction with actors at a larger scale. In most cases this means interacting with government and bringing policymakers on board. Finally, the iterative dimension involves social learning.

The ACM approach seeks to add value rather than replace existing approaches. Literature suggests that any natural resources management approach (e.g., community forestry, participatory forest management, joint forest management) that builds on the inputs of stakeholders is valid and may only need strengthening. An ACM approach can be partly or wholly adopted into such schemes to strengthen them. ACM focuses therefore on strengthening processes of collaboration, information exchange and communication among stakeholders, and on finding opportunities to learn collectively about the impacts of their actions.

Action research is increasingly being used in various contexts, including rural development, organisational change and natural resources management. It is a process through which members of a group or community identify a problem, collect and analyse information, and take action to find solutions and promote social and political transformation. Maguire (1987) and Selener (1997) have identified three principal activities of action research: research, education and action. People taking this approach systematically assess a social phenomenon by identifying a specific problem for the purpose of solving it. It is an educational process for both the researchers and the participants, who analyse the structural causes of particular problems through collective discussion and interaction. In this process researchers and oppressed people collectively take action, both short- and long-term, for radical social change.

Action research has been applied to organisational change in a variety of contexts, including business, education and government (Walton and Gaffney 1991). It has been used particularly in education (Kemmis and MacTaggart 1988) and in 'planned organisational change' (Foster 1972). It has also been applied to developing appropriate agricultural technology (Maclure and Bassey 1991) and natural resources management (Gilmour *et al.* 1987).

Sriskandarajah and Fisher (1992) view action research as an approach that aims to involve people who share concerns about a problem in a process of critical reflection through which they develop an improved understanding

of their situation and develop plans of action to improve that situation. They have identified the main ideas in action research as follows:

- Action research involves the systematic application of a series of cycles of planning, action, reflection on outcomes and replanning.
- Action research combines action and investigation. The investigation informs action, and the researchers learn by critically reflecting on the action.
- Action research is experimental in its orientation and flexible. It encourages people to try things despite uncertainty about possible outcomes. But because of the built-in process of continuing evaluation and replanning, adjustments in action are made continually.

The action research spiral, or learning loop (Figure 3-1) describes a management process that is cyclical and iterative, rather than linear, and the stages that the group will go through to address each issue:

- reflection: identify the causes of the problem, explain the failure of past attempts (if any) to address it and learn from past experience;
- planning: develop strategies for addressing the problem and assess their strengths, weaknesses, opportunities and threats (SWOT);
- action: carry out the agreed action;
- observation and monitoring: observe the outcomes of the action;
- reflection: reflect on the outcomes of the action, consider what lessons can be learned and improve the earlier strategy to address the problem; and
- planning: decide on the next action.

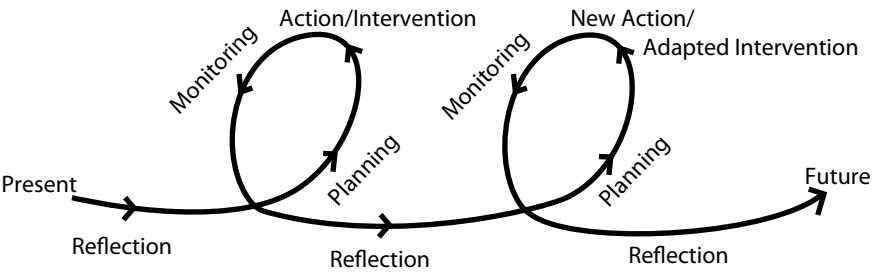

Figure 3-1. Action research spiral

The above cycle continues until the issue is addressed successfully. Participatory action research involves the formation of a team of people who share concerns about a particular problem. The team members will have different perspectives and interests but are willing to explore the issues and improve the situation. They are also willing to listen to and attempt to accommodate the views and interests of other team members. Team members become involved in a process of critical reflection through which they seek to understand the situation of concern. On the basis of this understanding, they develop plans of action, which are then implemented. Actions are reviewed and new plans are made. The process is thus cyclical and exploratory.

Reflection is not necessarily the entry point into an action research cycle, since many other activities can precede it. The idea behind action research is that groups of people with shared issues or concerns collaboratively, systematically and deliberately plan, implement and evaluate actions (Fisher and Jackson 1998). It is thus a process of learning in order to act more effectively in a particular situation.

Fisher and Jackson (1998) stressed the importance of recognising action research as an overall methodological framework, not a particular research technique; within the broad framework of reflective planning and action, other forms of research can be used as necessary. For instance, at various points in a series of action research cycles, it may be appropriate to carry out wildlife inventories, botanical studies, social surveys or anthropological studies of indigenous knowledge. De Koning (Chapter 8 of this volume) also explores useful understanding of action research in various contexts. Differing contexts and objectives have led to considerable diversity in the actual practice of action research—all of which demonstrate the adaptive potential and flexibility of the approach.

Context

The Ottotomo Forest Reserve covers an area of 2,950 ha and was gazetted in 1930. Situated in the Central Province of the humid forest zone of

Cameroon, it has important plant and animal species as well as a wide variety of forest products useful to the local population (ONADEF 1999), but is legally off-limits to human activities. The population of the area has grown considerably since 1930, and encroachments by local communities who claim customary use rights in the reserve have brought them into conflict with the state forest agency, which controls access to the reserve and is responsible for its management and conservation (Jum *et al*. 2001). In 1999, researchers contacted the state agency, and after a series of discussions, it was agreed that the research project should help the management of the reserve by facilitating the identification of a set of approaches, strategies, institutional arrangements and mechanisms necessary for enhancing stakeholders' interaction.

Though the reserve had no formal management plan until 1999, a series of 'management' operations, primarily regeneration, were conducted from 1930 to 1943, when they were stopped by World War II (Jum and Oyono 2005). According to Jum and Oyono (2005), the history of the state management of this reserve in post independence Cameroon is marked by human intervention activities. In 1972 a state agency, the *Fonds National Forestier et Piscicole,* restarted regeneration activities in the reserve, which lasted until 1979. In 1989, another state agency, the *Centre National de Développement des Forêts,* conducted inventory operations. Regeneration activities resumed in 1983 under the *Office National de Régénération des Forêts,* which in 1990, became the *Office National de Développement des Forêts* (ONADEF)[2]. This new agency has intensified regeneration activities over the past five years and in 1999 designed a management plan (ONADEF 1999). During the development of this plan, local communities were informed and consulted. But according to villagers, their aspirations were not taken into consideration and they were not involved in the process of decision making about the management of the reserve (Zibi 2002). In other words, the management plan was designed without the participation of local communities and without substantive collaboration. The new forestry legislation of 1994 mentions the participation of local communities in forest management, but powers were devolved to them only for the creation of community forests and for the management of portions of forestry fees. Protected areas and forest reserves have remained

a state affair, although local communities have usufruct rights on (limited) timber, non-timber forest products and wildlife for their personal use (MINEF 1994: Cameroon Forestry Law of 1994, Article 8).

When the French colonial government established the Ottotomo Forest Reserve in 1930, traditional territories were not taken into account and several villages lost part of their land. As population density increased, people perceived a growing shortage of land, and conflicts between local communities and the reserve management become increasingly frequent. Since 2002, CIFOR has been working to improve the relationship between local communities, local NGOs and the forest administration. In a recent study carried out in the area, Sassen and Jum (2007) observed that although the reserve had made it more difficult for people to get land, there was still sufficient land for the present. To obtain new land, one depends on other people's willingness to part with a piece of theirs. Sassen and Jum (2007) also noted that only a few villagers were actually physically restrained by the reserve in their land use and had to ask the authorities for use permits—a long and complicated process.

Stakeholders

The classical approach to understanding conflicts is through the actors. The nature and numbers of the actors involved has a direct bearing on conflict dynamics and the potential for escalation or management. The major actors in the Ottotomo Forest Reserve area are the local communities, the forest agency, the intervening agencies (*Association Terre et Développment*, the Ministry of Agriculture, and the Ministry of Environment and Forests), the municipal council, illegal loggers and the international community. Most of these actors have vested interests that they try to defend. The overlap of interests can lead to conflict.

Local communities. The Ewondo people of the reserve area have a strong interest in agriculture. Over the past decades, agricultural encroachments into the reserve and exploitation of forest products (fuelwood, medicinal herbs, fruits) have been numerous. Within the reserve, hunting is restricted by laws and regulations, and all forms of agricultural practices and timber

harvesting are prohibited. The local communities claim use rights over the forest areas adjacent to their villages, be they communal or state forest reserve, and this has brought them into conflict with the reserve management authorities.

Forest agency. The government agency wants to ensure the sustainable use and management of the forest, check and control illegal exploitation of the resources of the reserve, enhance collaboration with forest users and, where possible, ameliorate local communities' living conditions (ONADEF 1999; Mala and Jum 2001).

Intervening agencies and private services. This includes the Ministry of Agriculture, the Ministry of Environment and Forests and the *Association Terre et Développment* (ATD), a local NGO. Their interest is supporting the activities of the local people of the area (especially in agriculture and forestry). They also provide training to the local people where possible.

Illegal loggers. The Ottotomo Forest Reserve is located in the vicinity of Yaoundé, the national capital. The demand for wood is high (Plouvier *et al*. 2002), and illegal loggers from Yaoundé collaborate with local young men (Jum *et al*. 2001), and even perhaps local agents of the Ministry of Forests in encroaching on the reserve.

Municipal council. In Cameroon, the municipal council, or *commune,* is the local government. It is responsible for the socioeconomic concerns of the villages in and around the Ottotomo Forest Reserve.

International community. The International Tropical Timber Organisation has given financial support to the forest agency during the past two years. In addition to CIFOR, the International Centre for Research in Agroforestry (now called the World Agroforestry Centre) is conducting a small action research programme with some villages in the area, along with ATD.

Land use

The Ottotomo Forest Reserve is state land. Most of the land around the

reserve is national domain land, which is under official state custody but in fact subject to customary land tenure systems. Its use is administered principally by the village clans, lineages and households under a complex system of nested rights (Diaw *et al.* 1997). Each village claims a traditional territory and primary (though not necessarily exclusive) rights to the land and its natural resources. According to Jum *et al.* (2001), the people of these village communities normally live, farm, gather and hunt within their own territory. Each village in the reserve area has a generally recognised territory, though the boundaries are not official. The villages around the reserve are all inhabited by Ewondo clans.

Within the village territories, an individual looking for land to cultivate first ensures that no one else has a prior claim to the plot he has selected, he then clears the land for cultivation; his claim is thus established. Land over which there are no individual claims is 'communal'; all members of the local community have equal rights to it and its resources.

People living in and around Ottotomo Forest Reserve are engaged in various forms of natural resource exploitation: cultivation, hunting (or poaching, depending on one's perspective), collection of firewood, and harvesting of building materials plus medicinal plants and other non-timber forest products. These activities have a varying impact on the reserve and its environs, depending on the intensity, which in turn depends on the size of the human settlement. Most of these activities contravene reserve by-laws, which basically prohibit any exploitation of resources within reserve boundaries. This represents an obvious cause of conflict.

Zibi (2002) notes that the forest had been continuously occupied by some families from the 19th century until they were forced out by the colonial administration in 1930, without due compensation. After several years, he notes, the population increased in the enclave areas, cultivable spaces became small, and land conflicts became apparent within the area. He further observes that land is an ancestral inheritance that, by Cameroonian custom, belongs to the first occupant—a custom that has been generally ignored by the state in the Ottotomo forest area.

The reserve had been encroached upon by the local communities on several occasions before the research project initiated its activities in early 2000 (Jum *et al*. 2001). The main reason for illegal farming inside the reserve was the lack of agricultural land outside. This could be partly explained by the increase in population. In addition, an economic crisis led to a drop in prices for cash crops, giving rise to an increase in food crop farming and consequently an increase in demand for arable land. Another contributing factor was the long neglect of the forest reserve by the government.

The local population itself confronts encroachment from illegal forest exploiters, who harvest valuable tree species such as bubinga *(Guibourtia tessmannii)* (*Cameroon Tribune* 2002a).

Methods

Action research was the main approach used to effect social transformation that would strengthen local people's capacity for decision making in research and management of local resources, so as to improve their awareness of options and strengthen their ability to act on their own behalf. The application of action research embraces a multistakeholder approach. Many authors stress the importance of multiple stakeholder approaches to natural resources management (Grimble *et al* 1995; Ramirez 1999; DFID 1998). Grimble *et al* (1995) outline the steps and tools in stakeholder analysis. The project researchers conducted a formal analysis as described by these authors, identifying local communities, the government, nongovernmental organisations and the international community as the primary stakeholders. By early 2000, Collaborative Monitoring for Adaptive Co-Management of Tropical Forests, a research programme of CIFOR—alongside the state forest agency and the local NGO, ATD—had initiated contacts with communities around the Ottotomo Forest Reserve and was developing a common vision of the situation.

An essential aspect of this research was to help forest administration staff and local NGOs learn how to use action research routinely in their normal

activities. At the same time, the researchers wanted to evaluate the utility and applicability of action research. What was attempted, then, was a participatory learning experience aimed at encouraging participatory initiatives. The team's role was seen as facilitating a reflective learning process that would increase stakeholders' confidence and commitment.

The study did not consider collecting comprehensive technical or quantitative data. Gathering information of this sort is not the strength of action research. Rather, the results of action research can be expected to complement quantitative or economic data. However, intimations of the methods and the likely impact on the project can be gained from the kinds of information collected and the attitudes of local communities to the approach. Lessons learned are continually fed into the project planning cycle, and field activities are adjusted accordingly.

Selection of study villages

After a series of discussions and brainstorming sessions (with the forest agency, ATD and the ACM research team), three pilot villages of the 14 surrounding the reserve were selected for participatory action research studies, based on three main criteria:

- » frequency of conflicts over the reserve;
- » significant or high pressure on the forest resources; and
- » administrative considerations[3] (the study villages should be within certain administrative units).

The villages were ranked according to the first two criteria and then the administrative criterion was taken into consideration, and the villages of Koli and Nkolbibanda (*"groupement" de Nkong-abok*) and Ottotomo village (*'groupement' de Nkongmeyos*) were selected.

We hoped that by working with these three villages, most of the problems that cut across the entire region would be identified and that more villages would be added as the study unfolded. The population in each village ranges between 60 and 100.

Participatory methods included use of stakeholder identification and analysis, social mapping, agroecological mapping, historical transects, Venn diagrams, historical transects of the landscape, focus group discussions and pebble games assessing rights and means to manage the forest cooperatively among stakeholders, as well as intergenerational and intragenerational access to the forest and its benefits. These techniques, among others, helped the research team and the local communities look at resources and management issues from spatial, historical, social, economic and ethical perspectives. This was accompanied by a series of stakeholder fora to exchange viewpoints, concerns, and lessons learned.

Having identified local communities as one stakeholder group, researchers then conducted village-based stakeholder analysis in the three research villages to learn more about the major problem of the area—the insufficiency of arable land and the consequent encroachments from local populations who claim customary use rights in the reserve, leading to conflict with the reserve management authority. Meetings were later held in the villages to share the information obtained.

Participatory sketch mapping and historical transects of the landscape were undertaken in the three action research villages, though not fully representing the reserve area in terms of the number of villages. These techniques were helpful to the team and the local communities in seeing resources and management issues from a spatial perspective. This was followed by one internal seminar, open to the stakeholders and other collaborators, to share field lessons.

Setting the scene for stakeholder mediation and negotiation

A three-day stakeholder workshop on criteria and indicators (C&I) was organised for staff from the forest agency, local communities, local NGOs, municipalities and administrative institutions. The workshop effectively shared the research project's approach and terminology, such as C&I, action research and collaborative monitoring. The workshop also enabled the team to bring science and participation together through data collected

Table 3-1. Simple indicators identified for the Ottotomo Forest Reserve

Principles	*Indicators*
Ecosystem integrity	Many trees Animal species conserved Rationally exploited forests Abundance of non-timber products Good promotion of pharmacopoeia Abundance of fish in rivers Abundance of fauna
Human well-being	Resolution of internal conflicts Social harmony Relevant community organisations Good support from NGOs Secure access to resources Good roads Health centres Functional schools Enough food Well-built houses Many sources of income Electricity Many wells

by the stakeholders on resource conflicts, perceptions of collaboration, and stakeholders' rights and means to affect forest management. The workshop also provided the opportunity to share with the participants the information obtained during participatory sketch mapping and historical transects. Stakeholders identified their activities, constraints, opportunities and expectations in relation to the reserve. The workshop ended with fresh commitment from the stakeholders to reduce conflicts, clarify and negotiate interests and improve collaboration for the well-being of both society and nature. Our hypothesis was that sustainability of forest management in a given area could be better achieved if the stakeholders agreed upon collaborative management objectives and indicators to monitor the process.

Building institutional arrangements and agreements

The C&I workshop opened another chapter for building alliances and agreements. In Ottotomo, Diaw *et al.* (2001) noted that after some villagers

moved into the reserve to clear adjacent forest patches for agriculture, the local forest officers considered this encroachment an indirect result of the workshop, which had empowered local people for the first time. However, the team benefited from the strong trust and support of the forest agency's central authorities, who allowed enough time for field verification to establish that the two events were unrelated (Diaw *et al*. 2001). There was also strong pressure from the agency to formalise the collaborative agreement with CIFOR.

In all, the local communities reacted most favourably to the workshop, which enabled them to have their voices heard and to initiate new alliances. This feedback increased the urgency of formalising agreements with the forest agency.

Establishing a collaborative work plan

A quarterly work plan was elaborated by the stakeholders in a series of brainstorming sessions, and a series of field meetings were held. The whole process was putting forests on the local research agenda and making evident the need for action research.

A second workshop on action research methods was organised (ATD 2002) and attended by the stakeholders. This second workshop again enabled sharing the basic notions and concepts of action research.

There were also ongoing reflections and discussions with stakeholders on setting up a forest management committee and its role in the ACM process.

Building frameworks for problem visioning and action

Essentially, a vision is an anticipation of an event relating to some future point in time. The villagers were not in the habit of projecting, and they typically avoided speculating on future events. To them, a visioning exercise appeared to be an abstraction, similar to the promises of the political parties, which they regarded with considerable skepticism. Implementing

a visioning exercise therefore proved to be a challenge. To overcome this, the problems identified were visualised and drawn on flip charts with local illustrations by the project team. Participants were then asked to propose solutions to their problems and means of achieving them. They used this understanding to brainstorm about the best actions to take. It was then jointly agreed that the creation of buffer zones could provide temporary agricultural lands in which agroforestry strategies would be implemented. The different types of actions and situations that might occur in the process were discussed. Participants also reflected upon the types of actions suggested and the possibilities for implementing them.

Results

Conflict identification and resolution are not side activities to be undertaken before returning to the main process of natural resources management. Rather, they are central to the process itself. Our experience so far is that the process moves forward significantly at points where diverse interests meet and differences are resolved.

Involvement of all concerned stakeholders

In facilitating collaborative forest management, the project had to support contacts and discussions among the stakeholders. In mid-2000, the team's main functions were to help circulate information among the stakeholders, spark dialogue and provoke discussion on the phenomena and trends affecting natural resources and the measures needed to avoid depletion. Through such initiatives, the ACM research team succeeded in creating conditions favourable to a first meeting among all the stakeholders, held 15-17 February 2001. A total of 40 participants attended, representing the local communities (22 individuals), local government (2), forest agency at local and national levels (5), other local administrative departments (4), ATD (2), and the ACM research team (5). The ACM research team facilitated the meeting, and the debates developed in an open and candid spirit. In particular, the representatives of the local communities freely

expressed their views and contributed to the definition of problems, issues and solutions.

Subsequent meetings organised in research villages were well attended. In Ottotomo village, attendance increased from 14 to 21; in Nkolbibanda, it increased from 15 to 26; and in Koli, from 12 to 16. Since then there has been a steady rise in attendance. In the study villages, the emphasis was initially on collaboration within the communities, and only after that was achieved did it make sense to address collaboration between the community and others.

Joint action among stakeholders

In meetings with the forest agency, ATD and ACM researchers, the communities were urged to take action on encroachment from illegal forest exploiters and to report instances immediately to the appropriate authorities. Several cases have since been reported, either verbally or in writing. In July 2003, for example, a village representative of Nkolbibanda reported in writing an illegal harvest of bubinga in the area. Other illegal cases have been reported in the daily newspaper: *La réserve forestière d'Ottotomo victime d'une exploitation abusive* (Cameroon Tribune 2002a) and *La réserve forestière d'Ottotomo en voie de disparition* (Cameroon Tribune 2002b). The communities have consequently gained some confidence in the forest agency and vice versa, and the two parties now work more closely together.

Improved communication among stakeholders

To overcome the problem of poor communication, the stakeholders jointly agreed to have communicators who would report to the villagers and to the facilitators. The village communicators—one for each village—have been jointly selected and are being supervised by ATD (Jum *et al*. 2001). These communicators are using the ACM approach, monitored through village feedback reports or minutes to the ACM facilitators. Usually, the reporting reflects ideas that are within ACM perspectives. To promote conservation awareness, village resource centres have been created in five

of the villages; they are supplied with newsletters, books, field reports and minutes of meetings and are supported by ACM researchers, the forest agency, ATD and other environmental NGOs. Because the literature serves only the literate population, the communicators perform a more traditional role of information dissemination to both the literate and the illiterate. Making sure that all the villagers receive information is therefore important.

Trust and collaboration

One of the keys to multiple stakeholder management is establishing an atmosphere of trust among the parties. Jum (2001) points out that the wide range of stakeholders and the resultant conflicts in Ottotomo necessitated the need for participatory approaches to resolving local issues.

The difficulties encountered in engaging the communities in meaningful dialogue persuaded the team to conduct more facilitation in the villages. Researchers helped people share ideas and views during village meetings and informal discussions. Thereafter, the issue of collaboration between the communities and other stakeholders was addressed. For example, the mistrust between the forest agency and the local communities had been going on for a long time. The first stakeholders' workshop was an opportunity to rebuild the relationship between the agency and the communities. Similar workshops have been regularly organised to foster collaboration. To enhance collaboration, the research team signed formal agreements with the forest agency and with ATD.

Box 3-1. Engaging in positive dialogue with stakeholders

"At the beginning, all attempts by ACM researchers and local animators to promote dialogue were met with disdain and hostility. Only after a second attempt to explain the research objectives did a real dialogue begin. All the villages in the area were visited, and repeated discussions and debates occurred over many months. At the same time, meetings were held with all the stakeholders, such as government officials, the forest administration and representatives of *Association Terre et Développement*, a local NGO. These groups proved less difficult to engage in a positive dialogue than the local communities." (ACM Researcher explained)

Field meetings and workshops

The number of activities, including field meetings, workshops and retreats, indicates stakeholders' commitment and interest in collaborating with the ongoing research. For instance, in 2000, eight field meetings were organised in the pilot villages to understand the local context. In 2001, six such field meetings were held to set the scene for the communities' mediation and negotiation activities. This was followed by one internal workshop on criteria and indicators with all the stakeholders. Later, two workshops on methods were held, followed by two internal retreats. Beginning in 2002, another eight field meetings focused on building a framework for problem visioning and action. During this period the ACM team was spending most of the time in the villages facilitating discussions (formal or informal) aimed at enhancing people's visioning and action.

In 2000, 13 planning and preparatory meetings (including meetings relating to institutional arrangements and agreements) were held with ATD, the forest agency and other government administrators. In 2001, there were seven such meetings, as planning strategies (including establishing a collaborative work plan) took effect. In 2002 and beyond, nine meetings were conducted for problem visioning and action.

Capacity building

Workshops, meetings and retreats were usually open to most of the collaborators, including village representatives. In 2001, one workshop on participatory planning, two on methods and two internal retreats were organised. Issues such as updates on activities, site strategies, action research, evaluation of stakeholders' forums, evaluation of context studies, methods, documentation, field diaries and the ACM reporting format were frequent topics. Women as well as men manifested their interest in local developmental issues, and one result was the election of a Nkolbibanda woman as a member of parliament for the 2002-2007 term. It was felt that she could bring the problems and interests of the area to a higher policy level. Women are also being introduced to agroforestry strategies and intensive methods of farming, an initiative of the forest agency intended to enhance their capacity to limit farming expansion within the forest reserve.

Current situation

The reserve is now offering new prospects for its dwellers based on the outcome of a series of participatory visioning workshops facilitated by the ACM team. However, any additional demands for farmland for the local communities must still be negotiated with the state forest agency. Recently, the agency and other actors agreed on the creation of a buffer zone within the reserve to provide additional farmland and cash income from agricultural activities (Jum 2003). Agroforestry practices would be allowed within the zone to bring new resources to the community, but new skills will be necessary; the agency has pledged to provide technical support.

Three policy processes are being implemented in the area: Decentralisation, local governance and the poverty reduction strategy. On decentralisation, Jum (2003) observes that the state is ready to discuss the possible transfer of management responsibilities to the local communities. This could accelerate local governance processes (already part of the negotiations for the oil compensation benefit between the state, the Cameroon-Chad oil pipeline project and the local communities) for natural resources management, and help reduce poverty. Furthermore, local communities anticipate greater public accountability as one outcome of the management of the oil pipeline project compensations. This process is already under way, and for the first time information on the incomes of local councils is being made available.

Significant challenges still remain. The role of the newly reconstituted forest agency in management of the reserve and the buffer zone initiative remains unclear. The predecessor agency had developed a proposed work plan and mechanisms to ensure sustainable management of the buffer zone and protect vulnerable areas within the core of the reserve. Still, what three years ago seemed an almost impossible enterprise now appears to offer the prospect of significant benefits to rural communities, as well as many lessons to society at large.

Discussion

The project's conceptual framework has worked so far. Valuable insights have been gained on working with stakeholders, the importance of improved communication, building trust and collaboration, the central nature of conflict management and facilitating joint actions among stakeholders. With facilitation, the stakeholders in most cases have found an acceptable ground for collaborating. For instance, the forest agency staff now works more closely with the local communities. The extent of stakeholders' participation in workshops, fora and field meetings provides clear evidence of commitment and interest. Perhaps the central lesson about improving the collaborative management process was the strategic choice to initiate discussions and action in the local communities before convening larger groups in different combinations as appropriate.

Action research is a long-term process, and if the processes continue, there will be questions about how social and human capital can be translated into natural, physical and financial capital and whether causal relationships between variables exist in this complex environment, especially looking at the contribution of the so-called slow variables (e.g., the enabling social and political environment) and the dynamics of change in fast variables (e.g., social networks and associated norms). Furthermore, there are questions of scaling up and out, issues of understanding the nature of facilitation and catalysation, especially in institutional cultures and the behavioural patterns they induce.

In sum, the Ottotomo case demonstrates that action research has led to improved collaborative management, positive outcomes for forest-dependent communities and conservation because the following conditions were established:

- all stakeholders were involved throughout the process;
- stakeholders were encouraged to identify their problems;
- stakeholders were committed to finding solutions to their problems;
- the facilitation team guided and helped the parties, especially during the negotiation phase;

- » collaboration was first established with the community and later between the community and others stakeholders;
- » communication was enhanced within and between stakeholders; and
- » the process of visioning, although unfamiliar and difficult at the outset, created options for negotiation and progress.

De Koning (Chapter 8 of this volume) discusses how broad-based and vertically inclusive negotiations yielded benefits for all parties in Ottotomo and how the state forest agency came to depend on the communities to meet its conservation objectives.

The Ottotomo case demonstrates action research as a complex process; one in which there is need to be constantly attuned to what is happening in the communities, and to be able to respond flexibly to changing circumstances or new information that will enhance collaborative management. Action research, which stresses experiential learning, has provided a methodology that is conceptually and operationally consistent with collaborative objectives. Through action research, many lessons have been learned about multiple stakeholder interactions. Where there is uncertainty about what to do next, or even what to do first, action research provides a way to begin and to avoid paralysis because everything is not known in advance (Fisher and Jackson 1998). It is about learning to do it by doing it. In situations where outcomes will always be unpredictable, it enables mistakes to be detected and different actions to be taken. The Ottotomo experience demonstrates the potential for action research to establish collaborative platforms. That a wide group of stakeholders participated in the ACM process that was being studied—identifying the research issue (problematic situation), collecting data, visioning actions and planning action cycles—gives the research project hope that it is on the right track with ACM, and the stakeholders themselves have embraced these approaches in their routine activities. Preliminary analysis of the ACM processes on the ground seems to confirm that the Ottotomo local communities can effect changes in management practices and engage in policy dialogue.

Endnotes

[1] Adaptive Collaborative Management is a multicountry programme that is an initiative of the Center for International Forestry Research (CIFOR). It involves improving the shared, institutional learning that takes place among stakeholders (necessarily including communities) involved in forest management.

[2] Because ONADEF has been renamed ANAFOR, we will refer to the department as the state forest agency.

[3] Ottotomo Forest Reserve falls into two administrative units: 'groupement' de Nkong-abok and 'groupement' de Nkongmeyos.

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A forest village in southern Cameroon

Chapter 4

Council forests: The case of Dimako

Samuel Assembe Mvondo and Francis Sangkwa

The Cameroonian model of council forests introduced by the 1994 Law is undoubtedly one of the major innovations in the country's forest resource management policy (Nguinguiri 1997; Oost 1999; Oyono 2004). The creation of council forests is one of the specifications for the transfer of forest resources management powers from the state to local authorities—that is, councils (Karsenty 2000; Bigombé 2006). To some analysts, this new political strategy constitutes a departure from the centralised management of natural resources found in the countries of the subregion as a whole and in Cameroon in particular (Bigombé 1996; Assembe 2005). However, council forests, which are considered models for a vertical sharing of management powers and responsibilities over natural resources, were already common and the subject of experiments in other regions (Wittman 2002; Ferroukhi *et al.* 2003). The institutionalisation of this model in Cameroon seems to meet the requirements of ongoing decentralisation processes in general, such as the reorganisation of the state and its services on the one hand, and the reinforcement of autonomous regional authorities through the devolution of responsibilities in certain domains on the other.

This chapter briefly reviews the actions and summarises the council forests implementation process, using the Dimako Council Forest as a case study. Our thesis is that the implementation process and development of council forests in Cameroon are complex, in part because of the way that local actors have interpreted the concept. In addition, there are administrative and legal constraints and local sociopolitical hurdles. Understanding and dealing with this complexity will be crucial to the success of any 'experiment' of a new policy. In this chapter we stress the importance of developing such an understanding, since we believe that learning is essential for adapting and improving policies.

Whatever definition of decentralisation is adopted (e.g., Rondinelli and Cheema 1988), its attraction rests mainly on the assumptions of an efficient government that responds to local diversity and the need for participation in local democracy and development expressed by the people.

The Cameroonian council institution has antecedents. According to Law No. 74/23 of 5 December 1974, on organising councils in Cameroon, 'the council shall be a decentralised public authority and a public-law corporation'. These provisions are fulfilled by the 1996 Constitution, which considers councils one of the two decentralised political institutions of the country. The council is a type of local government at the grass-roots level within a context characterised by Jacobinism, or a strong centralised state. Paradoxically, public opinion still considers these local authorities mere extensions of the central government that provide local administrative services. People regularly solicit the services of these 'local governments'. Numerous demands for council services seem to justify the allocation of resources to ensure the effective autonomous functioning of councils under the supervision of the central administration. The state has therefore given the councils both public and private property, which is one of the main sources of council revenue. As apparent in speeches made by public authorities, council forests in Cameroon are used to fill council coffers (Mongui 2000) and ensure the sustainability of forest resources across the country.

According to Section 30 of Law No. 94/1, a council forest is 'any forest that had been classified on behalf of a local council or has been planted by the local council'. Only the first type of council forest will be examined in this chapter. To obtain the authorisation to carry out such a classification, any applicant public authority must first complete several costly social and technical operations. This chapter finds that the initiatives and actions relating to the classification of council forests by local authorities are bogged down by many operational constraints.

The Dimako Council Forest

The Dimako Council Forest is located in the Dimako Subdivision in Upper Nyong Division of the East Province of Cameroon. This forest, with an area of 16 240 ha, is subdivided into five five-year logging units. The documents classifying the forest on behalf of the Dimako Rural Council

specify that the forest be used for timber production only. Dimako, a semidegraded dense humid forest, is dominated by ayous *(Triplochiton scleroxylon),* fraké *(Terminalia superba),* moabi *(Baillonella toxisperma),* assam *(Uapaca guineensis)* and raffia palm *(Raffia bookeri)* (Mekok 2001). There are eight villages located in this forest area.

The Dimako Rural Council has a population of about 15,000 (Mongui 2000) located along the Dimako-Bertoua, Dimako-Mbang, Dimako-Kagnol and Dimako-Doumé highways. There are 17 villages and 1 urban centre. The Dimako Rural Council is ethnically diverse, comprising three main ethnic groups with an unequal population distribution: the Bakoum (majority) and the Pol, who belong to the Bantu ethnic group, and the Baka Pygmies.

The local economy, which depended on the timber harvesting activities of the Société Forestière et Industrielle de la Doumé (SFID) in the early 1990s, has now turned back to farming, hunting, small-scale logging, fruit collection and gathering of other forest products. This change, partly due to the relocation of the company's activities following exhaustion of local timber supplies, has turned to the advantage of the region of Mbang. Taxes, which depend on the level of local economic activities, constitute the main source of revenue for the council.

Early activities towards the establishment of the Dimako Council Forest, in particular multiresource inventories, were implemented within the framework of the Dimako Aménagement Pilote Intégré (API) project and financed by the Coopération Française. This project aimed to (1) promote rational exploitation of forests within the framework of a management plan; (2) contribute to the control of swidden agriculture through rural development activities; and (3) undertake research activities on forests and logging techniques (API 1998). The project began in 1992, before the 1994 forest legislation was enacted, and ended in 1996, shortly after it took effect. Because some of the project's objectives were not met, both partners—Cameroon and France—set up a new initiative, Projet Forêts et Terroirs. This project ensured the actual establishment of the Dimako Council Forest, the very first in Cameroon.

Local interethnic relationships

The political organisation of the Dimako Rural Council is influenced by the size of the population of each of the three main ethnic groups and the relationships amongst them. The Bakoum people are the most numerous and were the first to settle in the present site (Elong 1984). The Pol are second in terms of population. They are said to have migrated from the neighbouring Mbang region at the beginning of the twentieth century. The Baka Pygmies, the minority, were deported from the southern part of the forest to the present site by Christian missionaries, the Bantu and the local administration in the mid-1970s. The administration has forced these forest nomads to settle along the roads of the region, but the Pygmies have not been able to adapt to living in villages administered by a village chief.

Interethnic relationships in this region reflect the demographic situation. The Bakoum and the Pol belong to the larger Bantu ethnic group. In this region, these peoples have maintained an 'ideology of domination' (Guillaume 1989) characterised by a master-slave relationship with the neighbouring Pygmies (Oyono 2004). The result is a relationship of superiority and inferiority, of condescendence and scorn, that contributes to the marginalisation of the Pygmies.

The composition of the rural council reflects that social system and the quasi-sociopolitical exclusion of the Baka Pygmies (Bigombé 2002): all 25 municipal councillors belong to the Bantu ethnic group. The Pygmies, in response, appear to have rejected the dominant sociopolitical system by their passive participation in meetings or nonattendance altogether. In such a political organisation (Kekes 1993; Anderson *et al*. 1998), it is difficult to defend and take the specific interests of the marginalised group into account (Assembe 2006). The informal systematisation of discriminatory interethnic relationships perpetuated against the Baka has been reinforced by the Council Forest Management Advisory Committee: all the committee members, representing the 17 villages, are also of Bantu origin. Even villages that are entirely or partly Baka are represented by Bantus. Thus the Baka have no voice in local and national decision-making

spheres. Their absence from decision making may undermine the work of the political institutions.

ACM intervention

In 2000, CIFOR launched its Adaptive Collaborative Management (ACM) research programmes for tropical forests in Cameroon and chose the Dimako Council Forest as a research site. The study of the local context carried out by CIFOR revealed the ethnic problems and led to expressions of concerns by the local communities over land ownership and access to the benefits accruing from the commercial exploitation of the forest. CIFOR's researchers and facilitator focused on the 'renegotiation' of the portion of forest included in the council forest area (Assembe and Oyono 2004; see Chapter 8 of this volume).

Methods and results

The study involved contact with other projects, particularly the Forêts et Terroirs project, with follow up contacts and site background documentation. Interviews and focus group discussions were conducted with some stakeholders, particularly the local communities, the forestry administration (MINEF), the Forêts et Terroirs project technicians, local elites and municipal council authorities, with particular references to the process involved in the creation and implementation of the council forest.

Forest classification process

The legal classification of a forest begins with a series of operations intended to clearly distinguish the permanent public property of the state from the portions reserved for farming and logging by the local communities. In the case of the Dimako Council Forest, the operations were carried out with the technical assistance of the Forêts et Terroirs project. The operations consisted mainly of raising awareness in the local communities, collecting socioeconomic data in each of the 17 villages, drawing up a map detailing the various uses of the forest to be classified, producing digital cards using

a geographical information system (GIS) and holding general consultative meetings to specify the exact boundaries of the forest stand. This work was fraught with difficulties.

Administrative drawbacks

Administrative problems were related to awareness-raising in the community. Awareness-raising had to be carried out in each of the villages by the 'Forêts et Terroirs' technicians with the support of the administrative authority. In this respect, the latter tried to impose an administrative definition of a village. In other words, the existence of a chiefdom in a locality had to be considered as a basis for the definition of a village. Unfortunately, there are large villages such as Grand Pol, which extend over an area of more than 10 km, and are subdivided into several hamlets. Given that it was difficult to bring together all the inhabitants in this type of village, it was therefore logical to persuade the administrative authority to accept the definition of a village, which in reality corresponded to a hamlet.

Perceptions of ownership

The classification of the Dimako Council Forest began when the Ministry of Environment and Forests issued a circular requesting each economic operator to pay (on an experimental basis) 1000 CFA F/m^3 (USD 1.40) of timber collected to local villages located in a forest zone that had a licence to sell stumpage. The local people did not understand the importance of the council forest because the imminent issuing of a licence to carry out logging activities in their localities could generate revenue quickly and directly. Furthermore, the fact that the mayor of the locality was the manager of a logging company made the situation more complicated. The local people therefore considered the decision to set up a council forest a plot by the municipal authority to obtain benefits from the forest for personal purposes.

In particular, the Pol people did not understand why the state had decided to take 'their' forest and make it the property of the council. Concomitantly, the Bakoum of Kandara Village (in the northern part of the council forest)

had just received close to 4 000 000 CFA F (USD 6200) for a timber sale (based on a sale of standing volume, *vente de coupe*). It was therefore difficult to convince them of the merits of the council forest (Sangkwa 2000).

Procedural difficulties

The classification procedure described in Decision No. 1354/D/MINEF/CAB of 26 November 1999 has several inconsistencies, mainly in the composition of the team that conducts the operations in the field. It was therefore necessary to adapt it to the local context.

In the case of the Dimako Council Forest, the inventory of timber and non-timber resources and the consideration of socioeconomic data led to the drawing up of a management plan. In this document, the Dimako forest is divided into three management classes (Mekok 2000) corresponding to the geographical distribution of activities: (1) production forests, covering an area of 14 950 ha; (2) agroforestry, 466 ha; and (3) a research forest, 466 ha.

All the operations relating to the classification and design of the management plan encountered problems, such as land claims or limits, the local communities' perceptions of the council forest creation project and the integration of plantations within the classified area (Assembe and Oyono 2004).

Perceptions of the council forest

The stakeholders in the Dimako Council Forest—the rural council and the local population—have unequal powers. The council is the dominant party that manages council property. The local people, who are the custodians of the historical rights to the forestry resources, constitute the weaker party. Although this distinction is debatable from the legal viewpoint, it nevertheless illuminates how the local people perceive the council forest. In this respect, the conscious representations of the people with regard to this project reflect the social heterogeneity of the locality and their divergent interests. To the Pol and Baka people living adjacent to the

forest along the Dimako-Kagnol highway, the creation of a council forest is a violation of their user rights. They therefore hope to receive sizable compensation and obtain privileges with regard to revenues derived from the exploitation of this forest.

In contrast, the mainly Bakoum population living farther away from the forest, along the Doumé-Dimako-Bertoua highway, responded favourably to the decision to classify this forest zone as a council forest. They wish to obtain benefits equal to those of the villagers living nearer to the forest. Lastly, the primarily Bakoum and Baka inhabitants along the Dimako-Mbang highway expressed reservations about the classification of this forest as a council forest. Their reluctance is due to the integration of their farmland (which stretches from the road to the Abondja River) into the agroforestry component of the council forest. These reservations were presented formally in the consultative meeting held on 7 December 1999, in the presence of the administrative and municipal authorities. However, the latter did not take these concerns into consideration.

Classification of village plantations as council forests

The classification of the Dimako forest on behalf of the Dimako Rural Council includes within its boundaries village plantations (food crop and cocoa farms) in the Nkoumadjap-Nguinda village and even the farms of individuals who live in the central town of Dimako. The classification seems not to have taken into account the views of the local plantation owners, who wanted the boundaries extended beyond the immediate farming zone. The demarcation of the forest boundaries has led to conflicts between the inhabitants and the council authorities. The victimised population could allow their farms to be expropriated after the harvesting of fruits, without any form of compensation, or expropriated before the harvesting with a promise of imminent financial compensation: those were their only options. The classification decision applied to everyone without distinction, and depriving the people of farmland and farm produce had the same impact on all the victims. Moreover, the legal procedures for expropriation for reasons of public utility, which should have applied in this situation, were not followed. The specific interests of these injured

parties were sacrificed for the common good; the creation of the council forest (Assembe and Oyono 2004).

Legal and administrative constraints

The creation of the Dimako Council Forest exposed a number of flaws in the application of the 1994 Law: the lack of legislative regulations regarding council forests, the difficulties inherent in the obligation to register council forests, administrative bottlenecks due partly to the absence of deadlines for the processing of files and the cost of these various stages.

Legislative vacuum

The provisions of Decree No. 95/531/PM of 23 August 1995 to determine the conditions for the implementation of forestry regulations oblige village communities applying for the classification of a forest for community purposes to choose a type of organisation from the legal entities in force in Cameroon (Vabi *et al.* 2000). The central state has remained silent on this subject in the case of council forests. This gap in the law thus gives applicant councils the right to set up an internal entity adapted to the specific sociopolitical realities of their areas. In this respect, the inability to determine a specific entity can be interpreted in two ways, as the state's attempt to respect the functional autonomy of councils, or paradoxically, as the cause of the proliferation of non standardised arrangements from one local authority to another. The freedom of action enjoyed by local authorities is based on the subsidiarity principle, according to which a decision should be made at the lowest possible level. In this line of thought, local authorities have the legal standing to prescribe norms in order to set up their own forms of organisation. Whatever the interpretation given to this gap in the law, setting up organisational arrangements to manage council forests is not an easy matter, especially at a time when the institution of the council is itself still being shaped at the national level.

The Dimako Rural Council is no exception. To overcome the problems, the council created a special unit to take charge of forest resources and made it the legal entity responsible for managing all council property. As a result, the Dimako Council Forest Advisory Committee is responsible for giving advisory opinions on all issues relating to forest resources. Its institutional arrangements—its status is likened to a special municipal council committee (Assembe 2001), and its membership comprises statutory members and representatives of the 17 villages of the area—are specific to this council, where the villagers did not trust the elected councillors to ensure the transparent management of council property. However, it should not be considered a model for other councils as they embark on the process of classifying portions of forests, since this type of organisation is experimental and its efficiency has yet to be established.

Obligation to register council forests

According to Section 30(2) of the 1994 Law, 'the classification shall determine the boundaries and the management objectives of such forest … It shall serve for the establishment of a land certificate for the council concerned'. Similarly, Section 21 of Decree No. 95/531 states, 'State or council forests must be identified and demarcated in accordance with the conditions determined jointly by the ministers in charge of lands and of forestry, and bounded in conformity with the regulations in force governing real estate, for the purpose of recording and registering them in the land register, at the expense of the beneficiary'.

According to Kamto (2000 p. 9), these legal provisions are in line with the logic of the 1974 ordinances to determine land regulations. The decision to classify a forest on behalf of a council only determines its boundaries and management objectives. The registration of this area, on the contrary, is effected by the transfer of ownership from the state to the applicant authority. The resulting difficulty faced by the new owner is the lack of financial resources. The registration and demarcation of boundaries are very costly and vary with the area to be registered.

For the Dimako Council Forest, with a total area of 16 240 ha, the cost estimated by the council authorities is 300 million CFA F (about USD 430 000). This amount is to be paid into the public treasury for determining the boundaries and registering the forest. Given the current poor financial situation of the council, whose budget is about 20 million to 30 million CFA F/year (about USD 43 000), it will not be possible to obtain the rights to own the forest. This is why the project has been temporarily shelved. The strategy adopted by the councillors consists of self-financing the work with the help of revenue accruing from the sale of the first standing volume of the council forest. This will be done without any external financial support or taking advantage of the moratorium that the Ministry of State Property and Land Tenure (MINDAF) has granted to local councils on the payment of fees, given the general and public interest mission of council forestry and the wants of the population.

Delays in processing of files

It is a truism that administrative delays are rife in all Cameroonian administrative services. The Ministry of Forests is no exception to this rule (Assembe and Oyono 2002). Members of the public who solicit its services have to wait for very long periods. Delays in the processing of files are due mainly to the absence of deadlines in the regulations, and thus civil servants are not obliged to respond promptly.

The 1994 Forestry Law, for example, specifies no deadline for the processing of applications for council forests. The Dimako Rural Council faced this problem during the two phases of the setting up of this forest.

First, after the socioeconomic and technical work of preparing the classification documents and their submission to the Ministry of Environment and Forests, the Forêts et Terroirs project had to push for the dossier to be processed and sent to the prime minister's office. The council authorities then had to wait a year for the classification decree to be signed and promulgated. Second, the Ministry of Environment and Forests took an entire year to approve the management plan and the application for authorisation for the first standing volume.

Such administrative bottlenecks are drawbacks to local development and to some extent hinder the adoption of this development and participatory management tool by the local people and their authorities. Discouragement and lassitude are apparent in the pessimistic declarations by the local people, who are eager to enjoy the fruits of their labour.

Costs of setting up council forests

The costs for creating the Dimako Council Forest are presented below. For its classification, the cost model for each stage was adopted and made operational by the Forêts and Terroirs project. The costs related to management were more difficult to calculate because some studies, such as inventories, were made at the time of the API Dimako project, which preceded the Forêts et Terroirs project. In the absence of full documentation, official Cameroonian costs estimates are used in this chapter.

The cost of classification may appear high, but the Dimako Council Forest is an experiment in Cameroon, and when the technicians of the same project embarked on the classification of forest management units 10 046, the average amount per village dropped to 137 000 CFA F (USD 196).

Thus, in total, the classification and management work for establishing the Dimako Council Forest cost about 28 497 000 CFA F (USD 40 710). These funds were provided mainly by the French Co-operation, the main financial donor of the Forêts et Terroirs project. In fact, without the financial support of this foreign partner, the local council would not have been able to carry out the necessary work. To some extent, the same situation obtains with most other initiatives in governance and management in this domain. The financial requirements make the process of setting up council forests difficult and almost unrealisable for many rural councils. As a consequence, local authorities are left at the mercy of private donors and therefore relinquish their autonomy in decision making: every donor has its own requirements, which sometimes run counter to the objectives of local councils. The lack of qualified forestry staff available to local councils reinforces their dependence on external expertise, while raising the costs of meeting the requirements.

Table 4-1. Cost estimates for classification in CFA francs

Stages	*Villages*	*Cost/village*	*Total*
Preparation of technical note	SDIAF[1]		
Public notice	SDIAF		
Consultative meeting		Lump sum	200 000
Awareness-raising of administrative and religious authorities and local elite			400 000
Awareness raising of population[2]	17	95 000	1 615 000
Socioeconomic survey team (17 villages * 2 days/village * 3 persons * 10,000/ persons/day)	34	18 000	612 000
Presentation meeting	17	30 000	510 000
Work of classification commission (*ad hoc* meeting)		Lump sum	500 000
Preparation of texts to be submitted to prime minister			300 000
Total classification			4 137 000
Average per village			243 355

Table 4-2. Management costs

Items	*Surface area*	*Unit cost*	*Total*
Inventories	16 240	1 000	16 240 000
Ecological complement	16 240	100	1 624 000
Management plan	16 240	400	6 496 000
Total management			24 360 000
Total classification and management			28 497 000

Discussion and analysis

The establishment of the Dimako Council Forest illustrates some of the difficulties faced by local institutions seeking to use council forests as an instrument for local development and sustainable management of their resources. Indeed, people are objecting to the administrative and legal constraints, the local sociopolitical dynamics, and the forest classification work and articulation of management plans. The high financial costs and the lack of qualified local expertise currently hinder the development of

council forests. The 1993 zoning plan of southern Cameroon envisaged the creation of 16 council forests, and today about 19 forest blocks of the permanent state domain are about to be classified to the benefit of some councils. The interest of local institutions in council forests supports the thesis that the 1994 forestry law is considered innovative (Nguinguiri 1997; Ekoko 1998), but paradoxically, implementation has lagged: to date, only three council forests have become a reality.

Some authors (Bigombé 2003) allege that decentralised forest management is actually mismanagement. The cases of the rural councils of Djoum, Ebolowa, Ndélélé and Mbang and the process of creation of their respective council forests confirms this assertion. Even where funding is not a constraint, as in Djoum, Ebolowa, Mbang and Ndélélé, which had earnings from forest taxation fees (Nouvelle Expression No. 1127), a combination of problems—including disinterest, mismanagement and other factors that applied in the Dimako case—have served to prevent the establishment of council forests.

There are also contradictions in the attitude of the central administration authorities. Indeed, their support for implementing council forests seems to have been limited to the rural council of Dimako. Since the Forêts et Terroirs project phased out in June 2001, no other major initiative in terms of capacity building, financial support or material allocation has been available in this domain. Since the local council is the extended arm of the central state, the support of the central authorities would be expected in the dialectical connection between the two entities. It is therefore imperative that the central authorities improve the implementation process for this forest ownership type and encourage the participation of NGOs and external donors, which currently have limited interest in this sector.

Moreover, once communities have surmounted the hurdles discussed in this chapter and established council forests, they will certainly face challenges linked to governance of their forests. In fact, as Bigombé (2003) observes in his paper on the management of annual forest fees, governance in councils is characterised by non transparent management of the local communal

heritage, conflicts of interest, abuse of communal property, absence of accountability to the electorate, violations of legislation and little impact on local development. Council forests run a real risk of duplicating such models of poor governance. Early reports on the management of income from the exploitation of the Dimako Council Forest are alarming (Assembe 2006). Hence, local communities, supervisory administrations and the civil society should keep an eye on the management of council forests.

Conclusion

This case study shows the actual limits and difficulties in the decentralisation process of forest resources management in Cameroon. It appears that policymakers took very little account of the realities of council institutions in Cameroon before writing the forestry law and the related documents. This explains the gaps between the 1994 legal provisions and the implementation process and the need to readjust and adapt to local realities.

Council forestry should be considered an excellent tool for the decentralisation of the management of natural resources and for encouraging the participation of all components of the population (Ribot 2002). To bring effective councils into life, we make the following recommendations:

- The procedures for the creation of council forests should be clarified, simplified and published in a document other than that regulating forest management units, perhaps as a 'Manual of the Procedures for Establishment', and 'Standards for the Management of Community Forests'.
- The classification of council forests should emerge from consensus reached during negotiations over boundaries, and involve the stakeholders who have direct land interests (two groups that may not necessarily be convergent).
- The Ministry of Forests should reduce the costs for the creation of council forests by granting moratoriums for work relating to their

registration and by making qualified staff available to needy local councils. Foreign donors and the state should provide financial support to councils applying for council forests.

» Local authorities that receive forestry dues and wish to set up council forests should reserve part of these funds to cover operations related to the council forests.

» The use of a council forest should be managed by a committee set up for that purpose rather than by third parties, to ensure the sustainability of forest resources and maximise the resulting financial dividends and jobs for local inhabitants.

» Revenue accruing from the exploitation of forest resources should be distributed equitably to ensure social justice for all stakeholders.

Endnotes

[1] The Sub-Department of Forestry Inventories and Management developed the technical note and public notice.

[2] The 95 000 CFA francs per village represents the daily allowance of the awareness-raising team members.

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Showing the way:
The communal
work of women

Chapter 5

Community forests: Reconciling customary and legal concepts

Mireille Zoa

Since decentralisation was introduced into Cameroon forestry policy in 1994, local participation has become a primary strategy for achieving the sustainable management of tropical forest ecosystems and improving rural livelihoods (MINEF 1995; Crook and Manor 1998). In fact, rural communities are crucial actors in sustainable forest and natural resources management in Cameroon. The creation of community forests, defined as forest space given to and managed by local communities, is a major innovation (Fomete 2001), aimed at increasing the role of local institutions in the fight against poverty and the protection of biodiversity. This 'socialisation of forest policy' was based on the institutional and regulatory mechanisms set by Cameroon's 1994 Forest Law (MINEF 1998). However, community forestry in Cameroon is marked by administrative constraints on the allocation of community forests, weaknesses in the local communities that manage the forests, illegal logging and other problems. Consequently, the present management of community forests, based on logging and revenue sharing, cannot be considered sustainable and beneficial. The same holds for tropical forests in general (Bahuchet *et al.* 2000).

In Cameroon's forested region, limitations to implementation of the community forest concept are associated with, amongst other factors, limited social representation (Diaw and Oyono 1998b) in a context that requires collaborative management, partnerships, negotiation and the valorisation of the productive and economic values of customary lands *(terroirs)* (Lescuyer *et al.* 2001; I&D 2001). In fact, the issue of the sustainability of community forests in southern Cameroon is mainly related to institutional aspects of the community (Etoungou 2002; Vabi *et al.* 2000), land tenure status (Kamto 1996) and the economic value of forests (Fomete 2001). Moreover, the customary principles of access, control, use and sharing that govern the management of *terroirs* (Zoa 1998; Diaw 1997; Diaw and Oyono 1998a; Le Roy 1996) are not well integrated.

This chapter suggests that the sustainability of communal management systems requires the reconciliation of modern legal constructs with

customary perceptions of forestland, natural resources and the community. In other words, a pluralistic approach to community forest management, based on an inclusive outlook, enhances the social sustainability of community forests and becomes an instrument of local governance and sustainable economic development.

We also address the social adaptability of decentralised forest management policies through a comparative analysis of customary representations of local actors involved in community forest management and legal representations of forestland, resources and community. The analyses of customary and legal representations will be followed by an analysis of partnerships in the commercial exploitation of timber resources in community forests. We begin, however, with a look at community forest trends in Cameroon and a description of the study site.

Community forest trends and inventory

According to Cameroon's Forest Law, the establishment of a community forest begins with a community's request for forestland; the land is then reserved, a basic management plan is developed, logging operations can begin, and the resulting revenues are managed. Beginning in 2001 to 2006, community forest reforms were launched by the forest administration. These reforms—called phase 2—were marked by the revision of the management plans (phase 1). In fact, the process of revision has been long, and it is not yet complete.

Demand for community forests has increased significantly. Between 2003 and 2004, the requests for community forests equalled the requests for commercial forest management units, although community forestland accounts for much less area than forest management units. In fact, Cameroon's initial Forest Zoning Plan allocated only two percent of the national estate to community forests (Etoungou, 2002). In 2004, national

demand for community forests increased three to four times compared with initial demand in 1996 (Figure 5-1). As of 2008, the total area requested for community forests in Cameroon is at least 1 306 708 ha (Table 5-1).

The potential for community forestry in the East Province is higher than elsewhere in the country. This is the main community forest area in Cameroon, with most of the national reserves (46 percent) and a significant number of approved management plans (30 percent) (see Table 5-1).

Table 5-1. Community forest statistics per province

Provinces	*Files*	*Forest reserved*	*Forests with approved management plans*	*Area requested (ha)*
Adamaoua	2	2	0	7 002
Centre	107	31	65	446 612
East	141	63	50	447 866
Far North	8	3	3	25 564
Littoral	16	1	9	77 467
Northwest	22	8	11	15 936
West	2	0	2	7 002
South	73	34	22	112 788
Southwest	18	8	4	55 527
Total		**137**	**163**	**1 306 708**

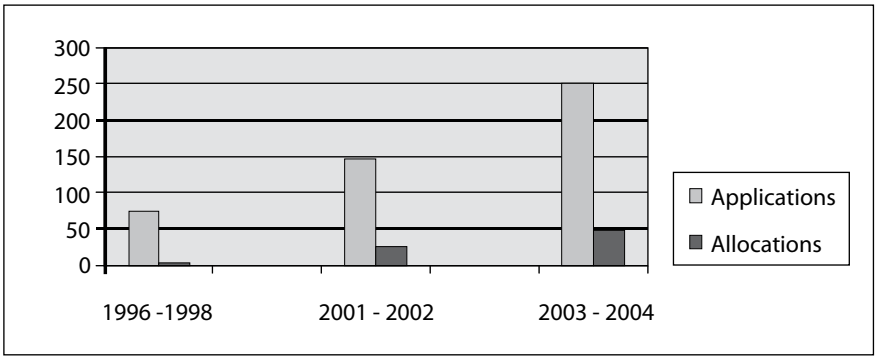


Figure 5-1. Community forest trends in Cameroon, 1996-2006
Source: Falconer et al. 2004

Table 5-2. Community forests under exploitation, 2005-2008

Year	*Community forests under exploitation*
2005	37
2006	21
2007	51
2008	30

However, despite widespread demand, few community forests are producing timber. For example, from 2005 to 2008, only 35 community forests were in production (Table 5-2). This is in part because of the long administrative process for creating a community forest, which takes an average of 18 months. Nevertheless, the most important constraint is the lack of means by those wanting a community forest. The process is expensive, and two-thirds of the cost comes from external funders (Bigombe-Logo and Etame 2005).

Furthermore, current management of community forests, based on logging and sharing of revenue from logging activities, has not yet achieved the political aim of the initiative, which is to ensure the well-being of communities and promote environmental health (Diaw *et al.* 2001; MINEF 1998). In Kongo and the Lomié region, in general, local populations involved in community forest management indicate that they have been left to fend to themselves, discouraged and poor (Efoua 2001). Also, illegal logging used to be rampant in these communities' forests while boundaries and logging regulations were ignored. This has created conflicts of interest and social disorganisation. In some cases, management plans were suspended—as was the case of the Kongo community forest in East Cameroon in 2001.

Study area and approach

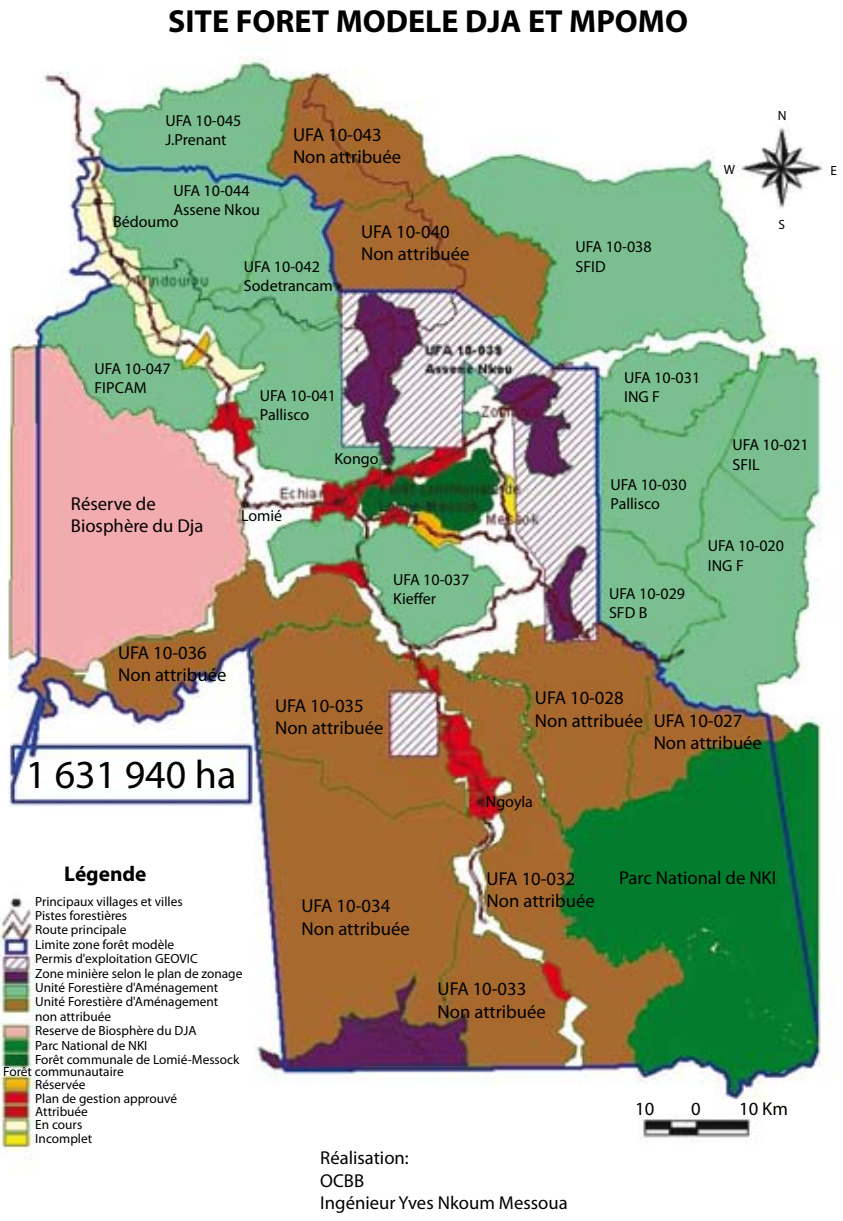
Lomié is a forested region in southeastern Cameroon; on the eastern flank of the Dja Biosphere Reserve in the Haut-Nyong area (classified as one of Cameroon's two most remote and least populated rural localities). The

area comprises about 12 000 km², two-thirds of which is forest. Most community forests here are adjacent to forest management units (production forests) (Map 5-1). There are also a council forest, forest reserves (the Dja wildlife reserve and a planned hunting zone) and lands used for traditional activities (hunting, fishing, agriculture and gathering). The result is a variety of management approaches (Assama and Pa'ah 2004). In 2005 the region became one of two model forest pilot sites for Cameroon and the Congo basin (MINEF 2005), namely, the Dja and Mpomo model forest.

This area is also one of the principal test sites for community forestry, with five community forests that have ongoing logging activities: Kongo, 3000 ha; Ngola/Achip, 4200 ha; Koungoulou, 3100 ha; Eschiembor-Malene, 4490 ha; and Moangue Bosquet, 1600 ha. These were the first five community forests established in 2000 by the Ministry of Forests (formerly MINEF, now MINFOF) with the support of a Dutch development agency, SNV (Klein *et al.* 2001). Many NGOs, both local and international, have contributed scientific support, capacity building and technical support for the implementation and expansion of communities' forests in the Lomié area and elsewhere in Cameroon (Jum *et al.* 2000; Munakwa 2005; Oyono 2003).

Lomié has two predominant ethnic groups, the Baka Pygmies, who are the minority, and the Bantu, made up of the Badjoué, Djem and Dzimou tribes. There is also a non indigenous Muslim community involved primarily in commerce. The total population is about 12 000 and the population growth rate is 1.66 percent (Klein *et al.* 2001). In addition to local communities, actors involved in forest management include local NGOs, elites, projects, commercial operators and the forest administration (Munakwa 2005; Pa'ah and Assama 2005).

The area has a rich flora (1 700 identified tree species) and evergreen forests. These biological resources are increasingly threatened by uncontrolled and destructive exploitation, mainly poaching and mineral extraction. Poaching is worsened by economic development and the remoteness of the area (Klein *et al.* 2001).



Map 5-1. Lomié: Dja and Mpomo Model Forest site

Data in this chapter are drawn from two studies carried out in Lomié in 2001—in the Kongo (Zoa 2001) and Eschiembor-Malene (Efoua 2001) community forests. Data were gathered through interviews, group discussions, structured interviews administered through questionnaires and observations made in the field. We also drew from the literature on community forests around the Dja Biosphere Reserve and in Cameroon as a whole. We obtained documentation from several institutions concerned with community forests at the national level (MINEF, CERAD—a research centre, the ECOFAC/PMDA project) and the international level (Department for International Development of the U.K., SNV—the Dutch volunteer organisation, IITA—the International Institute for Tropical Agriculture and CIFOR).

Analyses of perceptions

Forest management systems are organised around resources, uses, spaces and social organisation. However, modern legal perceptions of these levels of management differ from the traditional, customary perceptions. The sustainability of the management of common pool resources depends on reconciling the different approaches.

'Community'

According to the law, *community* in community forestry is a 'neighbouring village community' adjacent to forest resources on which it depends for subsistence (MINEF 1998; 1994 Forest Law). This concept of community embodies the principle of 'local' but ignores the possibility that a community is a multidimensional 'social substrate', as is the tradition of forest people in Cameroon (Diaw *et al.* 1999; Zoa 1988).

That one-dimensional definition tends to weaken the authority of the sociopolitical organisation responsible for the management of community forests, and it also influences how local communities perceive their community forests. In the Lomié forest region, the local perception of community forests is based on the 'race for space' and access to timber and revenue.

According to the law, one or two villages can jointly manage a community forest. For example, in the case of the Eschiembor-Malen community forest in Lomié, the community is represented by the Eschiembor and Malen villages (Efoua and Djoh 2002). In some cases in East Cameroon, joint management can involve up to seven villages (Falconer *et al*. 2004).

According to the customary model that obtains amongst the Fang, Ntumu (Diaw 1997), Bulu (Zoa 1988), or Nzime in Kongo, the 'community' is defined by a system of use rights, based on the community's relationship with a given resource. Hence, a community is a clan, lineage, or group that exploits a certain resource. A community can also be two or more villages that jointly manage distant forestland that constitutes their hunting area (Zoa 1988).

The establishment of a community forest entails many other social factors that may influence the traditional representation of community at the local level. According to the tradition of local people in Kongo Village, the community includes the traditional authorities who handle conflict management, traditional institutions socially established and vested with control of customary land and forest resources (clan, lineage, and residential unit), economic and religious associations, and the local elite. This perception of community does not, however, account for ethnic configuration, age, or gender, which are important factors, considering marginalised social groups (women, Pygmies) and tensions between the Bantu (Nzimé) and Pygmies (Baka) in multiethnic areas (Klein *et al*. 2001) such as the Lomié region. The concept of 'community' also entails the principles of access, rights, ownership and other sociopolitical aspects governing the organisation of customary forestland.

'Legal entity'

Legally speaking, a village community may be institutionalised as a legal entity, such as a 'common initiative group' (in 60 percent of cases) or an association (40 percent). Other legal forms, such as cooperatives, are absent in Cameroon (Falconer *et al*. 2004). The entity representing the community has responsibility for the community forest in accordance with a land use plan and a five-year management and monitoring plan

(MINEF 1998). According to the law, the management plan is developed through local participation, including that of marginalised groups (women, Pygmies) and then approved by the Ministry of Forests.

In Kongo, the community forest is managed and legally represented by a CIG named Cobanko. However, in practice, it is a minority group called the *groupe des sages,* or elders' group, which has set itself up as the expression of 'the community'. The *groupe des sages* confiscates and monopolises management powers. In the name of Cobanko, it negotiates partnership agreements for the control of commercial logging, manages the revenue from commercial exploitation of forest resources and implements the management plan. The *groupe des sages* has thus established itself as an artificial community endowed with most of the community forest management powers of the legal entity (Box 5-1).

Such groups delegitimise the putative authority granted to local communities under decentralisation (Oyono 2003). This is because institutional representation is based on the dissolution or 'miniaturisation' of the local community's diversity and interests within artificially created committees, with no consideration of central aspects of traditional governance.

In the absence of rules and mechanisms established by the wider community, the new body assumes all decision-making powers, including

Box 5-1. Kongo Community Forest *Groupe des Sages*

The group of elders, or *groupe des sages,* in Kongo Village consists of six men between 50 and 70 years old. It includes three representatives of the legal entity, one from the associative body and two traditional political authorities. At the technical level, it functions as the legal entity for managing the community forest.

It is also an interest group. Of the cash donations (1 200 000 CFA francs) paid by the logging company, 83 percent was shared amongst members of the group—a fact that created social unrest within the community. Denunciations and demonstrations were followed by a dispute between the Medjo'o hamlet and the rest of the village, and between young and old (Zoa 2001).

the selection of partners, and takes significant shares of revenue from forest resources. Many local people consider this a power grab by an elite group. It creates conflicts between segments of the population and the legal entity, conflicts between village chiefs and CIG delegates, and conflicts between communities and external stakeholders. The social institutions created under the one-dimensional definition of community are thus weak and fragile (Etoungou 2002).

The weakness of the concept of 'community' in community forestry is linked to the weaknesses of the sociopolitical organisation that governs customary forestland, in addition to the sociocultural nature of forest societies, and also to the inappropriateness of having CIGs serve as decision-making, managing and monitoring bodies. Many CIGs, including those that manage community forests, seek to operate as commercial companies and are not fully representative. They sell their goods and services to non members and share benefits amongst members (Oyono 2003). This partly explains why community forestry has not succeeded in achieving sustainability and relieving poverty.

The one-dimensional definition of community, based on locality, reduces the possibility of considering community as a multidimensional 'social substrate' (as is the case with the Bantu; Diaw *et al*. 1999). Thus, it is difficult to develop the 'community spirit' needed to implement community forest management. Rather, the definition and construction of the concept of community should take a deeper and more nuanced view of representation, integration and participation in order to address the complexity of local governance.

Community forestland

According to the Cameroon law, a community forest is a maximum of 5000 ha (MINEF 1998). The basic management plan organises the forest space into production, conservation and development areas (PSG Kongo. 2001). Forest management policy thus gives priority to the technical, administrative and legal dimensions of land and the organisational infrastructures for the implementation of community forestry.

In the customary organisation of landscapes, the community forest is considered a 'social and multipurpose substrate, governed by a system of appropriation based on rights, control and multi-use regimes'. The social implications of this change have not been addressed by the legal approach (Oyono 2003). In fact, the whole management of forestland in Bantu forest societies is based on a multipurpose vision of space that accommodates different social units (minor and major lineages, and clans) and a variety of activities, including the need for food security (Diaw 1997; Zoa 1998). These factors guarantee social exchange and the management of resources (Karsenty and Marie 1997).

In Cameroon's forest region, the community forest often takes the form of an agro-forest circle around the residential area. In such cases, the community forest can be compared to a farm-fallow-forests complex, closer to the forest zone than the village (Zoa 1998). Locally, it is considered a place fit for traditional agricultural practices, such as slash-and-burn agriculture, and its trees also have sociocultural values. This social organisation of the customary landscape also applies to many social groups located in the periphery of the Dja reserve, in particular the Nzime (Zoa 2001), the Bulu (Zoa 1998) and the Bajoué (Vermeulen *et al.* 1998; Joiris and Tchikangwa 1995), and it holds in general for the group of the Sanaga-Ntem complex in Cameroon and neighbouring countries (Diaw 1997).

In practice, besides land use specialisation, the organisation or management of the community forest space may also be affected by sociocultural factors. When the system of rights, control and multi-use regimes is ignored, the management of community forests is marred by violation of boundaries during logging activities (as was the case in Kongo or Eschiembor-Malen; Efoua and Djoh 2002), disputes between neighbouring villages (Gardner *et al.* 2001) and encroachment on permanent domains (Falconer *et al.* 2004).

Such irregularities occur because setting boundaries is optional in some community forests (Falconer *et al.* 2004) and because local mechanisms to control logging activities and regulate partnerships are lacking, especially

where community forests are located in between forest management units. Moreover, communities requesting community forests are not sufficiently aware of the process and sometimes consider it the only way to harvest timber.

Management of the community forestland should also take into account the capacity of the local people to organise themselves, manage conflicts, develop a community vision and understand the Forest Law.

Timber and common pool resources

In Cameroon, community forest policies focus mainly on the timber resource and the economic profitability of timber. The first phase five-year plan focuses on logging techniques and biophysical values like productivity, including tree size and diameter class. Also, the Forest Law takes a 'one tree/one function' approach; that is, each resource has only one value. As a result, non-timber forest products (NTFPs) (see Chapter 15 of this volume) are classified as 'subsistence and/or marginal resources' (Falconer *et al*. 2004). This approach does not ensure the sustainability of tropical forests because it does not accord economic and social criteria and ecological parameters equal weight.

Forest economies are gradually becoming more diversified, and opportunities to commercialise NTFPs are growing in Cameroon and in Central Africa (Diaw *et al*. 2001; Ndoye *et al*. 1997). In fact, NTFPs, including animal products and fisheries (see Chapter 16 of this volume), play a crucial role in improving the livelihoods of rural communities because of their significant and recognised economic potential. Valorisation of NTFPs helps promote the sustainable management of tropical forests.

Traditionally, management of landscapes in forest communities was influenced by subsistence priorities, the sociocultural value of the resource and the integrative and social vision of forestland (Diaw *et al*. 2001; Diaw and Oyono 1998a; Zoa 1998). In rural communities, such as the Kongo village and other forest regions in South Cameroon, trees are used mainly for their NTFPs—for food, pharmacopeia, agroforestry values, soil

protection and cultural values (Zoa 1998). Management of these resources often entails multifunctional land uses, according to the customary systems that govern communal management of the forest.

Hence a differentiation amongst the legal, customary and biological values of the tree results in conflicts of interest over management of resources that have both social and economic value. The same holds for management of domesticated trees in smallholder plantations, agroforests or agricultural spaces. Many of the exported timber species have social value in Cameroon and in Central Africa in general (Ndoye and Tieguhong 2004). For example, the people of East Cameroon consider *Baillonella toxisperma* an element of their identity. '*Moabi is us and we are moabi*', they say. It also has a high economic importance. Management of moabi therefore generates conflict between communities and forest companies over its sociocultural and economic value.

Commercial logging and partnerships

In theory, community forests are based on a multipurpose management approach. According to the basic management plan, provisions are made for conservation activities, economic activities that capture the value of timber or fuelwood, and regional development initiatives, such as improvement of houses and electrification of the village. The approach is based primarily on partnerships between the local community and external actors (Zoa 2001), as well as fair and equitable sharing of benefits from the exploitation of forest resources (Etoungou 2002).

However, in practice, the majority of community forests under exploitation in Cameroon are managed without a basic management plan. Hence, partnerships fail. Artisanal logging, for example, is supposed to be carried out through partnerships with local communities, yet 80 percent of the activity is subcontracted to commercial operators. Moreover, this activity damages the social environment (causing conflicts of interest and

internal disputes) as well as the ecological environment (encroachment by logging companies, mines, exploitation of logs, overcutting, and loss of biodiversity) (Zoa 2001; Nguegang 2005). These shortcomings lead the Ministry of Forests to cancel the Kongo community's management plan in 2001.

From an economic point of view, community revenue from commercial forests is meagre but useful. In East Cameroon between 2001 and 2003, community revenue from logging operations was invested in social projects in Bantu villages: funds were used to purchase sheet metal for construction of a village hall and houses (Table 5-3). The Pygmies in the Bosquet community forest have made financial investments in income-generating activities like beekeeping and oil palm plantations.

Table 5-3. Revenue from social projects and logging in some community forests in East Cameroon

Village community	*Income (FCA F)*	*Period*	*Social achievements*
Kongo	3 398 790	2002-2003	Purchase of sheet metal for 41 houses in construction (distributed to families)
Ngola achip	8 664 000	2002-2003	Purchase of 3000 metal sheets, electric generator, television set and parabolic antenna for village cultural centre
Eschiembor	2 200 140	2002-2003	Purchase of 700 metal sheets for 10 houses (distributed to families)
Bosquet	1 770 000	2002-2003	Setting up of 2 oil palm plantations, 1ha each. Financing of hives in forest for beekeeping
Bialabot de Massea	18 000 000	2001-2003 (2 years)	Building of shed for cultural centre

Source: Falconer et al. 2004

The failure of partnerships is mainly due to limitations within the community, plus administrative problems. The following are some limitations for the forest regions of Cameroon:

» *Community lack of expertise and financial resources.* Communities accept whatever is offered to them by their partners because they are unable to purchase equipment (Falconer *et al.* 2004).

- » *Weak decision-making and negotiating powers.* These weaknesses arise because the legal entity that is supposed to manage the community forest is not fully representative of the community, does not communicate with its constituents, does not involve women and minorities in decision making, lacks accountability mechanisms, has poor knowledge of markets and has insufficient managerial skills.
- » *Weak social cohesion.* The communities lack entrepreneurship and community spirit and suffer from internal conflicts and poor education.
- » *Insufficient financial resources and limited means of production.*

Furthermore, it is difficult to explain the communities' management choices and determine how they would implement management options. Thus, despite the ecological and socioeconomic advantages that artisanal logging might bring to rural communities, the challenge is to make such advantages sustainable (Auzel *et al*. 2001). The limitations listed above hinder self-determination amongst local communities that have acquired the habit of passively waiting for revenue from industrial logging (Auzel *et al*. 2001). The success of partnerships strongly depends on the capacity of the community in decision making and negotiation, funding and resources management, social cohesion, the selection of management options and their implementation.

Strengthening community participation

Community management systems require the integration of traditional and legal definitions of community, forest and resources. Looking at customary and administrative perceptions of these constructs, and at the community forest situation in Cameroon, we make the following observations:

- » In Cameroon, the community forest process is weakened by both internal and external factors.
- » The community forest concept has a variety of institutional, regulatory, organisational and governance mechanisms.

- In the pilot sites, the notion of community has not been articulated to its complex make up and reality. It is difficult to define community and equally difficult to develop and institute 'community spirit'. These factors limit the successful implementation of community forestry.
- Local ownership of the community concept—and consequently community forestry and collaborative management—entails consideration of principles of access, rights, ownership, capacities and sociopolitical aspects that govern the organisation of forestland.
- The sustainability of common pool resources at the local level goes beyond technical and economic forest management approaches. It requires taking into account the sociocultural and political issues that are central to governing forestland. Local values include customary systems of rights and uses and resource perception. Local communities need to develop a common vision, voluntary partnerships, organisational capacity, knowledge of the Forest Law and better use and management of traditional knowledge.
- A framework for social collaboration creates opportunities for local communities and actors to build local capacity in decision making and negotiation, accountability, funding and resource management, partnership management, conflict resolution and learning. This would permit local communities to organise themselves to engage in sustainable local development involving all stakeholders, including NGOs, research institutions and aid agencies.

Ensuring the social sustainability of community forests as a tool for local governance and economic development is a challenge. There is a need to improve governance at all levels, including rural areas, and factors that should be considered include the following:

- regulation and control of forests uses, in particular NTFPs;
- development of economic, political and organisational instruments that favour access to markets and the valorisation of resources;
- establishment of local governance structures and mechanisms of collaboration that define the roles and responsibilities of the stakeholders, including local minorities, in land use, partnership

agreements, market access, income and resources management and other management processes;
» local capacity building;
» development of action research (resource knowledge, management of knowledge, impact studies, regulation of harvesting and regeneration, market studies) for the valorisation of resources.

Participatory monitoring and evaluation as well as information and experience sharing amongst community forests and between local and external actors are essential to consolidating the lessons learnt from years of practice and for developing a better economic and social model for community forestry in Cameroon. Networks—local and translocal, as in the case of the model forest network—are particularly important as they can facilitate consolidation and institutionalisation of these lessons and widen the scope and opportunities for better practical applications.

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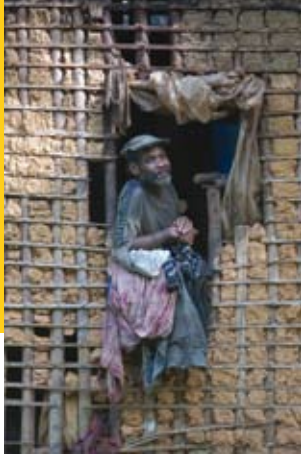

A Bagyeli elder in Campo-Ma'an

Chapter 6

Changing management direction in Campo-Ma'an

George Akwah Neba, Joachim Nguiebouri, Anne Marie Tiani and Mariteuw Chimère Diaw

Adaptive management is increasingly considered the solution to the management of complex systems (Lee 1999; Ruitenbeek and Cartier 2001). As Ruitenbeek and Cartier (2001) point out, complex systems are unpredictable and generate surprises. Unlike simple systems, which are characterised by a limited set of elements with understood—or easy to understand—behaviour, complex systems comprise a diversity of variables that influence each other in a dynamic process of interaction and change, all of which is unpredictable. There is no straightforward approach to managing complexity, and a 'learning by experimenting' approach is recommended for such situations. The conservation and management of biodiversity generally take place within complex settings, characterised by cross-boundary and large-scale landscapes, multipurpose and diversified resources, conflicting interests and perceptions and a diversity of stakeholders (see also Chapter 7).

The Campo-Ma'an National Park presents a case in which the different agendas pursued by multiple stakeholders are in conflict. The context is challenging but offers an opportunity for experimenting with innovative approaches based on learning.

Between 2000 and 2003 the Adaptive Collaborative Management (ACM) programme in Cameroon facilitated the emergence of conditions for collaborative management of forests in different sites within the country. In Campo-Ma'an, the programme's work focused on protected areas and biodiversity conservation by encouraging local actors in forest management to embark on an innovative approach based on negotiation and learning. The goal was to promote collaborative management of a protected area at a time when parks were mostly managed in a top-down fashion excluding local people. Protected areas had not been included in the decentralisation policies that had led to the devolution of natural resources to local actors in community forests and council forests, a process that has been documented by numerous publications including Chapters 4 and 5 in this volume.

As a team, the ACM researchers assumed that only an interactive approach could succeed in such a highly complex context as Campo-Ma'an.

Though the organisations in charge of managing the park in the region referred to collaboration as their management approach or principle, its implementation appeared difficult. This chapter describes efforts made by the ACM programme to facilitate conditions for stakeholders' interactions and negotiation over the course of two years or so. It then proposes steps that could be taken to call Campo-Ma'an 'a success', with the hope of contributing to the ongoing debate on the conservation and governance of biodiversity in the country. In the following chapter, Mbile makes additional contributions to this debate by addressing similar issues in the Korup National Park, which was not an ACM site.

Context of Campo-Ma'an National Park

The Campo-Ma'an National Park was established as part of an environmental pledge made during the deal on the Chad-Cameroon oil pipeline. The pipeline is a 30-year-old Chadian oil dream that seized the imagination of Cameroonians in the early 1990s, when the pipeline won out over other transportation options. Asked in 1994 to cofund the project (and also, it seems, to cover the political risks of the pipeline), the World Bank responded positively: the project appeared consistent with the bank's global strategy against poverty and corruption and opened national development opportunities for Chad and Cameroon. Immediately, however, the bank faced pressure from NGOs motivated by global environmental and human rights agendas. The various interests at stake led to protracted negotiations and ultimately to the design of a compensation programme for the social and ecological damage that the pipeline would cause, including a *Plan pour les peuples autochtones vulnérables* (Plan for Vulnerable Indigenous People), which sought to mitigate the effects of the pipeline on the indigenous Bagyeli Pygmies living along its route. One outcome—still discussed and disputed—was the decision to create two national parks, Campo-Ma'an and Mbam-Djerem, to compensate for some 15 km^2 of forest that would be lost to the pipeline. The Campo-Ma'an site (2800 km^2) was chosen

from a dozen options. It turns out that the park and its people were the compensation, not necessarily the beneficiaries of the compensation.

The environmental value of the Campo-Ma'an forest is unquestionable. The area meets most of the criteria needed for environmental compensation: it is an evergreen forest with diverse ecosystems rich in fauna, especially big mammals, fishes, amphibians, birds, reptiles and chiropters. Fulfilling World Bank conditions for the pipeline project, the government of Cameroon in 1999 published a decision creating a 7710-km^2 *Unité Technique Operationnelle* (technical operational unit) to be managed within the framework of a biodiversity conservation project. Of that land, 74 percent was allocated to the national park, logging, agroplantations and protection forests, causing population density in the remaining communal areas to jump from about eight to 29 people per km^2 (Tiani *et al.* 2001). Moreover, the exclusionary status of the park restricts and confines local people's activities to very small territories.

Social and economic factors

Social conditions in Campo-Ma'an are marked by a history of shocks, largely driven by external factors linked to the strategies of the international private sector and to global and national public policies. The establishment and fortunes of, sequentially, the logging, rubber and palm oil industries and the growth of the tourism industry in nearby Kribi have dramatically changed the social fabric in the Campo-Ma'an area, as evidenced by tenure insecurity and poverty. The changing demography and economy have altered gender dynamics, public health and ethnic relations.

The modern history of the area began in 1940 with logging. La Forestière de Campo, Wijma and other forestry companies, with multinational investment, have been the main economic actors, constructing workers' camps and sawmills. Many people from other parts of Cameroon and from neighbouring Gabon and Equatorial Guinea migrated to the area for jobs. Next, large agroindustrial plantations were developed in the northern part of the area by HEVECAM (a rubber company created in 1975, formerly owned by a French private group and the state of Cameroon but later

privatised and owned by GMG, a Malaysian group) and SOCAPALM (a state-owned oil palm company, now privatised). They recruited workers from other Cameroonian regions and built some 19 workers' camps. HEVECAM alone employs 4000 workers, but the total population of the company area now exceeds 20 000 because of workers' dependents and indirect employment. This has been an extraordinary demographic and urban development process in an area formerly occupied by small ethnic villages of 10 to 50 people spread throughout the forest.

People and tenure

The region is inhabited by several ethnic groups: Bantu from the Mvae, Ntumu, Mabi and Iyasa communities, and Bakola from the Pygmy minority. The Bantu's settlement in this region is mostly the result of the waves of migrations that spread out in the Congo basin several centuries ago through a system of social segmentation (Diaw 1997). These communities have a long tradition of political competition and cooperation, cultural and social exchange, ancestral territorial boundaries and varied resource-oriented interests influenced by proximity to the forest or the sea. The Mvae, Bulu and Mabi communities are mainly agriculturalists occupying the inland territories (Dounias 1993). The Batanga and Iyasa communities depend on fishing and live along the Atlantic coast. The Bagyeli—or Bakola—Pygmies are a social minority, traditionally nomadic hunter-gatherers, with no landownership tradition (Arnaud and Carriere 2000). Each in its own way, all the groups depend on the Cameroon rainforest for a significant part of their livelihood (Bahuchet 1996).

As in other forest regions of southern Cameroon, the Campo-Ma'an Bantu communities are exogamous and patrilineal societies. Their traditional organisation is based on clanship and lineages, without centralised power. Control of land, despite the state's legal custodianship, rests with traditional lineages. As the ultimate property of the dead, the living and the unborn (Diaw 1997), land is the common property of the extended family, and its management is supervised by elders on behalf of the entire social unit. Public infrastructure, protected areas, agroplantations and logging concessions, however, have challenged this ancient system of communal

tenure. Preliminary reports suggest that some villages may have lost up to 90 percent of their traditional hunting territories with the creation of the Campo-Ma'an National Park (Tiani *et al.* 2005; Nasi *et al.* 2001).

Status of collaboration

Campo-Ma'an is a complex and dynamic set of ecosystems, production or exploitation systems and different categories of social subsystems or units. Logging, agroindustry and community activities have been transforming the social and ecological landscapes for many generations—and even thousands of years, according to archaeological evidence. The conservation project injected a new actor with its own interests and perceptions. People's behaviours are determined by their different views of the resource: for the traditional communities, the forest constitutes a living environment and the basis for their beliefs and vision of the world. For logging and agroindustrial workers, it is a simple pool of resources that can be used to supplement their low salaries. And for the international community, the forest is important for global ecological services such as watershed protection, carbon sequestration and biodiversity enhancement, which are considered public goods (Ostrom 1999). How to conserve biological resources and promote human well-being in such a context is a critical issue.

Initial conditions

When the ACM programme first arrived at the Campo-Ma'an site in 2000, relationships between stakeholders (notably the Campo-Ma'an project and local communities) were tense, with a lot of community resentment and grievances. The land use plan, which divides the technical operation unit into 'multiple use' communal areas, industrial concessions and protected areas, had, as primary goals, the production of economic values from logging and agroplantations and the preservation of the pristine nature of the protected area. It was thought that this last objective would be accomplished by keeping people out of the park (MINEF and Project Campo-Ma'an 2002). This was a top-down management policy. Discourse

on participation and collaboration in Campo-Ma'an mainly concerned the areas surrounding the park, not the park itself. The hypothesis was that if people sustainably managed the multiple-use areas, then encroachment in the park would be significantly reduced or would even cease.

The land use plan also excluded the territory covered by the park from its definition and delimited *terroirs villageois* (community territories), places for community economic activity. That these *terroirs villageois* were also *social* spaces had little recognition. The project's guiding document limited village territories to five kilometres into the forest, starting from the roadside of each village—a space that corresponded to the village's agricultural land. Hunting and collection of non-timber forest products, however, are activities that require large territories to produce good yields.

The 'stabilisation' policy guiding the management of these forests was in conflict with the community's perception of their territory as a space that shapes social interactions and ties amongst forest communities, which are physically linked by a myriad forest paths. Community ownership and mastery of this milieu are apparent in the way local people can trace the history of any single path (recent or ancient) that crosses the forest and can recount settlement movements shaped by battles and alliances. They have a local geostrategic and geopolitical reading of the space that is not yet understood by outsiders. The exclusionary policy of forest management and its slighting of the social, strategic and cultural dimensions of resource use therefore left them feeling deprived, the consequence of which was resentment.

We first considered how to bring all the parties to the negotiating table and initiated a process aimed at understanding and sharing amongst stakeholders. We thought this process would help reduce the feelings of inequity that coloured actors' perceptions of each other. Dialogue amongst stakeholders would be an important step towards negotiating a shared vision of natural resources management in the area. We expected that in the long run, collaborative learning platforms would develop.

To build consensus and introduce a vision of resource management as a dynamic and learning process, we first organised and facilitated a workshop to which we invited the major stakeholders—the Campo-Ma'an Project, local officials of the Ministry of Forests, logging and agroindustries, and the local communities (see Tiani and Noubissie in this volume). The aim was to take criteria and indicators (C&I) at the local level and discuss them as a platform for multistakeholder negotiation (see Tiani and Noubissie, Chapter 9 of this volume).

Images and anecdotes were used to explain the concept of sustainability and let people see how divergent their understandings of the forest and its management were. This approach facilitated understanding, and participants immediately saw the conflicting visions and agendas of forest management. The question of what was to be done then arose, and the concept of C&I was introduced. After discussing the concept and practical uses of C&I, participants came to realise that C&I could help them more easily come to agreement on management objectives and could also serve as a tool for planning and monitoring.

Mixed stakeholder groups analysed the status of collaboration, rating the quality and frequency of communication and exchanges between pairs of stakeholders according to the following scale: 0 = no collaboration, 1 = bad, 2 = average, 3 = good (frequent and mutually beneficial interactions). The situation in Campo turned out to be generally 'bad', with a couple of 'self-deceptive' assessments whereas the actors more in control (state and project representatives—one instance each) thought the collaboration to be 'good' while the less powerful actor (community and state representatives) saw it as 'bad' (Diaw and Kusumanto 2005 p. 87-89).

Participants were also invited to play a pebble game to analyse the perceived rights and means of each stakeholder to manage the forest. The aim of the exercise was to weigh the power of each group and its perceived legitimacy. Tiani and Noubissie analyse this process in detail in this volume (see also Diaw and Kusumanto 2005).

The workshop helped people think creatively and shift from the confrontational attitudes at the beginning of the workshop to a more cooperative vision of their relationships and complementarity in their activities. The downside was the absence of the Campo-Ma'an project managers who lost a significant opportunity to mingle and learn with other stakeholders. However, the project had been associated with the planning of the workshop and was represented by its field staff.

Establishing collaborative frameworks

The workshop was the entry point of our activities in the area. We then toured the area, working with all stakeholders to translate the vision of natural resources management and development that had emerged during the workshop into transformative actions. The facilitating style of the ACM team was particularly well received by communities. Thus, in 2002, one of the authors (J. Nguiebouri) was approached to resolve a dispute on residential rights between a small Bagyeli Pygmy group and its Iyassa-Bantu neighbours in Campo. The Iyassa were a more powerful group and had, as agriculturalists, stronger tenure claim on the land. The Bagyeli were mostly hunters and gatherers moving periodically through the forests, but they could claim historical use of the forest from times lost to memory.

Through careful mediation and negotiation, this particularly case was resolved by the Iyassa recognising Bagyeli residential rights in the area. The bulk of the ACM team efforts, however, were directed at facilitating the emergence of broader collaborative agreements amongst stakeholder groups as a crucial step toward joint learning and action. Following the workshop, forest department officials as well as community representatives, local NGOs and project field implementers, manifesting increased interest to work together, sought out ACM researchers to help them move toward a joint framework. This was particularly important. Of the burning issues that had been raised during the workshop, only the problem of a road that the villagers and logging wanted to see reopened through the park had been resolved. Many points of tension still remained that hindered stakeholders efforts and interests.

From its stakeholder analysis, the ACM team had concluded that the Campo-Ma'an project was central to any meaningful attempt to address these problems through collaboration and adaptation. Until the end of the formal ACM program in late 2002, the ACM team thus persisted in developing a series of collaborative and learning initiatives for the project and other stakeholders. This included a study of local indicators and anti-poaching activities in the only village still located inside the park (Nasi *et al*. 2001), an agreement to support a project intern and the project's village land use (*terroirs*) component, a draft collaborative agreement, and a joint project to develop an interactive management plan for the park in collaboration with local communities. This last initiative was particularly important as it resulted in a detailed report listing the 'offer and demand' for collaboration of 10 communities living inside or in the immediate vicinity of the park (Tiani *et al*. 2001).

It is striking that despite early and apparent agreement on all these initiatives, the project did not follow through with any of them. In the last case, the idea of the joint study came from and was co-developed with the project's park manager. However, his bosses forced him to pull out at the last minute, citing financial issues. Nevertheless, the ACM team completed the study on its own and presented the results to the project to see if they would do something with the communities' offers of collaboration.

It is impossible for people engaged in any social process to claim objectivity. The authors of this chapter do not claim so and recognise the eventuality, even necessity, of mistakes and wrong assumptions. In any case, the assessment that we made in 2002 of our attempts to develop a collaborative platform with the project in Campo-Ma'an was unequivocally negative. In our assessment, we saw that in Campo-Ma'an the project had a tokenistic position on collaboration, bad relations with local actors (communities, administration officials, and logging companies) and failed to follow through with five major collaboration opportunities freely offered by ACM. This was to be the only collaborative failure of the ACM effort in Cameroon, and certainly one worth its share of lessons.

Conditions at the end

Though we do not assert that people's attitudes changed solely because of our work, we can make the following observations. First, we noticed that the more people gained understanding of their situation and the evolution of the resources surrounding them, the more open they were to discussing conservation. Most communities began developing scenarios of community development in the context of a conservation project. They also began identifying constraints and opportunities provided by the national park, instead of simply opposing it.

Second, actors increasingly began to see collaboration as important for achieving their goals. Towards the end of this research phase, the local delegation of the Ministry of Forests asked us to facilitate a process to initiate collaborative management of wildlife by the ministry's representatives and the local communities. This was an important step, since wildlife management has always been perceived and defined by the law as the exclusive task of the government, carried out through game guards. The project's park manager also agreed to experiment with an interactive approach in the elaboration of a management plan for the national park. Most important, some of the communities closest to the park developed scenarios of collaboration that they wanted the Campo-Ma'an project to consider. As we saw, however, those proposals ran into a wall; neither this initiative nor its results on the ground were used to improve stakeholder relations and management conditions in the areas.

At one point, frustrated local people started using C&I to challenge the Campo-Ma'an project, which they accused of not producing the promised results, and the World Bank, which was accused of not taking into consideration the well-being of the local communities. In brief, the ACM work, building on scenarios, visioning, interactive games, and engagement with a range of local actors helped foster learning and understanding amongst most actors and change perceptions of forest management. Social capital increased amongst key groups, including communities and state actors. A key lesson of the Campo-Ma'an process, however, is that

goodwill and facilitation skills are not enough to produce comprehensive collaborative frameworks. In this case, institutional incentives from more central actors (the government and the World Bank, notably) would probably have helped[1].

More generally, establishing collaboration and adaptation as management hypotheses and options can provide the necessary flexibility for innovation. Some actors may view collaboration and adaptation as surrender by less powerful actors. In many ACM sites in Cameroon, influential actors understand participation and collaboration as 'assimilation'—that is, the dissolution of less powerful actors into the more influential actors' projects and vision. This tendency emerged in Campo-Ma'an, where collaborative management was a *leitmotiv* without much substance in the language of the most powerful stakeholder.

The idea that local communities' livelihood activities threaten the park and degrade the forest is one indication of the 'collaboration as assimilation' vision of management. Another is the language used to describe local communities' way of life by the Campo-Ma'an project's guiding document (MINEF et Projet Campo-Ma'an 2002 p. 36), which reads, *Les pygmées représentent un groupe minoritaire dont le mode de vie particulier les marginalise par rapport au reste de la population. Des activités spécifiques seront menées pour faciliter leur intégration dans leur environnement humain et physique* (The Pygmies are a minority group; they are marginalised because of their lifestyle. Specific activities will be carried out to facilitate their integration into their human and physical environment). This statement is based on the idea that the exclusion of minority groups is justified by their way of life, which implies the need for intervention to change it. In that case, the capacity to constrain people may appear to be an indicator of success in management. In other words, if the project keeps people away from the protected area and changes their lifestyle, then the goal has been achieved, no matter the social impact.

Lessons for the future of Campo-Ma'an

Conservation is a social process, rather than a simple focus on ecosystems. Conservation means organising people's interaction with a milieu, beginning with the way they perceive it and the way they carry out their interventions.

The management challenge in the Campo-Ma'an is higher than a simple fight against poaching and efforts to stabilise human activities. The real issue is the establishment of a process whereby ecological systems, production systems and social actors interact fruitfully. Be it logging, agro-industries or community subsistence, these activities are now part of the regional dynamics and none of them can be disadvantaged without negative social and ecological consequences.

The participatory development of a management plan for Campo-Ma'an is crucial as a basis for interactive management. A management plan describes the activities that will take place and their timeframe, and it lays out the objectives and indicators needed to measure performance in the implementation of planned actions. A management plan for a protected area can be developed by an expert who, based on available data, decides what is going to be done, when, how and by whom. Another way is to generate the plan from stakeholders' vision of human and ecological well-being. In this type of approach, the plan is a collective production whose content is negotiated and agreed upon.

A plan, thus, is far from enough. Plans are just documents; the process of developing them and using them as stepping stones for broader engagement and learning is much richer and challenging. This type of interactive approach appears to be the best way to proceed in Campo-Ma'an because of the transformative capacity it has demonstrated in getting 'native stakeholders' (state and community actors, mainly) to learn from and adapt to each other. Learning occurs as a result of 'continuous

dialogue and deliberation amongst scientists, planners, managers and users to explore problems and their solutions' (Wollenberg *et al.* 2001 p. 3).

Conservation actors in Campo-Ma'an have an opportunity to experiment with an interactive management approach that builds on local communities' collaboration with the forest administration. In fact, the communities living in or around the national park, with the help of facilitation, clearly articulated what actions they believed the project and local people should take to achieve mutual understanding and begin collaborative management activities. Local communities would like to negotiate conditions for community hunting and commercialisation of bush meat, as well as ways of becoming involved in game management.

As a facilitation programme, ACM intends to build on local communities' interest in negotiation and facilitate the emergence of collaborative management platforms. Between 2000 and 2003, we focused on understanding the conditions under which collaboration could work. This effort continued well after the end of the ACM project and facilitated the emergence of a comprehensive vision of multistakeholder collaboration in a place like Campo-Ma'an. Starting in 2004, the actors in Campo-Ma'an got together of their own accord to develop an alliance of all stakeholders in the landscape in order to join the International Model Forest Network. They are now working with conservation organisations such as the World Wide Fund for Nature (WWF) to explore possibilities for improved livelihoods within a Micro-Meso-Macro framework quite similar to ACM's (see Chapter 18). The Campo-Ma'an landscape is yet to experience long lasting solutions to its problems but it is surely moving forward. What is the timeframe of social change and how does real change operate? For the time being, from the multiple paths and alternatives opened to them, the actors in Campo-Ma'an seem to have opted for the collaborative vision, which they laid out several years ago by getting together and discussing their problems.

Endnotes

[1] Our team came to realise this toward the end of 2002, when we met the International Consultative Group set up by the Bank to monitor activities related to the pipeline. This group showed keen interest in the ACM experience in Campo-Ma'an and was thankful for two ACM research and policy briefs summing up the experience and collaborative potential in Campo-Ma'an. This was late in the process, however, as the Campo-Ma'an project was about to be closed.

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Living in the wild

Chapter 7

The Korup National Park story revisited

Peter Mbile

Originally published by Elsevier's Journal of Environmental Management *under the title 'Linking Management & Livelihoods in Environmental Conservation: Case of the Korup National Park Cameroon' (Mbile et al. 2005), this chapter addresses changing national and global contexts. This new version of the paper includes lessons learned and recommendations for future directions. In keeping with current shifts from a 'park' to a 'landscape' model in environmental management, the recommendations have been developed to help guide projects like Korup.*

The countries of the humid tropics of West and Central Africa show an average population growth rate of 3 percent (World Bank 1997). Agriculture accounts for the main income and livelihood activity of these growing populations. Faure (1989) estimated that approximately 200 000 ha of forest were being lost to agriculture each year in Cameroon alone. Corroborating work, by Njib N (1999) estimated that between 1990 and 2000, Cameroon lost approximately 221 763 ha of forests yearly to agriculture, poorly managed logging and desertification.

Forest fragmentation and loss threatens livelihoods and is an important cause of reductions in species populations and increased extinction rates of tropical forest species (Wilcoe *et al*. 1986; Hudson 1991; Forman and Godron 1989)

Unsurprisingly, the government of Cameroon, Nigeria and others in the region consider protected areas as part of an overall environmental management strategy. The result being that approximately 2 098 000 ha in Cameroon, 3 021 000 ha in Nigeria and 73 000 ha in Gabon are protected (EarthTrends 2001).

This environmental management strategy is not unique to the region. Protected areas cover approximately 7 percent of the terrestrial surface (IUCN 1994) and span an immense variety of ecological habitats and social contexts, from some of the most densely populated territories, highly affected by human presence, to some of the least explored areas in the world. The concept of protected areas in its current international context

is increasingly familiar to rural communities in sub-Saharan Africa, even if resistance to it remains widespread.

Though widely recognised and accepted today in many developing countries as a means of sustainable biodiversity management, the protected areas concept finds its roots in strategic models that emerged in the 1960s and 1970s in Europe and America (West and Brechin 1991) and can be grouped into two types of models. The first, the 'exclusive' management model, developed largely in the United States, consists of decoupling the interest of local communities from the protected areas, ranging from openly anti-participatory attitudes to outright resettlement of the resident communities. The second, the 'inclusive' model promoted largely by European states, is based on the premise that 'the well-being of those who live and work in the National Park must always be a first concern' (Harmon 1991). Whereas the exclusive approach is ideal for preserving areas of wilderness and scenic beauty under threat of imminent destruction at low opportunity cost to surrounding communities, the inclusive approach is the obvious model of choice for protected areas that include human settlements and whose protection may pose a very high opportunity cost to surrounding communities. Nevertheless, consistent with postcolonial trends, with or without the explicit intention of copying the U.S. experience, it is the exclusive model that is most common in Africa, including Cameroon.

The Korup National Park in Cameroon is one such protected area; an estimated 2700 people live inside it and within 3 km of its borders (Bijnsdorp 2001). Since 2002, the park has had a management plan, which unfortunately was not fully implemented because a supporting project closed down a year later, in 2003. The park's management plan was developed by various stakeholders, including co-opted community members and officials of the Ministry of Environment and Forests. The process was funded by the European Union and supervised by the ministry. To date, few of its recommendations have been attempted, let alone implemented in full. The plan then expired in 2007. Given the continued importance of the park, it seems appropriate to reflect on what happened and begin preparing a framework for reviewing that management plan.

This chapter aims to contribute towards that process by examining some of the findings of the watershed livelihood survey completed in 1998-1999, on which the plan's Community Conservation Strategy was based (KNP Management Plan 2002). It uses the case of the Korup National Park, one of the earliest integrated conservation and development projects in Cameroon, to argue for a community-centred approach, precaution, flexibility and recognition of broader spatial, social and economic relationships in the management of multifunctional landscapes that include protected areas. The chapter's recommendations for future directions provide advice on how disappointments experienced in Korup could be averted in comparable cases around West and Central Africa, such as in southern Cameroon, the Democratic Republic of the Congo and even as far as Liberia.

Context

In October 1937, the Korup forest was established as a 'native administration forest reserve' by Order No. 25, later modified in January 1962 by the Kumba Western Council Forest Order. The Korup forest was made a national park by Presidential Decree No. 86/1283 in October 1986; at the same time the boundaries of the forest reserve were extended to cover the current surface area of 1260 km^2.

The Korup forest lies between latitudes 4°54' and 5°28' N and longitudes 8°42' and 9°16' E in the southwestern corner of the Southwest Province of Cameroon; it is contiguous with the Oban National Park in neighbouring Nigeria.

The topography is mainly low lying (50 to 300 m above sea level) with the highest point reaching 1079 m at Mount Yuhan, a *horst* (Gartlan 1986). Three main river systems drain Korup: the Bake-Munaya (north), the Ndian (southeast) and the Akpasang-Korup (southwest). Knowledge of the geology of the Korup forest area is fragmentary (Geze 1943; Hawkins and Brunt 1965). Soils are generally strongly acidic, sandy and relatively poor

in nutrient and organic matter (Hawkins and Brunt 1965). The region is characterised by a distinct dry season from December to February and a rainy season between June and October. The mean annual rainfall is in excess of 500 cm (Zimmermann 2000).

Korup is in the middle of the Guinea Congolian forest refugium (Maley 1996; Maley and Brenac 1998). The park is reputed to be richer than any other African forest for which comparable data exist (Richards 1952). Despite the environmental stress on the ecosystem, the forest has a biomass and production equivalent to other African forests (Newberry *et al*. 1997). Korup is unique in the high degree of endemism amongst its indigenous species (Ruitenbeek 1990; Thomas 1986).

Despite the presence of 6 villages with a population of 1500 people inside the park and 23 others with an approximate population of 2700 within 3 km of its borders, available evidence suggests that very little human disturbance has occurred in the past (Gartlan 1986), probably explaining the park's species richness.

At the time of its creation as a forest reserve in 1937, three legal enclaves existed within its boundaries to allow the inhabitants of three villages, Bera, Esukutan and Bakumba (since abandoned), to have right-of-way, fish, hunt and collect fruits, food and construction materials (KNP Management Plan 2002). With reunification after the 1961 plebiscite in then West Cameroon, Nigeria became a foreign country, and after negotiations between Erat (another reserve village) and the forestry department, a legal enclave was established for its residents in the southern section of the Korup forest.

Twenty-five years later, in October 1986, the livelihood situations of those three villages and three others—Ikenge, Bareka Batanga and Ikondo Kondo I, all technically outside the Korup forest reserve—changed when Presidential Decree No. 86/1283 established the Korup National Park, extending the boundaries to include these latter three villages. With this new status, the integrity of the boundaries of the national park became

a crucial issue and with it, the awareness of a potential threat from 23 villages occurring within three kilometres of its new limits.

When the status of the Korup forest changed from a reserve to a national park, the intentions of the state and its non-governmental partners became clear: all the communities inside the park had become illegal and its residents should be resettled, since their use of the park's resources was no longer compatible with the conservation and management objectives of a national park. Internationally, we see increasing uneasiness over the limitations of the 'pristine park' model of biodiversity conservation. The Korup National Park is not unique in having people living within it, and being faced with the challenge of recognising the legitimacy of such inhabitants and the contribution they can make towards the management of a protected area. In Korup, park authorities had to face this reality on the ground and sought somehow to integrate the communities' perspectives, capacities and wishes in park management. This strategy, within the framework of the overall park management programme, has come to be referred to as the Community Conservation Strategy.

Study methods

The study was carried out over a four-month period in the dry season of 1998-1999 by two teams of researchers working simultaneously (Table 7-1). The research teams were all staff of the Korup Project, and funding came from the project's regular budget. The teams were supervised by the social sciences coordinator (rural sociologist) of the World Wide Fund for Nature, then the supervisory body of the Korup National Park Project.

A relatively high number of villages were sampled from within the park because it was assumed that they were major users of park's resources, made the greatest claims to its resources and were most affected by its creation (Tables 7-2 and 7-3, Figure 7-1). All households were sampled within the villages because the total number of households ranged from only 11 to just fewer than 60. A sampling intensity of 22 percent of the

Table 7-1. Research teams and survey methods

Team member	*Survey themes*	*Participatory survey tools*
Agronomist	Farming systems, marketing channels for forest products	Historical timelines, agricultural calendar, pie charts, semistructured interviews, mapping
Forester and botanist	Forest user groups	Historical timelines, pair-wise ranking of non-timber forest products, mapping, semistructured interviews
	Participatory mapping	Arcview-GIS, GPS
Agroeconomist and social scientist	Household income and expenditure patterns	Semistructured interviews, pair-wise ranking of income sources
	Institutions	Venn diagrams, semistructured interviews
	Household demography	Semistructured interviews
Wildlife technician	Hunting, trapping, wildlife abundance	Informants, semistructured interviews
Guide	Ethnobiology	Semistructured interviews, informants

Table 7-2. Sampling by geographic location of village

	Inside park	*Outside park*
Total villages	5	23
Villages sampled	4 (80%)	5 (22%)
Households sampled per village selected	100%	100%

Table 7-3. Sampling by ethnic group of village

Ethnic group	*Villages inside or within 3 km of park belonging to ethnic group*	*Villages sampled*
Oroko-Bima	7	2
Oroko-Bakoko	4	2
Korup	4	1
Oroko-Batanga	5	2
Ejagham	6	1
Upper Balong	2	0
Total	28	8

villages outside of the park was considered sufficient, since all the ethnic groups were represented in the survey by at least one village community. In addition, the study focused on the northern sector of the park, where

both wildlife and human activity were concentrated (Infield 1988). This might have been a biased sampling, given WWF's focus on human-animal conflicts, and since the elephant population had been reported to be more concentrated in the north (Usongo 1997).

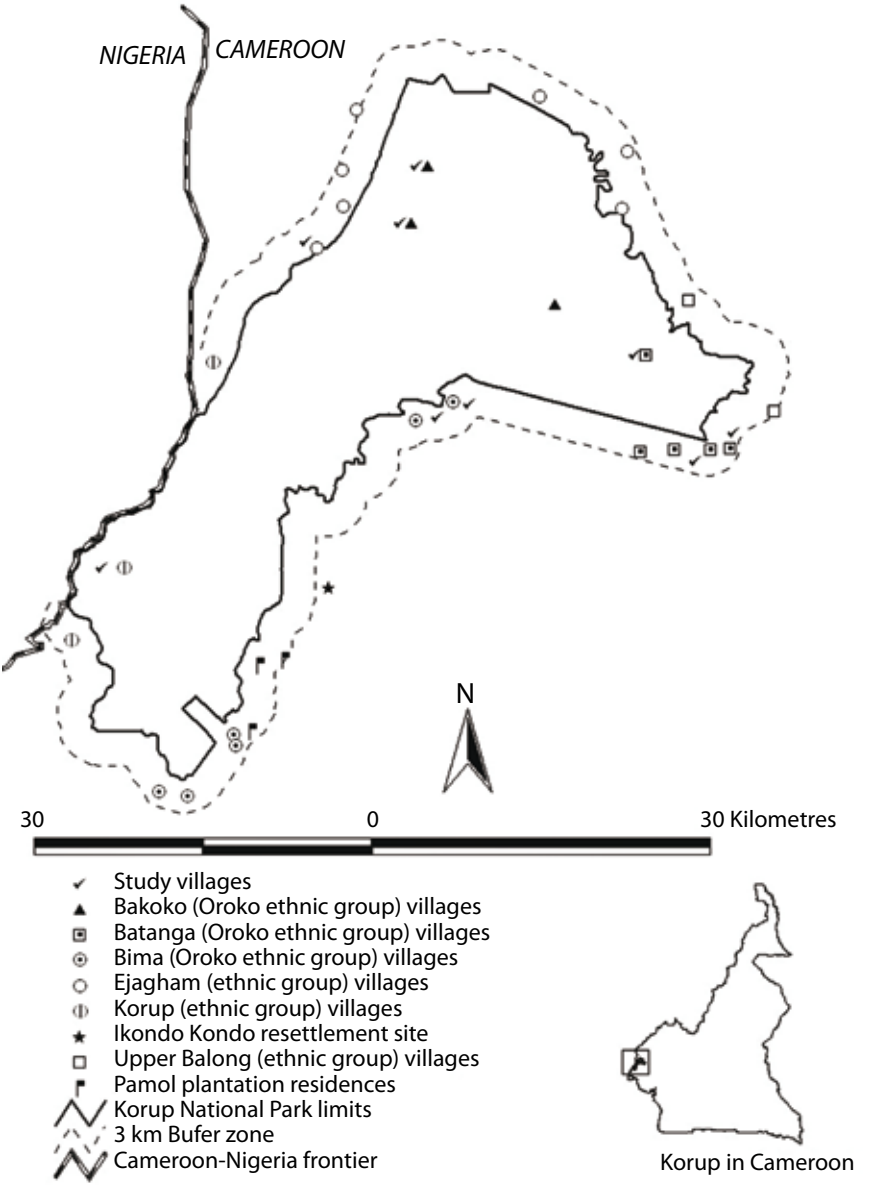

Figure 7-1. Study sites

Only one of four ethnic Korup villages—by far the largest and most populous of all the study villages—was sampled; another was in the process of being resettled out of the park. Although seven Oroko-Bima villages occurred within the study zone, only three claimed territory inside the park; two of these three were sampled. The Upper Balong ethnic group was not sampled because they claimed no territory in the park. In addition, the population of the Balong village closest to the park included many people from the other ethnic groups sampled in the study, and it did not appear that they used the park on a regular basis.

GIS-assisted participatory mapping. To establish sufficient grounds for any form of collaborative management, the study needed to carry out a spatial analysis of land use and create maps indicating any regular use of the park's resources by the local communities. A methodology combining socioeconomic observations and spatial analyses using geographic information systems and technologies was employed. This process consisted of integrating village participatory maps with global positioning system (GPS) readings of resource use and farms inside the park into one georeferenced map in Arcview GIS. The full methodology (Mbile *et al.* 2003) consists of taking geographic coordinates and descriptive information for farms, hunting sites, product collection sites, hunters' huts and marketing routes both inside and outside the park, using GPS. During the natural resources mapping process, the researchers identified key informants—knowledgeable local people. These informants were later interviewed using semistructured interviewing techniques and occasionally focus group discussions.

Data analyses procedures. Given the participatory and community livelihood-based nature of the study, the data collected were largely qualitative, and analyses and interpretations were based largely on inferences. However, some quantitative data were collected, such as distances to resource collection sites (using a time-distance conversion, such as 4 km per hour of trekking time). When combined with historical data on how much time villagers spent collecting forest products, it was possible to evaluate the extent and trends of penetration (for villages outside the park) and

overall use of the park's resources (for villages inside the park). Historical timelines were also used to evaluate different parts of the park as well as the encroachment of farms. Transportation routes for wildlife products from the park into Nigeria and other parts of Ndian and Manyu divisions were also developed by integrating participatory mapping and geographic information systems.

Population and household data were analysed using Excel and interpreted inferentially in terms of their likely influence of resource use within the park. The assumptions were that higher resident population (or increased in-migration) would mean greater potential impact on natural resources. Comparative analyses of income sources were done using a pairwise approach to identify the most important resources and linking that information with park management requirements. The importance of resources found primarily inside the park indicated a strong dependence on park resources for livelihood and therefore greater motivation to be involved in park management. Finally, ethnobiology, user group and institutional analyses were carried out through focus group discussions with the aim of assessing local knowledge and organisations as indicators of management capacity. The assumption is that knowledge of the resource and how it is changing and an understanding of traditional institutions and how they work would indicate the ability of local people to contribute to collaborative park management.

Main results

Figure 7-2 shows (1) changes in land tenure after the creation of the Korup National Park in 1986 and (2) the routes by which park resources are currently distributed to markets. The trade routes predate the creation of the park and therefore should be viewed not solely as a 'problem' to be addressed but as a phenomenon that needs to be incorporated in any subsequent management process. The use of the park's resources, including its animals and non-timber products, has historical roots, having developed when communities were legal residents of what is now a national park.

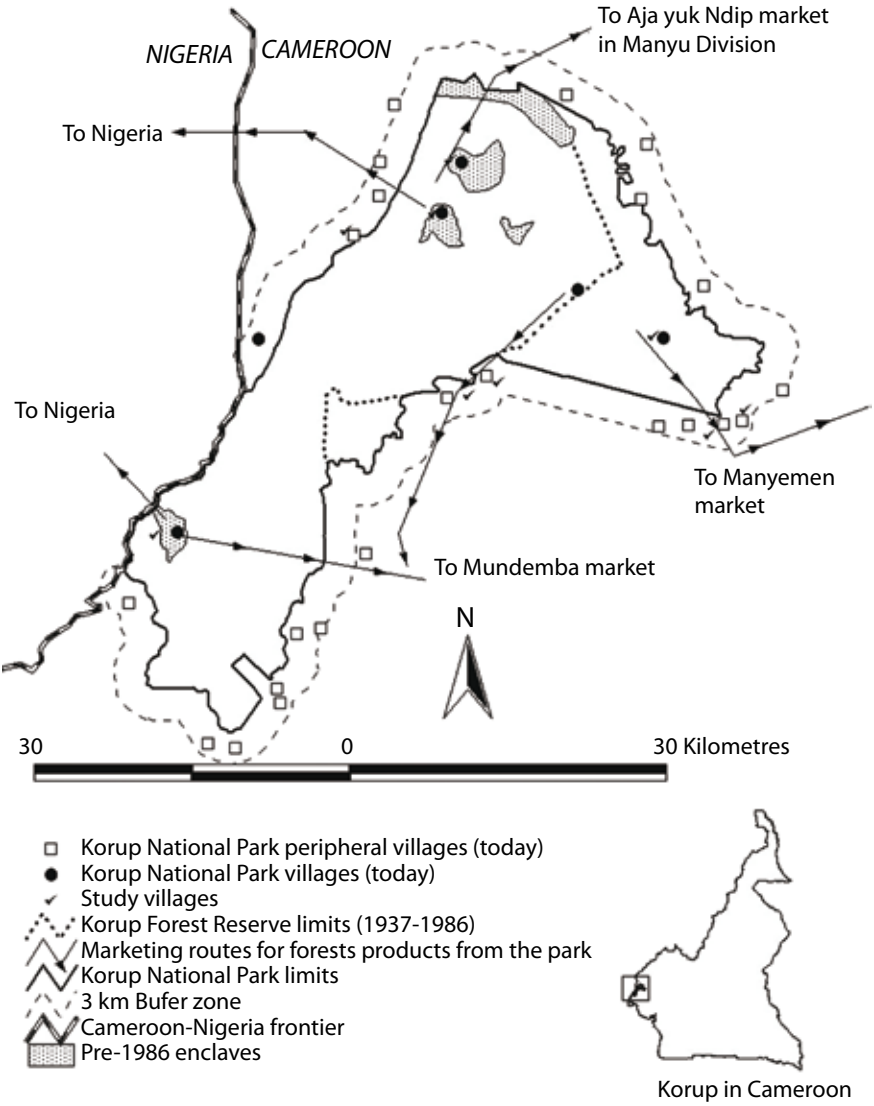

Figure 7-2. Land tenure changes in park and movement of forest products

The creation of the new boundaries of the park turned these legal enclaves and their occupants into 'illegal' residents. Their continued *de facto* use of forest resources needs to be harmonised with the *de jure* situation.

All the villages sampled, both outside and inside the boundaries, use the park's resources extensively. Although most of the activities are basic hunting and gathering, more than 50 percent of the villages had farms within the park, some of them as old as 25 years.

Table 7-4. Communities' use of park resources

Study village	*Location*	*Customary territory inside park*	*Farms inside park*	*Activities and main sources of income*
Erat	Inside	100%	Yes	Hunting, trapping, NTFPs, food crops
Mufako	Outside	>70%	No	Hunting, trapping, NTFPs
Ngenye	Outside	>50%	No	Hunting, trapping, NTFPs
Bera	Inside	100%	Yes	Hunting, trapping, NTFPs
Esukutan	Inside	100%	Yes	Hunting, trapping, NTFPs
Banyu	Outside	<30%	Yes	Hunting, trapping, NTFPs
Tombel	Outside	>40%	Yes	Hunting, trapping, NTFPs, cocoa
Bareka II	Inside	100%	Yes	Hunting, trapping, NTFPs
Ekoneman-ojong-arrey	Outside	>60%	Yes	Hunting, trapping, NTFPs, cocoa (sold in Nigeria)

NTFP = Non-timber forest product

Table 7-5. Wildlife use and perceptions by user group

Species, in order of importance for income	*Perceived availability trends*	*Main hunting period*	*Main user group*	*Main hunting approach*
1. *Cephalophus ogilgyi ogilbyi* (ungulate)	Abundant	Rainy season	Men, boys	Guns
2. *Cephalophus monticolor* (ungulate)	Abundant	Rainy season	Men, boys	Guns
3. *Atherurus africana* (rodent)	Abundant	All seasons	Men, boys, elderly	Trapping
4. *Cephalophus dorsalis* (ungulate)	Abundant	All seasons	Men, boys	Guns
5. *Hyemoschus aquaticus* (ungulate)	Decreasing	All seasons	Men, boys	Guns
6. Monkeys	Abundant	Rainy season	Men, boys	Guns

Although actual quantities of wildlife harvested could not be ascertained (community members were reluctant to provide this information), the local perception (especially of hunters) that 'encounters' with certain animals were becoming less frequent was considered symptomatic of declining availability of a few wildlife species. Professional hunters from outside were reported to be heavily involved in hunting activities. Hunting was also an important activity in some of the villages. Nevertheless, five of six animal populations were perceived as increasing. Hunting zones were not contiguous with perceived village territorial limits, and both the park's interior and periphery were considered hunting areas. Hunting using light weapons was mainly done in the rainy season, when game would be foraging for food; during the dry season, the animals are either hibernating or easily alerted to approaching hunters walking on dry leaves. For certain animals, like chimpanzees, hunters frequently used dogs in the dry season. The hunters are mainly men and boys; women are more involved in non-timber forest products harvesting.

Trends in hunting for three villages all drawn from the Batanga clan are shown in Figure 7-3. Bareka has the largest hunting population, and all males younger than 40 except for young children are involved in hunting activities. Some of the resident males came from Banyu and Tombel, both outside the park. Members of the same clan moved freely between villages

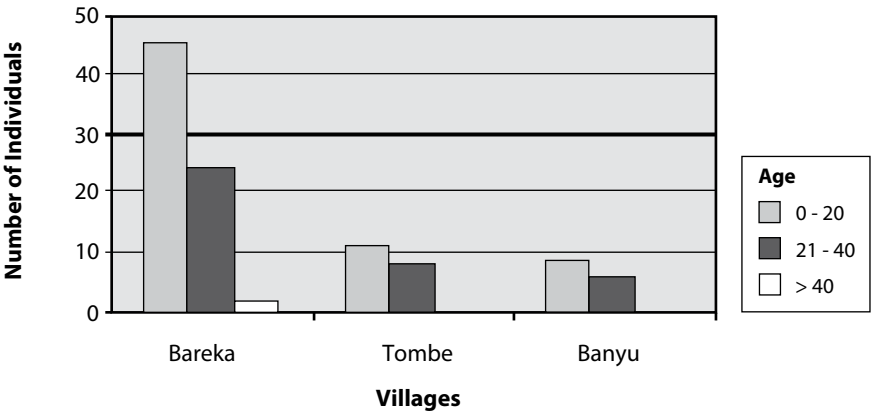

Figure 7-3. Trends in active hunter groups in three park catchment villages

to hunt. Tombel has the most extensive farmland, which supports 32 women, compared with 14 in Bareka and 12 in Banyu. In the park and its periphery, hunting is often incompatible with agriculture, since both take place in the rainy season, but men pursue the hunt while the women are involved in agriculture and forest products (especially where possibilities for marketing exist). Where hunting is intense, subsistence agriculture tends to be the norm.

Mostly women harvest non-timber forest products in the rainy season, with boys providing help. Except for low-intensity collection of *Garcinia manii* (chewing stick) by some Nigerians, the incidence of 'outsiders' is much lower than in hunting and trapping. The majority of these products are consumed at home, given the lack of roads and the difficulty of transporting bulky goods by head-load. The abundance of *Baillonella toxisperma* was perceived to be decreasing outside the park because of previous and ongoing timber exploitation. *Piper guinensis* was also thought to be in decline, and the harvesting method—which entails cutting the stem—was the main reason.

Finally, the capacity of local communities and institutions to participate in collaborative management depends a great deal on the extent to which

Table 7-6. Non-timber forest product harvesting and local monitoring, by user group

Species, in order of importance (use in brackets)	***Access, control and availability***	***Main user group***	***Main collection approach***
1. *Ricinodendron heudelottii (condiment–soup flavouring)*	Open, controlled (on farms)	Women, girls, boys	Gathering
2. *Baillonella toxisperma (Edible oil producing seed)*	Open, decreasing outside park	Women, men, boys	Gathering
3. *Irvingia gabonensis (condiment–soup thickener)*	Open	Women, men, boys	Gathering
4. *Afrostyrax lepidophyllus (Spice, flavouring)*	Open	Women, boys	Gathering
5. *Garcinia kola (stimulant)*	Open, decreasing	Women, men, boys	Plucking, gathering
6. *Piper guinensis (spice, flavouring)*	Open, decreasing	Women, men, boys	Stem cutting, gathering

indigenous decision-making systems continue to function and how easily these could be linked to modern institutions of the state. Figure 7-4 illustrates one such example, showing the internal organisation of the Batanga and their links with external institutions. Level A in the figure is the state administration and the 'umbrella' ethnic group, the Oroko—a somewhat artificial grouping of culturally similar societies. A stronger sense of ethnic identity begins to develop from level B to C. Level C is the internal arrangement of a typical Batanga traditional village. Though complex, levels B and C were distinctly organised, providing various

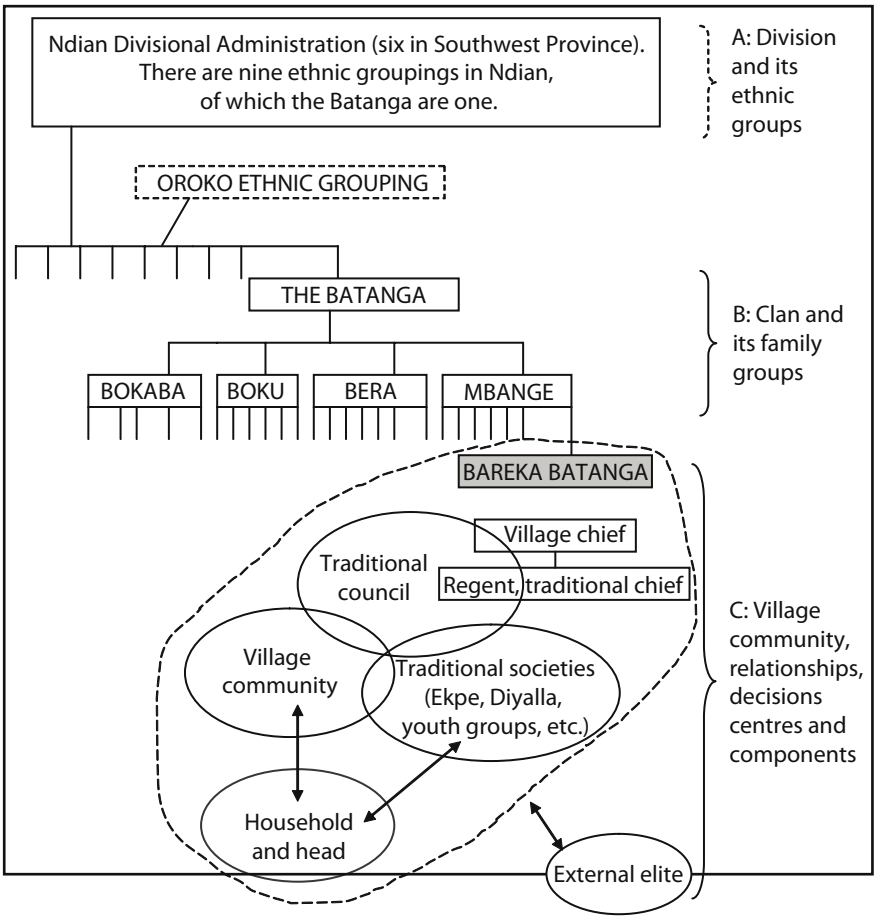

Figure 7-4. Institutions, linkages and decision-making levels in park village of Bareka Batanga

options and opportunities that can be used to develop local organisation and decision-making capacity. Although not immediately apparent in the diagram, the decision-making structure of the Batanga, like most forest societies, is not hierarchical but more complex and built on principles of egalitarianism. This complexity is often not well understood by outsiders and thus sometimes ignored in superficial, project-driven institutional analyses.

Decision making in the villages starts with the household head. Then there are the youth groups, which can move quickly in situations involving external hunters. These youth groups are organised in different ways but undertake regular activities and generally respond to the authority of the traditional council headed by the chief or the regent. Chiefs, considered auxiliaries of the administration, are generally recognised by the local government authorities and represent the village in negotiations and important decisions. Regents or traditional chiefs assist the chiefs. The regents are often representatives of a council of elders, who are the guardians of the customs and traditions of the village. The chief is thus directly linked to the heart of what constitutes the village, in its complete sense, through the regent. Decisions are presented to the regent to get the feel of the community. The government chiefs are often literate and can interact very easily with the educated external elite, who tend to come from the community and participate in village affairs but for employment or business reasons do not live in the village.

Within the communities themselves, social groups form power centres. In the Korup area, the *Ekpe* or *Nyamkpe* for men and the *Diyala* for women are the most important and powerful. These societies are powerful decision-making and disciplinary entities, sometimes shrouded in mystery. It is perhaps as a result of this latter attribute that these societies are not effectively connected with the rest of the decision-making system, both in the villages and in the communities as a whole. By probing during the survey, the research teams determined that these societies, though not strictly hierarchical, maintain an authority system based on personal achievement or title. The system succeeds in instilling discipline and

order where the administrative system may not be working efficiently. The different groups operate as a sort of check and balance in the community, providing backup authority. These structures provide both horizontal and vertical means of carrying out consultations and transmitting decisions or information. Although the legitimate authority always stays with the village chief, these other structures often help qualify that authority.

Discussion of results

Korup makes an excellent case study because despite plentiful human resources on the project and goodwill from the population at large, the management plan's 'exclusive' approach has left much to be desired. For instance, in the 17 years from 1986 to 2003, few evaluations were made of the extent to which the approach succeeded even in achieving its own core purpose. One of the few, Llewellyn-Smith (1998), estimated that by the end of the project in 2003, only 20 percent of the park could be considered adequately protected.

As our results revealed, hunting in the park remained extensive, with hunters increasingly using high-calibre weapons smuggled from Nigeria to kill large mammals. And as corroborated by the current management plan, commercial hunters from other parts of Cameroon and even from Nigeria are highly skilled, organised and highly motivated (KNP Management Plan 2002). These outsiders come into the park area as protégés of park communities and pay fees to the host village or individuals after a successful campaign. This accounts for the park villages' 'no-go areas', where villagers are openly hostile to guards. Blaming the outsiders could be considered evasiveness on the part of local communities, but what is more important here is the existence of tension, suspicion and mutual mistrust.

Park authorities are increasingly aware that policing methods are unsuccessful and that there is collusion in the community, but such problems are common in protected areas around the developing world (De Marconi 1995). The prevailing sentiment amongst Korup managers,

however, is that the local community is a major threat to the park. The current management plan implies that increasing the level of policing by increasing the number of guards may be appropriate. But the guards by themselves cannot 'protect' the park; they require the community's help; as our surveys revealed, the communities have the necessary knowledge, moral authority and historical and cultural links regarding the park's resources.

In terms of livelihood analyses results, the natural resources in the park are vastly more important and central to the villagers' livelihood than to the guards'. The communities not only collect products and continue to hunt in the park but also use the land to farm annual crops and even permanent crops like oil palm and cocoa. The villagers are more culturally and historically attached to the resources than most guards, who are viewed with great suspicion, especially if they come from the community. This combination of closeness to and dependence on the resources, customary proprietorship and indigenous knowledge gives the villagers greater intrinsic moral and *de facto* authority over the resources of the park.

The park was created without any prior negotiations with the villages it subsumed. The authority of the poorly paid guards is only an abstraction of government policy. In the remoteness of the park, the guards lack moral, technical or traditional authority to execute their responsibilities. Similar scenarios and the effect on guards' behaviour in other protected areas are discussed by Thapar (1992) and Callister (1999), who tell a common story: the guards' insufficient psychological and material authority can create an ideal atmosphere for corruption in the form of collusion, collaboration and bribery. Though such corruption may be petty and perceived as insignificant, because it can be rampant, Callister (1999) argues, the cumulative effect on a protected area and its management can be devastating.

The management process for Korup, comprising protection, community involvement, research, monitoring, ecotourism and administration, must essentially be viewed as a 'development' process. And like development (Schumacher 1973), it is a whole; it is an integral, value-laden cultural

process that encompasses the natural environment, social relations, education, production, consumption and well-being. It should be endogenous, springing from the core needs of the communities, each relying on its own strengths and resources to define with some degree of sovereignty a vision of its future cooperation with individuals or groups sharing in its aspirations and problems. Endogenous strengths, faculties and behaviour tend to vary geographically, from context to context, in the way they relate to the natural resource domain, and management should adapt to this uniqueness. By adapting management systems to local realities and capacities, the management process becomes a tool to frame the philosophical, methodological and practical challenges associated with on-going use and 'management' of natural resources (Gunderson 1999). The premise for management then becomes very simple: policies are experiments within the local socio-cultural context, and all stakeholders, including governments, are expected to learn from them. Even the supposed incompatibilities between community approaches and scientific methods are often based on the absence of a system of valorisation, integration of knowledge and adaptation to problem solving.

This study, for instance, revealed that even without significant modifications, current scientific approaches would interact very positively with the endogenous knowledge systems within an adaptive management framework. The surveys and interviews on natural resources use patterns in the park indicated that hunters' 'encounters' with wildlife—increasing sightings of live animals and droppings indicative of abundance, and decreasing sightings indicative of rarity—had changed over the years. 'Encounter' as a measure is widely used in inventories and biological monitoring (GTZ/Unilever 2003; Lien 1998). Our results suggest that although a few species appeared to be rare, the perception of hunters was that wildlife populations were actually increasing.

Other kinds of local knowledge could also be useful for park management. Hunters, for instance, know that animals are commonly sighted during the rainy season, when food is more plentiful, but are rarely seen in the dry season. Such knowledge can be acknowledged, shared and adapted to the management context interactively and can provoke innovation.

Innovation, being an inevitable outcome of adaptation of approaches, will lead to 'ownership' of the process by all the users of the knowledge. Local communities have experiential knowledge rather than knowledge gained through structured experimentation or top-down imposition of approaches (Olsson and Folke 2001). The process of achieving benefits both for the environment and for livelihoods in protected areas like Korup therefore requires a nondeterministic and evolutionary approach to system uncertainty (Moran 1991; Berkes *et al.* 2000). In thus tailoring management to the indigenous knowledge context, scientific uncertainty is embraced because it supports and encourages continuous, open and interactive learning (Grumbine 1994). Finally, risk sharing is enhanced through both structured experimentation and management flexibility, especially because adaptive management is an integrative tool to help address the complexities and broader challenges of conservation (Salafsky *et al.* 2001) across regions.

Positive interactions between park managers and communities can give local people the motivation to fend off outside hunters instead of colluding with them; cooperation can also build trust, reduce enforcement expenditure, enhance general awareness of management processes and increase the potential for sharing benefits.

As a result of harnessing a community's experiences, knowledge and skills, such as those revealed by this study, situations of comparative advantage (Inglis 1993; Ruddle 1994), often a basis for effective adaptive comanagement, may arise. To achieve the overall aim of more effective natural resources management, park authorities may need to share management responsibilities and, to that end, develop local capacities in resource management. Central to these two requirements is the existence of an adaptable organisational capacity and decision-making system. The traditional societies, though complex, interlink all sections of the community and can thus respond to the various needs of participatory management. It nevertheless requires patience to understand the traditional mechanisms of decision making and knowledge acquisition.

The isolated, remote park villages have experienced depopulation over the years. Though literacy is low amongst permanent residents, some community members who live elsewhere but maintain links to their villages are educated. They regularly send home money, kerosene, soap and other valuables not easily acquired in the village. When we include these 'external elites,' the educational attainment of the park villagers would range from primary school to post-university. The educated ex-villagers can assist in human organisational capacity development for adaptive management of the protected area. A community's capacity to share management responsibility is also influenced by its functional organisation.

The potential role of human organisational capacity in achieving successful natural resources management is highly important and thus merits further mention. During the study and while doing background research, we found that existing, often negative perceptions by academics unfamiliar with the decision-making capacities of these forest societies appear to have been influenced by on going social constructions. In a recent report (Sikod *et al*. 2000) prepared for a managing agency of the park, for instance, the communities were described as 'basically acephalous'. The common interpretation of *acephalous society* by those who may lack the training in the discipline of sociology is that these societies lack order. Expressions like this, perhaps originally used in a correct sociological context, have tended to become colloquial in their interpretation and understanding by a generally 'unschooled' readership in which everyone is a sociologist. The discipline-based concept is then inaccurately interpreted and perpetuated to mean 'a society lacking leadership'. Added to the dualism[1] (Freire 1972) that characterises development practitioners who use both popular misconceptions and sound science, the result is misrepresentation through misunderstanding, leading to disempowering relationships vis-à-vis external facilitators and the communities.

The misinterpretation of nonhierarchical societies as acephalous has its roots in the popular misconception that the absence of a 'strongman' at the top equals lack of organisation, disorder and lack of capacity for progress and decision making. Faced with such sociological challenges, Marsden

et al. (2003) encourage deeper analyses of community understandings and practices to highlight more clearly the aspects of community-own construction and practice, evolving governance and local embeddedness. According to Marsden *et al.* (2003), these factors then become important conceptual bridges in the larger social science quest to relate human materialities much more effectively to natural materialities (and vice versa).

Full participation in park management, when it comes, will thus not be limited to the Korup National Park. Around the world, participation has been built on a vision for human empowerment, advancement and welfare with the fullest range of available natural resources as an integral part. There is no better way to view this argument for participatory management in the Korup National Park than to see the extent to which local people are integrated in protected area management in other countries.

In Latin America (Amend and Amend 1995), 80 percent of national parks have people living inside their borders. Throughout Europe, protected areas are commonly inhabited by legal residents. In India alone, the number of people living inside protected areas is estimated at 3.5 million to 4 million (Kothari *et al.* 1995). What the park needs to do as a first step is to define the status of these communities more comprehensively as legal residents.

The park management then needs to link with these local communities by providing information on policies and environmental problems and by supporting their decision-making institutions and income generation potential. Coexistence should also mean mutual respect. The communities need not live to serve the interest of the park management, but by living responsibly according to negotiated agreements, they can help protect the park and its resources. For the Bwindi Impenetrable Forest in Uganda, for example, a management agreement between the local communities and the authorities of the park allows certified local users to extract an agreed-upon quantity of specific resources (e.g., vines, honey, medicinal plants) at specific times (Borrini-Feyerabend 1995). Though this case does not go far enough, it is a start.

Through such recognition, collaborative and locally adaptable resource management practices and local economies can develop. Externally imposed sustainable harvesting levels and methods have proven technically challenging and often lead to management deadlock and conflicts between international guidelines and local needs. The current recommendation by CITES for the wholesale suspension of *Prunus africana* imports by EU countries from Cameroon, due partly to the absence of a 'sustainable management' plan, is a case in point: everyone is penalised while some communities' efforts towards sustainable use, as in the Mount Cameroon area, go unrecognised. Were the state to officially advocate for collaborative approaches, local management capacity and practices could be recognised and encouraged, and frameworks of criteria and indicators, like those of the Forest Stewardship Council, could become flexible mechanisms for vetting sustainable management on a case-by-case basis.

The government of Cameroon has a fundamental role in managing national parks and a legitimate right to derive revenue from research and tourism activities. However, the question arises whether a balance is being achieved between local and wider interests and objectives in terms of benefits sharing in protected areas. The relationship between people, protected areas, economic interests and governments is not unique to Cameroon. Shackleton *et al*. (2002) argue that the notion of conservation as a 'public interest' area and the need to achieve national economic development objectives have often been used to serve more narrow interests of the managing departments or agencies and to legitimise their actions, often to the detriment of local livelihood systems and the real choices available to people. In any case, national development objectives and local interests need not be mutually exclusive. The Great Barrier Reef Marine Park in Australia presents a final example. This park brings more than a billion dollars (US) annually to the Australian economy. Following a high court repeal of the concept of *terra nullius* (no man's land), used at the time of the 'conquest' of Australia by the British, the rights of Aboriginal peoples as stakeholders in the park have been recognised (Hill and Press 1994), and today their representatives sit permanently on the management board of the park management authority itself.

Recommended future directions

Since the publication of the article on which this chapter is based, much has changed in environmental management practices and principles in Cameroon and around the world. Many justifications for a different kind of management now exist, and suggestions on how this can be achieved are numerous. But first, has the context changed?

The Korup National Park is now a part of the Takamanda-Ndongore Technical Operational Unit, like the Dja, Campo-Ma'an (Cameroon), Maringa-Lopori-Wamba (DRC) and nine other protected areas in Central Africa. In these areas, environmental management principles are shifting from the pristine parks model to that of managing ecosystem services in multiple-use landscapes. Since the era of the exclusive park management model of West and Brechin (1991), management for biodiversity has given way to managing flows of ecosystem services. This change was prompted by awareness that the pristine parks model was yielding disappointing results (Hakizumwami 2000; Musters *et al*. 2000; Byers 1999; Hart *et al*. 1998). Some studies have questioned whether the traditional model for managing biological diversity is effective, practical or even ethical. There is now a mature school of thought for the dismantling of that model (Musters *et al*. 2000; Sayer 2000), both because traditional parks are too small to represent the full range of interdependent biophysical processes that sustain continued ecosystem functions, and because the social, economic and policy scales of parks do not appear to facilitate a coordinated understanding of the full range of interdependent processes occurring in landscapes.

Although equally applicable at economic and social scales, the concept of landscapes within the context of complex systems theory has emerged from the need to develop understanding of the spatial and functional interdependence between man and nature (Raskin *et al*. 2002; Kasperson and Kasperson 2001). The landscape concept also considers linkages in life-supporting ecosystem functions like food chains, gene flows, water flows, pollination, seed dissemination, soil formation, disease regulation

and nutrient assimilation (Baskin 1997; Daily 1997) over huge geographic scales. Complex systems thinking is thus used to bridge social and biophysical sciences to understand phenomena like climate history and human actions (McIntosh *et al*. 2000), assess regions at risk, and link social and ecological systems for better and integrative environmental management and livelihoods (Gunderson and Holling 2002; Berkes *et al*. 2002).

In landscapes, therefore, two main forces are at play: anthropogenic and non anthropogenic. Non anthropogenic forces—the ecological processes being conserved in parks and landscapes—need no greater emphasis here, so the rest of this chapter will focus on anthropogenic ones.

Managing landscapes requires the awareness that human communities can have strong and non-static relationships with ecological processes, from farm to ecosystem scale. Extensive evidence shows that local people's knowledge and experience of natural processes in landscapes offer deep lessons on how to adapt to ecosystem shifts and manage biological diversity (Gadgil *et al*. 1993; Berkes and Folke 2002).The complex nature of these socioecological relationships requires that we revise our misconception of a global steady-state, in which the effects of human actions on ecosystems are linear, predictable and controllable.

Managing change in landscapes is an essentially anthropogenic process; it requires flexible and open institutions that allow for dynamic learning and actions through information generation, communication and feedback. It is by mastering such knowledge and information generation and flows that different parts of a landscape can communicate with each other, so to speak. And it is by using such systematic information generation and analyses that we, as we pursue better standards of living, can begin to see how to reduce the system's vulnerability to change, stresses and shocks.

Four main issues arise: (1) how to facilitate the development of a social context with flexible and open institutions that allow for dynamic learning and actions; (2) how to ensure a functional landscape-level information

system on resource use, prevailing policies, scientific knowledge and changes brought about by livelihood activities; (3) how to facilitate and contain the development that drives economic growth; and (4) how to adapt to unpredictable, stochastic shifts, shocks and stresses on social, economic and ecological components in landscapes. A brief explanation of each of these four pillars of landscape management follows.

1. *A social context with flexible and open institutions.* Identification, prioritisation, strengthening and monitoring of all decision-making institutions, from household level to landscape level, using the capital assets approach (Bebbington 1999).
2. *A functional landscape-level information system.* Identification of representative and critical land uses, such as agriculture, hunting, fishing and forestry. Development of monitoring protocols for resource use, problems and policies, incorporated into a geographic information system.
3. *Well-managed economic development.* Mobilisation and development of management and monetisation mechanisms for agriculture, timber, non-timber resources and ecosystem services through cost-effective analyses and investments. Containment through interactions with the landscape information system.
4. *Adaptation to unpredictable shifts, shocks and stresses.* Presupposing that 1, 2 and 3 are fully functional, adherence to the precautionary principle (Cameron and Abouchar 1991), which holds that although we may be unaware of limits to natural resource use, we must assume that they exist and proceed accordingly.

Endnotes

[1] Whereby practicing professionals remain active and willing users of both popular misconceptions as well as sound scientific logic in their work.

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Forest handicraft

Chapter 8

ACM as a tool for conflict management

Ruben De Koning

Since the beginning of the 1990s, the environment has become a major concern in conflict and security studies. Although natural resources have been contested throughout history, their scarcity has recently been said to lead to or contribute to conflict (Fukayama 1992; Homer-Dixon 1994; Kaplan 1994). The increasing pressure on natural resources creates problems of degradation, depletion and pollution that are likely to affect the most vulnerable groups in society, deepening inequality and increasing resentment. An abundance of high-value but non-renewable resources like oil, diamonds and gold is also said to increase the risk of conflict by financing armed factions (Berdal and Malone 2000; De Soysa 2000; Sachs and A.M. 2000; Collier and Hoeffler 2002). Indirectly, income from natural resources may increase corruption and hamper economic innovation.

Responding to various levels of natural resource conflict, development theorists and planners around the world recognise a new governance paradigm that stresses the involvement of local actors in resource management processes. The multistakeholder platform has become a popular format over the past decade (Klem 2003). 'A multi-stakeholder platform brings different actors together who have a stake in the management of a common pool resource to discuss issues of mutual concern' (Warner *et al.* 2002 p. 21). Such platforms may serve a variety of purposes. 'Some see it as the locality where social learning takes place, others see it as the arena of negotiation and conflict management, or where co-governance is pursued' (Warner *et al.* 2002 p. 22). There is evidence that if managed well through collaboration of key stakeholders, intense conflict can catalyse positive social change (Buckles and Rusnak 1999).

In 2000, CIFOR launched its Adaptive Collaborative Management of Tropical Forests research programme to initiate multistakeholder platforms in forest regions in different countries around the world. Researchers in adaptive collaborative management (ACM) increasingly have realised that natural resources management is fraught with social conflicts over access to and benefits from the forest. Consequently, collaborative planning became a tool to mediate conflicts over resources and overcome inequalities

amongst user groups. ACM, like CIFOR's research in general, raises burning questions about the outcomes of multistakeholder negotiation for the poor and the role of researchers in the field: how can researchers balance neutrality and engagement in a field where inequalities, conflicts and contradictions are rife?

In this chapter I will address and explore these questions with the use of case study examples from three sites in Cameroon: Dimako Council Forest, Ottotomo Forest Reserve and Campo-Ma'an National Park. Before moving to case descriptions and lessons learned, I offer a brief introduction to the theme of natural resource conflict, followed by an overview of central methodological concepts that frequently appear in CIFOR's ACM literature.

Natural resource conflict

Although the academic debate on linkages between the environment and conflict is recent, competition amongst user groups over natural resources such as land, water, and forests is ubiquitous and has a long history (Anderson *et al*. 1996; Ayling and Kelly 1997). Ownership and usage of natural resources inherently carry the potential for tension and conflict, as the use or ownership of one party usually excludes that of others. Yasmi (2007) holds that there is no natural resources management that is free of conflict. At the same time, natural resources management—the traditions, customs, rules, laws and policies dealing with issues of access to and use and management of natural resources—can bring order and predictability in situations of competing interests (Castro and Nielsen 2003). It is safe to say that natural resources management implies, and in many cases constitutes the process of conflict management.

Conflicts over natural resource, vary greatly in intensity, magnitude and scope, depending on the resource characteristics and the number and plurality of people with an interest in them. Conflicts may range from intergenerational tensions over rights of inheritance to interstate crises

over the use of water resources or violent rebel clashes over a diamond mine. Although natural resources form a central object of struggles, other, immaterial interests are often tied up in the conflict, such as status (whether people believe that they, their traditions and their social position are treated with respect and dignity), identity and values (the cultural, social and political communities to which people feel tied, and the ideas of right and wrong these entities generate) and power (how control and participation in political decision making are allocated) (adapted from CAII no date). This chapter focuses on community-level, non-violent conflict in the context of decentralisation in developing countries, where many rural communities have developed new needs and opportunities to manage local natural resources. Although associated tensions and conflicts usually are of low intensity and managed without the use of force, some do deteriorate or feed into destructive violent conflict.

'Conflict' can be understood in various ways. In the most general sense, conflict can be perceived as the existence of differences and incompatibilities in social interaction between groups and individuals. This definition is insufficient, however, because it includes differences that are not conflicting. Authors have therefore suggested that these differences must be perceived as conflicts, they must be manifested in some way, and this manifestation should in turn be perceived as damaging someone else's value or interest (Glasl 1994). Other definitions of conflict are less demanding and do not see the need for people's full perception of impairment. Conflicts may be described as latent, for example, involving situations of structural inequality in society where actions taken by one party are at the expense of another, but without being perceived as such. Latent conflict may be caused by self-delusion, rationalisation, lack of knowledge, or suppressed information. One form of latent conflict is structural violence, a term Galtung (1969) uses to describe situations where unequal, unjust and unrepresentative political, legal, economic or cultural structures prevent humans from realising their full potential. Such violence is almost always invisible and is normalised by stable institutions and regular practices.

The first, more general definition is safer than the second because it does not run ahead of people's perceptions. However, it ignores a lot of problems

that because of their complexity are difficult to relate to, or to blame on the actions of one or the other party. Neither the outside observer nor the people affected may perceive the impairment that is central in the first definition. Furthermore, latent conflicts form the underlying conditions or causes of manifest conflict. Considering the importance of prevention and mediation, conflict responses should address such conditions. Lockwood (1951), quoted in Oyono (2005 p. 117), offers a suitable definition of conflict for this chapter, namely: 'The existence of differential and asymmetrical rights/powers between individuals and/or groups of individuals—this in connection with the institutional arrangements governing resource distribution.' Natural resources are *par excellence* the objects or stakes that are distributed unevenly in a society as a result of asymmetrical rights and powers.

Adaptive collaborative management

Adaptive collaborative management is a broad and flexible concept that has been treated differently by researchers working with it. The 'co' of collaborative has also been used to refer to community or cooperative (Ruitenbeek and Cartier 2001), and adaptiveness can be seen as a response of local communities (to a changing environment) as well as the researchers (to the changing conditions in the field). To create some order and common understanding, Prabhu (2002 p. 4) came up with a definition for the concept that is not too rigorous and contains the minimum number of attributes:

> ACM for CIFOR is a value-adding approach whereby people who have interests in a forest, agree to act together to plan, observe and learn from the implementation of their plans recognising that plans often fail to fulfil their stated objectives. ACM is characterised by conscious efforts among such groups to communicate, collaborate, negotiate and seek out opportunities to learn collectively about the impacts of their actions.

This definition reflects the conviction that research should not replace but add value to the existing organisational and problem-solving capacities of the stakeholders. The way value can be added is to strengthen the management cycle that groups of stakeholders go through to define appropriate goals and plans that reflect their diverse interests. Stakeholders must consciously participate in the management cycle. That is, they should realise that they are jointly responsible for formulating goals and objectives, planning and implementing activities, and monitoring and revising them.

The rationale behind the ACM programme is that collaboration and conscious planning amongst local stakeholders will enhance local communities' ability to deal with change and unpredictability, in fact making them more adaptive. The type of research that should contribute to such processes draws from various approaches and management tools, the most important of which is participatory action research (PAR). According to Colfer (2005), PAR forms the 'heart and soul' of ACM and is an overall methodological framework of reflective planning and action; it encompasses different research techniques and even offers room for other forms of research. In Zimbabwe, CIFOR researchers Mutimukuru *et al.* (2005) built their approach and philosophy around the idea of 'social learning'. In Cameroon, Assembe and Oyono (2004) employed the concepts of 'social negotiation' and 'mediation'. Although the overall methodology of PAR and particular techniques like social learning, social mediation and negotiation share a similar community-based and participatory approach, the researcher's role vis-à-vis his or her research population may differ considerably.

In PAR, the researcher learns about his or her research group by actively participating in and contributing to the processes of change and adaptation the group is going through. The term *action research* was coined by Kurt Lewin (1890-1947), who defined it as 'a comparative research on the conditions and effects of various forms of social action, and research leading to social action' (Lewin 1948 pp. 202-203). The researcher may simultaneously study, initiate and participate in a spiral of steps, 'each of which is composed of a circle of planning, action and fact-finding about

the result of the action' (Ibid. p. 206). From its inception, action research has been used to achieve emancipatory ends for particular disadvantaged groups. In the America of his time, Lewin's work was intended to benefit minority groups, such as Jews and African Americans. More recently, action research methodology has been used to transform discriminatory educational systems (Freire 1970) and address gender inequality (Reinharz 1992).

In the developing world, users of PAR have aims of poverty alleviation, democratisation and the empowerment of marginalised and oppressed groups. The 'activist' researcher ideally pursues action through research activities that are in fact experiments for proving (or disproving) that people can use certain group strategies to change their situation for the better and showing how to do this effectively through group formation and common action on their own behalf (Huizer 1997). Rather than claiming objectivity, researchers pursuing PAR elucidate, emphasise and embrace the political nature of their work, which hinges on the belief that people have the right and the ability to reshape their lives and their communities (Brydon-Miller 2002). Thus the researcher is not an outside observer who studies objects from a distance; rather, he or she affiliates with the research population and learns through empathy and friendship about their problems, needs and feelings (Huizer 1997).

In the emancipatory process of PAR, *social learning* is the activity through which research subjects are endowed with the ability to initiate social change. Social learning can most simply be defined as the process of sharing knowledge, opinions and concerns (Buck *et al.* 2001). The implications of such understanding can, however, be dramatic: it may generate the knowledge and insight needed to awaken the critical consciousness that is essential to taking action and forging transformation (Deutsch 1988). Moderately formulated, it can lead to mutual understanding, a shared perception of problems and their causes, followed by agreed ways of looking at intractable social impasses, collective resource mobilisation and establishment of leadership for action (Maarleveld and Dangbegnon 1998). In participatory community development, social learning is a way

to craft and strengthen internal solidarities at the local level and overcome contradicting perceptions, ideas and beliefs of how social life should work. During social learning processes, the researcher's role is that of a facilitator rather than an advocate. He or she does not affiliate with any one stakeholder group but instead seeks to improve communication amongst them, using such techniques as future scenarios analysis and participatory modelling (Slocum and Klaver 1995; Vanclay, F. 1997; Vanclay, J.K. 1997; Scearce and Fulton 2004).

Social mediation and *negotiation* are a third set of concepts frequently referred to in ACM methodology and practice. I use *mediation* here because it directly assumes the involvement of a third party in the process of stakeholder negotiation—the issue of interest in this chapter. The role of a mediator is to assist conflicting parties in a negotiation process to identify commonalities of interest and ways to mutually trade off interests. Such identification can consequently bring solutions by which everybody gains (win-win situations) and/or nobody loses (give-and-take situations). The mediator's role is mainly to improve the problem-solving or negotiation process. It is procedural rather than substantial. Procedural assistance refers to two items. The first is providing a place where different interest groups can communicate effectively and without fear of coercion—that is, bringing people around the table. The second is finding a way for the parties to communicate once they are there—that is, finding the right language (Wollenberg *et al*. 2001). The mediator must also understand the negotiated topic thoroughly so that he or she can follow the negotiations. A mediator may propose options related to the content. But no matter how much a given mediator may steer, he or she should be seen as the catalyst who assists the participants in their search for their own solutions (Hamacher 1996)[1].

The relationship of a mediator to conflicting parties is assumed to be neutral. The mediator cannot have any vested interest in a particular result. Partiality in the process may lead to outcomes that are less satisfactory for one party than for the other, creating sources for future conflicts. Naturally, a third-party mediator cannot completely forget his or her own

beliefs, experiences and cultural background, which may shape his or her views about the subject and the outcome of the conflict. But neutrality means that the mediator separates these views from the wishes and ideas of the parties to the conflict and concentrates on helping them make their own decisions (Ibid p. 22). If mediators have their own agendas—vested interests in the outcome of negotiation—they must openly acknowledge them; then it is up to the parties to accept or reject this mediator in the negotiation setting. According to Filer (1996), social scientists, because of their objective representative enquiry, are well positioned to persuade all the other stakeholders to take better account of each other's mutual interests.

The practice of social negotiation shares many characteristics with social learning; it is about putting people together, letting them express their differences and seeing at what points these differences can be overcome so that they can make a commitment to work together and if possible reach decisions that are mutually beneficial or at least acceptable. The difference between the two concepts is the purpose this facilitation serves. Whereas social learning is a tool deeply embedded in PAR, in the sense that it is used to strengthen one group in a context of inequality (e.g., between men and women, communities and the state, seniors and juniors), social negotiation moves away from this advocacy role and stresses the total impartiality of third-party intervention. A second difference is the type of conflict the different techniques respond to. Social learning intends to create awareness of latent conflicts rooted in structural inequalities, but social negotiation usually presumes that conflicts are already visible and experienced by the people involved.

ACM interventions in Cameroon have an advocacy aim but consist of 'neutral' scientific experiments of multistakeholder negotiation, as well as social learning, thus combining the concepts outlined above. Interventions take place in conflict settings, where actors have widely varying perceptions about the appearance and urgency of the conflict and the quality of their respective relationships[2]. Oyono *et al.* (2003) summarise the aims of ACM in Cameroon as follows: (1) setting up mechanisms of social learning

and collaboration at the local level; (2) giving rise to change in forest management and promoting equal benefit sharing; (3) monitoring change in forest management regimes; (4) affecting national policies; and (5) generating scientific and strategic knowledge and information. Although the developmental consequences of ACM intervention are explicit, the interventions are principally experiments that should generate scientific knowledge. The philosophy of ACM research is not to actively seek or steer change in a certain direction but rather to see whether and how increased social learning and collaboration amongst local level stakeholders can improve their forest management systems. ACM researchers facilitate broad-based multistakeholder forums, which are assumed to lead to positive outcomes for all parties concerned, including the underprivileged.

Cameroon experiences

In the three ACM sites discussed below, tenure problems had recently arisen as a result of state demarcation of forestland. Stakeholder forums in all three sites aroused heated discussions about the legitimacy of the state's authority (on behalf of commercial and conservation interests) to define local communities' tenure and rights of forest access. All stakeholders were dissatisfied with the situation at hand but unwilling or unable to resolve the impasse (Diaw and Kusumanto 2005).

ACM researchers in each site began by inviting the stakeholders to attend a forum to develop criteria and indicators (C&I) for an ACM intervention (see Chapter 11 of this volume). The forum was intended to facilitate, through participatory system analysis and interactive games, a joint assessment of local collaboration and the rights and means to manage local forests (Ibid.). After the initial stakeholder forum, meetings, workshops and forums targeting particular subjects or stakeholders were held to tackle more specific problems related to forest management and tenure. Although the issues, aims and approaches of ACM interventions were similar, the outcomes differed greatly by site, and the researchers were tossed between strict neutrality and community engagement.

Ottotomo Forest Reserve

The Ottotomo Forest Reserve was gazetted in 1930 and made off-limits to human activities (see Chapter 3 of this volume). Soon after, however, population increase and expanding cacao farming prompted encroachment. Declining commodity prices in the 1980s forced many young people to leave the countryside to find work in the city. Nevertheless, pressure on the reserve continued in the form of farm encroachment, hunting and illegal forest exploitation. At the time CIFOR arrived in 1999, conflicts between local populations and the state management authority, the *Office National de Development des Forêts* (ONADEF), were frequent. Local communities claimed customary user rights in the reserve on the basis of their presence before the reserve was established, and their rights were being denied by ONADEF on the basis of statutory gazettement.

The ACM research intervention in the area was first and foremost inspired by participatory action research. Referring to Maguire (1987) and Selener (1997), Jum *et al.* (2003) suggest that researchers and oppressed people join in solidarity to take collective action, both short-, and long-term, for radical social change. The need for PAR in Ottotomo Forest Reserve derived from observations during preliminary community assessments in 2000. These concluded that state management of forests had never been participatory and that the local community had still not been involved in management decisions, even though forest legislation had opened room for this five years earlier, in 1994 (Jum and Oyono 2005). The main rationale for PAR was to strengthen local people's capacity in decision making, research and management of local forest resources.

But the ACM intervention did not exclusively target the local communities. As much as community livelihood needs were considered, conservation interests were also taken into account. Researchers established contact with ONADEF and decided to assist forest administrators and local NGO staff in learning how to use participatory research as a routine approach in their normal activities. In fact, the need to 'join in solidarity for collective action' devolved from the international NGO (CIFOR) to local state and

non-state actors. Jum *et al*. (2003 p. 12) conclude that 'the Ottotomo experience demonstrates the potential for participatory action research to empower forest administration staff in peripheral situations'.

Because of the urgent need for community strengthening and democratisation, as well as sustainable development, a unified approach was taken. That is, rather than unilaterally joining 'the oppressed', the ACM team initiated a process of social negotiation between local communities and the state. By adopting this approach, the team was able to forge a joint understanding of the contemporary problems—the legal dualism of landownership combined with a lack of communication between state officials and the community (Jum and Oyono 2005 p. 41).

A visioning exercise on the desired future of human-environment relations surrounding the reserve enabled local stakeholders to suggest concrete solutions to integrate different interests. This materialised in an agreement between ONADEF and local communities to create a buffer zone within the reserve and provide additional farmland and income-generating agricultural and agroforestry activities. Arguably, these solutions increased stakeholders' confidence in and commitment to joint resource management and should make it easier to solve future conflicts over forest access, illegal exploitation, access to development benefits and revenue sharing. In the beginning stages of the ACM research intervention, poaching declined and local monitoring of hunting practices improved (Jum *et al*. 2003). Social negotiation thus resulted in a win-win situation for the two major stakeholder groups.

Dimako Council Forest

In 2001, the forest surrounding the small logging town of Dimako was classified and demarcated on behalf of the municipal council and became the first council forest in Cameroon[3]. This created an institutional crisis between the municipal council and two local communities whose land partly fell within the council forest (see Chapter 4 of this volume). Neither

side could accept the other's perceptions of ownership, and relationships were highly antagonistic at the time the ACM team started its work. Given these conditions, researchers sought to mend fences between the stakeholders and forge an infrastructure of consensus and collaboration by acting as neutral facilitators and mediators (Assembe and Oyono 2004). To this end, frameworks of social negotiation were used to arrive at 'social consensus on the vision of the future desired' (Borrini-Feyerabend *et al*. 2000 p. 40).

A crucial point that arose during discussions was that farmland in the northern part of the council forest had been annexed by classification operations. According to the researchers, this neglect of customary tenure rights had occurred because the people of the two villages had not fully participated in initial decision-making processes. The villagers said that although they had been interviewed and consulted, their needs and viewpoints were not taken into consideration in the final decisions, leading them to conclude that 'the council forest had no local legitimacy, since it deprived the two village communities of agricultural lands' (Assembe and Oyono 2004 p. 80). With and on behalf of the aggrieved communities, researchers aimed to renegotiate the portion of the forest taken by rural council authorities.

In the renegotiation, researchers involved all the parties concerned: the villages that had lost their land, several villages in the immediate surroundings, various administrative authorities, and Ministry of Environment and Forests representatives. Although the first stages of the process were helpful in creating a shared understanding of the present situation, consensus about the future proved more difficult to achieve. Any demand for partial declassification or renegotiated access rights was deemed impossible by the rural council. Having declared any such solution unacceptable, the council decided to exit. Fortunately, an alternative solution was achieved between villages themselves, through negotiations in another venue, the *palabre traditionelle*[4]. Using information derived from agroecological and social mapping, the elders and *notables* from one village agreed to give their secondary fallow land to their deprived neighbours (Assembe and Oyono 2004).

Campo-Ma'an

Campo-Ma'an National Park was created in 2000 (see Chapters 6 and 10 of this volume) as compensation for the forest lost as a result of the construction of the Chad-Cameroon oil pipeline[5]. The project was funded by the World Bank's Global Environment Facility and was primarily concerned with biodiversity conservation (Pye-Smith 2002). The management area (called a technical operational unit) involved in the Campo-Ma'an project includes three zones: multiple-use zones, logging concessions and protected areas. The demarcations had harmful effects on the local communities. As a result of resettlements, the population in communal multiple-use zones jumped from 8 to 29 persons per km^2. Village limits, within which economic activities could take place, were set at a narrow 5 km into the forest from the road. According to Owono (2003), the Bagyeli people were, as a result of the park, barred from entering a 2000 km^2 zone of forest set aside for scientific research and could not hunt or take anything from a further 4000 km^2.

The result was local resentment of park management and the Campo-Ma'an project[6] in general. In Chapter 6 (this volume), Akwah *et al*. write that relationships were tense by the time the ACM researchers arrived in Campo-Ma'an in 2000. The ACM team saw an opportunity to help stakeholders communicate, explain their problems and work towards common solutions. It proved difficult, however, to gain the trust necessary for stakeholders to cooperate in the process. The foreign donors involved in the existing project were reluctant to allow a new actor, CIFOR, to step in because nature conservation was their priority.

Part of the reluctance may be explained by the fact that the communities initially tried to use CIFOR to strengthen their bargaining position vis-à-vis commercial and conservation interests in the region. The ACM team had to refuse to adopt any such position lest it jeopardise the principal aim of the collaborative learning experiment—bringing together a wide range of local stakeholders and fostering social learning amongst them to resolve their differences. Because the team declined to side with the communities,

the people themselves softened their attitude towards conservation and became more open to its discourses. As a result, the ACM team gained credibility in the eyes of conservation actors, who increasingly joined in common initiatives and agreed to work with the ACM team to develop an interactive approach in the elaboration of the management plan for the national park. As mentioned in Chapter 6, however, this collaborative effort was not pursued to its end and the results were mitigated.

Lessons drawn from comparison

Overall, one can conclude that the final Ottotomo negotiation ran more smoothly than negotiations in the other two areas[7], and we can discern certain factors that helped determine its inclusiveness and overall success.

The main difference between Ottotomo and Dimako was the negotiation objective. In Dimako, negotiations were intended to lead to redrawing legal, state-granted boundaries, while those in Ottotomo, as well as other ACM sites, sought to determine access rights and management responsibilities. The Dimako case was thus more formidable and had a greater risk of collapse (Diaw pers. comm.). Although the ACM team wished to continue negotiations, the council could, and did, opt out of the negotiation platform because it did not depend on any of the other players to fulfil its objective. This points to a second, related difference with the Ottotomo case. In Ottotomo, the state management authority depended on the communities to fulfil its objective of conservation. A collapsing negotiation process and the resulting dissatisfaction amongst local communities would hinder forest conservation. In contrast, a failed negotiation in Dimako would not affect the ownership status of the forest and was not likely to prevent the council from exploring forest exploitation opportunities.

In Ottotomo, broad-based and vertical negotiation yielded benefits for all parties. In Dimako, on the other hand, success came about through horizontal intervillage negotiation, instead of vertical negotiation between

villages and state authorities. The researchers shifted their strategy from outward-oriented neutral mediation to inward-oriented capacity building, with strong village affiliation. The Dimako example is a real-life illustration of the position, defended by Wollenberg *et al.* (2001), that in an unequal setting, selective alliance building often promises better outcomes for disadvantaged groups than all-inclusive neutral negotiation.

The Ottotomo and Campo-Ma'an cases differ with regard to the support of the conservation actor. In Ottotomo, CIFOR entered the field through ONADEF at the national level. At the time, the institution had just come to realise that a rigid conservation approach was doomed to fail and considered CIFOR's intervention an opportunity to develop a more participatory management model that it believed would serve conservation interests. Initial reservations by ONADEF ground staff in Ottotomo were easily dispelled because of higher-level support. The Campo-Ma'an project, however, did not perceive CIFOR as a complementary asset in achieving sustainable forest management. Strong backing in the early stages of the ACM intervention was thus lacking. This, in combination with the eagerness of the ACM team to succeed in Campo-Ma'an's villages, led to the perception amongst some project managers and staff that CIFOR sided too much with the communities.

The difficulties in starting up the ACM intervention in Campo-Ma'an involved a lack of clarity surrounding CIFOR's position in the field. Stakeholders confidently faced each other, shared information and worked together only after its role was sorted out. Despite, or maybe as a result of initial difficulties, the multistakeholder experiment yielded an important lesson in Campo-Ma'an; that any research intervention, however neutral it is intended, risks being considered biased towards one party's vision or perspective. CIFOR researchers had to adapt to this reality. At one point the question arose whether to step out of the 'wide forum' model and centre attention on capacity building of the local communities interested in the process. This was not pursued because it would have been inconsistent with the Cameroon interpretation of ACM and ruined the social science experiment (Diaw pers. comm.).

Using ACM experiences in Cameroon, this chapter scrutinises the basic assumptions underlying social mediation and negotiation approaches. When all parties converge at the negotiating table, compete and collaborate fairly according to rules that apply to all players, and share an interest in resolving conflicts in a mutually agreeable way (Richards 2000), win-win situations are considered attainable. The last condition is often considered to be obvious within frameworks of intervention in natural resources management: 'In the long run compromise may be the best way to serve everyone's interests, especially when destructive conflict is replaced by the stability and predictability of a mutually agreeable solution' (Borrini-Feyerabend *et al*. 2000).

ACM experiences in Ottotomo show that win-win solutions in a broad-based forum are attainable, but they are not preordained. In Campo-Ma'an, not all parties converged at the negotiation table in the beginning stages of intervention, and the intervention itself had to be negotiated first. And in Dimako, the parties did not agree on a basic set of rules, with the council rigidly stuck to formal law and the communities insisting on their historical customary rights.

Conclusion

During ACM interventions in Cameroon, researchers experimented with conflict mediation and negotiation techniques that led to some remarkable resolutions, such as the development of multiuse buffer zones in Ottotomo and the intervillage land exchange in Dimako. Besides the direct benefits of such solutions, local stakeholders gained negotiation, visioning and decision-making capacities. Thus far, participating community groups continue to organise and negotiate natural resource rights, internally and externally, under the informal configurations formed at the time of ACM research.[8]

To achieve management solutions, researchers had to affiliate strongly with communities, building on their knowledge, values and practices.

At the same time, they engaged with more powerful local and national stakeholders to gather their support for multistakeholder processes and to endow these actors with the capacity to initiate them on their own. Engagement and affiliation with stakeholders had to go both ways to create acceptance for broad-based negotiation forums—the ultimate goal of the ACM experiment.

ACM research in Cameroon shows that neutral mediation, negotiation and advocacy are not mutually exclusive. When researchers engage in capacity building of state administrations and community groups, their neutrality is not affected and the chances of success of the multistakeholder forum increases. The way ACM research has been practiced in Cameroon—multilevel engagement before and neutrality during negotiation—suggests a middle way in between 'joining the oppressed in solidarity' and strict 'neutrality'.

Endnotes

[1] This is 'facipulation'—that is, getting other people to do what you want while making them believe it is their idea. This is not recommended but sometimes proves difficult to avoid, particularly when facilitators unrealistically believe in their neutrality and do not reflect on and admit their own values, interests and positions (Colfer, pers. comm.).

[2] Diaw and Kusumanto (2005) provide a useful typology to characterise the quality of interstakeholder relations in ACM sites, based on subjective perceptions. Four categories are discerned: (1) open conflict, when both parties agree that collaboration is bad or nonexistent; (2) self-deceptive conflict situations, when one party says that the collaboration is good or acceptable but the other party says it is bad; (3) slightly biased but acceptable collaboration, when one party finds the collaboration good but the other party says it is just acceptable; and (4) fair to good collaboration based on congruent perceptions. Interstakeholder relationships are perceived differently by stakeholders involved in 63 per cent of the cases analysed in Cameroon. Usually, one actor (always the less powerful) is profoundly dissatisfied while the other thinks there is little or no problem.

[3] The Dimako Council Forest was the first forest to have been granted to an administrative council in Cameroon, in June 2001. Its management plan was approved in January 2002. The first annual standing volume (ASV) certificate was signed in March 2004. The method of operation chosen by the council is that of local government control. Logging activities were in progress early in 2004.

[4] The *palabre traditionnelle* is a village-based customary institution comprising family heads. It deals with legal matters and conflict cases.

[5] A wildlife reserve has existed in Campo-Ma'an since 1932.

[6] Three partners at the time collaborated in the project: the Ministry of Environment and Forests, the Dutch development agency SNV and Tropenbos International.

[7] This is not to say that ACM interventions were problem free. In the beginning stages of the research it was very difficult to engage the communities of Ottotomo in constructive dialogue. It took several inter- and intravillage meetings to dispel the scepticism and get communities 'ready' to face other stakeholders in a broad-based negotiation setting with state parties.

[8] It should be noted that the ACM programme in Cameroon was funded for only three years, which is insufficient time to formally institutionalise new, more democratic management systems.

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Women trading: A periodical forest market

Chapter 9

Assessing rights, means and handicaps

Anne Marie Tiani and Elise Noubissie

Natural tropical forests are managed by a variety of actors and stakeholders, with a tangle of sometimes divergent interests and motivations that create tension (Wollenberg *et al*. 2001; FAO 2003). In pluralistic forest management contexts[1], it is becoming more and more difficult to define sustainable forest management. Whatever the definition accepted, it should reflect the goals and outcomes negotiated between actors with legitimate interests in forests (Raison *et al*. 2001). Since the 1990s, criteria and indicators (C&I) have been developed as a tool to help better define sustainable forest management and assess changes in the condition and output of forest goods and services. Many institutions recommend combining two principles: maintaining or enhancing ecosystem integrity, and maintaining or enhancing the well-being of people (Prabhu *et al*. 1999). An important aspect of human well-being can be conveyed by the word *livelihood*—the satisfaction of the economic, social and cultural needs of forest-dependent people.

Institutions involved in the development of C&I share the view that the rights and means of each party to participate in forest management are two essential conditions for the livelihoods of local people[2]. According to CIFOR's C&I Principle 4, 'Concerned stakeholders [should] have acknowledged rights and means to manage forests cooperatively and equitably'. What rights and means are we then referring to? How can such abstract concepts be assessed?

In 1996, Colfer and her team developed and tested social science methods and tools for mapping the perceptions of forest stakeholders on abstract concepts and processes such as the allocation of actors' rights and means to forest management[3]. In 2001, in three workshops organised for the launching of the Adaptive Collaborative Management (ACM) Programme in Cameroon, we used some of these tools to assess equity, collaboration and mutual recognition.

This chapter narrates the experience of using pebble games and other social science tools to facilitate interactive assessment by stakeholders of the level of collaboration among them and their respective rights and means to

manage forests. Here, we describe the forest management issues in three sites (Campo, Ngoumou and Lomié), define the concepts, present the tools, analyse results and finally draw a few lessons.

The context of the workshops

Three workshops were held with actors involved in forest management in Campo (far southwestern Cameroon), Ngoumou (Centre Province) and Lomié (East Province)[4]. The workshops had two objectives:

» to assess the level of mutual recognition and collaboration and to collect baseline data for future evaluation and monitoring of ACM; and
» to give stakeholders the opportunity to meet, talk, share their perceptions, promote dialogue and facilitate the setting up of a platform for adaptive collaborative management.

Campo

The Campo-Ma'an Technical Operational Unit[5] (TOU) covers an area of 7710 km^3. It is located in southwestern Cameroon, on the border with Equatorial Guinea. The population, consisting of about 60 000 inhabitants, is heterogeneous. The unit includes the Campo-Ma'an National Park, production forests, logging companies (Wijma, HFC), agroplantations (SOCAPALM for oil palm, and HÉVÉCAM for rubber) and agroforest zones belonging to local communities. Successive external interventions (allocation of logging concessions, creation of forest reserves and agroindustries) were often carried out against the interests of the local people. As a result, local communities lost their customary rights over the forestland and its resources. The creation of the national park[6] exacerbated the tension between local people and the forest administration. The workshop reported here brought together the conflicting stakeholders and provided a platform for dialogue and negotiation.

Attending the workshop were representatives of three groups of actors: local communities, the local forest administration and the project in

charge of managing the park. Contrary to the other groups, this last group was represented by lower-level field agents and not by project managers. Private concessionaires were also absent but were included by the other groups in their assessment. The actors present participated in the games and expressed their perceptions of the social relationships[7] and distribution of rights and means between stakeholders.

Ngoumou

The Ottotomo Forest[8] Reserve is about 30 km^2. It was established by the Cameroon government in 1930 and placed under the control of the forest agency, the *Office National de Development des Forêts* (ONADEF)[9]. It is a production and conservation reserve, meaning that agriculture and hunting are prohibited within its boundaries. One village is inside the reserve and seven others are adjacent, and it is close to the city of Yaoundé. The population is dense—1239 in 2001—and growing. These factors make it difficult for managers to implement conservation.

Management of the reserve has been monopolised by government agencies, causing resentment amongst the local people. As a result of population growth, the crisis over arable land has increased this latent tension. At the time of the three-day stakeholders' workshop in Ngoumou, the relationship between local communities and the reserve managers was very tense.

Lomié

The Lomié region was selected by the Cameroon government to test the policy of decentralisation in the 1990s. In 2001, it already had five community forests, amongst the first to be legally recognised in Cameroon under the 1994 Forestry Law, and the first forest allocated to a Baka Pygmy minority group. Also in the area are logging companies and a Dutch development agency, SNV.

In Lomié, the local population is made up of two separate groups, the Bantu and the Baka, whose relationship is characterised by rivalry and patron-client relationships. The objective of ACM was to study the extent to which decentralisation reforms had empowered minorities and enhanced mutual

recognition amongst forest actors. It was a test case for understanding the changing position of social minorities in forest management (Diaw and Oyono 2001).

Concepts of rights, means and handicap

In many communities in Africa, natural resources are subject to communal ownership, and all members of the community have rights of access. Most local systems recognise multiple rights over land, whether held by different levels of rights holders or by different groups at different times.

The introduction of private and state ownership by the European colonists in Africa has had major consequences for local tenure systems based on communal forms of resource management. In Cameroon, the normative system inherited from the French civil code was based on exclusive ownership of all rights (use, abuse, and disposal) over tenure[10] and the exclusion of the possibility for others to have simultaneous rights, and it was imposed as a central determinant of stakeholder identity and power.

Instead of disappearing, however, customary systems, which were 'already complex in precolonial times, further evolved into multidimensional constructs of econiches and overlapping rights' (Diaw 2005 p. 44). Diaw (Ibid p. 52) describes this situation as 'embedded tenure', which he defines as 'an appropriation regime where private, shared, and collective rights to natural resources are nested into each other and into larger social institutions based on kinship and descent'. At present, this system of rights overlaps and clashes on the ground with statutory law and related public and private property rights, thus creating a complex situation where each actor can acknowledge and pick elements of one system or the other, or sometimes both, according to his or her perceptions and interests. In this *rapport de force,* communal actors have had to cope with more powerful actors entitled with rights granted to them by the state. Conversely, those

actors have tended to disregard communal tenure and to see community rights as weaker and in the process of being sidestepped or converted into the 'modern system of rights'.

The concepts of rights and means are thus polysemous, marked by multiple meanings. This complexity is exacerbated by translation of these concepts into local languages. In fact, the meanings of these two words pose problems already raised by Brocklesby *et al*. (1998). For some, rights have to do with legitimacy, which is perceived as power, hence a means. In Campo, one of the local words for 'rights' is *ngul* or *ovangul*, which means force and could also be considered in this context as means. Hence it is difficult to tease out the differences in the concepts. Rights and means are two aspects of the same reality. For some, only statutory rights ought to be taken into account, and for others, rights ought to be the expression of deeper historical rights. Customary law, notably, recognises several ways of obtaining legitimacy in forest management: through genealogical rights based on the occupation of land by a lineage, through the axe-right, deriving from the first cutting of a plot of primary forest; through production rights, meaning the right to reap from one's labour; and through succession rights, giving access for men or women through lineage (Diaw 1997; Weber 1977; Laburthe Tolra 1981).

In the workshops, all definitions expressing different aspects of rights were considered by the stakeholders, according to their perceptions and interests. To analyse the concept of rights, participants used its meanings in local languages to start with; they then defined rights as the perceived legitimacy of an actor's role (on going or assumed) in managing local natural resources (Nguiebouri *et al*. 2001); 'what they feel should be the case' (Brocklesby *et al*. 1998), and who should have a say (Diaw and Kusumanto 2005). Such rights may be conferred by an external authority, but more important is internal legitimacy arising from sociocultural and political norms. An internal legitimacy derived endogenously and endorsed by the state is likely to produce a robust base for organisation (Leonard and Longbottom 2000). However, legal competence acquired by a stakeholder without the approval of others is perceived as power and in this context is considered a means rather than a right.

Means refers to the actual and concrete power to do things—the instruments that forest actors use to carry out or influence management. These instruments include 'money, logistics, physical force, knowledge, know-how, as well as the law (not as a moral category, but as a tool to have things done in a certain way) … In attributing means, people make judgements about who, as a result of …various sources of authority, has the actual power to do certain things in forest management' (Diaw and Kusumanto 2005 p. 90).

In an ideal situation, each stakeholder's rights and means are recognised by other stakeholders. Also, management may be considered equitable if, in addition to the previous premise, existing conditions enable stakeholders to exercise their authority within the limits of their rights—that is, they should have the means to enforce their rights.

Imbalance between rights and means results in a situation Diaw and Kusumanto (2005) refer to as a *handicap* (H). The concept of handicap creates an interaction between rights and means—two seemingly different terms—that results in better understanding of the factors that contribute to the exclusion of some forest actors or that keep such actors apart from each other. Handicap is obtained by subtracting the score of means (M) from the score of rights (R): $H = M - R$. Handicap may be positive or negative (plus or minus) and ranges from –100 to 100. In a situation where rights and means are equal, stakeholder handicap is equal to zero. Any stakeholder with a handicap that is close to zero is considered to be in the best position.

If a stakeholder has more means than rights (H is positive), he or she has excess power and is illegitimate, and his or her action is not socially acceptable. If on the other hand, a stakeholder has more rights than means (H is negative), then he or she has a power deficit, which should be adjusted if he or she wants to fully participate in forest management (Diaw and Kusumanto 2005).

Method and tools

We used a pebble game to access actors' perceptions (see Chapter 10 of this volume). As with other participatory methods, this game is simple and easy to understand and allows for discussion and debate (Brocklesby *et al.* 1998; Oyono and Efoua 2001); it permits high-level community participation, saves time, is cost-effective and reveals community perceptions and opinions. In the context of the workshop, it offered several advantages in:

- bringing together actors from all the levels of forest management (administration, local communities, NGOs and development projects, logging companies, etc.).
- making it possible to assess or quantify perceptions or abstract ideas, such as equity, collaboration, powers and rights.
- giving each group of actors the opportunity to position themselves and make room for others, according to their perceptions.
- acting as a social learning tool that permits mutual learning by giving actors the opportunity to discuss and negotiate.

The game was implemented in several steps. First, the participants listed roles in forest management and selected three—defining forest boundaries, resolving conflict and applying sanctions—for the exercise. Then, they divided themselves into stakeholder groups, three at Campo and Ngoumou and five at Lomié. Each group went separately to answer three pairs of questions:

- Who has the rights to define forest boundaries? Who has the means to define forest boundaries?
- Who has the rights to resolve conflicts? Who has the means to resolve conflicts?
- Who has the rights to sanction? Who has the means to sanction?

For each question, the groups negotiated within themselves to distribute 100 pebbles amongst the stakeholder groups, including their own. This was both an abstract and practical exercise, whereby each group was scoring its rights and means to carry out a given forest management role as well as the rights and means of other groups. The groups then recorded their results and presented them in plenary where they were discussed.

Assessing rights and means

The pebble game yielded different results from one group of actors to another and in the three workshops. The process, however, was basically the same and led to similar discussions and conclusions from the participants. Discussions during the analysis of results were all characterised by honest dialogue, which was a prelude to building future platforms for partnership and collaboration in the three sites. We present here the results of the game as they were discussed and decoded in each site.

Campo

Figure 9-1 shows the coded discourse of each stakeholder group in Campo-Ma'an. Contrary to what could have been expected from historical oppositions and the tense situation at the beginning of the workshop, the state and local communities[11] basically acknowledged each other's rights to forest management. This mutual recognition has been a base to build a platform for mutual learning and collaboration[12].

However, despite this mutual recognition, actors had divergent opinions on the means available to carry out their respective duties. In fact, state agents did not acknowledge the means that local people had developed for resolving conflicts and defining limits. The representation of handicaps revealed the perception of each actor regarding the legitimacy of others and the balance within the system. The forest administration saw its handicap only with regards to the means of enforcing borders (-25), while local communities thought that it was handicapped in all areas (-25 to -40) except in the means to resolve conflicts. Both felt that the situation between them was more or less balanced despite criticism by communities that the state exceeded its rights (+20 to 25). The discourse from and toward the Campo-Ma'an project was the most striking. According to them, the state did not have the capacity to manage forests (H: -25 to -50). On the other hand the communities completely ignored the project in their assessment (no rights and no means!).

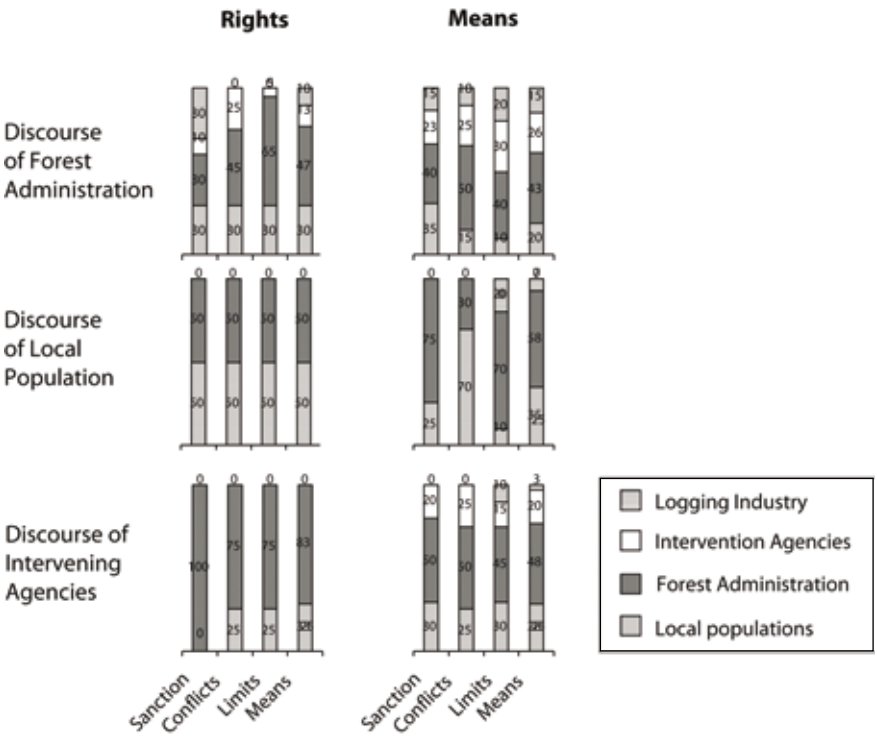

Figure 9-1. Graphical representation of the Campo discourse

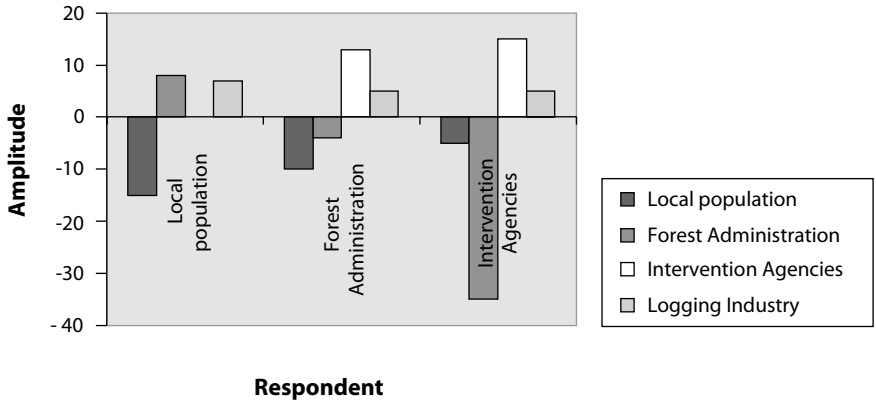

Figure 9-2. Handicap according to stakeholders at Campo

This exercise showed that in Campo-Ma'an, there was already some kind of mutual recognition between some stakeholders but this did not extend to all, particularly to the project managing the park. Conflicts over the roles and responsibilities of stakeholders were solvable, as participants in the workshop later noticed.

Ngoumou

Actors' discourse at Ngoumou was different from that at Campo as stakeholders' opinions were divergent on the very distribution of rights. Forest agency staff allocated almost all rights and means to forest management to the state. Local people distributed rights between the state and themselves but said they did not have the means to enforce their rights. The state and the local people clashed particularly over the duty of imposing sanctions (Figure 9-3).

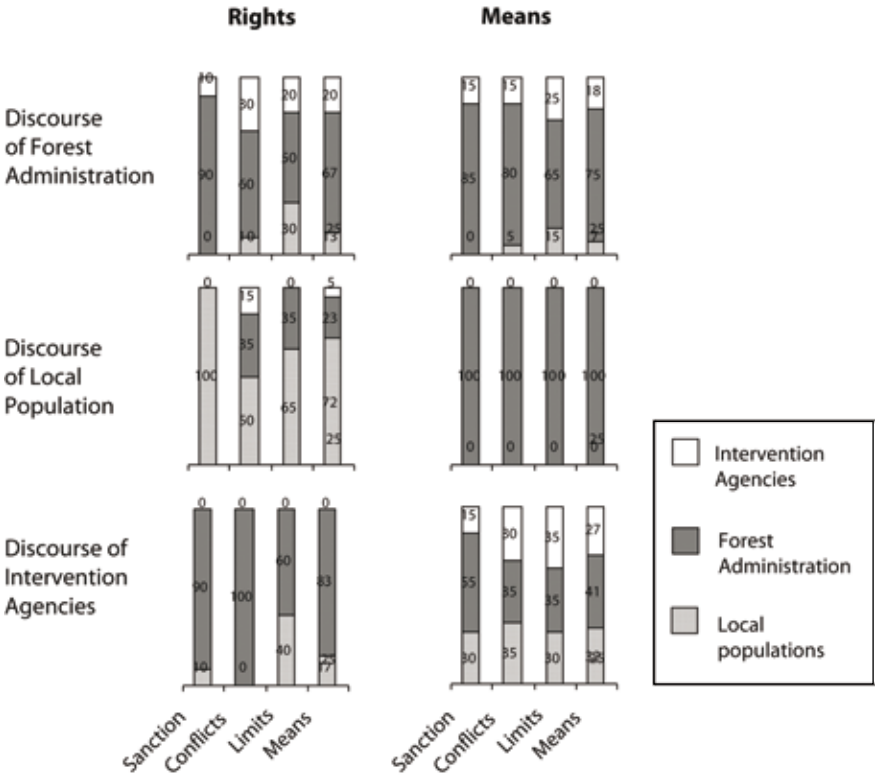

Figure 9-3. Graphical representation of the discourse in Ngoumou

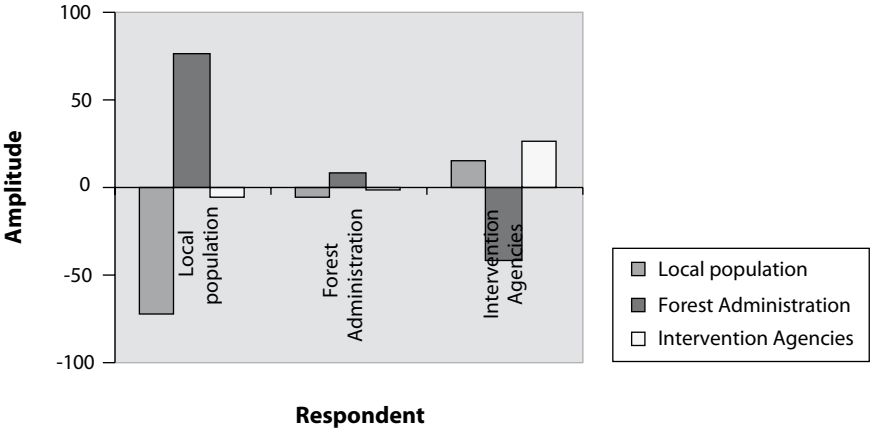

Figure 9-4. Handicap according to stakeholders at Ngoumou

Actors agreed on the distribution of means, saying that only the state had the necessary means to carry out the three roles (defining boundaries, resolving conflicts, and sanctioning) in forest management. This apparent agreement concealed deep discord over the legitimacy of each stakeholder. In fact, Figure 9-4 shows that by scoring a plus handicap (+77) to the forest agency, the local people considered it a usurper. Also, by scoring a minus handicap (–72) to themselves, they confirmed their disempowerment in relation to a more powerful stakeholder. The local forest agency staff had a different opinion. The handicap they gave other actors was close to zero (5 to -15) depending on the role considered. According to them, all actors had roughly the means to enforce their rights: each stakeholder was thus in the correct position, and the situation was in good balance. This position contrasted with the assessment by the agency's higher management that the situation of the reserve was compromised by the level of conflict amongst stakeholders (see Chapter 3).

With regard to rights, the discourse of the NGO agents was similar to that of the agency staff, confirming the supremacy of the state over other stakeholders. On the other hand, the local NGOs had a different view about means. By distributing means amongst the three groups, they highlighted the inability of the state to handle forest management by itself. By claiming

no rights, they further positioned themselves as external facilitators with the means to contribute to resolving management problems.

Lomié

Coded discourses in Lomié show that local communities were not considered full managing actors by other stakeholders. The stakeholders recognised by all the others as having rights and means were the state and, to a lesser extent, the community forest NGOs. The rights of local people were acknowledged only by the latter. The inadequate capacity of local people was taken as a given, including by themselves. Government and industry agents did not allocate any rights or means to local people, as if to say 'the forest is none of your business'. The most unexpected discourse was that of the local people. The Baka contradicted Bantu assertions regarding community rights. According to the Bantu, rights were shared between the state and local communities, with the Bantu and Baka having an equal share, but the Baka did not accord any rights or means to the Bantu.

The divergent opinions of the Baka and the Bantu were symptomatic of the depth of resentment between the two communities. To the Bantu, the state and local people had equal rights to set boundaries and resolve conflicts, and the share assigned to local people was evenly distributed between the two communities. However, only the state had rights and means to sanction. Whereas the Bantu considered the situation balanced (almost 0 handicap), the Baka denounced project NGOs and the state: they considered the former a usurper (H: +33) and the latter incompetent (H: –46).

Project personnel classified stakeholders in two categories. On the one hand, they considered rights holders as unable to manage forests; on the other, they saw themselves and logging companies as having excessive roles and powers (Figure 9-5).

The hidden discourse decoded by the game proved to be ambivalent. Points of view differed according to the cultural context and the emotional state of participants. In the case of the Baka, whose rights were more recognised

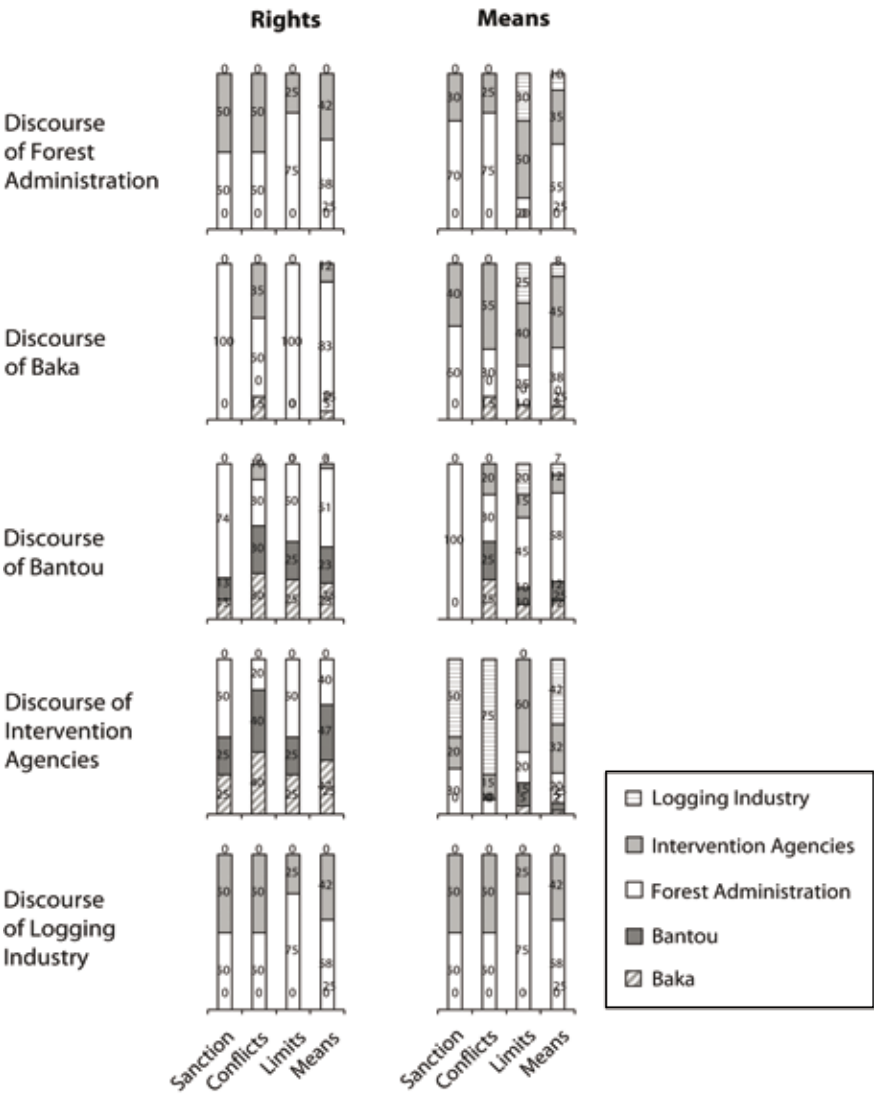

Figure 9-5. Graphical representation of the Lomié discourse

by the NGOs and their Bantu neighbours than by themselves, their statement may have meant to recognise their historical marginalisation as it may have been an expression of resentment, particularly toward the Bantu. Similarly, when the industry representatives scored no rights or means to themselves, was it really because they believed their legal logging

titles gave them no rights or was it a strategic way to say, 'I may not be legitimate to your eyes, but I am here because of the authority given to me by the state'?

Another important discourse was the refusal of the Baka to assign rights to the Bantu. The former ignored the latter, as if they did not want to acknowledge their existence. Their discourse concealed resentment: 'Since you despise us, to us you do not exist'. The allocation by the Baka of almost all rights to outsiders (the state and project NGOs) could be interpreted as an attitude of the weaker stakeholder, willing to have strategic and circumstantial ties with any stakeholder except those whom it is in conflict with. Weaker stakeholders may consider the external actor a potential ally that might help them neutralise their powerful neighbour and opponent. This discourse was in sharp contrast with the 'politically correct' discourse of the Bantu. According the Baka Pygmies equal rights and means was not founded on reality, given that the relationship between the two ethnic groups is characterised by clientelism (Joiris 1992). This allocation reveals a kind of withdrawal, as if to say, 'The allocation of rights and means between the Baka and us is strictly a community business that you should stay out of'.

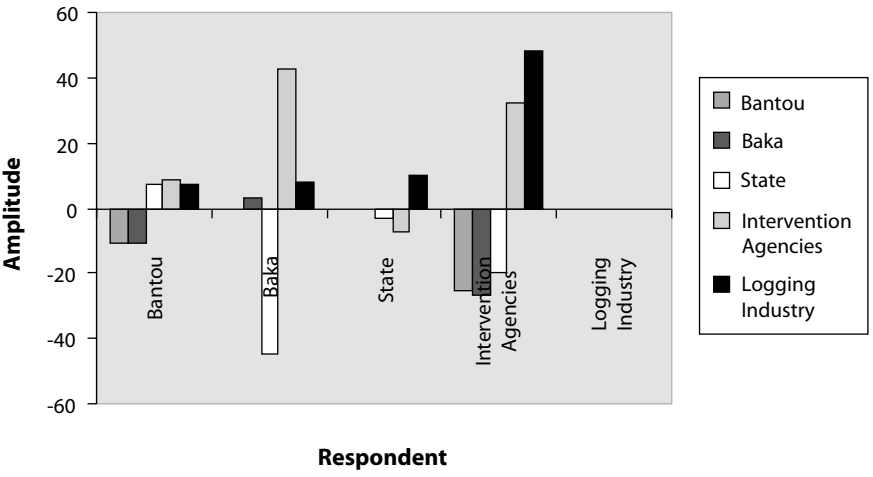

Figure 9-6. Handicap according to stakeholders at Lomie, 2001

Because of that ambivalence, the pebble game alone does not allow us to decode the discourses of stakeholders—it only provides a window into the opinions and positions of the actors. Deciphering the meaning of discourses requires more knowledge of the actors and context, but the game remains an excellent tool for facilitating interaction and social learning amongst stakeholders.

Power issues between actors

The rights and means game revealed that forest stakeholders may occupy central or marginal roles in forest management, according to their formal management role and/or perceptions. In addition, the game made it possible to measure gaps between forest policy discourses and management realities.

The state: Narcissistic and domineering? Although the forest agency readily recognised some community rights in Campo, the proportion of rights and means allocated to them (30 percent and 12 percent, respectively) may not have been enough to raise them to the full rank of partners in forest management. In the three sites in general, we note the state's disapproval (non validation) of the legitimacy local communities assigned themselves, giving them a minor position in Campo, almost no position in Ngoumou (13 percent and 7 percent) and no position at all in Lomié (0 percent and 0 percent). State officers did not assign the highest scores to the state in all sites and in all management roles. In some cases, they assumed a position of near-absolute power (e.g., the right and means to sanction in Ottotomo), in others, they were more modest and recognised significant weaknesses (e.g., powerlessness in enforcing forest limits in Lomié and Campo).

Local communities: Inadequate capacity and disempowerment. The games show that local people do not have appropriate means to manage forests. Even in Ngoumou and Campo, where some rights were recognised, local communities had insufficient resources to exercise these rights. However,

the Baka in Lomié are a typical case of disempowerment. This group did not recognise itself as a stakeholder (insignificant rights and means), hence publicly validating the statement of the forest agency[13].

The paradox between discourse and reality

The three study sites have three different management issues: The Ottotomo forest is a state reserve managed for timber production, the Campo-Ma'an Technical Operational Unit includes a biodiversity conservation area, and Lomié was chosen by the state to test the new policy of decentralisation of forest management. It is no surprise that an exclusionist management regime in the first two sites caused problems between the state and local communities. That this exclusion also exists in a systematic and categorical way in Lomié—the decentralised forest management site—was completely unexpected. Because the new forestry law in 1994 institutionalised the decentralisation of forest management, political discourse—at all levels—has adopted the same credo of the transfer of powers and responsibilities to local communities. Consequently, one would have expected that at Lomié, local people's rights and means to manage forests would have been recognised, and that local people would have been the most concerned with forest management. Yet the opposite obtains. This state of affairs raises doubts about the will of government officials to devolve some of the exclusive powers they held before 1994. The resistance of state officials to implementing decentralisation has been noticed in many countries in Africa (Larson 2005). Murphree (2000) notes that reluctance and lassitude in truly implementing decentralisation policies are common. Decentralisation has often been only a matter of rhetoric. This can be explained by the tradition of command-and-control within forestry, and the situation is worsened by the loss of patronage that true devolution entails. Moreover, many technical experts believe that rural people and communities do not have the capacity to manage natural resources.

Conclusion: What about sustainability?

According to Colfer *et al.* (1999a), 'concerned stakeholders [should] have acknowledged rights and means to manage forests cooperatively and equitably'. When effective, this principle of sustainable forest management, identified by CIFOR and shared by many other institutions, brings about mutual recognition amongst the stakeholders involved in forest management. However, the analysis of rights and means is problematic. How can such abstract concepts be assessed? In our study, we used interactive social science tools to reveal the meaning of stakeholders' discourses. Each stakeholder scored the rights and means of forest management actors. The concept of handicap creates a link between rights and means and also brings in the notions of legitimacy, capacity and equity. This exercise, carried out during three workshops in 2001, showed that there was little mutual recognition amongst forest actors. In fact, the state was the only actor unanimously acknowledged to have rights and means. By refusing in several cases to acknowledge the rights of local people, state actors revealed a narcissistic and authoritarian trait and the power deficit and disempowerment of local communities.

We noted that the three sites had different levels of mutual recognition. Despite disagreements in Campo, participating actors agreed on the distribution of rights and means. The most surprising discourse was noted in Lomié, where decentralisation was being tested. By rejecting local people's rights and, to a lesser extent, means to manage forests, the state and its partners revealed an inclination to maintain exclusive management and monopolise power. This result confirmed the need for an adaptive collaborative management approach, whereas stakeholders make conscious efforts to communicate, collaborate, negotiate and seek out opportunities to learn collectively about the impacts of their actions. It also showed that stakeholders need to have a good and shared understanding of each other's rights and means to lessen conflicts and to promote sustainable forest management.

Endnotes

[1] The forest is managed for timber production and other goods and services of interest to various actors at different levels (MA 2003).

[2] ATO/ITTO: Criteria 1:3 and 4; FSC principles 2, 3 and 4; Smartwood criterion 2:1.

[3] These methods and tools are documented in the CIFOR toolkit; see Colfer *et al.* 1999a and b.

[4] See Mala and Jum 2001; Oyono and Efoua 2001; and Nguiebouri *et al.* 2001 for additional information on these sites.

[5] The Technical Operational Unit was established in 1999. It is a space defined by the state to preserve and develop the economic, ecological, scientific and cultural values of the forests in the Campo-Ma'an area.

[6] The national park was legalised in January 2000 and the workshop was held in February 2001.

[7] For one of the games each group of actors had to evaluate the quality and degree of collaboration between stakeholders (see Mala and Jum 2001; Oyono and Efoua 2001; Nguiebouri *et al.* 2001; Diaw and Kusumanto 2005).

[8] The Ottotomo reserve is located close to Ngoumou, where the workshop was held.

[9] Office Nationale de Développement des Forêts (ONADEF) became Agence Nationale d'Appui au Développement des Forêts (ANAFOR) in June 2002.

[10] All resources on and beneath the surface of the land belong to the state.

[11] We deliberately focus more on these two actors because they hold the most significant historical and legitimate rights over forests.

[12] This observation was verified four years later, as forest actors in Campo-Ma'an came together to apply for and join the International Model Forest Network.

[13] This behaviour is a result of social relations this group has had with other forest actors since colonial times, relations characterised by exploitation and marginalisation.

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Walking the path: Young Bagyeli women and researchers in Campo-Ma'an

Chapter 10

Managing pluralism in Campo-Ma'an

Joachim Nguiebouri

What is pluralism? The Macmillan English dictionary defines pluralism as the idea that people can and should live together amicably despite differences in race, religion, culture and politics. With regard to the management of common goods, pluralism is a theory about the nature of the values whose realisation makes lives good (Kekes 1993). The concept relates, in our case, to the inevitable existence of often conflicting and different opinions about policies for the management of ecosystems (Rescher 1993; Blackburn *et al.* 1998).

The roots of pluralism originated with religious[1] and political thinkers like Aristotle[2] (in 350 BC), David Hume (1741), John Stuart Mill (1859) and Charles Montesquieu (1748), amongst others. Aristotle wrote that the ultimate aim of life is for individuals to find happiness 'living well and doing well'. According to him, happiness depends on virtue and on how society makes choices that bring about happiness. Although writings on pluralism predate the eighteenth century, it emerged as a coherent and documented ethical doctrine only in the twentieth century (Wollenberg *et al.* 2005, Aristotle, as translated by Rackham in 1934).

Why is pluralism desirable? Pluralism enables individuals or groups to maintain their autonomy while functioning as part of a larger society. It permits cooperation where there are differences. It helps people value social diversity and use it in a way that balances social and individual needs (Wollenberg *et al.* 2005; Anderson *et al.*1999). In the context of the Campo-Ma'an National Park, pluralism seems the best way to resolve the conflicts that have emerged relating to social diversity.

Important steps in developing pluralistic forest management include the following:

- describing differences and determining principles for handling these differences (including identifying interest groups and their needs);
- acknowledging customary norms and laws as legitimate;
- understanding the way people co-opt or adapt policy and how that affects its implementation; and

» helping other people understand the value a particular group attaches to forest goods and services.

Such a series of steps can also guide a benign decision-making process for using or managing forests in ways that allow people to pursue their ideas of a good life (Wollenberg *et al*. 2005; Anderson *et al*. 1999; Bebbington *et al* 1997). We premise this chapter on the assumption that forest governance needs to be facilitated with methods and tools aimed at managing social diversity.

Context and historical trend

The Campo-Ma'an forest is located in southwestern Cameroon (Campo-Ma'an 2002); it borders Equatorial Guinea and is a habitat for globally valued, endemic plants and wildlife. This space has traditionally been shared by a variety of ethnic groups, including the Bagyeli (Pygmies), Mabi, Fang, Batanga (Banoho and Bapoukou), Iyassa, Mvae, Ntumu and Bulu communities. Their traditional lifestyles are characterised by hunting, gathering, fishing, subsistence farming and collection of plants for medicinal use. Small communities harvested what they needed for subsistence, without exerting significant pressure on forest resources, until the end of the nineteenth century—the beginning of the modern historical era and constantly changing policies.

The Campo wildlife reserve was created and imposed (Campo-Ma'an 2002) by the colonial authorities in 1932 over an area of 260 000 hectares (ha). Logging was permitted in the reserve (Campo-Ma'an 2002) until 1945 (Table 10-1). In 2001, the Campo-Ma'an project developed a schematic framework and a temporary management plan for the national park, which was later rejected because stakeholders objected to its lack of attention to the social diversity in and around the park.

Table 10-1. History of administrative actions in Campo-Ma'an

Date	*Action*	*Actor*
1932	Reserve of 260 000 ha is created	Cameroon government decision
1968	Reserve is given to HFC for logging on 245 000 ha for 30 years	Agreement between Cameroon and HFC, a logging company
1975	60 000 ha in north-central area of Campo-Ma'an is given to HEVECAM , a rubber company, for exploitation over 99 years	Agreement between government of Cameroon and HEVECAM
1980	20 000 ha in the southeast is given to SOCAPALM, a palm oil company	Agreement between government of Cameroon and SOCAPALM
1994	Cameroon Forestry Law is passed	Submission of draft document to parliament by Ministry of Forests
1995	Implementation decree 710 000-ha reservation in Campo-Ma'an area becomes priority site for GEF-biodiversity project	Decision No. 091/A/Minef/Daj
1996	Creation of Campo-Ma'an project	Agreements between DGIS/ FEM/Cameroon, Netherlands government and World Bank
1997	Wildlife reserve is downgraded and becomes part of forest management unit 09025	Cameroon government allocated forest management unit 09025 to HFC
1999	March: Protected area is created in Campo-Ma'an May: Protected area is declared open to public use for creation of Campo-Ma'an National Park August: Campo-Ma'an technical operational unit of 771 668 ha is created, including protected area (Campo-Ma'an National Park) and peripheral multipurpose zone	Decision No. 372/Minef/Daj, Public Notice No. 0628/AP/Minef/Daj of May 24, 1999
2000	Campo-Ma'an National Park is created with area of 264 064 ha	Decree No 2000/004/PM of January 06, 2000
2001	Schematic framework and first draft of national park management plan are developed	Campo-Ma'an project
2003	WWF (World Wide Fund for Nature) becomes main manager of Campo-Ma'an National Park	End of funding for Campo-Ma'an project and new funding from Foundation for Environment and Development in Cameroon (FEDEC) given to WWF
2004-2005	Validation of management plan for national park	Ministry of Environment and Forests
2006	National park management plan is promulgated	Cameroon Minister of Forestry and Wildlife

There had been no public dialogue before decisions were taken about land use or park management. Although public notices, decrees and orders were issued from the top, local people had little access to information on these developments. The absence of dialogue resulted in conflicts of power, interest and perception (see Chapters 1 and 9 of this volume). For example, local communities believe that the agroindustries Hevea du Cameroun (HEVECAM) and Société camerounaise de palmeraies (SOCAPALM) have absolute power to do as they wish, and they are being perceived by the local population as having destroyed ancestral lands. Logging companies are having to adapt to the new legal context and are hence trying to forge friendships with local communities trapped in poverty—a process that has resulted in increases in illegal logging.

The complexity of these differing interests and perceptions, combined with repressive actions by the state and the forest administration, has caused serious social and environmental problems. The state, the forest agency and its representatives eventually realised that they would have to institute a multistakeholder approach at all stages of forest resource management, as stipulated in Cameroon's 1994 Forestry Law.

CIFOR's Adaptive Collaborative Management Programme seized the opportunity to intervene and began to facilitate interactions amongst these diverse stakeholders. It applied management tools that identified and considered the expectations of all actors within a complex management system (Colfer 2005a, 2005b, Diaw and Njomkap, 1998) suited for the Campo-Ma'an National Park project. This approach bore many fruits in the area. Capacity building for local and indigenous communities permitted them to better negotiate with state forest officials, the administration of the national park, logging companies and agroindustries on the basis of shared and verifiable criteria and indicators. At the moment, stakeholders are resolutely engaged in the establishment of a management framework that considers social diversity in forest governance and local development. In the following sections, we explain how this came about.

Approach and tools

Stakeholder analysis was the first step in the adaptive collaborative management (ACM) process in the Campo-Ma'an National Park. This work included literature reviews, single- and multistakeholder meetings, guided discussions, mapping, future scenarios, interviews and social science methods based on participatory rural appraisal, tested in this area by CIFOR in 1997.

We studied actors' activities on the ground and conducted guided discussions with managers and resource persons using the patrimonial mediation approach—a negotiation method that brings in a neutral third party to obtain agreement (Oliver de Sardan and Jaffre 1991). In this approach, each party's views on the issue or problem are translated to the other(s). According to Ollagnon (1991: 2-35) 'patrimonial' refers to 'all the material and non-material elements that work together to maintain and develop the identity and autonomy of their holder in time and space through adaptation in a changing environment' (see also Chan *et al.* 1993).

The local diversity necessitated careful sampling of the approximately 200 neighbouring villages so that each group could be adequately represented. We chose Bantu villages bordering the national park, agroindustries, logging companies and Bagyeli (Pygmy) villages, totalling 32 of the 200 villages in the Campo-Ma'an National Park area (Tiani *et al.* 2005). These included 12 communities bordering the national park, 10 villages far from the park and 10 Bagyeli villages or camps.

In the following section, we introduce the series of participatory rural appraisal techniques we used to familiarise ourselves with the communities and to engage them in self-analysis and collaborative efforts. We then describe the participatory action research process that followed these initial methodological efforts.

In using the appraisal techniques, we gave the people the opportunity to express their needs—through interviews and brainstorming meetings

in the field. Respondents identified actors (Table 10-2), described their activities, classified them into categories and identified their priorities. Rights holders and non holders were also identified. The analysis of the results obtained using these tools reveals that only the state and the local communities are widely recognised to have traditional or customary access rights to resources. The access rights of other actors (logging companies, agroindustries, etc.) are recognised in contracts signed with the state. Local communities have verbal contracts for harvesting and other forest uses. The state and economic operators have the most power in managing resources, followed by grassroots organisations, the Bantu community and lastly the Bagyeli Pygmies. The aim of ACM was to enable stakeholders to find common ground that would permit equity in management.

To sensitise communities on the state of their resources, we introduced a simple exercise for estimating the quantity of resources consumed by their ancestors, the amount used by the present generation and what will remain for future generations. The exercise is similar to what women do

Table 10-2. Stakeholder analysis

Key actors	*Activities*	*Impacts*
Ministry of Environment and Forests	Outlines legal framework, approves management plan, prevents poaching, controls forest management, gives logging rights	Legal framework for forest management, biodiversity conservation through creation of national park, decentralisation of forest governance and community forestry
Ministry of Agriculture	Outlines agricultural policy, promotes agricultural research and development	Employment generated by two agroindustries
Campo-Ma'an National Park	Park management, conservation, ecodevelopment	Schematic framework, management plans, promotion of community forests
Bantu and Bagyeli populations	Hunting, harvesting, subsistence farming, fishing, pharmacopoeia, commerce	Environment and biodiversity conservation
Agroindustries	Plantations, rubber and oil palm processing	Jobs (creating new areas of interest), development
Logging companies	Logging and selling of timber	Jobs (creating new areas of interest), roads, socioeconomic development

in the kitchen when they share food. We used three dishes, one for each generation, and people distributed 100 pebbles amongst the dishes to obtain the percentage allocated to each generation. The people, including women and children, were familiar and comfortable with this exercise. The most important finding at this stage was the visualisation and realisation of the excessive consumption of resources by the present generation and the need to manage resources sustainably.

We then used participatory mapping, in which stakeholders drew scenarios of the resource availability trends on maps. The maps were used to reflect on and design the expected and desired futures. Results from transects showed continuous degradation of resources around village areas toward the interior of the forest. These results strengthened people's desire to regain the past condition of the forest.

We used community landscape mapping to gather further information about natural resources, special sites and local perceptions within a common geographical framework (see Sheil *et al*. 2002 and Robiglio *et al*. this volume). After mapping, stakeholders visualised overlapping practices in recent and traditional land use systems. Stakeholders recognised this tool as a potential means of negotiation and recovery of lost spaces.

Also, we used Venn diagrams to assess stakeholders' perceptions on collaboration and differences amongst them. Participants evaluated the relationships amongst them by assessing and scoring the quality of a relationship. This method makes it possible to clearly determine the real relationship between groups. It equally makes it possible for groups to understand that in a plural context, agreement is crucial and can be achieved using common indicators to achieve a common objective.

We organised meetings and workshops to formalise approvals after compromises were made. At the end of the workshops, actors exchanged handshakes and hugs—an outcome no one expected.

Participatory action research (PAR), began after we secured general approval through patrimonial mediation. PAR makes use of information

obtained through the methods described above. It involves the development of participatory action plans (Bob 2004), implementation of planned activities, and collaborative monitoring and evaluation integrated with a system of self-correction and self-improvement based on critical thinking. PAR uses criteria and indicators developed collaboratively by all stakeholders (see Chapter 11 of this volume). It is a cyclical step through which a group can observe, reflect, act, monitor and evaluate (ORAME) its actions (Diaw *et al.* 2002). Applying PAR in this area provided a starting point to set up a framework for transparency in forest governance, mutual learning, legal pluralism, teamwork and more. Local communities and NGOs considered it a means to solve the problem of sustainable management in the Campo-Ma'an National Park area and particularly for the national park—by making the management process more collaborative, more adaptive and more equitable.

Local communities primarily practice subsistence activities, which do not have a considerable impact on resources. The state and its partners (official institutions, logging companies, agricultural processing industries, including immigrant populations) also exert pressure on resources. A process such as ACM is designed to bring these varying needs and interests together in a harmonised and beneficial way.

Discussion

Conflicts amongst stakeholders over resource use and ownership were confirmed, and efforts to deal with these conflicts are underway. Pluralism is a process, and we hope that ongoing efforts will ultimately bring about the general happiness that philosophers believe pluralism fosters. The state and its collaborating institutions, local institutions, neighbouring communities, logging companies and agroindustries are moving to elaborate an adapted strategic plan, with benefits for each stakeholder. ACM started participatory action research to manage pluralism in a permanent search for compromise, to achieve peaceful coexistence and successful conservation of biodiversity in the Campo-Ma'an National Park.

Finally, effective pluralistic management depends on facilitation and other methods (Diaw *et al*. 1998; Diaw and Oyono 1998; Diaw *et al*. 2002; Chan *et al*. 1993) and tools that guide management in recognition of social diversity. While this does not work in all circumstances (see Chapters 1 and 6 of this volume), overall, we have seen convincing improvements in Campo-Ma'an:

- social diversity is more accepted;
- people are working more together to enhance their happiness;
- more decisions are taken together;
- people have greater opportunity to unite and act under a single umbrella;
- more peaceful coexistence generates synergies and the potential for more innovation and adaptiveness;
- the voices and interests of marginalised groups are more often considered; and
- positive views of the minority are now often welcomed.

Conclusion

The general trend in the Campo-Ma'an National Park area is that the management process is moving towards pluralism. Pluralism requires special ways of doing things, including adapting methods and tools to make it a reality. Pluralism in the context of sustainable forest management and rural development is guided by the combination of normative and prescriptive approaches (laws and rules) and of prospective and anticipatory tools (mapping, visioning and scenarios through dialogue and cooperation) that contribute to incorporating the multistakeholders dimension. The management of the national park was initially mainly normative, as discussed above in the section on historical trends. The adaptive collaborative management project, which combines normative, retrospective, prospective and anticipatory methods, was introduced by CIFOR and adopted by stakeholders as a complementary and adaptable approach to facilitate the pluralism implicit in the Campo-Ma'an National Park project and the Cameroon 1994 Forestry Law.

This chapter has demonstrated that forest governance can be improved when adaptive methods to facilitate relationships within a context of social diversity[3] are used. It is important to note that pluralism is a fundamental element of the sustainable management of forest ecosystems. Politics, the grass roots, economics, NGO representatives, development agencies and research and facilitation organisations can achieve sustainable forest management and enhance livelihoods only through sustained dialogue. ACM used an integrative approach based on patrimonial mediation, which involves numerous tools that have led to understanding, trade-offs and, in some cases, consensus.

Endnotes

[1] Religious texts tend to promote tolerance and social cohesion (Wollenberg *et al*. 2005).

[2] Aristotle suggests that choices about how to achieve happiness should be consistent with practical wisdom, maintaining the viability of the social group, allowing reflection and the search for knowledge, achieving that which is noble or beautiful and doing the right thing at the right time in the right amount.

[3] People have a basic need to perceive themselves as both the same as and different from others. Individuals deal with this tension everyday in their choice of people with whom they associate, what they teach their children and even with which words they use to communicate. Comparing ourselves with others is a reality of social life (Wollenberg *et al*. 2005).

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Sharing notes: Participatory workshop in southern Cameroon

Chapter 11

Simplified criteria and indicators for local forest management

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In 1995, CIFOR initiated a series of tests of criteria and indicators (C&I) to evaluate the sustainability of community-managed forests in Indonesia, Brazil and Cameroon (Burford de Oliveira *et al*. 1998; Ritchie *et al*. 2000). The aim of the research was to explore the significance of C&I as a tool for making community management of resources viable and sustainable and to balance the distribution of the costs and benefits of forest management. The process of developing C&I at the community level should be of interest to organisations concerned with rural development and certification bodies promoting the economic, ecological and social profitability of community management (Burford de Oliveira *et al*. 2000). The selected C&I were to be used by forest experts, scientists and policy makers to assess community management systems. They were also to be used as a monitoring tool to assess changes and consequently improve future projects managed by local communities.

The methodology was borrowed from that of productive forests managed for commercial purposes, with almost the same structure and about the same technical language. Such an approach runs the risk of cultural misinterpretation. And in fact, even though scientific C&I were adapted to the sites, tests of their use at the local level as a monitoring tool proved difficult in most cases (Shrestha 2001; Pokorny 2001). The disciplinary base of C&I development—ecological, social and economic, and their hierarchical organisation (Lammerts Van Bueren and Blom 1997) with four superimposed stages (principles, criteria, indicators and verifiers)—requires knowledge different from that which communities traditionally use to manage and interpret their activities in natural environments (Nasi *et al*. 2001). C&I therefore needed be simplified to facilitate appropriation by local managers. This implies cultural reformulation of its language and its referents, and the involvement of all stakeholders.

Between 2000 and late 2003, CIFOR carried out research to simplify C&I identification in many sites[1] and at various levels, from the community itself (micro-level) to the community in relation to logging companies and forest administrators (meso- and supra-level). Research was carried out in sites at each level:

- *Micro-level.* Nkoelon is a small village of about 60 inhabitants at the southwestern entrance to the Campo-Ma'an National Park. This is a homogeneous community, made up of a single clan and a single lineage with legitimate customary rights over a specific forest space.
- *Higher micro-level.* The Canton Fang from Djoum, in the southern province of Cameroon, and the Ngambe Tikar District, in the Centre Province of Cameroon, are community-managed forests. They include villages of several groups of local participants motivated by ethnic or other ideals with superimposed rights over tenure and resources (Diaw 2002).
- *Supra- or meso-level.* Three workshops were held at Campo, Lomié and Ngoumou[2] in 2001 with representatives of ethnic groups, the forest agency, forest companies and development agencies working in the sites. The aim was to test the development of a minimal set of C&I for collaborative monitoring at the landscape level (see also Mala and Jum 2001; Nguiebouri *et al*. 2001; Oyono and Efoua 2001; and the conclusion to this volume).

A common problem identified in all the sites was discomfort because of the progressive reduction of community 'space' as a result of interventions from external actors. This chapter presents methods and tools used to develop simplified C&I by local people at the micro-level and by stakeholders at the meso-level. We describe the process of simplification, present the methodology and findings and conclude with a discussion on the validity of these C&I in light of lessons learned during the field tests.

Simplification of criteria and indicators

Simplification of the process, language and structure of C&I entails the following:

- » bringing the development of C&I back to one of its main aims—the identification of common management objectives and indicators specifying conditions for the achievement of objectives;
- » stripping the C&I language of its complicated terms or technical words without affecting its scientific validity, to make it easier to understand and accessible to all;
- » contracting the hierarchical structure of C&I by reducing the number of levels between objectives and their verification (Lorenzo and Hartanto 2001), to obtain sets that correspond to local stakeholders' perception and conception of the environment.

This structural simplification is not often advised, however, because the weight of the normative aspects (principles and criteria) and informational aspects (indicators and verifiers) of C&I vary according to the context and the objectives of the exercise (negotiations for a common vision, say, or the establishment of a participatory monitoring system).

Other aspects of C&I could also be simplified. Indeed, C&I systems cover vast fields of forest management—social, ecological, policy, productive, financial—simultaneously, as a consequence of the original intent in international fora to develop C&I for certification of broad forest management or timber harvesting. However, in reality, it is not likely that all aspects of forest management are of interest to all managers at the same time, and in the same proportion. From the viewpoint of a forest actor seeking to first of all control the conditions and impact of his actions on a site, it is not necessary to monitor everything.

Methodology for simplification

The methodology had two phases: a visioning exercise followed by the development of criteria/indicators.

Developing community visions and criteria

Developing a vision or future scenarios entails enabling people to articulate

their hopes; to build awareness about their hopes and to empower them to think they are possible to achieve (Wollenberg *et al*. 2000).

For the representatives of each social group, the exercise consisted of creating a vision of the forest and its stakeholders (regardless of the current situation). These different representations were later compared to identify common aspirations amongst participants, as well as ethnic, sociocultural or economic biases specific to each stakeholder. Thus, a forum for 'negotiation of the future' was created, that would lead to a shared vision. Once identified, ideal conditions could thus be regarded as common standards—fundamental values or natural ideals resulting from concepts such as 'good', 'well-being', 'integrity' and 'progress'. Only the social system and the environment were considered for the exercise. The ideal conditions, stated as management objectives, were considered as principles or criteria.

Developing indicators for identified objectives

For each identified objective, stakeholders developed markers, or indicators, for monitoring. These are observable or measurable variables, which can provide information on the state or quality of the conditions required by a criterion. However, in the process of identifying simplified C&I, the phase of the development of indicators was not completed. We only discussed examples and assessed their validity. We also noted that some conditions identified could be considered criteria or indicators variably. As a result of this ambiguity, we considered such conditions as both criteria and indicators.

Simplified C&I development experiences

In order to better understand the complexity of the identification process and the use of simplified C&I, tests were carried out in 3 sites at the micro-level and three other sites at the meso-level.

Box 11-1. Protocol used to identify consensual C&I

1. Focus groups organised in Djoum and Ngambé Tikar.
2. Concept of sustainable forest management and its dimensions—social, environmental, economic, political, relational—explained. Participants asked to translate these concepts into their own words, language and context. Visual support (drawings, pictures) and metaphors provided.
3. Sustainable forest management explained as a vision and goal. Participants asked to develop a vision for their village and forest and describe key characteristics of the sites. Characteristics grouped into two fundamental objectives that revealed the social and environmental dimensions of sustainability.
4. Participants asked to list the conditions/indicators showing that a fundamental objective has been achieved.
5. Brainstorming on signs that show what these conditions obtain (this phase was not completed, hence indicators were not identified, but we obtained as many sets of C&I as there were focus groups).
6. All the criteria put together and presented in plenary.
7. Criteria selected and ranked by each focus group, and other non selected criteria weighted.
8. Selected criteria were those considered most important by the majority (¾) of groups and also had the highest weighting.

Tools used to identify C&I varied according to each group. We used discourse analysis[3] with groups (Fulani and Pygmies) that could not read or write. For others, criteria were identified through brainstorming. Pebble games were used to weight criteria.

Identifying simplified C&I at the micro-level

Nkoelon is a village of about sixty inhabitants located at the southwestern flank of the Campo-Ma'an National Park. The park covers most of the community territory. The village is remote and about 30 kilometres from Campo and Ipono, which is a small town with about 5500 inhabitants. Men, women and children participated in the meeting.

The protocol below was used:

» Ask community to develop a map of resources in the village. During this exercise, the community reflects on the availability of these resources, management rules, actors and evolution of resources over time and considering certain factors;

» Carry out visioning and mapping of village scenarios;

» Identify criteria or indicators of ecosystem health and social well-being;
» Assess the current management, using identified C&I and comparing past and present situations.

Some ecological and social criteria were developed (Table 11-1). Discussions showed that indicators of abundance of animals actually referred to stock variations, not to stock *per se*. This was done by assessing the abundance of animal tracks in forests, droppings, songs of birds, the destruction of food crop farms and variations in hunting and fishing output.

Table 11-1. Simple C&I identified by 7 men and 8 women at Nkoelon, June 2001

Principles	***Social well-being***	***Ecosystem health***
Criteria or indicators	Presence of motorable road	Large animals in forests
	Presence of community forest	Abundant fruit trees in fields
	Limits of village land well demarcated[4]	Forest rich in exploitable timber
	Employment for young people in village sawmill and neighbouring national park	Presence of various fish species
	Food, drinking water and electricity for all	High fishing output
	Better social organisation, with functional working groups	Constant flow of rivers
	Developed ecotourism	

The result of this exercise, which was aimed at obtaining the community's perception of sustainable forest management, was not consistent enough to be used as a tool for monitoring or evaluation. There was need for consistent observable or measurable indicators, which seemed hard to develop at that stage, mainly because of the lack of incentives.

Simplifying C&I in heterogeneous communities

The Fang *Canton* in Djoum (southern Cameroon) spans about 2240 km^2, with a population density lower than 4. It includes 15 villages, made up of two main ethnic groups: the Fang (almost 90 percent of whom are farmers[5]) and the Baka Pygmies (mainly hunter-gatherers).

The humid and deciduous tropical forest in the region is rich in fauna, flora and fish resources and was undisturbed until the 1990s. The forest's recent history has been marked by a succession of events such as the classification of the Dja biosphere reserve; the creation of oil palm plantations, a council forest, the Mengamé gorilla sanctuary and intensive logging activities that gradually divested local communities of their rights to these land and timber resources.

The interventions coincided with the marginalisation of local communities by other more powerful stakeholders such as elites, logging companies, government bureaucrats and managers of the protected areas. At the same time, these communities began to suffer the consequences of a drastic loss of living space.

For this research, six focus groups were constituted, each made up of 15 people: Baka Pygmies, the young, women, representatives of organised groups (common initiative groups and associations), elites and resource users. Workshop participants were asked to define or list environmental and social C&I. These C&I were later divided into social and environmental C&I, which turned out to be criteria and indicators inversely.

N'Gambé Tikar is located at the extreme northwest of the Centre Province of Cameroon. The district covers about 7000 km^2 and has 35 villages and hamlets with a population of about 12 000 inhabitants. The communities are made up of two unequally represented ethnic groups: the Tikar, with a population of about 10 000, and the Medjang-Pygmy group, about 1000 inhabitants. Besides these two groups, there are settled or migrant Fulani, also called Peulh or Bororo. Multiple conflicts divide forest users. The two most violent conflicts are between Tikar farmers and Fulani cattle breeders and the Tikar and logging companies over forest management unit boundaries and illegal logging activities in agroforest zones managed by communities.

The area is a transition zone between forest and wooded savannah. The wealth of timber species in the region explains the succession of logging

companies. Local economic activities are essentially subsistence farming, livestock breeding (sheep, goats, chickens, ducks and pigs) by the Tikar and cattle and sheep breeding by Fulani in the savannah. In N'Gambe Tikar, five focus groups were organised. Each group was made up of about fifteen people in four large villages including the young, the women, the Fulani, the Medjang Pygmies and local elites.

The following question was discussed in each of these groups: What are the conditions necessary to have *Forêt Bien—Homme Bien* (forest and human well-being)? The procedure was the same in both sites. Each social group was to identify, arrange and weigh its C&I, then elect four delegates to present them in plenary. During this meeting, criteria/indicators were

Table 11-2. Simple C&I identified at Djoum and Ngambe Tikar

C&I tabulated and weighted at Djoum	***C&I tabulated and graded at Ngambe Tikar***
1. Better access to health care (9)	1. Better access to health care (11.6)
2. Respect of logging regulations (7.5[6])	2. Social peace (10.6)
3. Presence of all animal species (7.5)	3. Better schooling for children (8.6)
4. Having and managing community forest (7.5)	4. Having a home and starting a family (7.0)
5. Better access to information (7.3)	5. Having a community forest (7.0)
6. Better access to education (7.0)	6. Better access to information (6.8)
7. Presence of non-timber forest products in forest (6.2)	7. Better land organisation in division (6.6)
8. Respect of regulations regarding hunting, fishing and forest (5.7)	8. Food self-sufficiency (6.2)
9. Good food (5.5)	9. Promotion of social and economic development (6.0)
10. Abundance of fish (5.2)	10. Rational exploitation of forests (5.5)
11. Better relations between individuals in villages and amongst villages	11. Greater solidarity amongst communities (5.4)
12. Development of road infrastructures (4.7)	12. Better organisation within CIGs and associations (4.8)
Having home and starting family (4.5)	13. Maintenance of soil fertility (4.6)
13. More equitable distribution between	14. No pollution of streams (4.6)
14. Baka and Fang (4.0)	15. Controlled fishing and hunting (4.0)
Investment in local infrastructures (4.0)	
15. Reinforcing solidarity through creation	
16. of Common Initiative Groups (CIGs) and associations (3.5)	
17. Respect of religious and ethnic differences (2.8)	
18. Farming rotation and diversification (2.5)	

compared, then put together in one 'basket of criteria' and then filtered and weighted. Ultimately, the selected C&I were those that had been identified by at least half of the groups and that had a consistent weight[7]. A final set of criteria was approved by the representatives of stakeholders and could be used by these social groups as a guide for sustainable forest management.

In Djoum, of 38 criteria identified by the six social groups, 18 were selected. In Ngambe Tikar, of 33 criteria developed by five social groups, 15 were selected. Table 11-2 shows C&Is selected and weighted by various focus groups at Djoum.

C&I workshops at the meso-level

Collaborative management is 'a situation in which two or several social participants negotiate, define and guarantee equitable distribution of rights and responsibilities in their functions of management, over a territory, a space or a set of given resources' (Borrini-Feyerabend *et al*. 2000 p. 1). Our assumption is that collaborative management can be efficient only if stakeholders agree on a minimum number of management objectives and define indicators, which also function as milestones to ensure monitoring of activities related to these objectives. Collaboration thus involves the building of the capacities of all partners, which can lead to more responsibility, more equity and efficiency in management.

The CIFOR Adaptive Collaborative Management (ACM) Programme held three workshops[8] in Cameroon in February 2001, with the aim to develop and test the methodology for identifying simplified criteria and indicators for collaborative management of forests. It was expected that the development of consensual and negotiated C&I would pave the way to further development of collaborative monitoring using these C&I as tools. Three sites with different forest management issues were selected: the Campo-Ma'an Technical Operational Unit, the Ottotomo Forest Reserve and the Lomié Community Forest.

The Campo-Ma'an forest landscape is located in the southwest of Cameroon, at the border with Equatorial Guinea. In 1999, it was made a

technical operational unit. Campo-Ma'an covers an area of 7710 km^2. The population is very heterogeneous and comprises about 60 000 inhabitants. The unit consists of protected areas, including the Campo-Ma'an National Park, production forests, logging companies (WIJMA, HFC). There are also SOCAPALM (oil palm) and HÉVÉCAM (rubber) agroplantations, plus agroforests reserved for local communities. Successive external interventions were carried out, often not in the interests of the local communities who lost forests and their use rights over forest spaces. The workshop was held in a tense atmosphere yet it brought together actors in conflict and offered a platform for dialogue and negotiation.

The Ottotomo Forest Reserve is a forest block spanning about 30 km^2. It was established in 1930 and placed under the control of the national forest agency, the *Office National de Développement des Forêts* (ONADEF), by the Cameroon government. Because it is a production and protection reserve, agriculture and hunting there are prohibited. There is one village inside, and seven villages adjacent to the reserve. A dense and growing population (1300 inhabitants) and proximity to Yaoundé make it difficult for managers to preserve the forest.

In Lomié, the local community is made up of two separate groups, the Bantu and the Baka. Both tribes have a complex relationship, characterised by rivalry and patron-client relationships. There are five community forests, including the first community forest devolved to the Baka Pygmy 'minority'.

The organisation of the C&I development exercises was the same in the three sites. Participants were divided into four subgroups: local communities[9], institutional managers,[10] logging companies and NGOs. Each group was asked to develop a minimum set of conditions that would favour human and forest well-being, according to their perceptions. Sets of C&I were developed by the groups, assembled and compared. A consensual minimal set was then selected. Table 11-3 presents the selected C&I at the Lomié, Ottotomo and Campo workshops.

Table 11-3. Simplified C&I for collaborative management, Lomié, Campo and Ottotomo workshops

	Environmental C&I	***Social C&I***
Lomié	• Forest is not overexploited • Abundance of timber species • Presence of medicinal plants • Protection of rivers against pollution • Abundance of fishes in rivers • Diversity of wildlife • Abundance of wildlife • Presence of moabi *(Baillonnella toxisperma)* • Abundance of trees with large diameters • Control of timber exploitation • Craftworks exploitation of wood	• Community is well organised • Socioeconomic activities are monitored by NGOs • Many youth • Married young people with children • Rural exodus is minimised • Presence of health centre • Zinc roofs • Well-arranged water spots • Villages are electrified, • Good football field
Campo-Ma'an	• Presence of plants and animals, each occupying its space, which explains equilibrium of landscape	• Conflict resolution without violence • Protected access to resources • Health, education, nutrition are provided
Ottotomo	• Abundance of game and birds • Natural or normal forest regeneration • Soil fertility • Forest products are developed • Landscape management is respected • Training team is devoted and consistent	• New income generation activities • Understanding between neighbouring populations and forest administrators • Involvement of bordering communities in decision making • Access to forests and forest resources for bordering communities • Specifications regarding land use are respected • Complaints by communities are taken into account • Locals participate in monitoring of reserve • Gathering of non-timber forest products is authorised for neighbouring populations

At the beginning, the atmosphere in the workshops was tense. The development of C&I created a framework for social dialogue amongst participants. Each group benefited from the opportunity to expose and

share its concerns about other actors through the selected indicators. For example, communities living adjacent to the National Park and the forest reserve expressed their right to access park resources and to fully participate as stakeholders in the management of forest resources. They also wanted 'peace', strengthening of their partnerships and capacities (their social capital) and solutions to the problems that came up since the state decided to give away 'their' forests to the park and private industries (communities lost their rights and control over forests, there was poaching by outsiders, etc.). The forest administration expressed its concerns about poaching and other livelihood activities carried out by local communities that deplete forests.

One of the great lessons from the workshops is that stakeholders' views regarding criteria for sustainable management converged on key issues. For example, all agreed that abundance of forest animals, rational exploitation of forests, and social peace were significant criteria. The major divergence was at the level of the means to reach the sustainability objective. For some participants, the surest means was the repression and exclusion of groups rightly or wrongly considered a threat to forests; to others, it was awareness raising and development of alternative activities. However, after discussions, participants admitted that both were applicable, particularly the latter. Finally, the debate and negotiation were more at the level of means to manage forests than management objectives (see also Chapter 9 of this volume).

Analysis

While simplified C&I revealed the perception of forest actors regarding sustainability in forest management, they also unveiled actors' mode of organising knowledge. In Djoum, we asked the Baka Pygmies, when are the Baka happy? They answered, 'When there are many animals in the forest'. In Ngambe Tikar, the conditions for human well-being were 'peace, healthy cattle, health, enough grass to feed cattle, nature is not destroyed by agriculture and wild animals are far away'. This intertwining of the

social and natural worlds, which Nasi *et al.* (2001) describe as a 'holistic' vision, confirms the thesis put forward by the Millennium Ecosystem Assessment (2003 p. 83) that 'ecosystems and their services are not only instrumental for improving well-being, but also constitutive elements of well-being'. Given that the forests' health is a prerequisite for well-being, we have concluded that compartmentalising C&I into social, political, ecological and development realms is both artificial and ineffective (Tiani and Bonis-Charancle 2007).

Farmers at Nkoelon affirmed that to assess the sustainability of the animal stock present in the forest, it was necessary to record variations in households' meat supply, the number of traps set to have the same quantity of game per unit in time, and distance travelled to have the same quantity of game. That meant that monitoring changes in the stock of resources was possible; the only problem was the lack of incentives to do so.

Some of the simplified C&I can be logically considered principles because they express norms or higher objectives. For example, human well-being and forest's health are two SFM principles set by local facilitators in Djoum and Ngambe Tikar, under the slogan '*Homme Bien—Forêt Bien*'. In Lomié the criterion was 'a well organised community' and 'social peace' in Ngambe Tikar; these, too, could be classified as principles. In fact, most C&Is are stated as conditions necessary to achieve objectives and can function as criteria. The indicators (and verifiers) are culturally and socially contextualised, defined in ways that are pertinent to and of interest to local people. For example, in response to the question: 'How do you measure the abundance of fishes in the rivers?' a woman from a village in Campo-Ma'an replied, 'When washing plates in the river, one can determine the abundance of fish by observing the number of young fishes, the small fishes that rush for scraps of food from the dishes'.

Lastly, not all indicators fulfil criteria defined by scientists (observable and measurable) in village contexts, especially when rather metaphysical explanations[11] are used.

Ambivalence of simple C&I

Simplified C&I for collaborative management are presented as an ambivalent tool: on the one hand, they can serve as a tool for social communication, claims or negotiation, and on the other, they can be used by the majority to legitimate domination.

During the development of C&I for collaborative management, C&I proved to be a powerful tool for communication. All the social groups represented, even the most marginalised, such as the Baka Pygmies from Djoum, the Medjang Pygmies and the Fulani in Ngambe Tikar, who do not usually have a say in the presence of other participants, seized the occasion to voice, share and discuss their stand point on sustainability through C&I. Was their voice heard? The answer may be yes, if we consider the fact that representatives of stakeholders selected 8 criteria out of 12 identified by the Baka from Djoum. C&Is developed by these minority groups expressed needs and specific claims that they had not dared pronounce during other negotiation processes, because here they were given the occasion to express their concerns without oppression by the more powerful stakeholders. For example criteria such as *'land access and control by communities (Baka)',* and '*better redistribution of forest taxes*' were highlighted by the Baka in Djoum, and the Medjang allocated the highest weight to the criterion, '*having our Community forest*'. Hence, it would be worthwhile to further explore the methodology for the development of simple C&I as a tool minorities can use to express their views.

Recognising domination by majority

Looking closely at the 8 criteria developed by the Baka that were selected by representatives as consensual criteria, one realises that they were adopted probably because they were shared by most of the other stakeholders, or because they did not diverge from the interests of the others. This is the case of criteria such as, '*better access to health care',* or '*social peace*'. On the other hand, in the two sites, criteria specific to the minorities, which were presented in the form of a claim, were quickly eliminated[12]. The phenomenon, already described by Tiani and Bonis-Charancle (2007),

can be generalised considering that each participant has a dormant set of complex identities that can be activated at any moment. Thus, in order to discuss certain criteria, participants would split up suddenly into men versus women, farmers versus leaders, adult versus young, etc. This relative ability to change identity shows, as noted by Lescuyer *et al.* (2004), in the case of normative C&I, that there is a strong amount of subjectivity in the identification of C&I and also in the process of their use as a tool for social negotiation. Each representative does not only defend its social interests, but also a multitude of other interests, though not often admitted. The process is therefore not only subjective, but also very complex.

In Djoum, the representatives of stakeholders selected 8 out of 12 criteria developed by the Baka. 10 other criteria selected were not of great interest to this social group. The Baka scored 0 for the criteria, '*respect of hunting, fishing and forest regulations*'. It was the same for the Fulani from Ngambe-Tikar; they took no interest in the criterion, *'having a community forest'* or, '*rational exploitation of forests*'.

These examples show that a certain number of C&I were selected, not necessarily because they fulfilled sustainable management or development requirements, but because they served the interests of the majority of participants in the meeting. The minority group was obliged to accept results imposed by the majority. This acceptance, which validates a set of obtained C&I, does not mean that all the groups comply. Rather this process can reinforce the marginalisation of minority groups and aggravate and crystallise their frustration.

The problem does not concern the selected C&I per se, but rather the selection methodology employed. It is important to reflect on other approaches that would take minorities' real aspirations into consideration, either by reviewing the composition of focal groups, or by weighting essential and imperative criteria by each group. These are some of the reflections that require further study. Increasing the number of minority representatives could be a way of balancing power, but this is not enough. Another way of empowering minorities could be to ask representatives

of each group to divide its set of C&I into two parts: the key or major criteria and the minor criteria. The first is to be taken into account in the negotiation process.

This weakness in the process must not, however, overshadow its strength i.e., that it gives minority groups an opportunity to voice their opinions and particular concerns in a non-judgmental framework and influence outcomes—an opportunity they had rarely had before now.

Note of hope

The merits of the process of identifying C&I and their use in social negotiations was because an approach was found, which allowed all groups to state their claims. This was a step towards social dialogue. There was an intake of certain principles, for example, '*equitable sharing between the Fang and Baka',* even if its practical application—'*better redistribution of forest taxes*'—was rejected. The explicit intake of the principle of equity is a success, which is a result of negotiations using C&I. This is particularly important in these societies where Pygmies are being denied any ownership rights over land and forests. Also, they have been excluded from the sharing of forest benefits. Equity in daily life will come in its time we hope, following the process of social change.

Conclusion

The simplification of C&I came about as a result of difficulties encountered by local forests managers during attempts at developing or using normative C&I. Though these were certainly developed together with local communities, they did not fully reflect their needs nor did they correspond to their perception of the environment. It was thus necessary to simplify the process of C&I identification to make this tool accessible to forest stakeholders. It entailed stripping the C&I language of its technical and complex jargon, and removing disciplinary partitions in order to move closer to an integrative view for local managers. The methodology adopted consisted in facilitating the vision/scenario of an ideal future.

A vision converted into common management objectives and developing indicators specifying the successful conditions needed to achieve these objectives.

Tests for the identification of simplified C&I for sustainable management of forests were carried out at three levels of decision making:

- » forests managed by small monoclanic communities;
- » extensive forest landscapes, managed by a group of villages made up of many social groups, with different interests and motivations; and
- » forests managed in a more conventional way, with a written management plan, approved by forest administration (supra-level).

Experience showed that simplified C&I can be an invaluable tool, helping the community in decision making, as they make it possible to emphasise the aspirations of different groups or actors, and allow them to negotiate positions and meanings. They were proved to be a tool for communication and negotiation. One of the most convincing results was that those without a voice got an opportunity to voice their opinion, namely, the Pygmies and Fulani who through sets of C&I, expressed and shared their most daring perceptions, their interests and motivations with other stakeholders.

However, the identification and use of C&I can be used to legitimate the desire of other partners to dominate. Other possibilities of the use of simplified C&I are to be explored. The fact that they create a forum for the minority to voice their opinion is yet to be thoroughly examined. In the near future, local participants may be able to use simplified C&I to monitor local development projects, and to evaluate the impact of these projects on the well-being of the communities and the health of ecosystems.

Endnotes

[1] Within the framework of the Adaptive Collaborative Management (ACM) Programme implemented between 2000 and 2002 and the COAIT programme developed by Innovative Resources Management (IRM).

[2] Campo, South Province; Ngoumou, Centre Province; and Lomié, East Province.

[3] At this point we asked participants to quickly say what 'well-being' and 'forest' meant to them. We also asked the following questions:

- What is the meaning of 'good community'? What conditions are necessary to have a good community? What is suffering?
- What does a good forest mean and what conditions are necessary to have a good forest?
- Currently, is the forest doing well or not?
- Currently, are people doing well or not?
- What should be done in the future for humans and the forest to be in a good condition?

[4] Communities have been clashing with park guards because park borders have not been clearly marked out.

[5] These farmers practice shifting cultivation of food crops and also engage in hunting, gathering and other minor activities.

[6] Weight of the criterion (on a scale of 100).

[7] The weight of each criterion is the average of its weight allocated by the social groups. It is determined in percentages, in relation to the weight of the set of criteria.

[8] The description of these three localities is the same as in Chapter 10 in this book.

[9] In Lomié, local communities were represented by two groups, the Bantu and the Baka Pygmies.

[10] These are institutions that received their management authority from the state: park managers at Campo-Ma'an, ONADEF at Ngoumou, and SNV, a Netherlands development agency, in Lomié.

[11] Many indicators referred to witchcraft, which is not directly observable or measurable.

[12] For example, at Ngambe Tikar, four criteria—8, 'Better land and pasture security for cattle breeders'; 31, 'Pastures are not invaded by weeds'; 33, 'Ensuring cattle health and safety'; and 34, 'Determination of space to integrate the Fulani into the town'—that were specific to the Fulani were eliminated in the first short-listing round. The same happened to criteria 10, 'Rational use of NTFPs (cola, lianas, raffia, vouakanga, ndjansang, honey, etc.)'; 15, 'Abundance of game'; and 22, 'Freedom', even though they were very important to the Bedjang.

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COAIT training workshop

Chapter 12

Strengthening local analytical capability: Community options analysis and investment

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Little applied research has been done to determine (1) what is technically required to enable communities to assess sustainable development options; and (2) how far communities can act within the bounds of incentive (or disincentive) structures that limited control over natural resources have traditionally provided. This chapter makes a contribution to this area of applied research and presents results from two field sites in Cameroon over a six-year period (1998-2003). It touches on issues of empowerment, stewardship, and community and conservation with regard to natural resources management[1]. It provides evidence that communities are willing to invest in capacity-building activities when they perceive that this investment could increase their leverage over decisions pertaining to natural resources access and use.

It is now commonly accepted in conservation and development circles that local communities are one key to sustainable development and natural resources management.[2] Specifying communities' roles may vary enormously from context to context. In developing countries, sustainable development strategies are increasingly based on the premise that rural communities with 'traditional' cultures have the potential to implement sustainable development.

The scope of capacity building is broad and encompasses technology, institutions, information and specific skills. Significant work has been carried out (see, e.g., Agarwal 2002; Ostrom 1990; Baland and Platteau 1996) to identify facilitative resources and institutional conditions that can increase the probability of successful community-based natural resources management. This body of work suggests that community-based management depends on context-specific conditions, one of which is capacity.

Here, we argue that analytical capability is one aspect of capacity to manage natural resources. Analytical capability is the ability of communities to assess and choose beneficial options based on a clear evaluation of benefits, costs and risks, inclusive of all ethnic, class and professional distinctions within the community. We explain how analytical capability is essential

for effective community-level resources management and economic development, based on two case studies in Cameroon. We describe how we developed a specific set of training and 'learning by doing' activities to enhance the analytical capability of communities as a whole, with particular emphasis on the needs of marginalised subgroups (Pygmies, women). We describe strengthening community-level decision making by targeting the capacity building towards community representatives, called local facilitators, who are either appointed or endorsed by local leaders and are therefore perceived as legitimate. This strategy has proven effective for capacity building in community institutions.

The field experience described here is part of the broader framework of the Community Options Analysis and Investment Toolkit (COAIT), a comprehensive capacity-building methodology developed and piloted by Innovative Resources Management (IRM), a Washington, D.C.—based NGO, with technical support from CIFOR and CIRAD. Our field experience demonstrates that previous community choices and decision-making processes regarding natural resources management were largely dictated by opportunism. Communities and local individuals would often jump at opportunities reactively without analysing the consequences. Experience has shown that decisions made with incomplete or biased information often do not produce sustainable results.[3]

Whether the question is developing a proposal for managing a community forest, collecting and adding value to a non-timber forest product or promoting gorilla conservation, COAIT helps communities identify the pathways that offer them the most appropriate and feasible opportunities. It achieves this by injecting objective business principles of cost-benefit and feasibility analysis into community deliberations.

Four features set the toolkit apart. First, the economic, social and environmental analysis of development options is carried out by the community itself, strongly supported by local facilitators trained through COAIT. Second, it assists communities in building and negotiating partnerships with other stakeholders. Third, it is highly participatory,

flexible and easily replicable and is grounded in the principles of adult education. Fourth, while based on participatory rural appraisal principles, COAIT goes beyond such appraisal to mobilise communities and build broad stakeholder coalitions on very large landscapes. We find it very promising for the toolkit that, over the past six years, we have had the constant support and participation of community institutions, without needing to provide the standard array of 'concrete benefits' associated with development work in rural Africa. We conclude that people participated on a sustained basis through six years of part-time capacity building because they believed it was in their interest to do so.

Context in Cameroon

The sites where we worked in Cameroon are characterised by diverse and conflicting interests. Multiple stakeholders have different perceptions of resources, conflicting activities and problems of equitable access to the resources and benefits generated by forest exploitation. Local institutional capacity for influencing external actors in natural resources management processes has generally been very low. Our work took place in the context of the decentralisation process that the government of Cameroon instituted in the late 1990s to devolve community forest management rights. However, most communities in Cameroon have proven to be inadequately prepared to seize the opportunities that the new community forestry legislation offers[4].

Most Congo basin communities[5] have limited degrees of *maîtrise,* or control, over natural resources[6]. For example, they have fairly firm control over nontimber forest products and fairly loose control over highly valuable timber resources (see Chapter 15 of this volume)[7]. They have options for how to sustainably or unsustainably manage resources in the context of different tenure rights and their perceived legitimacy. Theoretically, nothing prevents local communities from making management decisions, at least for the resources over which they have a reasonable level of control. However, to exercise control, they do need to be able to determine their options and the associated costs and benefits. To help them do so, IRM

developed tools that would enhance the analytical capacity of communities and designated individuals to assess costs, benefits and options—the Community Options Analysis and Investment Toolkit.

Tools for enhancing analytical capability

Communities are faced with a myriad choices about resources management and economic development. Yet they lack both sufficient information and the ability to process the information they do have in a coherent manner that lets them make good decisions where common pool resources are at stake and where the needs of the community (and its particular interest groups) must be considered.

Hartanto identifies the need for analytical ability in her work with communities: 'What is most needed is the ability to analyse the information and generate sound and sensible conclusions about the consequences of their management interventions' (Hartanto 2002 p. 194). The skills needed to generate, process and use information to make better decisions—and the experience in using these skills—are what we call analytical capability[8]. The analytical capability of a community faces the constraints outlined in Box 12-1.

In this chapter, we follow Peter Morgan (1992) in differentiating between capacity (existing skills and behaviour patterns within an organisation) and capability (what an organisation can do). Thus capability involves freedom of choice (Sen 2000). The Community Options Analysis and Investment Toolkit (and the analytical capability training within it) is clearly a capability-building approach—that is, an approach that primarily seeks to increase freedom of choice.

Based on our results from COAIT implementation in promoting sustainable development and natural resources management, we propose that analytical capability be further broken down into the following capacities:

» data generation (this may require capacities in survey research and interview techniques);
» monitoring;
» integrated analysis (of the sociological, ecological and economic aspects of an issue);
» economic cost-benefit analysis (including distribution of benefits within the community);

Box 12-1. Constraints limiting community self-development

Information

- *Lack of information*: How can communities make informed choices on NRM options if they only have fragmented, outdated or biased information to reflect upon?
- *Lack of confidence in information at hand*. Even when people have solid information, they have a tendency to give up rapidly if external stakeholders bring contradictory information to them. How can communities negotiate with other stakeholders if they do not feel confident enough to defend the information they bring to the table?
- *Low levels of economic information*. Community members tend to focus on the out-of-pocket aspects of financial costs - not taking into account the value of their work time, for example. How can communities make sustainable long-term choices if they cannot perform a simplified economic analysis that takes all costs and a reasonable time period into account?

Analysis

- *Low capacity to verify or triangulate information*. New information is often aggregated as yet another "rumour" rather than purposefully verified or triangulated with other information to create a more "close to the truth" general understanding.
- *Negative findings and impacts not shared easily within the communities*. Individuals within communities, such as internal elites, who have knowledge about negative impacts would often rather focus on the positive impacts when speaking in public. They rarely place emphasis on issues of who would be excluded if one or another NRM option were implemented. How can communities make sound and sustainable choices if each and every development option is associated with an utopist vision in which the given option will contribute to each and every goal of the community and equally benefit each and every member of the community?
- *Analysis not comparative*. Communities rarely analyse any one NRM option in comparison with other alternatives. How can communities decide what is the best way to manage their natural resources if options are analysed independently from each other?
- *Analysis not integrative*. Analysis is usually dominated by one or a few people or arguments.

» context analysis (to integrate the broader picture into the analysis); and
» integration of 'traditional' and 'modern' knowledge[9] (to validate, explain, confirm and inform).

The Community Options Analysis and Investment Toolkit is intended to impart those capacities and enable communities to strategically, systematically and comprehensively collect and analyse economic, environmental and social data and use it to make sustainable choices amongst various development and natural resources management options.

COAIT is a long-term effort, carried out over 12 to 36 months. This time frame is necessary to allow communities to sufficiently analyse and discuss their options and seek appropriate development partnerships. It helps communities make effective decisions and take actions that promote both self-sufficiency and environmental sustainability based on data and perceived needs[10]. Our training methodology facilitates reflection and is designed to be easily replicable.

The tools are based on this central assumption: that communities in developing countries generally remain overly dependent on external assistance delivered through traditional aid channels. Because communities perceive that they have little influence over project design decisions, they opportunistically engage in development activities—activities that generally depend on donor priorities rather than on community-driven demand. They do not systematically analyse options available to them. This leads communities to undershoot their development potential and remain, for lack of a better term, opportunistically responsive to development aid agendas. Communities are rarely empowered to set priorities and agendas.

In response, COAIT is premised on the following hypothesis: better-informed communities will *more likely* choose sustainable options, particularly if the necessary information has been generated and processed

by the communities themselves. Using this toolkit, communities bring together information generation and analytical tools to enable effective decision making that accounts for development and conservation trade-offs. They become proactive, and they negotiate projects with new partners using business principles and analysis. Results in Cameroon to date prove that these community-level successes are achievable through COAIT capacity building.

Using the toolkit, communities in our sites in Cameroon have generated baseline information through activities such as assessments of current resource management systems, participatory mapping, resource inventories, research outside the community and natural product development analyses[11]. They have used the data to select the options deemed best for them in terms of the sustainable development criteria that they identified. The final phase built upon the positive outcomes of the previous phases: communities organised their findings and plans in prospectuses, best practice manuals and management and business plans. They are, at present, using the outputs to guide their own work and as input for seeking partnerships with NGOs, funding agencies and the private sector.

Going beyond participatory rural appraisal

The documented successes of participatory rural appraisal approaches have made them logical points of departure for 'second-generation' participatory methodologies. Such appraisals are often very effective in soliciting information about community contexts and perceived needs as an early part of a project planning process. However, participatory rural appraisal is not generally linked to community-based decision-making processes where either cost-benefit or feasibility analysis is a component in development planning. Rather, it often constitutes a strategy that is suggested by and facilitated by outsiders to acquire information and confer credibility and validity to what essentially remain top-down agendas for project implementation.

Participatory rural appraisal normally includes tools for organising what the community already knows rather than for generating new qualitative or quantitative data to better understand local processes and impacts. The information is thus often not owned by or even available to local people; rather, it belongs to external 'experts' who use it based on their own goals, for which they try to enlist communities' support. That is, given project cycles, participatory rural appraisal is more often used to refine an agency's project implementation plans than to help communities engage proactively in their own discussion of what they want to do and how to go about doing it. Thus, such appraisals arguably miss opportunities to increase communities' internal capabilities and their power to act in relation to external stakeholders.

As expectations and standards for participation have evolved, and as we continue our work with rural communities, we have found the need for a model that establishes a much more comprehensive and long-lasting community engagement and, in particular, enables communities to be proactive. Conversely, we needed a model for establishing the conditions for attracting external partners to collaborate with communities on a sustained basis. The result for us was the development of COAIT.

COAIT hypotheses

In developing and implementing COAIT, we started with five linked hypotheses pertaining to communities and natural resources management in the Congo basin:

- Congo basin-wide forest conservation can be achieved only by strengthening the capacity of community-level institutions to participate in sustainable development and sustainable forest management;
- Communities with high capacities for generating information on management options and for processing that information into decisions are likely to choose more sustainable livelihood development and management options;

- » Well-informed communities will likely choose sustainable options, particularly if the necessary information on development and conservation trade-offs has been generated and processed by the communities themselves;
- » Broader and more open community discussions on difficult subjects like benefit sharing can influence local decision-making processes towards sustainability and equity;
- » When communities have a good understanding of the costs and benefits (both individual and collective) linked to specific livelihood and management options, they are likely to make decisions that support both sustainable development and natural resources management.

A starting point in our work is the premise that with appropriate support, traditional authority structures (such as chieftaincies and their advisory councils) can manage the necessary changes to internal institutional mechanisms (such as rules and laws) related to natural resources management at the local level to engender equitable outcomes. We did not think, for example, that new management structures, like a wildlife management committee or *groupe d'intérêt communautaire* (community interest group), were necessarily required in the sites where we worked. However, we believed that traditional structures needed to become more 'efficient' on a larger scale if they were to achieve landscape-level results beneficial to the community as a whole.

First step: Building analytical capabilities of local facilitators

Through COAIT training and learning, people nominated by their community worked to become local facilitators. They developed their capacities to identify missing ecological, economic and social information, locate that information and obtain it. They developed their capacities to organise themselves to analyse this information and draw informed

conclusions. They also developed their capacities to present information, facilitate analysis and generate discussions within communities to establish consensus on priorities, criteria for selecting options and implementation.

COAIT learning process. The COAIT learning process is based on the following premises: (1) a minimum level of external facilitation is sufficient to help local communities carry out a feasibility study of their management processes; (2) well-trained and legitimate community representatives are an efficient means of introducing innovation and change; (3) good information collection and analysis can help communities make sustainable management decisions; and (4) groups of community representatives constitute a good channel for triggering innovative thinking and social learning within the local population.

The formal training involved a self-learning process combined with a teaching process. The multidisciplinary training team—one anthropologist, one ecologist and one economist—all had strong backgrounds in facilitation and social science methods. The team worked with the local facilitators to integrate new scientific information into their own knowledge base.

The COAIT learning approach has several unique features: (1) community representatives (i.e., the local facilitators, not the external facilitators) are empowered (trained) to do the job; (2) the role of the external facilitators is limited to catalysing the process and bringing technical assistance; (3) communities own and use, for their own benefit, the information they collect; and (4) the external facilitators interact with local communities not directly but via the trained community representatives, thereby creating a built-in limitation on their ability to influence local agendas.

Integrated analysis. The formal training centred on participatory cost, benefit and risk analysis of natural resources management options (Figure 12-1). We based our ecological analysis training on the assessments, made by the local facilitators themselves, of the positive and negative impacts of different courses of action on a wide variety of ecosystem components. We

helped the facilitators question the future of their resource base, uncover the interactions between natural and human systems and analyse the consequences of the degradation or disappearance of specific resources or ecosystems. We used a similar approach in social analysis training, though with a focus on the potential positive and negative impacts that management options might have on the social systems of the region, the community and subgroups within the community. Given the relatively weak mathematical skills of the local facilitators and the importance of transparency for community members, we used a simplified form of economic analysis focused on basic concepts, rather than a rigorous (but incomprehensible) presentation of economic theory and tools.

Learning by doing. Formal training sessions lasted two to five days and were held at least once per month over a six-month period. Using participatory rural appraisal, participatory action research and facilitation methods, the local facilitators practiced basic sociological, ecological and economic techniques. Assignments were given after each session, and the facilitators

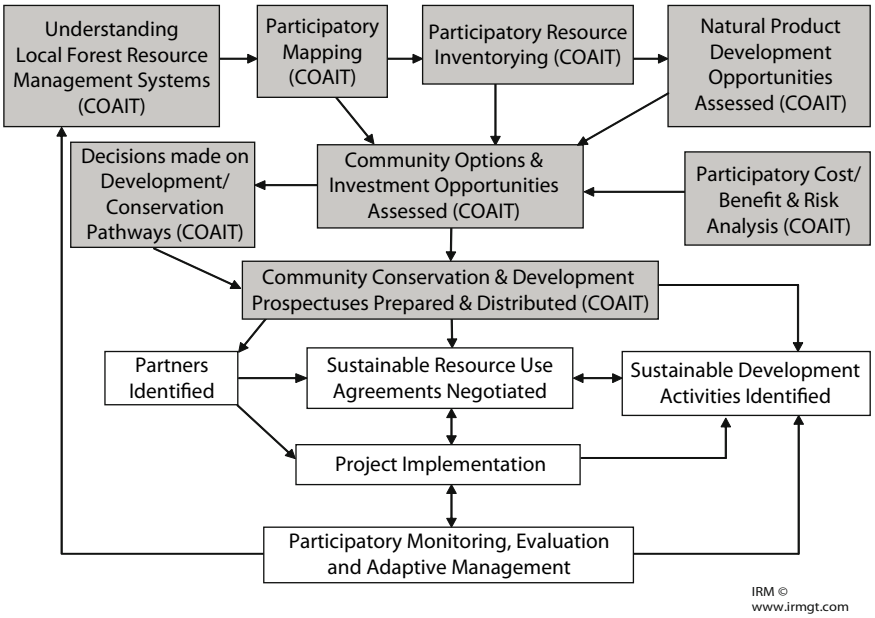

Figure 12-2. Innovative approach to facilitating decentralised natural resources management

worked with their communities to gather the information or to carry out the other activities (local surveys, meetings with external stakeholders) needed to advance the process. The information gathered was analysed and discussed during the following session, with emphasis on data accuracy, validity and credibility. The feasibility analysis involved the following steps:

- The multidisciplinary training team explained basic sociological, ecological and economic concepts and their importance in natural resources management;
- The training team introduced the types of data and information necessary to efficiently analyse a given natural resources management option;
- Together, the training team and the local facilitators designed data collection tools and methods;
- The local facilitators collected the data, working with their communities;
- The training team and the facilitators analysed the data, emphasising costs, benefits and risks;
- The local facilitators worked with the communities to develop visions of and criteria for sustainable development and natural resources management (based on the data analysis);
- The local facilitators, again working with their communities, developed scenarios of how management options would help realise the visions (with emphasis on the relationship between the expected outcomes of each option and the community's sustainable development and resources management criteria) and considered the costs, benefits and risks of each option for the local environment, society and economy;
- The local facilitators led their communities in developing a 'prospectus', a mix of business plan, resource management plan and practice guidelines to be used to negotiate partnerships with external stakeholders.

Linking local facilitators to local decision makers. Because traditional authorities (chiefs and notables) in the region generally make the decisions

on local resource use[12], we believed that the facilitators' recommendations would have more credibility if the links between them and the traditional authorities remained strong. The information and innovations transmitted to communities would then be more easily appropriated and used in local decision making. Therefore, we chose 'soft', flexible criteria for finding local facilitators. Our only requirements were that the nominated individuals have some 'valuable' knowledge or qualities, that they be consistently available to work, that the nomination process be community driven and that they be well-respected by their community.

We decided that each village should use its own customary selection mechanisms. As it happened, most representatives were selected through village elections, though a few were chosen by chiefs. In Djoum, 42 delegates were selected to represent 15 villages, but in N'Gambé-Tikar 26 people represented 50 villages.[13] The communities selected a diverse group of people. In Djoum, 19 percent were women and 21 percent were from the Pygmy minorities; in N'Gambé- Tikar 8 percent were women and 11 percent were from the Mbororo (Fulani) minority. A few representatives were not literate, but were nonetheless considered to be 'knowledgeable and wise'. Both older and younger people were selected. Most were agriculturalists, but the Pygmy representatives were more focused on hunting and harvesting of forest products, and the Mbororo specialised in cattle breeding.

Results to date

Generally speaking, the steps depicted in Figure 12-1 were successful in mobilising community participation in all aspects of COAIT capacity building. Arguably, participatory mapping is the step that grounds the COAIT process and establishes incentives for broad community buy-in. The participatory cost, benefit and risk analysis phase, though most complex, given the time commitment involved, is the main determinant in the overall capacity-building programme.

Increasing analytical capability. We found anecdotal evidence that COAIT training enhanced the local facilitators' analytical capability: their reasoning power and ability to participate in all aspects of the COAIT process improved significantly over time. The local facilitators were able to convincingly present the synthesis of their options analysis to their communities in a manner that clearly demonstrated their nuanced understanding and analysis of complicated issues. For example, they could explain to communities what the steps taken would yield, where uncertainties lay and what information and analysis still remained to be done. As a result—and this is a key indicator—the recognition of the local facilitators by their communities significantly grew during the COAIT process. This was attested to by many public statements made by chiefs and notables in the presence of researchers, partners and government authorities. In the early stages, local facilitators had difficulty bringing together a handful of individuals for restitution meetings, but towards the end of the training, they had large and enthusiastic crowds.

Using analytical capability to design sustainable development options. Communities went beyond simple yes or no judgments in their analysis of development and natural resources management options. Instead, they often used their analytical capability to redesign options to make them more sustainable. For example, when analysis revealed that palm tree plantations in Djoum did not pass the ecological sustainability criteria, but nevertheless promised substantial economic benefits, the communities focused their efforts on designing feasible mitigation measures to lessen the expected environmental impacts. One village group from Djoum concluded that it was better, for ecological reasons, to plant small patches of palm trees rather than the large plantations that are the norm in the area, and that palm tree cultivation should be kept away from rivers to avoid contamination from chemical runoff.

Taking control of local development. Communities that were more advanced in the COAIT process, after discussing and validating the local facilitators' recommendations, made binding commitments through a *guide de gestion locale des ressources* (local natural resources management

guide). This was followed by a prospectus prepared for external agencies potentially interested in supporting (or imposing) work in the region. The prospectuses captured the socioeconomic and environmental aspects of life in a region, provided milestones for future development and outlined plans for achieving the vision. The 18 communities in Canton Fang titled their prospectus *Homme Bien—Forêt Bien*[14] after the motto they had chosen for sustainable development during the COAIT process. The prospectus included (1) prospective activity plans for the region; (2) a description of the communities' historical trajectory, including their vision for the future; (3) the socioeconomic and environmental characteristics of the communities and region; (4) a description of historical land use and natural resources management in the region; (5) characterisation of existing conflicts; (6) local involvement of national and international NGOs; (7) a local guide to sustainable natural resources management; (8) local sustainability criteria (Box 12-2); (9) outlines of development and natural resources management options and their potential impacts; and (10) participatory maps, land titles, photos and other supporting documents. All this information provides support for communities to be proactive in their own development.

Carrying out their own development activities. Communities also showed an increased ability to work together and make sound development decisions. For example, one community used the forestry royalties obtained in 2002 to purchase improved oil palm planting material to rehabilitate existing plantations. All this was done within the overarching logic of the plan developed through COAIT training.

Catalysing actions to address local problems. Local facilitators have been the main actors in catalysing actions to address problems with external stakeholders. For instance, chiefs in N'Gambé-Tikar realised they did not have the information necessary to determine whether logging companies were indeed distributing benefits to local communities in compliance with extraction quotas and areas negotiated under Cameroon's 1994 Forest Law. There was particular concern about the *cahier de charge* (the ledger that serves as the basis for royalty auditing) kept by each logging concession.

Box 12-2. *Homme Bien—Forêt Bien:* Canton Fang's vision for sustainable development

For the Prospectus that the 18 communities of Canton Fang (a 1200 km^2 area within the Arondissement of Djoum) produced to guide their own sustainable development, they designed a system of indicators that would show that they were indeed on the path they have planned for themselves. These indicators include:

1. *Livelihood status of individuals has improved because needs have been satisfied at the local level*

- My family and I can sustain our livelihoods without leaving the locality
- I have access to credible and diverse sources of information
- My children can go to school, and their teachers are trained and available
- My family and I don't go to bed hungry
- We invest in local infrastructure improvement, and as a community we maintain this infrastructure
- The community has solidarity and is stronger
- We have obtained community forests and are managing them ourselves
- Conflict is minimal within villages and between villages
- Benefit sharing from resource management is increasingly equitable between the Fang and the Baka pygmies
- We are strong because we are organised Groupes d'Interet Communautaire, and it is not every person for himself
- We respect ethnic, religious and social differences because we know now that diversity is wealth when it is well managed

2. *Our resources are sustainably managed—they are not diminishing*

- We make sure that established norms for timber harvesting are respected
- All animal species that are found in the forest remain present
- Non-timber forest products are abundant
- Hunting, fishing, and forest exploitation are respected by all stakeholders
- Fish are abundant in water courses
- We are practicing crop rotation and agricultural diversification to slow the degradation of our forests

If the *cahier de charge* did in fact exist, local people knew nothing of its content—and thus did not know whether the negotiated terms were being heeded. Local facilitators responded to a request by several chiefs to investigate whether the royalty payment agreements were being honoured, and IRM supported a study and information mission to the national forest agency. The team also gathered information from local administrators, timber companies and the mayor's office in N'Gambé-Tikar and then proposed solutions for villages that had not fully benefitted from the royalty distributions.

In addition, at the request of the N'Gambé-Tikar communities, community representatives asked forest agency staff for the assistance of a government technician to explain how royalties were accounted for under the new legislation. The local facilitators organised a workshop with the subdivisional officer, chiefs and other local stakeholders at which many questions concerning possible misappropriation of funds, improper record keeping and abusive logging practices were addressed. The chiefs decided to reorganise the regional forest management committee and designate members according to the proximity of their villages to timber concessions. To ensure transparency and provide for good governance of concessionaire-harvested forests, the chiefs decided to use requests for proposals that required concrete governance-strengthening objectives and had clear revenue-sharing plans. All these actions resulted from skills gained through COAIT training (see Chapters 2 and 4 of this volume, for cases of accountability without COAIT).

Developing new natural resources management institutions. Many of the local facilitators trained through this project are in fact working to create new opportunities and expand their work beyond the borders of their own communities. In N'Gambé-Tikar, some local facilitators have begun to work together to organise themselves as a local consulting office to provide options analysis services to the neighbouring communities. In Djoum, local facilitators from a group of communities wrote a proposal to analyse the impacts of the Mengamé Gorilla Sanctuary—and the sanctuary proceeded to hire them to carry out the work. Their proposal clearly follows the approach emphasised in the COAIT training.

Advancing both conservation and governance agendas. COAIT has been successful in facilitating the emergence of community institutions for natural resources management and in strengthening these institutions and communities such that they have a good understanding of forest management stakes and the kinds of steps they can take towards community-level sustainability. To improve forest management, there is now a flow of forestry information coming to the people of Djoum and N'Gambé-Tikar through the channel of community-led efforts to

understand and act on forest policy processes in the country. For instance, some communities have compiled local 'Community Forest' files with information on national forest policy, forest management, etc.

Putting credible information into action. The people of Djoum, N'Gambé Tikar and Mokoko on Mount Cameroon have used the participatory maps produced by their communities to challenge perceived unjust land use planning by government. One instance of this was the case of a conflict between the Cameroon Development Corporation (CDC) and the Mokoko people, who were constrained to live on and use a very small area because the largest part of their territory had been given to the corporation and a conservation project. With their participatory maps in hand, Mokoko people felt more confident in their data and in their ability to present it. They used the facts that they gathered through their participatory process to renegotiate their land access with government authorities. Communities in Djoum used their participatory maps to expose illegal logging activities in neighbouring forests. In N'Gambé-Tikar, traditional leaders sent petitions to the government and to radio and TV broadcasters presenting the results of their investigations on how the timber felling royalties due to them had been misrepresented by the timber concession in question. These leaders also denounced information withholding by local administrative authorities who kept communities in ignorance of royalties due and appropriated higher shares of the royalties for themselves. Other communities used their maps as evidence that helped them stop illegal harvesting of timber on community lands.

Moving towards landscape-level natural resources management. Although some anecdotal evidence suggests that new natural resources management organisations are appearing at broader landscape levels involving multiple communities, these will take more time to fully coalesce and prove their staying power. The following actions are currently being driven by people who participated in the COAIT process:

» establishment of working relationships between communities and logging companies in Ngambé-Tikar;

- » work towards establishing clear limits for the forestry concession area that are understood and accepted by both logging companies and communities in Djoum; and
- » formal challenges against a forestry company in Djoum by communities that have contested illegal logging practices.

Increasing community credibility in the eyes of external actors. As the people of Canton Fang put it, 'as of now we are considered by other forestry sector actors as equal partners. Our representatives are invited either as individuals or as local facilitators to meetings concerning forest resource management in Djoum. Administrative authorities regularly call local facilitators to inform them on the evolution of our activities and to allow us to give our points of view on future orientation [of work in the region] … With protected area managers, relations are improving, albeit at a slower pace' (pers. comm., Canton Fang Communities 2003).

Affecting the resource base. The impacts that we have measured so far have primarily been at the process level. Biophysical impacts on the resources base are a longer-term result of recommendations, actions and changes in behaviour that COAIT has put into motion. We have worked with the local facilitators on monitoring practices, and we intend to follow up with them over time to monitor broader changes. Still, communities have taken concrete actions, such as protecting streams by maintaining trees along watercourses and by instituting comprehensive regulation of fishing activities. Both actions can reasonably be expected to have positive environmental impacts and serve as the basis for scaling up activities across the landscape.

Lessons learned

Criteria for selecting local facilitators. One of the most difficult issues at the beginning of the COAIT process concerned the type of institutional arrangement that would best serve as the interface between outside facilitation and local communities and as a catalyst for community learning and transformation. We were also concerned about representation within

villages organised in clans and lineages. Selecting participants was one of the most important moments of the COAIT process. The question was whether, as external facilitators, we should impose rigorous selection criteria. As noted above, we decided it was more important that the local facilitators have the fullest possible legitimacy in their communities. We later discovered that the communities used the following selection criteria:

- investment or interest in a local natural resources management option (we found an unconscious or conscious gender-based assignment: women were predominantly selected to work with non-timber forest products while men were selected to work with other options);
- prior work with our research team (e.g., as local cartographer for the participatory mapping exercises held at an early stage of the COAIT process);
- prestige in the village (e.g., links with the traditional authorities, morality, prior responsibilities as a civil servant);
- active engagement in civil society movements or political parties; and
- seniority (the average age was 41.8 years for Djoum and 31.3 years for N'Gambé Tikar).

Mathematical skills. The main difficulties we observed in the implementation of COAIT had to do with the low level of mathematical skills of some local facilitators. The principles and concepts of economic analysis were acquired by all the local facilitators. That said, only half of them were able to apply the cost-benefit analysis that they learned through the COAIT training. The main difficulty lay in their fluency with basic mathematical operations. Most were accustomed to calculating cash they expected to receive or spend but had some difficulty in accounting for economic costs like those related to time horizons. Because risk analysis requires a higher level of mathematics than that possessed by many of the local facilitators, we dealt with risk analysis only as part of a concrete group case study and did not expect local facilitators to acquire these skills in the first phase of activities.

Given that limitation, we considered requiring a minimum level of education (such as CM2 = grade 5) to ensure that local facilitators could use the economic analysis training. However, we felt that if we made education level a prerequisite, we would run the risk of eliminating individuals who could contribute in other phases of COAIT analysis. The participation of women was a case in point. Adult women generally receive little formal schooling: the illiteracy rate for women in Cameroon is 30 percent overall and far higher in rural areas (World Bank 1999). Yet their participation is essential to the success of COAIT's sustainable development objectives. We concluded that educational attainment should not be a prerequisite for the nomination of individual local facilitators, especially where more than one local facilitator was to be chosen by a community. Instead, we decided to address this through good facilitation on our part, ensuring the conceptual credibility of the analytical tools and linking people who lacked math skills with others having high skill levels. We learned that communities could, despite shortcomings in mathematical skills, make good decisions if they had good data and strong analytical skills.

Importance of the decentralised, iterative training process. Capacity building is a long process. In fact, we doubted that the capacity of the local facilitators had significantly increased until near the end of the process, when we observed the community-level meetings that local facilitators organised to discuss their findings with their communities. The decentralised, incremental, iterative process and its length (with multiple opportunities for participants to practice skills between formal training sessions and bring questions and ideas back to the group for discussion) proved to be a core strength of the methodology: it encouraged initiative, autonomy and ownership of the process by the local facilitators and the communities themselves.

Conclusion

In this chapter, we have described our first test of a tool that specifically targets increasing the analytical capability within communities through extension of the Community Options Analysis and Investment Toolkit. Lessons learned from this pilot have informed improvements in the COAIT methodology itself. Because we are about to launch a major phase of COAIT in the Democratic Republic of the Congo under several USAID funded projects involving natural resources management, biodiversity conservation, anticorruption, and good governance and decentralisation, this learning has been pivotal.

In general, we have learned that communities can acquire relatively sophisticated and technical skills, even in environments where formal training is generally lacking. We learned that it is possible to promote collaboration amongst communities in landscapes featuring multiple biomes, with excellent implications for biodiversity conservation and natural resources management. We believe (though it has yet to be proven) that communities *will* be able to operate independently and proactively to establish sustainable development agendas, which they themselves will be able to market to prospective partners without necessarily being dependent on either First World or elite developing country facilitators. All these lessons have proven fundamental in confirming a number of our initial hypotheses that underpinned the applied research programme described here.

Endnotes

[1] We wrote this chapter for sustainable development practitioners and researchers who, like those on our team, are interested in helping communities assume a more proactive role in sustainable development. COAIT was developed and piloted progressively in Cameroon by IRM. We subcontracted with two partner organisations —CIFOR and CIRAD—for specific elements of methodology development within the USAID-funded CARPE programme. This chapter is part of a series of papers that discuss aspects of the COAIT methodology, a comprehensive capacity building effort for Congo basin natural resources management developed by IRM. It focuses on only one element of COAIT—analytical capability—rather than the overall methodology. Additional information on COAIT is available at www.irmgt.com.

[2] See Hulme and Marshall 1999, 2001.

[3] The dilemma faced by communities in our sites has been raised by Ostrom: How do groups that are highly interdependent organise and govern themselves to obtain continuing joint benefits when all face temptations to free-ride, shirk, or otherwise act opportunistically? (see Ostrom 1990 p. 29)

[4] See Mandondo (2003) for an excellent analysis and critique of the current community forestry operative in Cameroon.

[5] *Communities* refers to common interest groups. These groups in our experience often comprise villages with a high degree of ethnic and socioprofessional homogeneity. They may also comprise multiethnic and multiprofessional groupings where a common concern brings 'a community of interests together'.

[6] See Le Roy *et al*. (1996) and Karsenty and Marie (1997) for details on the *maîtrises foncières* theory.

[7] As an example, traditional authorities have a high level of *maîtrise* over fishing activities in areas where fishing is not productive enough to have attracted large number of migrants. Particularly on smaller streams in the Congo basin, local *maîtrise* has enabled traditional authorities to forbid unsustainable practices (like fishing with poisons) and to effectively enforce these prohibitions.

[8] Implicitly, analytical capability is one of the keystones of capacity building efforts in Agenda 21 (37.1): 'A fundamental goal of capacity building is to enhance the ability to evaluate and address the crucial questions related to policy choices and modes of implementation amongst development options, based on an understanding of environmental potentials and limits and of needs as perceived by the people of the country concerned'.

[9] The introduction of specific 'modern' knowledge related to environmental issues is required to sustain this analytical capability building effort. By this, we do not intend to diminish or question the value of traditional knowledge. Rather, we agree with Chambers who pointed out 20 years ago that it is a foundation to build upon. 'Rural people's knowledge and modern scientific knowledge are complementary in their strengths and weaknesses. Combined they may achieve what neither would alone' (Chambers 1983 p. 75).

[10] The first tests of COAIT have focused on local forest resources management systems. However, COAIT is designed to be usable wherever the objective is to enhance and promote the role of local communities in the management and the protection of natural resources (e.g., in areas with high biodiversity value and high population density and around protected areas), and in situations where there are conflicts over resource management and access (e.g., areas with significant in-migration, impact zones of infrastructure projects such as dams and pipelines, and areas such as desertified zones where resources are scarce).

[11] Specific IRM reports on the COAIT methodology and results are available upon request.

[12] This finding was confirmed by IRM work during CARPE Phase 1.

[13] Local facilitators received a per diem for transportation and accommodation during the formal training sessions, but no other remuneration was provided. Some said that their commitment was motivated by the fact that their communities relied on them to better defend their interests.

[14] *Homme Bien—Forêt Bien* is a term that the community as a whole selected. From IRM's standpoint, it could have logically been '*Gens Bien—Forêt Bien*' to reflect a more gender-neutral philosophy. Our sense is the term *Homme* (man) was used similarly to 'mankind' in English, referring to all humans.

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A forested landscape

Chapter 13

Integrating participatory mapping and GIS to build local information systems

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Participatory approaches have become essential to collaborative forest management and the definition of strategies based on local communities and stakeholders' perspectives. One of the basic tools for participatory community appraisals is participatory mapping (PMap), which adopts cartography as a visual technique to collect and document local experience, knowledge and perspectives on land, natural resources and management. Through PMap, local knowledge about the resource becomes a foundation for analysis and planning of interventions in participatory decision making. It is increasingly necessary for researchers, project managers and local communities to be able to systematically capture, store and manage the information gathered through participatory means to facilitate planning and management processes.

Geographic information systems (GIS) provide the integration base for a variety of spatial data and have been successfully used for modelling and planning in land management and resource assessment. Once differences in data formats, data capturing and modelling techniques are reconciled, PMap can support traditional GIS spatial modelling. We merged PMap techniques with GIS to model human-nature relationships at the forest-agriculture interface in three test sites in southern Cameroon. GIS was used to build the spatial interface between social science methods and the FLORES[1] model implemented by the Alternative to Slash and Burn (ASB) programme in the region. Our original objective was to overcome the gap between spatial modelling data and social decision making in space by elaborating a geographically consistent representation of the social landscape and building a geographical base for the connection between land use, its cultural representation and its social management. Specific objectives were: (1) to identify the territory of local villages and microecological zones; (2) to identify rules and social levels of land use decision making; (3) to identify the spatial dimension of resources management and land use types; and (4) to develop a database for quantitative spatial modelling with GIS.

Although community members participated in the mapping, the method we present in this paper was not conceived to be a fully participatory approach to landscape studies. Rather, it was one step to increase the

readability of local rules influencing resource management, land use choices and thus landscape dynamics. Nevertheless, the comparison of the preliminary PMap sketches with the final maps resulting from the PMap+GIS integration gives us the opportunity to assess the potential of the process and the value of the outputs as a knowledge base and tool for adaptive collaborative management.

Background

GIS is a computer based information system capable of capturing, storing, managing, and displaying geographically referenced information for solving research, planning and management problems; the power of a GIS comes from its ability to relate different information derived from different sources and at different scales in a spatial context on the base of a location reference (latitude and longitude). Data capture involves identifying objects and their absolute location on Earth's surface. Objects are recorded in a series of attribute tables, which constitutes the 'information' part of the GIS.

GIS is used more to support land use and management planning as it provides baseline data and produces output information for decision making (Sedogo 2002). The use of GIS in spatial modelling and decision making on land management and resources assessment is based on its capacity to integrate spatial data from various sources and at various scales and manage complex geographic problems through the intersection and the analysis of relationships amongst spatial objects.

But GIS applications are limited to spaces that can be mapped; it has limited capacities for representing and managing qualitative information concerning perceptions and knowledge of social groups. This has restricted its usefulness for collaborative management and planning.

Adaptive collaborative management relies heavily on participatory processes aiming at gathering the perceptions and perspectives of stakeholders. In participatory decision-making processes, information

supports the definition of problems, their ranking, the identification of options and eventually the monitoring and evaluation of interventions. The information platform is built by integrating knowledge and data produced through the combination of tools in the participatory rural appraisal (PRA) family (Chambers 1992). Various participatory methods have been implemented under this umbrella to build and structure the information stock for collaborative processes and to organise and make accessible local communities' knowledge about natural resources management. The basic assumption is that local communities have the knowledge and experience to implement management strategies.

Participatory mapping was one of the first participatory instruments successfully applied in traditional anthropological research in the early 1980s, and it has become a classic tool for PRA community information gathering and analysis[2]. In a participatory mapping exercise, participants represent how they view and use their land. People use drawings—on the ground, on the floor, on paper—to map social, demographic, health, natural resources or agricultural information. The objective is to collect information and knowledge linked to resources management strategies and the actions of stakeholders.

Data is gathered via discussions in groups (delineated by class, gender or age) and used with the community for further analysis, ranking and action. PMap takes a bird's-eye (zenithal) view and thus reveals the distribution of objects and their spatial relationships. Objects include not only visible items such as hills, valleys, buildings and roads but also important invisible features, like boundaries and place names. The final participatory sketches graphically represent the community's territory. Territory, or *terroir*[3], is a geographical concept as well as an indigenous knowledge system applied to the landscape (Lazarev and Arab 2002, Sedogo 2002). There are countless definitions of *landscape,* but geography is of particular importance (Forman and Godron 1986) in focusing on the dynamic relationship between natural landforms or physiographic regions and human cultural groups. Thus landscape is a useful concept to link land and society. This is well expressed by the definition of landscape as 'the creation of a place at the intersection of geographic space and social activity' (Dougherty

2002). Through the social interaction of people within places, landscape is created; buildings, trees, roads, fields and other items in the landscape come to assume the form that they have through social activity. The map of the community's landscape is often implicit, with already built-in and named spatial references in a mental representation (Diaw and Oyono 1998). Participatory mapping reveals the mental map that community members have (Lazarev and Arab 2002). Each individual or group of individuals perceives different functional hierarchies and relationships on the base of which they select centres and peripheries. Researchers facilitate the process of representing these mental maps according to a simplified semantic, along defined spatial axes.

Despite the richness of the PRA information used in PMap, its inefficient geographic representation limits the identification and characterisation of spatial units and consequently the use of spatial analytical tools to support negotiation amongst stakeholders.

Research context

In the Southern Province of Cameroon, intensive research has been conducted since 1996 by the International Institute for Tropical Agriculture (IITA), focusing on a forest margin benchmark area[4] in the humid forest zone. This huge transect (1 450 000 hectares) extends from densely forested and sparsely populated areas in the Southern Province of Cameroon to largely deforested and more densely populated areas in the Centre Province, including Yaoundé, the capital city (Figure 13-1). Conceptually, the benchmark area is an interface of relational systems interacting at different scales. Infrastructure networks, flows of commodities, migration and patterns of interaction between villages and urban areas are all phenomena that are analysed at the benchmark level through a geographic information system (Robiglio 2002). The GIS was implemented within the Alternative to Slash and Burn framework for modelling purposes, integrating various sources of digital information at the regional and local level with satellite images (Robiglio 2002).

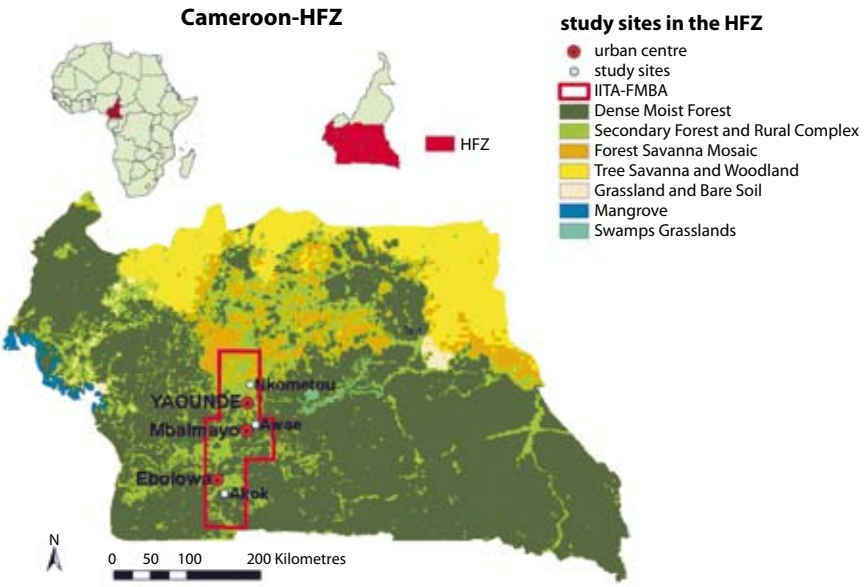

Figure 13-1. Humid forest zone and three study sites
Vegetation map source: TREES project 1998 – JRC

Within the benchmark area, three sites representative of the gradients of forest and population density were selected for detailed study and FLORES modelling (Legg 2003). The sites are Nkometou, 25 km north of Yaoundé; Awae, 35 km southeast of Yaoundé; and Akok, 35 km from Ebolowa, the provincial capital of South Cameroon. Akok is also the site of a research project called Local People, Devolution, Adaptive and Collaborative Management of Tropical Forests. Here, at the forest-agriculture interface, the ACM model was tested for identifying and implementing management options to stabilise the agricultural mosaic within the forest matrix. This project had conducted a PMap exercise in 2001, sketching social and land use maps to portray the spatial position and use of various resources—land, fauna, forest and water. The exercise, conducted in each of the villages, permitted the local community to visualise and better conceptualise their landscape (Mala *et al*. 2003).

The village-level GIS originally integrated (1) high-resolution satellite images (IKONOS) georeferenced and corrected at the source; (2) land cover maps (1:20 000) derived from on-screen interpretation of the satellite images using land cover classification legends; (3) hamlets' location from GPS records; (4) households' location from GPS records; and (5) local transport infrastructure (including logging tracks) from GPS records. Because existing public data[5] and the digital data set derived from it were insufficient for accurate village-level mapping and modelling purposes, we realised that PMap could be used instead to build the local information system and resolve issues of spatial modelling and decision making as discussed in the introduction of this chapter. The first participatory sketches were considered the basis for building an interface with GIS. The process completed in the villages of Akok was then replicated in Nkometou and Awae.

Method

Conceptually, the local information system integrates 'hard' and 'soft' systems (Röling and Jiggins 1998; Scoones and Thompson 1994; Sedogo 2002), in that the hard GIS data set is supported by the PMap as a basis for understanding the relationship between community social entities and the spatial objects represented. The existing GIS database is structured on geographical objects (i.e., exact objects characterised by attributes, geometry and relations; Molenaar 1998), but the local knowledge[6] system is based on resource management and social rules and therefore complex and 'fuzzy'. Before starting the PMap process, we discussed and identified with the community the spatial objects involved, the thematic and geometrical relation between them and the type of attributes they could carry. We destructured the hierarchical relations linking social entities, use rules and appropriation of resources in specific interconnected themes[7], which referred to specific spatial units organised in a relational database within the GIS. A georeferenced thematic map (discussed further below) was created for each identified theme by means of a base map derived from the integration, through GPS points, of the original participatory sketches

into GIS. The georeferenced base map offered a shared and recognised reference space for the thematic discussions with the community groups. That enabled us to produce a set of complementary layers that can be integrated into the village-level GIS as attributes of spatial objects.

Mapping process

An introductory meeting illustrated the work to the communities and defined a protocol with the principal steps of the mapping activity. A mixed group of about 15 community members of the local settlement units sketched a map of the site on A0 (33- by 47-inch) paper, using markers. They were asked to start from simple and close spatial references, such as main transport and walking axes and settlements[8], to successively distant watercourses. Information on people, clans and social structure was added to define the social relationships between settlements, identify the relationship between main hamlets and quarters and set the spatial frame. Participants at the first meeting identified the territorial segmentation determined by the kin group's heterogeneity across the area. In Nkometou and Awae, territory is under the control of a major clan and thus relatively homogeneous in terms of clan and lineage. Akok is an administrative aggregation of seven villages inhabited by lineages belonging to four clans.

In Nkometou we worked at the hamlet level in order to produced six basic maps that were integrated into a final map. Thematic layers were implemented at the village level. In Awae we worked at the hamlet level and produced three basic maps that were integrated into a final map. Thematic layers were added at the village level. In Akok we worked at the village level (for the seven villages) for both the basic and the thematic maps.

A further participatory mapping activity was started at the hamlet level, with a mixed group of at least 15 persons, using the same procedure as in the first meeting. In the office, we interpreted and compared the resulting sketches with the GIS dataset. Some references were very clearly recognisable, others less so; many were absent. The topology (the relative

spatial relationship amongst geographical objects) of the positioned features was particularly confusing because it did not correspond to either our personal knowledge of the area or the GIS display. Back in the village, we convened a focus group of hunters and elders, mostly men, who claimed to have a wide knowledge of the land. Together, we reviewed the original sketches, the topology and the toponymy (the local place names). We selected reference points for GPS field checking based on the spatial significance given to them by the group or their incongruity with the GIS data. Guides then took us to the points. During the long walks in the following days, a dynamic of open communication between our team and the guides was established. The guides provided explanations about past and present land use and interpretations of the land we were traversing. On average, 100 points per day were recorded using a GPS with a preset spreadsheet to systematically note the characteristics of each point.

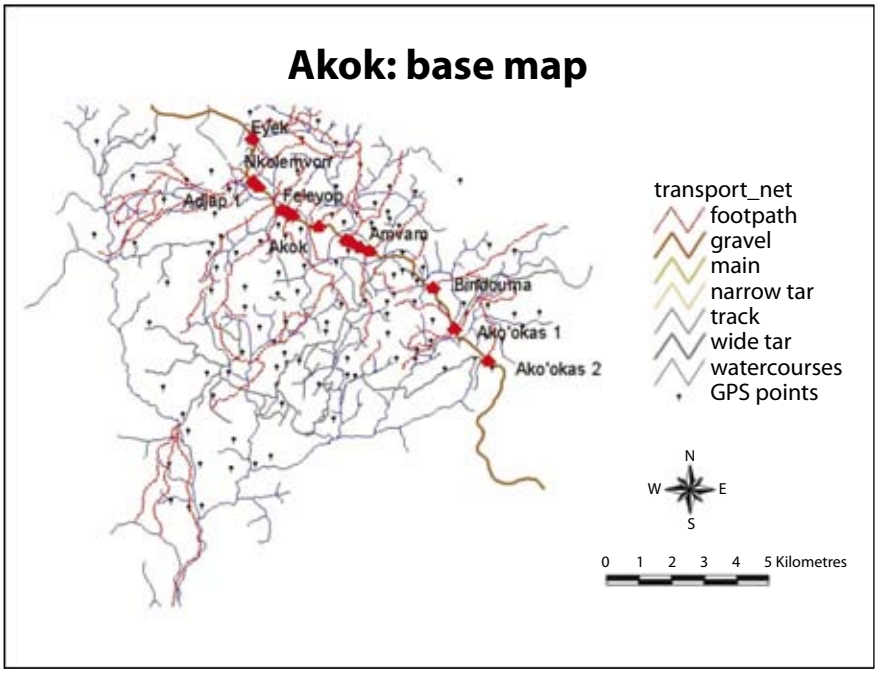

Figure 13-2. Basic map with GPS reference points indicated by local groups

We imported the spreadsheet into the GIS and labelled features and points. We then digitised the watercourses and relief indicated on the original sketches and checked on the ground, using the new references and the satellite images as a background. Borders between communities were traced only as they corresponded to the GPS points or natural features and left open elsewhere. The layout of the base maps shows rivers, hills, and the borders, junctions and other reference points indicated by the community, with their place names. A copy of the layout was printed on A3 (12- by 17-inch) paper and brought back to the villages.

The reporting exercise involved a larger group (at least three persons per hamlet and the guides) and aimed at verifying the information and showing the progress of the work. The focus was on hamlet locations, names and inhabitants; watercourse locations and names; roads and tracks; bordering communities and type of border (administrative versus social); and place names for landscape units and particular topographic features. To do this we drew enlarged copies (poster size) of the basic maps. The drawing proceeded hamlet by hamlet, with participants comparing their original sketches with the georeferenced map, discussing the location of any object and coming to agreement before we traced it. The guides were important for clarifying and legitimising the process and bridging the gap between villagers' representations and the geographical references. The final step was to add the main trails and communication routes connecting neighbouring villages. Once in the office, we integrated the corrections and modifications into the GIS. The final map became the base document for the next phase.

Thematic layers

Thematic layers reflect the social and cultural dimensions of spatial units. We defined the thematic structure—the type and number of layers—by reviewing the original sketches and notes taken during village meetings and guided walks. We first listed the categories of information considered relevant to local rules that affect resource management, and then considered how these categories could be translated into thematic layers and integrated into the local information system as attributes of spatial

objects. Land cover units, for example, are polygons, and tracts of water flows, arcs. We used these units as the elementary objects of reference.

The thematic discussion was held in a series of meetings with identified focus groups, who sketched on georeferenced transparent sheets superimposed on the base map (Figure 13-3). Four themes were mapped:

1. *Agroecological units, according to a local classification of landscape units.* First a list of local Landscape units' typology was set and the units were located on the base map. Some units correspond to single polygons, such as a forest, one of the pure classes in the Land Cover Classification System (LCCS) legend; others are patches within a mixed mosaic, classified according to building units, such as a matrix of fallows with scattered cultivated fields, corresponding to mixed classes in the LCCS legend. Cocoa fields were explicitly indicated because of their size; other crops were classified as fields in a specific matrix.
2. *Land access, by clan, lineage or extended family.* Symbols were used to designate clans, lineages and families on a level of detail corresponding to the ethnic complexity of the area. Land access was sketched using the landscape units as a reference to maintain correspondence between type of unit and type of access[9].
3. *Hunting.* Rights, types, areas and animal species were indicated, and abundance of animals was ranked as poor, medium or high.
4. *Fishing rights.* Types were noted along river tracts, and fish abundance by tract of watercourse was ranked.

Figure 13-3 Basic sketches with thematic transparent overlays (watercourses and access to fishing resources)

Using the maps as a platform for discussion, we collected further information on history and process of settlement, tenure rights (how land was occupied and allocated amongst lineages and within a *lineage*, existence of fields registered to the cadastre, existence of sold or rented fields, rules for land exchanges and transactions), important events and the history behind toponyms. That information was entered in the GIS through on-screen digitisation using the base map features and the land cover map as a reference. The entered objects generally corresponded well with the geographic features, as when borders coincided with a watercourse; in some cases it was arbitrarily set to reproduce as precisely as possible the features of thematic layers corresponding to the land cover map units.

The use of satellite images as background facilitated this work, as did our direct experience of the represented landscape. Once integrated into the GIS, the information becomes part of a broader database and can be combined with spatial data derived from other sources to produce new variables for analysis and scaling up.

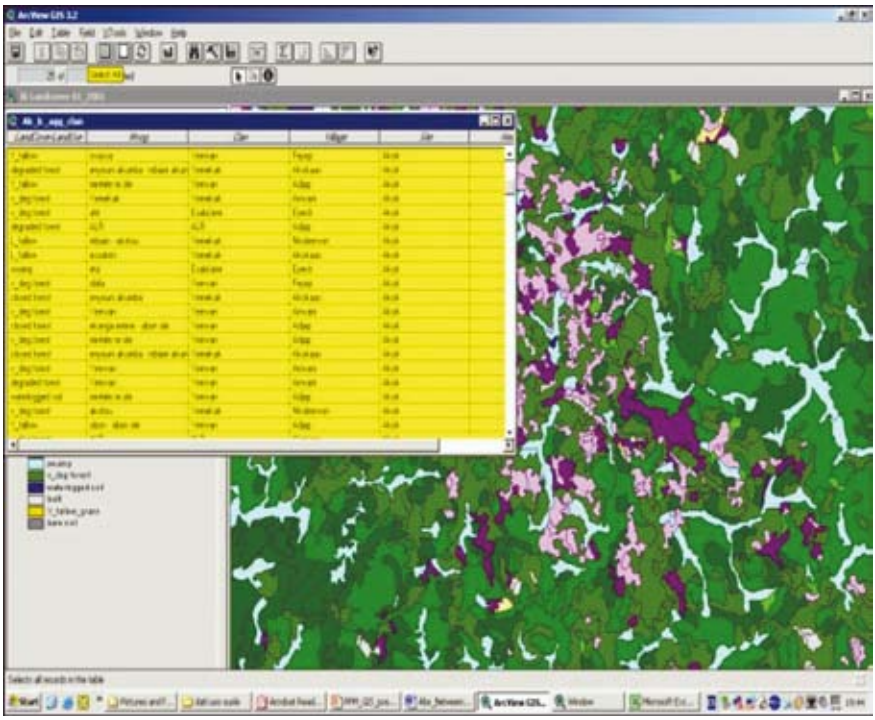

Figure 13-4. the ArcView3.2 GIS display.

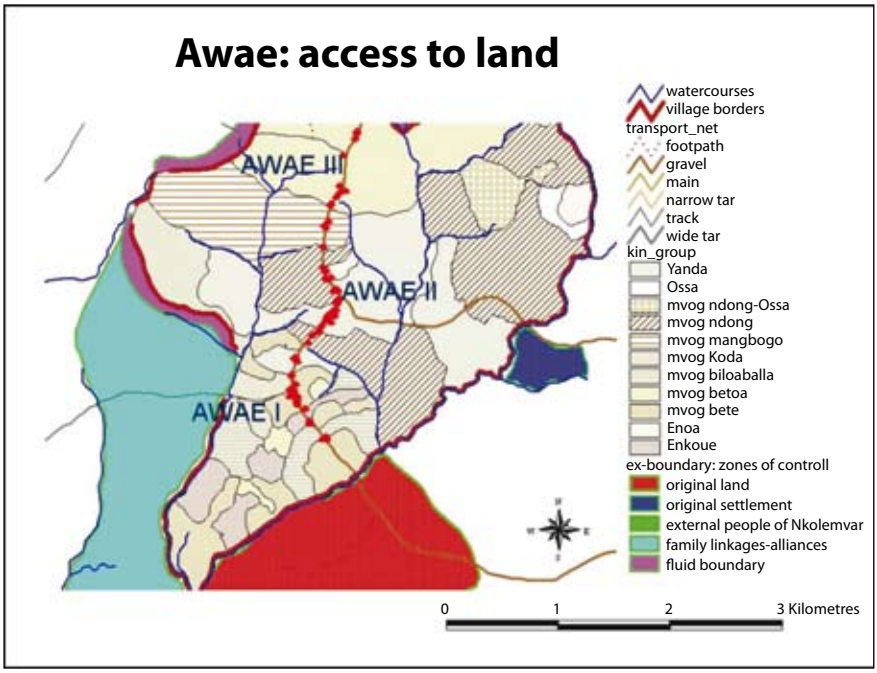

Figure 13-5. Access to land in Awae

Framework for analysis

We present a framework to compare the traditional PMaps with the local GIS in Akok. We analysed the two methods in terms of the information's quality, its potential use and relevance and the process per se (see also tables 13-1 to 13-3). These three perspectives are obviously connected: we cannot have relevant, high-quality information if people are not actively involved in the process and if the level of interaction with investigators is low. Other differentiating factors, like time, cost and the suitability of the technology to manage local knowledge, are discussed below.

1. *Quality of information.* The geographical validity of a map is determined by its spatial accuracy, correct topological relationships and richness of detail. The thematic content corresponds to the amount of relevant information carried by the map and the way this is conceptually organised. The systematic representation is the uniformity of the thematic content; this means that any spatial sector represented on the

map should carry the same thematic content. Readability, accessibility and durability refer to the map's ease of use, ease of access to and management of the information and the possibility of storing it, respectively.

2. *Potential use and relevance of information.* Future scenario discussions could use the map as a facilitating platform for considering 'what might be' (Wollenberg 2000). Management scale refers to the identification of the spatial boundaries of a certain problem—that is, village-level issues versus watershed-level issues. Cross-scale and cross-time analysis is based on the comparability in space and time of represented features; integrated analysis and modelling refer to the possibility of integrating data from various sources and doing simple and complex modelling. Scaling up is the possibility of integrating the information at higher geographical levels, such as from the village to the regional level. All these criteria are fundamental for assessing the suitability of methods to set the base for monitoring change.
3. *Quality of process.* Learning as defined by Jiggins and Röling (2000) is 'collective'; that is, groups, communities or organisations can collectively learn on the basis of shared perception of problems, their causes and solutions, agree on goals and take concerted action. It is strongly related to participation as the functional, interactive involvement of the community in the process, and it can be retrospective or anticipatory, depending on whether it focuses on the monitoring of past actions or gathers information on what might happen on the basis of identified driving forces. It is linked to scenario drawing and monitoring.

Learning is evaluated primarily from the communities' point of view; investigators need to consider the effectiveness of the technical procedure, the robustness of the method, and its reliability. The technical procedure (Diaw *et al.* 1998) refers to field procedures as well as before-and-after field operations and considers the ease of implementation. A method is robust if it can be replicated in different scientific and social contexts. Reliability of a measure can be considered as the consistency with which repeated measurements produce similar results in similar conditions over time. Diaw *et al.* (1998) consider a method reliable if it does not induce

systematic intersubjectivity (from one observer or respondent to another) or intrasubjective (the same observer or respondent over time) conditions of ambiguity and inconsistency in the responses obtained.

Results

Quality of information

The thematic richness of participatory sketches often conflicts with readability and visualisation power. The more elements we want to have on a map, the less clear and more difficult to manage it becomes. Users of GIS maps can select the themes to be represented. Information is stored and is accessible through printed maps or through consultation of the database. In PMap exercises, inaccuracy may be a significant problem. Inaccuracy is linked to a subjective experience of topological relationships; therefore the analysis of spatial inaccuracies can reveal subjective hierarchies of sites within the village territory related to the activities that forest dwellers practice on their land or reveal crucial issues related to borders and access rights. To avoid a 'flattening' of spatial perceptions, traces of these are kept as notes for particular spatial objects in the database. In some cases the representation of boundaries and spatial limits is 'stretched'. Sharp boundaries could help in the definition of spatial objects for the GIS. But village territories are characterised by non-linear bands and permeable, fuzzy boundaries. Boundaries are not absolute and their definition depends from the type of tenure they limit. We therefore choose to represent village and hamlet boundaries as series of discontinuous points that correspond to specific spatial references such as paths, streams, and rocks. The nature of boundaries is simply recorded as a note in the database, but the correct management of this type of fuzzy information would require further methodological analysis.

Potential use and relevance of information

PMap and PM-GIS scored high for their suitability for building scenarios. A higher score is assigned to the Local Information System because once

combined with other types of information, it enriches the analysis of options and reduces the uncertainty of results. The definition of management scale is high in PMap and Local Information System, whereas the possibility of doing cross-scale and cross-time analysis for comparison and monitoring is intrinsically high in the local GIS. The same evaluation is valid for modelling and scaling up.

Quality of process

Participants gained a high awareness of their landscape, its components, mutual interactions and their role in shaping the environment through both methods. Generally, we thought that creating PMaps integrated with GIS was an effective learning process that involved the local people. Moreover, the regular presentations and progress reports and the discussion of the outputs helped keep interest and expectations high. If we compare the content of the first PMap sketches with the final basic maps at scale, we notice a big increase in the number of features and details, which we attribute to the communities' growing interest in the mapping work, with people increasingly seeking to mark the location of their fields or the presence of game or fish, as if representing the landscape georeferenced and at scale increased the room for representation. The trails and paths marked on the maps allowed farmers to mentally follow their usual itineraries and precisely locate fields, abandoned settlements, and other relevant sites in the geographical space.

We also noticed that farmers acted in the landscape as individuals or in small groups, even though PRA methods presuppose the existence of a community. Landscape mapping was very effective in building the awareness of shared space and the spatial relationships between both landscape and social elements. This contributed to improved communication amongst local people and between local people and outsiders.

The technical procedure for the two methods in the field does not really differ. One important element of difference, however, is time, since the Local Information System requires more meetings to elaborate the basic map and hold thematic discussions. Moreover, before-and-after field

operations for GIS are time consuming and require GIS skills for the conception of the system, data entry and spatial analysis. GIS skills are also required to use the database. Robustness and reliability are high for both methods.

Table 13-1. Comparison of information quality

Information quality	PMap	PM-GIS
Thematic content	****	****
Systematic representation	**	****
Geographical validity		
• Spatial accuracy	*	***
• Topology	*	****
• Objects	**	***
Readability	**	***
Accessibility	**	***
Durability	**	****

***** very high; *** high; ** medium; * low.*

Table 13-2. Comparison of potential use and relevance of information

Potential use	***PMap***	***PM-GIS***
Scenarios	***	****
Boundaries	***	***
Cross	**	****
Cross-time	**	****
Integrated analysis	**	***
Modelling	**	****
Scaling up	*	****

***** very high; *** high; ** medium; * low.*

Table 13-3. Comparison of quality of process

Process	***PMap***	***LIS***
Learning	****	****
Technical procedure	***	**
Robustness	***	***
Reliability	***	***

***** very high; *** high; ** medium; * low.*

Discussion

Compared with traditional PMap techniques, the PMap+GIS method applied in the three study sites increased the quality of the information collected, especially in terms of the systematic representation of thematic content, geographical validity, accessibility and durability. It broadened the spectrum of the potential applications of the information by merging local communities' knowledge of their land with the 'expert' information of outsiders. Furthermore, the PMap proved critical for LIS implementation, providing details on the spatial features plus information provided by the community itself that could not be captured using other tools.

Nevertheless, the integration of the two techniques poses some controversial issues. From a 'hard' GIS point of view, the integration of qualitative data into the system is a limiting factor for modelling and spatial analysis, mostly because of the inaccuracy and high subjectivity of the PMap representations and the difficulties of dealing with fuzzy and non systematic information. For example, the ranking of abundance of game animals and fish and even the classification of land cover units according to local criteria are too qualitative for complex modelling. On the other hand, from a PRA perspective, subjectivity is inherent to all social representations of the world, including scientific representations. In that perspective, the inability of modelling and spatial analysis to fully incorporate qualitative information reflects a limitation of these modes of representing reality rather than a problem for other modes of representation. Thus, incorporating local knowledge into a GIS frame and using quantitative data to represent qualitative information into a database both complicates the modelling and distorts the basic nature of PRA.

The advantage of combining the two methods is nevertheless being recognised by some authors (Mapedza and Fawcett 2003), who propose using aerial photographs as the basis for group discussion and participatory mapping and as a tool for the triangulation of PRA-derived information. Participatory GIS processes have been suggested for community natural resources management (Craig *et al.* 2002). In terms of the quality of the

process, the criteria considered in the evaluation did not highlight striking differences between the PMap implementation and PMap+GIS processes.

In terms of procedural effectiveness, we noticed that the first phase of base map construction demands time; people's landscape references are rich and the presence of different lineages or groups of interests can lead to long discussions. Nonetheless, mapping language and tools were gradually acquired by the villagers. Once familiar with the methods, language, and scale used to represent orthogonal geographical space, community members were able to use them to describe and locate specific elements in a standard topology. The implementation of the thematic layers was therefore easy and quick. Furthermore, observing people describing and representing their land was a critical experience, from which decisive clues other than the ones appearing on the sketches could be obtained (Robiglio 2002). Still, in our experience, the implementation of the local GIS was mostly extractive, contributing just minimally to the real empowerment of the community, whose members were excluded from the more technical aspects of GIS implementation and management.

It was not our intent to evaluate the decision-making process at the community level, but we can assess the present difficulties in turning over the local GIS to the villages. The method requires expensive equipment and a high level of expertise that is not always available at the local level, apart from projects like ours and national-level planning activities. Although the community was involved and the level of interaction during all the phases of the process very high, this can be seen as a political weakness, since traditional PMap, in portraying a local community's perspective on land and resources management, is regarded as an empowering, grass-roots process, whereas technological instruments like GPS and GIS are perceived as authoritarian and exclusive. This is part of a larger debate over the transfer of GIS into indigenous and local communities (Harris and Weiner 2003) and, more generally, the controversial role of technology in our society. We still think that the encouraging results of the work described here should be seen in a long-term perspective, especially considering the increasing importance of participation and GIS components in natural

resources management projects, the more or less explicit pressure of donor agencies to adopt GIS at the national level for natural resources management and the decentralisation process in many African countries. The added value of PMap+GIS in terms of the quality and usefulness of the information should be considered for the potential of the georeferenced database, which integrates local knowledge and perspectives with 'expert' information and can be scaled up from local to higher levels of decision making or used in research and development projects for monitoring and evaluation. Furthermore, the availability of spatially referenced data makes a critical difference in building capacity for planning and managing at the local level.

Methodologically, improvements are required for data collection, such as refining the PMap steps or adding more PRA tools to integrate the mapmaking activity, and for data management, such as building a more user friendly GIS interface.

Conclusions

Geographical space can be a useful link between the family of participatory rural appraisal tools, especially participatory mapping, and the quantitative and extractive approaches used in resource management systems analysis, such as baseline surveys and biophysical data derived from remote sensing and technical maps. The construction of a geographical space based on GIS technology and PMap allows for an efficient integration of the information gathered, and spatial analytical tools add value. The method presented is based on an informed decomposition of the relationships that link landscape and natural resources management to social systems, and their conceptual translation into geometric objects' attributes. Two critical steps are structuring the collection and translation of local knowledge into spatial information with the preliminary PMap and then identifying the themes to be mapped on the basis of the specific research objectives. The method has proven effective in both quality of information and quality of process.

Endnotes

[1] FLORES aims to model dynamics of land use patterns in time and space, enabling quantitative analysis and testing of the effects on landscape of management and policy options. Land use patterns are made by actors who interact and collaborate as individuals, families, communities, associations or corporations. The spatially explicit nature of the model is based on the specificity of decisions taken for any given patch of land. FLORES assumes that complex reasons guide land use decisions and that people explore all available options available within a context defined by resources (finance, labour, techniques), knowledge and perceptions, and their own social-cultural background. It is recognised that the actors' culture is part of the grid that defines the 'basket' of options (Vanclay 1997).

[2] A summary listing of PRA and RRA methods that focus on space and representation includes village sketches, participatory analysis of aerial photographs, transect walks, trend analysis and PMap.

[3] *Terroir* is a francophone concept meaning the land area habitually used by members of an agrarian community for their livelihoods, whose boundaries are recognised by members of the spatial unit and by those residing outside (Lazarev and Arab 2002). More than just a physical area, *terroir* is also a social construct; the ecological capital from which communities derive their means of existence is likewise socially defined (Sedogo 2002).

[4] The benchmark area approach of IITA is defined by Douthwaite *et al.* (2005) as a way of operationalising integrated natural resource management (INRM) and eco-regional research by (1) conducting research in a characterised benchmark area that contains within it farming system dynamics and diversity that is representative of a portion of a wider agroecological zone; (2) combining 'best-bet' innovations and processes; (3) developing the linkages and knowledge networks necessary for scaling up.

[5] Institute National de Cartographie, Cameroon. The most recent edition of topographic maps dates back to the middle 1970s and suffers from a series of geometrical and thematic inaccuracies. The maps were first drawn between 1951 and 1954 using black-and-white aerial photographs at a scale of 1:50 000 and were updated in 1971. They do not show current infrastructure, and a comparison with the high-resolution satellite images of the study area showed geometrical inaccuracies and sometimes missing geographical features, especially watercourses. This, combined with the relatively small scale (1:250 000), makes these maps unsuitable for mapping resource management at the village level.

[6] Local knowledge is the knowledge system resulting from the experiences, needs and observations of local people on the ecological conditions and environmental relations. It is presented as embodying many attributes and qualities, including not only the essential knowledge critical to harvesting natural resources successfully but also complex understanding associated with resource occurrence and distribution, with reference to the broader environmental and ecological contexts and dynamics, cultural beliefs and social institutional systems that characterise core aspects of human-environment relationships (Davis and Wagner, 2003). In our work we focus mainly on the latter aspects.

[7] A theme is the set of values of a specific attribute for a spatial object. The complete description of an object in a GIS consists of a geometric and a thematic component. The thematic component corresponds to the thematic description and is expressed through attributes that take a value per object (Molenaar 1998).

[8] Settlement structure in the forest zone is the outcome of the forced resettling of forest dwellers along the colonial roads started after World War I (Weber 1977). Villages are artificial aggregation of lineages or segments of lineages of different clans, settled in separated hamlets and quarters. Data of a study conducted in the humid forest zone by Diaw (1997) show an average of 1.6 clans per village and 8.6 clans per village group. Segment of lineages originally scattered in hamlets in the forest moved towards the roadside. A system of hamlets and quarters reflects the original spatial separation of the various groups. Clan identities at the village level are defined mainly through lineages and family groups (Diaw 1997).

[9] In any specific locality, a gradient of tenure regimes governs access to natural resources and usage rights by kinship. To understand which regime applies, it is crucial to know the type of forest land where a resource is found and whether particular investments have been made in the productivity of that resource (van den Berg and Biesbrouck 2000). The same piece of land can support different resources (e.g., crops, trees, game), each of which is covered by specific rules of appropriation and use. Forest may be exclusively controlled by members of a corporate lineage or it can be an open, shared space with gradients of access and uses defined by the type of resource, its use and kinship. Households exert short-term exclusive control on the land they crop, which is tenure of the extended family, lineage and ultimately the clan's segment. For land left fallow, reversion to secondary forest coincides with individual control merging into the collective control of the lineage (Burnham 2000; Weber 1977).

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Clearing and making farmland in the forest

Chapter 14

Broadening the resource base: Shortened fallows in southern Cameroon

Martine Ngobo

Agricultural expansion through smallholder shifting cultivation—also referred to as swidden agriculture—has a major impact on forest structure and age in the southern part of the Cameroonian rainforest; some authors view it as the major contributor to deforestation (Essama-Nssah and Gockowski 2000). Some of this deforestation is temporary. Nevertheless, rising population densities increase the demand for agricultural land, resulting in diminished fallow time, which in turn leads to more deforestation, forest degradation and soil erosion. Thus, the tropical forest, so crucial for the swidden or fallow agroecosystem, diminishes under increasing pressure from smallholder agriculture, landless settlers, logging concerns and national financial needs.

Although numerous researchers have studied swidden agriculture, and particularly the different fallow types, very few studies have considered how short-fallow systems in southern Cameroon affect biodiversity, soil conditions, crop productivity and ecological sustainability. Available reports on this swidden farming system include classical anthropological studies, which have provided much of the basic knowledge on the system (Diaw 1997; Diaw and Oyono 1998) as well as socioeconomic information provided by Weise and Tchamou (1999) and Ngobo *et al.* (2004).

At the heart of the matter is not only the *cutting* of the forest, which foresters do all the time, but also the *burning* of the trees (Warner 1991). Governments have perceived tree burning as a misappropriation of resources from the national to the most local level—the small farmer. However, for smallholders, this practice is a response to the difficulties of establishing an agroecosystem after clearing tropical forestland. By cutting the forest and burning the felled trees and litter, the swiddener makes use of an 'artificial energy pulse' that eliminates competitor species and concentrates nutrients 'in order to briefly … transfer the energy flow into food crops' (Odum 1971). It is an active manipulation of a patch of the forest and conversion to a more open and useful succession for the cultivator (Warner 1991).

In the humid forest zone of southern Cameroon over the past two decades, macroeconomic constraints coupled with increasing demographic pressure have led to higher resource use demands, resulting in a shortening of fallow duration from more than 10 years to merely five to seven years. Previous studies conducted in the area revealed a shift in the fallow characteristics and vegetation composition as a result of increasing land use intensity. Herbaceous fallow lands dominated by one species are replacing bush fallows (Figure 14-1), as the invasive shrub *Chromolaena odorata* (L.) gradually replaces other species in the traditional bush fallows.

The study presented in this chapter finds that the shortened fallow systems widely found in southern Cameroon have different ecological characteristics and imply different management strategies or options. The chapter also compares the specific attributes of Chromolaena-dominated fallow systems with those of bush fallows. After a description of tropical swidden agriculture as portrayed in the literature, I discuss the major functional and structural functions associated with each short-fallow system as well as the related species composition. Finally, I offer recommendations for management options and strategies that could improve both the ecological and the socioeconomic benefits of shortened fallows in the study zone.

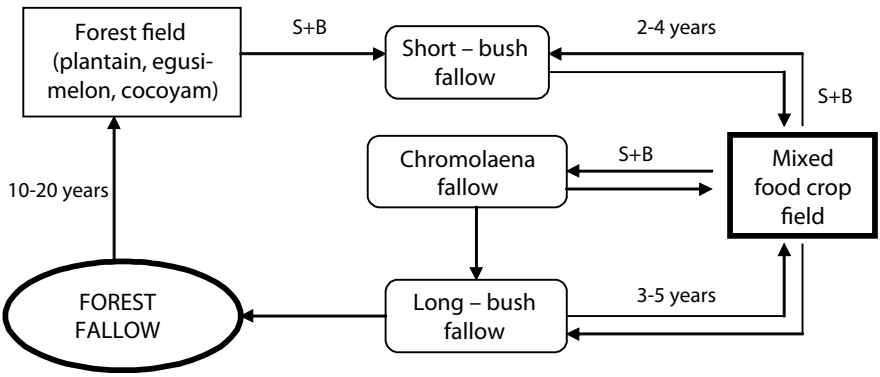

Figure 14-1. Dynamic model of formation of different forest types and agricultural production systems in the southern Cameroon humid forest zone

Source: adapted from Weise and Tchamou 1999.
S+B = slash-and-burn

Conventional wisdom about swidden agriculture

Most studies on swidden agriculture have been based on the assumption that biodiversity and crop yields decline when the length of fallow periods is reduced and no chemical or organic fertilisers are introduced into the system (Fujisaka 1991; Roder *et al.* 1995; Jong 1997; Sanchez 1999). This assumption is in many ways logical, since a decline in nutrient availability in the ecosystem can be expected with erosion, leaching and, perhaps most importantly, volatilisation of some essential nutrients (mainly nitrogen and sulphur) when the vegetation is burned. Weed infestation and poor soil physical properties would also support the assumption. Guillemin (1956) described the relationship by saying that any given system has an optimum fallow period for production—that is, longer fallow periods are unnecessary, and shorter fallow periods lead to a decline in fertility of the system and thereby productivity.

However, there is no quantitative study that proves such a shortened fallow-profitability relationship. The few studies conducted in other tropical areas usually give an inconclusive picture, and their empirical basis is either weak or absent (Mishra and Ramakrishnan 1983; Roder *et al.* 1995; Slaats *et al.* 1998). Good, correlated data on fallow and plant diversity in swidden agricultural systems of southern Cameroon are scarce, and the assumption appears to have been taken for granted. Moreover, in some cases, farmers have in effect confirmed this theory by stating that they prefer longer fallows.

The assumption about the ecological dynamics in swidden agriculture has been adopted by a wide range of authors (Sanchez 1976; Ruthenberg 1980; Greenland and Okigbo 1983) and helped fuel the condemnation of fallow systems by many governments, since it purports to show that when fallow periods are shortened—because of land scarcity and population pressure or other factors—this farming system will in all cases enter a downward spiral of declining biodiversity and decreased yields. Moreover, the shorter

fallow periods are believed to cause environmental damage in the form of soil mining and accelerated erosion. What Boserup (1965) considered a natural process of agricultural intensification under population pressure with increased frequency of land use is interpreted by many other authors as the deleterious process of swidden agriculture (Ramaswamy and Sanders 1992; Kleinman *et al*. 1995; Juo and Manu 1996). This, in combination with national interests in protecting forest resources for other purposes, has in many cases led to an official resentment towards fallowing practices (Fujisaka 1991; Dove 1996; Jong 1997) and made it difficult to focus on the development of sustainable short-fallow farming systems that may actually be more environmentally acceptable than permanent farming systems in terms of deforestation, soil erosion and carbon release.

Traditionally, shifting cultivation is ecologically sound if forest fallows can be maintained (Moran 1981). Forest fallow, also called long fallow, results when the cleared, planted field is left to regenerate to forest after the harvest. By tradition, it was the most common form of swidden in the humid forest zone of southern Cameroon. If fields are small, the sites, like naturally occurring forest gaps, rapidly regenerate. The surrounding forest serves as a seed source for the site while protecting it (as it did the swidden field) from winds and erosion (Weise and Tchamou 1999). By cultivating small fields and retaining parcels of the original forest for reseeding, the traditional swiddener is actively managing the regeneration of the forest.

The traditional swiddener also uses other techniques of management that favour forest regrowth. While the field is under crops, many cultivators practice 'selective weeding' (de Rouw 1995). Herbaceous plants and shrubs that will become part of the desired succession may be cut back rather than uprooted, and once harvesting of cultigens declines, they are allowed to regrow. Rather than being cut and burned, trees may just be cut back; they then resprout and become part of the succession. Trees that are especially valued may be protected and not cut at all. The already-established plants and trees further a rapid regeneration of the forest. The swiddener does not have the compulsion to maintain a 'clean' field with large patches of exposed soil. Just the contrary: in fact, it is recognised that uncovered soils will wash or blow away.

In southern Cameroon, swidden agriculture is usually a multifield system, with both short- and long-fallow systems. Long-fallow fields are usually farther from the village houses. They are traditionally cropped for a brief phase and then fallowed for more than seven years. Short-fallow fields are closer and tend to be cropped for longer periods, with shorter fallow periods; in some areas they become intensive home gardens. In addition, small swampy areas are used for dry-season fields, and old secondary forest sites are planted with more demanding crops (such as plantains or *egusi,* a melon). The general pattern is that each family is responsible for its own fields. Each household has the autonomy to make decisions concerning site selection, crops, labour and microsite utilisation. The swidden household, therefore, makes a series of decisions concerning the management of the agricultural component of the agroecosystem. These decisions are guided by the available resources and land, the individual's knowledge of how to make use of them, the rules and preferences pertaining to residence, the religious beliefs of the community, and the household's labour resources (Warner 1991; Weise 1995; Diaw 1997).

Context and methods

The study was conducted in the humid forest zone of southern Cameroon, where the International Institute of Tropical Agriculture (IITA) and the *Institut de Recherche Agricole pour le Développement* (IRAD, the Cameroon Institute for Agricultural Research) developed a benchmark area for research on sustainable farming systems and resource management. Covering 15 400 square kilometres of humid forest, the benchmark area is a research site covering a north-south population gradient from urban regions with intensive land use to thinly populated zones with less land use pressure (Fig. 14-2). This differing intensity of resource use presents a gradient around which it is possible for researchers to develop and evaluate farming systems and resource management practices. The gradient ranges from dense forest and low population in the southern area to degraded forest and high population density in the north—that is, from the desolate Ebolowa domain in the south to the Yaoundé domain in the north, which is close to one of the major urban centres of the country (Table 14-1).

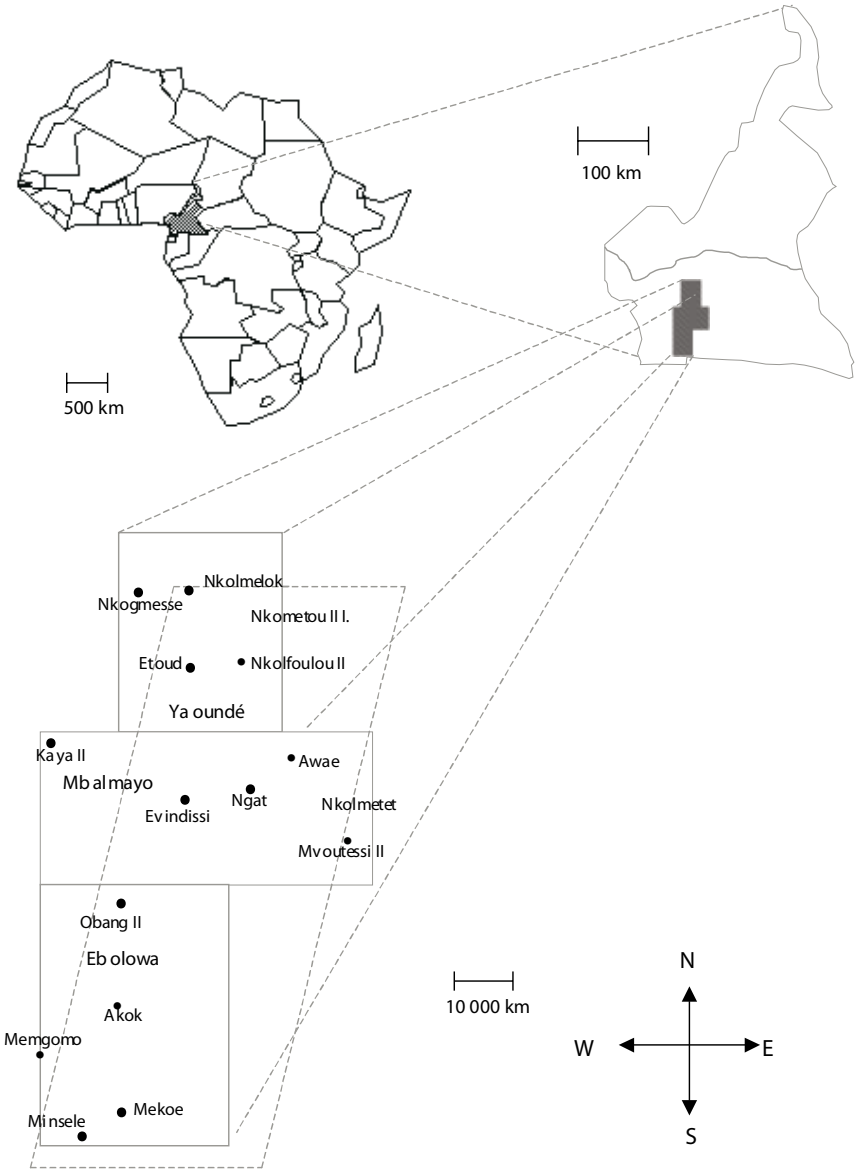

Figure 14-2. Benchmark area of southern Cameroon

Table 14-1. Characteristics of study areas in southern Cameroon

	Yaoundé area	*Mbalmayo area*	*Ebolowa area*
Mean annual rainfall (mm)*	1 510	1 643	1 820
Mean annual temperature (°C)	22°9	25	24°4
Rural population density (inhabitants per km^2)	14-88	10-41	2-15
Mean distance to market (km)	17	20	21
Average fallow duration (years)	3.9	5.4	7.5
Estimated mean annual land cover per household (ha)	1.4	0.9	1.1
Ethnic group	Eton	Ewondo	Bulu

**Ten-year average*
Source: Gockowski et al. 1998

According to the relative intensity of resource use, the benchmark area can be ranked in three resource domains: the Yaoundé domain, the Mbalmayo domain and the Ebolowa domain. It has been reported that the gradient within the benchmark is driven by proximity to one major centre, as well as by village characteristics, such as the size of the village, road infrastructure and social infrastructure (Gockowski *et al*. 1998).

The red and red-yellow soils in the benchmark area fall mainly into the broad FAO soil class of orthic ferrasols that are characteristic of areas with an equatorial climate. From Yaoundé to Ebolowa, four soil profile classes, with distinctive physicochemical properties, form a north-south fertility gradient (Gockowski *et al*. 1998). In the southern area, yellow ferralitic soils are more frequent. These fragile soils are acidic, with pH generally less than 4.5, clay content between 10 and 50 percent, lime content of less than 8 per cent, organic matter around 2 percent, humus content ranging between 1 and 4 percent and a nitrogen level of 0.007 to 1 percent. These features all indicate poor soil fertility. More frequent in the Yaoundé domain, red soils are similar in structure to yellow soils but are less acidic (pH between 5 and 6), less compact and more stable with higher mineral reserves (calcium, magnesium, potassium).

The climate of the benchmark is characterised by two rainy seasons and two dry seasons. The first long rainy season occurs in March-July, followed by a short dry season, July-August. The second rainy season of August-November is followed by a long dry season from mid-November to mid-March. Although an increasing precipitation gradient has been reported from the northwest to the southeast of the benchmark area, in both resource domains, annual precipitation follows the same bimodal pattern and ranges from 135 cm to 190 cm. The bimodal rainfall pattern allows two cropping seasons, and climatic data indicate a growing season of nearly 295 days per year (Santoir and Bopda 1995).

Remote sensing estimates revealed the existence of infrastructural and institutional cross-domain differences within the area. The Yaoundé resource domain, where population densities are higher, has better-developed institutions (e.g., a competitive marketing system) and infrastructure (e.g., higher rural road densities) than the Mbalmayo and Ebolowa domains. Rural exodus is also reported to reduce on-farm labour resources, in turn influencing agricultural production methods (Kotto-Samè *et al*. 2000).

Although the number of urban consumers is growing as a result of rural exodus, small-scale farmers in the study zone are not always able to fully exploit market opportunities for agricultural products, particularly during the rainy season. The most frequently grown crops include plantain *(Musa paradisiaca),* vegetables, cocoyam *(Xanthosoma sagittifolium),* 'wild' fruits, cassava *(Manihot esculenta)* and maize *(Zea mays).* There is significant spatial variation in market access within the benchmark area. Moreover, transport problems usually induce changes in the number of traders and in the amount of products available for sale. However, near the city of Yaoundé, there are indications that food production has become an important cash enterprise for many smallholder agricultural producers (Gockowski *et al*. 1998). One indication is that long-term fallow lands, formerly reserved for cocoa production, are nowadays used for food crop fields.

In all cropping systems throughout the benchmark, maintenance of soil fertility is achieved mainly through the fallow system (Russell 1993). The main stages of the swidden cycle are clearing, burning, planting, weeding, guarding (against pests) and harvesting; the effectiveness of the burn and the time spent weeding are particularly important for yields. Labour availability and productivity are also crucial parameters for farmers' livelihood strategies. In the traditional fallow system, a small plot of forestland is cleared, cropped, harvested and gradually allowed to go into a fallow phase for up to 15 to 20 years. The secondary forest restores fertility as it grows. However, in some areas of the benchmark, this traditional bush fallow system is being transformed to a rotational fallow system, especially when population pressures are high (Kotto-Samè *et al*. 2000). This means that a large plot of forest is cleared with chainsaws and used in a permanent rotational fallow system that includes some perennial crops. Each cropping season, a subplot of the field is prepared for groundnut-cassava food fields.

Within each resource use domain (Yaoundé, Mbalmayo and Ebolowa), five communities engaged in swidden agriculture were selected from the northern, central and southern zones of the benchmark area. The selection of communities was based on hypothesised levels of resource use intensity and on representativeness of the social and physical environment of the domain. The methods used comprised questionnaire surveys, semistructured interviews and field assessments of plant diversity. Fallow periods were established through semistructured interviews and, whenever possible, field histories were established to determine the past land use situation. Farmers were often able to recall the use of a given area several decades back by relating to different significant events. Direct observations by the researcher, complemented with interviews, were carried out in the field to facilitate the recollection of events by the respondents. Focus group discussions were conducted with village representatives to understand community perceptions of the study fallow typology. Field surveys were conducted to elicit farmers' knowledge of fallow plant composition.

Species richness and structural diversity

The vegetation survey of the sampled fallow sites indicates a clear difference amongst the three study types of short fallows in their plant functional and structural diversity components. There is a consistent pattern of significant (at $P<0.05$) differences between 'recurrent' (i.e., repeatedly cultivated fallows) Chromolaena-dominated fallows and fallow sites that had been forest prior to the previous cropping phase; increasing intensity of land management appears to be a significant predictor of falling plant species richness along with reduced functional and structural diversity.

Field inventories revealed an average number of species per fallow type that varied from 45 to 92 per stand, with the highest richness in each fallow type averaging about 65 species per 200 m^2. The average species richness was similar for the two fallow types that had previously been forested. These figures are obviously much lower than the reported species richness found in mature secondary forests of the study zone, thus confirming that shortened fallow systems are associated with reduced species diversity.

Chromolaena-dominated fallows that had been forest were clearly distinct from recurrent Chromolaena-dominated fallow stands in all structural diversity components. However, substantial differences did appear over the two years of this study in the ordering of fallow types based on their modal diversity indices. For example, in the first year, fallow types dominated by Chromolaena scored high on the modal Fisher's alpha index, but second-year data show a completely reverse ranking. Moreover, data analyses revealed a consistent link between plant species richness and the stand diversity (indicated by the *modi* richness, the Shannon and Fisher's alpha indices for plant functional attributes) in all three fallow types, thus confirming that *modi* and plant functional attributes can be 'good' indicators of a site's level of physical or anthropological disturbance (Gillison 2000).

Another pattern of difference between recurrent Chromolaena-dominated fallows and fallow fields that had been forest prior to the cropping phase was seen in the analyses of site structural features. Over the two study years, the three fallow types were consistent in their ranks for average canopy height, litter depth, basal area, and furcation index. Fallow types with the most recent link to forests generally displayed the highest values of site structural parameters, mostly canopy height and furcation index. Therefore, by analysing these latter site parameters, which are relatively easy to estimate (Gillison 2000), one can derive the land use history of a fallow stand.

A significant positive correlation was found between the stand functional diversity as indicated by the number of *modi* and the modal diversity indices ($0.48 < r^2 < 0.71$ at $P<0.05$) and two fallow stand structural features, canopy height and basal area. On the contrary, the correlation was significantly negative with two other stand structural parameters, crown cover and furcation index of woody plants. However, there was no significant correlation between functional diversity and litter depth.

Plant communities in short fallows

Characteristic species

In total, considering the three fallow types altogether, about 225 species of vascular plants were recorded from the study sites over the two years of this study. These species belonged to nearly 72 families, the most richly represented being Euphorbiaceae, Fabaceae (or Papilionaceae) and Sterculiaceae, with 23, 21 and 12 genera, respectively.

Although up to 85 plant species were common to all fallow types, about 67 plants were exclusive to stands that had been forest prior to the cropping phase (Figure 14-3). Among the species most frequently found in all study sites were Chromolaena, *Haumania danckelmaniana*, *Milletia* spp., *Dioscorea* spp., *Cissus* spp., *Cnestis ferruginea* and *Nephroplepis biserrata*,

which were present in more than 70 percent of the sites. These species could therefore be considered typical of shortened fallow lands in the study zone, whatever the land use history.

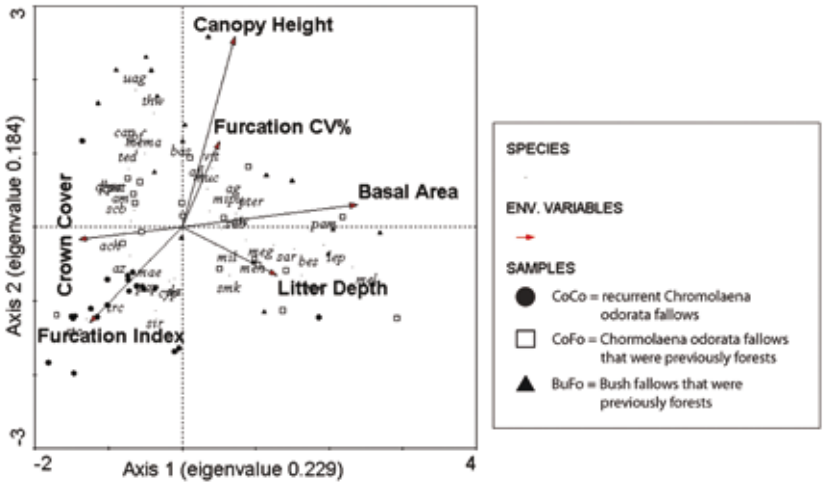

Figure 14-3. Site-conditional ordination of presence or absence of species (4%<frequency<75%) in 58 sites from three short-fallow types at Mengomo, 1998-1999

Source: based on a canonical correspondence analysis by CANOCO

Illustrated are selected species that have N2>20 (i.e., 39 species of the 202 included in the CCA). Figures in the diagram identify species and are coded as follows: ag= *Agelaea* spp., az= *Albizia zygia*, afl= *Alchornea floribunda*, ach= *Alchornea* spp., am= *Ampelocissus bombycina*, bas= *Baissea* spp., bes= *Bertiera* spp., bf= *Barteria fistulosa*, cap= *Carapa procera*, cis= *Cissus* spp., cyp= *Cyperus* spp., da= *Desmodium adscendens,* dbe= *Distemonanthus benthamianus,* lep= *Leptonychia* spp., meg= *Megaphrynium* spp., mel= *Meiocarpidium lepidotum,* mema= *Megaphrynium macrostachyum,* men= *Menispermaceae* undetermined species, mil= *Milletia,* mipu= *Microsorium punctatum,* muc= *Musanga cecropioides,* paa= *Palisota ambigua,* pam= palisota mannii, pap= *Paullinia pinnata,* pter= *Pteris* spp., pet= *Petersianthus macrocarpus,* ren= *Renealmia* spp., sab= *Sabicea* spp., scb= *Scleria boivini*, sir= *Sida rhombifolia,* smk= *Smilax kraussiana,* stc= *Stachytarpheta cayennensis,* ted= *Tetrorchidium didymostemon,* thu= *Thalia welwitschii,* trc= *Triumfetta cordifolia,* uag= *Uapaca guineensis,* vit= *Vitex thyrsiflora.*

When the diversity parameters recorded in the sampled fallow sites were compared with values obtained in other land use types in southern Cameroon, the structural features recorded in the five- to seven-year-old sites sampled in this study broadly fall within the range found in other short fallows of about eight years old. However, the species and

stand functional (or *modi*) richness in these five- to seven-year-old fallows appears lower that recorded in two- to four-year-old fallows dominated by Chromolaena and much lower than of secondary forests. This is a rather surprising finding that might confirm the suggestion already made by Gillison (2000), that Chromolaena increases plant diversity in (very) short fallows (i.e., fallows of less than four years), probably by enhancing soil nutrient availability through increased litter deposition and reduced soil exposure. This statement needs to be confirmed by more studies on soil and subsequent agronomic features of shortened fallow systems, however.

As in other studies of vegetation successions after agricultural abandonment in humid tropical conditions (Letouzey 1968; Mitja and Hladik 1989; Carrière *et al*. 2002), this study demonstrated that establishment of woody fallow species was associated with sites where canopy height was greatest, and where crown cover and furcation indices were negligible.

Species diversity

Recurrent Chromolaena-dominated fallow sites were characterised by the abundance of Chromolaena, *Albyzia zygia* and *Dioscorea* spp. This fallow type also displayed the highest number of different species per stand, with *Calpolobia alba*, *Elephantopus mollis*, *Stachytarpheta cayennensis* and *Stephania* species exclusive to this fallow type. Another floristic feature of fallows of this type was the existence of almost only one stratum, of about two metres high, dominated by Chromolaena but showing some stems of the pioneer species *Alchornea cordifolia*; the understorey was occupied by a few Poaceae and some Cyperaceae.

The second fallow type—the Chromolaena-dominated fallows that had previously been forests—was characterised by the abundance of Commelinaceae and Marantaceae species (families common in mature secondary forests) represented by *Palisota* and *Megaphrynium* genera. The system presented clearly two strata, with a canopy codominated by *Alchornea cordifolia* and *Albizia* species, accompanied by some pioneer trees such as *Musanga cecropioides* and *Macaranga* species (in more than 50 percent of the sample sites of this fallow type). The second stratum was an

understorey more prominent than in recurrent Chromolaena-dominated fallows and occupied by some forest herbaceous plants like *Aframomum* species, *Harungana madagascariensis* and *Haumania danckelmaniana*.

Table 14-2. Relative frequency (%) of the most common species found in short fallows at Mengomo (southern Cameroon), 1998 and 1999

Species	***Frequently cropped* (Recurrent Chromolaena-dominated fallow)***	***Moderately cropped (Chromolaena-dominated fallow)***	***Recently forest (Bush fallow)***
Aframomum sp.	36	50	75
Agelaea sp.	27	60	88
Alchornea cordifolia	82	60	63
Chromolaena odorata	100	100	63
Cissus sp.	45	80	100
Clerodendrum sp.	73	60	38
Cnestis ferruginea	73	80	63
Cyperus sp.	82	30	50
Desmodium adscendens	73	60	50
Dichapetalum sp.	73	70	63
Dioscorea sp.	100	60	75
Haumania danckelmanianna	91	80	100
Microdesmis puberula	18	80	75
Milletia sp.	82	80	88
Nephroplepis biserrata	45	90	88
Palisota hirsuta	64	80	63
Penianthus longifolius	36	80	63
Sabicea sp.	36	90	88
Tabernaemontana crassa	73	50	88
Trichilia sp.	27	60	88

**Frequently cropped fallow lands.*

The third fallow type—bush fallows that had been forest—was characterised by the lowest number of species (i.e., lowest plant species diversity) but a vertical structure mimicking that found in mature forests, with three distinguishable strata and a floristic composition very different from that of the two other fallow types (Table 14-2). The upper storey was dominated by pioneer semiwoody species (of up to 6 to 8 metres high), the intermediate stratum comprised small individuals of mostly secondary or primary forest species, and the lower storey was dominated by secondary forest herbaceous species. Characteristic species of the mature secondary forest were consistently present in fallow stands of this type (e.g., *Musanga cecropioides*, *Macaranga* spp., *Combretum* spp. and *Palisota* spp.).

Species assemblages

A canonical correspondence analysis confirmed the plant species distribution or assemblages already observed during the field inventories, as reported above. Plant species assemblages appear clearly associated with each study fallow type, in relation with their respective environmental (i.e., site structural) parameters.

As shown in the ordination diagram (Figure 14-2), the position of the fallow sites along the first axis suggests that recurrent Chromolaena-dominated fallows are characterised by plant species exhibiting recurrent branching from break-points on the main stem; with resulting high furcation index values. In contrast, fallow stands that had been forest in the previous cropping cycle are characterised by a high coefficient of variation of the furcation index and a small amount of litter.

In the diagram, species lie within a circular belt around the centre and appear to be associated with environmental variables, which give rise to differences between species assemblages. Species can be separated into three main groups: one at the lower left of the diagram (Group 1), a second at the upper left (Group 2) and a third on the positive pole of axis 1 (Group 3). These species assemblages differ across the three fallow types, with more weedy plants associated with the recurrent Chromolaena-dominated fallows than with fallows that had been forest.

This distribution corresponds well with that of the stand vegetation survey, with Group 1 species associated with recurrent Chromolaena-dominated fallows (for both study years), whereas the 1999 fallow sites that had previously been forest are characterised by species of the Group 2, and the 1998 fallow sites that had previously been forest are associated with species of Group 3. Apart for some small trees and shrubs, Group 1 mainly comprised weedy species (e.g., *Axonopus compressus*, *Desmodium adscendens*, *Oplismenus burmannii* and *Sida rhombifolia*). Group 2 was mostly made of secondary rapidly growing woody or semiwoody pioneer species (e.g., *Alchornea floribunda*, *Musanga cecropioides* and *Trichilia rubescens*), as well as of some long-lived pioneer species (e.g., *Distemonanthus benthamianus*, *Diospyros conocarpa* and *Tetrorchidium didymostemon*). Species of Group 3 were mostly plants that are found in the understorey of mature secondary forests in the study zone (e.g., *Cissus* spp., *Ficus* spp., *Megaphrynium* spp., *Sarcophrynium* spp. and *Smilax kraussiana*).

Management strategies

The above findings suggest that management strategies for the shortened fallow systems of southern Cameroon need to consider existing fallow typologies, such as the one used in this study. Hence, for example, recurrent (or repeatedly farmed) Chromolaena-dominated fallows, containing very few trees, would certainly benefit from agroforestry-management strategies, which will improve this fallow system with high-value (ecological and socioeconomic) species. Management strategies for short fallows established not long after the forest was converted should rather capitalise on (or develop) mature forest seedlings already present in the understorey.

To encourage the establishment or maintenance of more forest species on short-fallow lands and thus rehabilitate degraded fields, farmers should be encouraged to selectively leave more forest trees in farm sites during land clearing. Additionally, the maintenance of forest trees during the cropping phase should also be encouraged or introduced, along with

management techniques (such as pruning) that will increase soil nutrient status and control weeds while providing off-farm revenue to farmers. The development of improved agroforestry practices suitable for increasing the survival and productivity of these species while preserving the dynamics of the land use mosaics in the study zone is very necessary.

Conclusion

The argument of this chapter is that both conserving or rehabilitating ecologically valuable fallow lands and broadening the resource base of village economies can be achieved by developing the existing ecological and socioeconomic potentials of shortened fallow systems, taking into consideration their typology and in particular their link (long or short) to the previously cleared forest. Farmers' practices as well as factors influencing land use change also need to be studied so that aid workers, whether from the government or from conservation organisations, can influence rural economic development in southern Cameroon. In the context of this book on adaptive collaborative management, it is important to stress the 'extractive' nature of our methodology. Though central to the knowledge that we gained, the information that farmers provided will hardly transform into active strategies for managing fallow fields differentially and adaptively unless it is linked to vigorous capacity development and co-learning programmes.

This is an especially timely chapter because it provides valuable data and analysis of a practice—swidden-fallow agriculture—that is currently in disrepute with forestry planners and environmentalists. This study does not assert that smallholder farmers of southern Cameroon can continue with their shortened fallow systems, especially in the face of increasing competition for land. However, it does provide suggestions for improving these systems based on a sound understanding of their ecological characteristics. This suggests potential for better ecological and economic performance in particularly complex tropical forest environments.

An ethnobotanical list of plants, even if complemented by soils classifications and other data, although necessary, is not enough. It is not just *what* we know of the fallow environment that is important. It is *how* that knowledge is utilised. Considering new environmental information and knowledge, given possible crops, land, labour and market configurations, what can the farmer or the planner do? In strategies for adaptive collaborative management of natural resources, it is as important to know about diverse fallow categories and dynamics as it is to understand their implications for sustainable management. This knowledge can be used by the farmer and the land use planner to develop procurement strategies that provide both food security and ecological sustainability.

What role, if any, can the swiddener play in the regeneration of the forest or in reducing forest degradation in southern Cameroon? Until recently, the prevailing view was that the swiddener should abandon the swidden and let it regenerate. This view is currently being questioned because studies have revealed the active management that farmers apply in shaping fallow succession. The importance of preserving trees in the field is increasingly recognised by many groups—even though it might be more for their immediate use in the field (fruit, support for vines, microclimate for plants needing shade, etc.) or as an attraction for game, rather than as a seed source for their regeneration or for the prevention of soil erosion. The swiddener may actively manipulate the succession so that certain desired trees will become dominant.

The challenge is in developing tropical agroecosystems that build upon the knowledge of the traditional swiddener and can be used by small farmers, not for a few years but for generations. Clearly, much of the knowledge on fallows developed in this chapter is too area-specific or too tied to specific fallow types to be readily transferable to other areas. However, there are some general principles that are applicable not only to the intensification of swidden agriculture but also to the development of other tropical land use systems. These principles include the integration of trees into the agricultural system[1] as well as the role of plants such as Chromolaena in suppressing weeds and maintaining bush fallow systems and soil fertility[2].

Important research requirements for such developments involve deeper investigation of indigenous knowledge, which in some areas have already been conducted; studies into the marketability of major fallow products, which are still missing for some species; and participatory research with farmers into developing their priorities and acting on them in a local context, possibly within an adaptive collaborative management approach. Harmonising the current understanding of the concept of secondary forest and facilitating a legal framework for secondary forest vegetation management by local communities—such as the community forestry legislation already being implemented in Cameroon—are also important requirements for effective adaptive management of shortened fallows.

Endnotes

[1] As forest resources decline, protection of trees within the field in some areas may be supplemented by planting trees. Tree planting must be increased as forests recede. Since diverse trees were protected in the fields and used in the forest, a variety of trees will be needed to replace the 'naturally' occurring forest products.

[2] Results of past research in IITA show that Chromolaena can control other particularly noxious weed plants (such as *Imperata cylindrica*, grasses or sedges) within a short fallow. This could be attributed to the ability of Chromolaena to establish easily and compete successfully against other plants. Research carried out in Ultisols by IITA also shows that mulching with dry Chromolaena shoots decreased soil bulk density and increased soil moisture retention. Results show that Chromolaena litter contains percentages of N, P and K that are comparable to either the natural bush fallow or forest regrowth.

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Umbrellas under the sun:
A rural NTFP Market

Chapter 15

NTFPs and services for sustainable livelihoods in Central Africa

Ousseynou Ndoye and Tieguhong Julius Chupezi

The Central African rainforest spans Cameroon, the Central African Republic, Gabon, Equatorial Guinea, the Republic of Congo, the Democratic Republic of the Congo, Sao Tome and Principe, Rwanda and Burundi. This tropical forest, which until recently has been managed for timber production, is a cornucopia of plant and animal species. The forest is also a source of important cultural and socioeconomic products, termed non-wood or non-timber forest products (NTFPs). As defined by Okojie (1995), NTFPs are biological materials extracted from forest ecosystems that are utilised within households, marketed or have social, cultural and religious significance. NTFPs include foods, medicines, oils, resins, gums, tannins, bamboos, fuelwood, rattans and game meat sold and consumed at local, national, regional or international scales.

As used by the Food and Agricultural Organization of the United Nations, *non-wood forest products* refers to all plant and animal products derived from wild forest sources and collected from forest species. These products can also be gathered from plants grown on plantations or in agroforestry systems of varying degrees of domestication (Vantomme 1999).

Regardless of the preferred term, such products have attracted considerable global interest in recent years, particularly from the Food and Agricultural Organization (FAO), the International Tropical Timber Organisation (ITTO), the Center for International Forestry Research (CIFOR), and the International Network for Bamboo and Rattan (INABAR) (Catriona 1997; Catriona *et al*. 1999; Porsell 1999; Pastore 1999; Verlasquez 1999). The interest arises from an increasing recognition of their contribution to household economies, food security and environmental objectives, such as the conservation of biodiversity (Vantomme 1999).

NTFPs have become very important in the Central African rainforest because of the region's rapid rates of deforestation, forest fragmentation and degradation. The current rate of forest loss is accompanied by loss of biodiversity, which generally threatens the safety net functions of forests for forest-dependent people. For instance, the economic crisis and resulting decline in international markets for cocoa and coffee in the

mid-1980s prompted many farmers to diversify their income sources and minimise the risks of traditional agriculture by harvesting and using more NTFPs (Ndoye and Tieguhong 2002). The 1994 devaluation of the CFA franc increased the price of pharmaceutical products, forcing many rural dwellers and poor urban households to use forest products as medicine. The devaluation further increased the price of beer and whisky, which led many consumers to switch to palm wine and local whisky made from the juice tapped from *Elaeis guineensis* and fermented with other forest products like *Garcinia lucida* and *Garcinia kola* (Ndoye and Tieguhong 2002).

In addition to providing safety net functions, NTFPs have a higher economic potential to alleviate poverty than traditional cash crops, such as cocoa. This implies that the production and commercialisation of such NTFPs can be promoted as a strategy for poverty reduction in Central Africa. For example, between 1996 and 1999 the average prices of a kilogram of *Irvingia* spp. (bush mango) and *Ricinodendron heudelottii* (njansang) were more than 200 percent higher than the average price of the same quantity of cocoa beans (Figure 15-1).

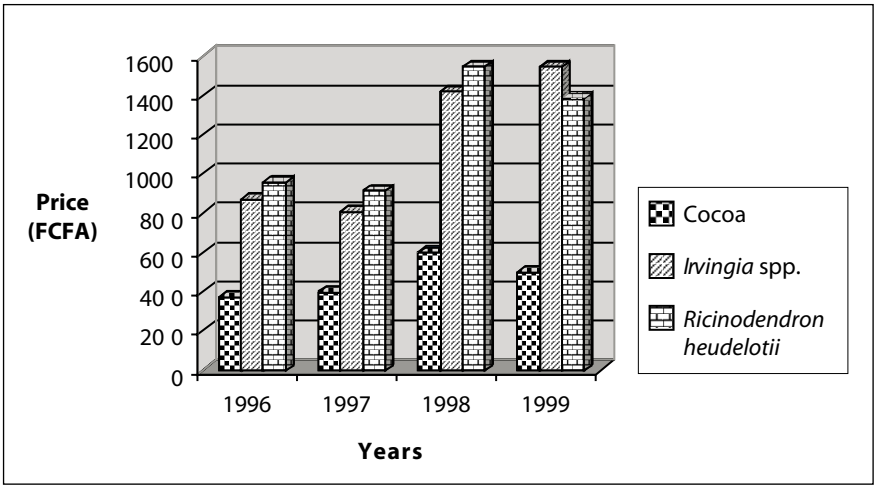

Figure 15-1. Value of cocoa and selected NTFPs (CFA francs per kg)

Importance of NTFPs for livelihoods

The majority of NTFPs have multiple uses, and allocation into specific categories is relatively arbitrary from the perspective of a typical villager. Uses can nevertheless be classified as herbal medicine, food, fuelwood, craft material, income, and other uses and services.

Herbal medicines

Forests provide medication for a large majority of rural and urban dwellers. The World Health Organization (WHO) estimates that some 80 percent of the people of the developing world use NTFPs for health and nutritional needs (Vantomme 1999; Leak 2000). Ndoye *et al.* (1999) estimated that more than 70 percent of rural populations turn to traditional healers and herbal medicines to treat common ailments. Of 19 tree species used for health purposes in local communities around the Mbalmayo Forest Reserve in Cameroon, 63 percent are also harvested for timber by private companies.

The intensity of harvest of forest products for medicinal purposes has risen since the economic crisis and the devaluation of the CFA franc, which led to a sharp increase in the prices of pharmaceutical products (Table 15-1). Table 15-2 shows that rural people are financially rational in using traditional medicines because they are cheaper than modern medicines. The loss of forest resources customarily used to cure these illnesses can therefore be highly detrimental to the health of local communities.

Parts of forest plants (barks, roots, shoots, leaves, fruits, seeds) are used in various combinations to treat ailments ranging from common colds to serious diseases like cancer. The importance of herbal cures in West and Central Africa has led to the popularity of tradomedical clinicians who claim a high degree of success for their cures. Although these claims cannot be substantiated, there is agreement amongst researchers that the use of plant medicines is increasing because of the rising cost of modern

Table 15-1. Increase in intensity of monthly harvest for medicinal use of tree species in communities around Mbalmayo forest

Scientific name	*Trade name*	*Indication*	*Average increase, 1998 – 1983-1985**
*Pycnanthus angolensis***	Ilomba	Breast cancer	1 000%
Drypetes gossweileri	Olelan	Sexual impotence	800%
*Astonia congensis***	Emien	Malaria	600%
*Nauclea didderrichii***	Bilinga	Measles	600%
*Klainedoxa gabonensis***	Eveuss	Rheumatism	600%
*Terminalia ivorensis***	Framire	Bile	500%
Prunus africana	Mueri	Prostate cancer	500%
*Carapa procera***	Engang	Syphilis	500%
*Albizia adianthifalia***	Saliyeme	Gonorrhoea	500%
Enantia chlorantha	Moambe Jaune	Yellow fever	400%
Fagara heitzii	Bongo	Gonorrhoea	400%
*Cylicodiscus gabonensis***	Okan	Stomach pain	400%
Piptadeniastrum africanum	Dabema	Painful menstruation	400%
Anonidium manii	Ebom	Typhoid	400%
*Baillonella toxisperma***	Moabi	Back pain	300%
*Staudtia gabonensis***	Niove	Scabies	300%
Oldfieldia africana	Vessambata	Wounds	300%
*Fagara macrophylla***	Olonvogo	Cardiac palpitations	300%
*Guibourtia tessmanii***	Bubinga	Hemorrhoids	250%

Source: CIFOR surveys.
** In absolute terms for both subsistence use and sale.*
*** Species with both timber and NTFP values.*

Table 15-2. Costs of modern and traditional medicines in rural communities

Illness	*Western pharmaceuticals (CFA francs)*	*Traditional medicine (CFA francs)*	*Cost differential*
Back pain	10 000	3 000	+7 000 (70%)
Cold, cough	7 500	2 000	+5 500 (73%)
Gonorrhoea	8 000	5 000	+3 000 (38%)
Haemorrhoids	25 000	7 000	+18 000 (72%)
Malaria	7 000	2 000	+5 000 (71%)
Measles	9 000	2 500	+6 500 (72%)
Rheumatism	40 000	10 000	+30 000 (75%)
Scabies	6 000	1 000	+5 000 (83%)
Yellow fever	20 000	6 000	+14 000 (70%)

Source: CIFOR surveys. USD 1 = XAF 700.

health care (Adekunle 1992). For example, more than 2000 tonnes of bark from *Prunus africana,* used to treat benign prostrate hyperplasia, is exported each year from Cameroon (Cunningham and Mbenkum 1993). Surveys carried out in the Dja Forest Reserve in Cameroon identified 45 remedies for fevers and malaria made from 22 different plants (http://www.ecofac.org).

Plant parts used are usually gathered from forests, fallow lands and communal lands. Some of the plants have become very scarce, and long-distance travel is necessary to collect them. Adekunle (1992) has therefore called for the genetic conservation and propagation of plants in the subregion. In Cameroon, the World Agroforestry Centre, through various domestication and vegetative propagation methods, is producing improved propagules of medicinal plants like *Prunus africana* and *Pausingstalia johimbe* for integration into multistrata farming systems.

Western demand for traditional medicines

Traditional medicines has assumed growing importance in the developed world. According to the estimates of Yaun and Grunwald (1997), herbal medicines commanded a global market value of USD 14 billion in 1996, but Subrat *et al*. (2002) estimated this global market at USD 60 billion, with an annual growth rate of 7 percent. Europe, the largest market, represents one-half of the global trade, and Asia, 36 percent. In the United States, 20 percent of adults taking modern medicines are also using herbal medications (Eisenberg *et al* 1998). In 1997 U.S. consumers spent more than USD 10 billion out-of-pockets on herbals. A January 2001 survey of more than 1000 U.S. adults revealed that 75 percent of parents would use licensed herbals on their children, 89 percent would support legislation for licensing herbals, and 67 percent wanted to be able to buy herbals in supermarkets (Leak 2000). According to Dr. Tannis Jurgen of the College of Pharmacy, University of Dalhousie, the use of medicinal herbs has grown dramatically over the past five to 10 years, and herbal medicines are now available at pharmacies and grocery stores and by mail order and through Internet sources. Table 15-3 shows the growing importance of herbal medicines in the treatment of common ailments in the United States.

Table 15-3. Percentage of Americans using herbal remedies, 1997

Condition	*Usage*
Colds	59%
Burns	45%
Headaches	22%
Allergies	21%
Rashes	18%
Insomnia	18%
Premenstrual symptoms	17%
Depression	7%
Diarrhoea	7%
Menopause	4%

Source: http://www.molbio.princeton.edu/courses/mb427/2001/projects/10/usage.htm

Increased demand for traditional medicines in the western world indicates potential avenues for economic development for rural communities with forest resources in Central Africa. It is also enlightening for Africans still prejudiced against taking medicinal herbs and who condemn them as the 'pharmacy' for poor people who cannot afford modern drugs. Medicinal plants are precious resources for the pharmaceutical, food and cosmetics industries, and with the current trends of acceptance by western cultures, it is possible that in the future, the biodiversity of the Central African rainforest will be more useful for medicinal values than for timber, especially with the development of African pharmacopoeia. Plants with active ingredients against cancer, hypertension, diabetes, Ebola virus and prostate disorders have been identified in this ecoregion. The next frontier will be plants with active ingredients against HIV/AIDS (Ndoye and Tieguhong 2002).

Food products

Some forest plants and animals are eaten wholly or in parts and contribute to diet enrichment in rural communities. They supplement staple foods and are consumed in times of food scarcity, famines, emergencies and periods between crop harvests.

In the humid forest zone of Cameroon, 587 tonnes of *Dacryodes edulis* (African pear), 212 tonnes of *Cola acuminata* (Abata cola), 172 tonnes of *Ricinodendron heudelotti* (Njansang) and 140 tonnes of *Irvingia gabonensis* (bush mango) were recorded in 31 markets of five provinces between January and July 1995 (Ndoye 1995). These foods, according to Pastore (1999), were NTFPs of economic importance, with a production value that exceeded USD 200 000. Some common important edible NTFPs in Cameroon include *Gnetum* spp. (eru, a leafy vegetable), *Piper guinensis*, *Garcinia kola*, *Elaeis guinensis,* honey and mushrooms. Records indicate that more than 1500 species of wild plants are consumed in Africa. Okafor (1981) recorded 171 indigenous woody plants of nutritional importance within the forest zone of West and Central Africa. Most of these are eaten as snacks, condiments or dietary staples. Forest mushrooms are consumed as meat substitutes (FAO 1989).

Another category of food derived from the forest is wildlife meat (bushmeat). According to CARPE (2001), more than 1 million tonnes of bushmeat is eaten annually in Central Africa, which is equivalent to about 4 million head of cattle. The total amount of bushmeat consumed in Gabon was estimated at 17 500 tonnes valued in CFA francs at XAF14.5 billion, or an estimated 17.2 kg per capita (Steel 1994, cited by Bourobou and Ngoye 1999). About 30 to 40 percent of meat eaten in Central African Republic comes from bushmeat, and a town like Bangui consumes about 2 tonnes of bushmeat per day (FAO 1999). This is similar to Ajayi's (1971) estimate that bushmeat is consumed by more than 80 percent of people in southern Nigeria and supplies about 20 percent of their animal protein.

Craft materials

Some NTFPs provide raw materials for small and large-scale industrial processing, including internationally traded craft items. For example, over the past 10 years, Panama has seen growing sales of art objects made from NTFPs from the province of Darien (Verlasquez 1999); these art objects represent important sources of income for the indigenous communities (Harp 1994). In Thailand and the Philippines, bamboo and rattan are important raw materials for furniture and woven products (Chenggang

1997). The output value of bamboo handicrafts is estimated at USD 12 million to 20 million, and bamboo and rattan products are worth around USD 36 million annually (Fang and Chao 1997). The approximate export value of Thailand's NTFPs totalled USD 18 million in 1996. At present, nearly 1000 factories in China alone are engaged in the production of various bamboo boards and pulpings. In addition, many mills have been set up to process bamboo shoots, weave mats and make chopsticks and other articles.

Bamboo offers an alternative to some timber products and therefore can reduce unsustainable harvesting and deforestation, reducing pressure on forests. Bamboo's excellent mechanical properties, such as superior strength and rigidity, and fast growth make it a highly promising NTFP (Xinqiang 1997).

What future do bamboo and rattan hold for Cameroon and other Central African countries? Current production, processing, utilisation and trade of these commodities are poorly understood, albeit relevant to some rural economies. However, during the colonial period, there was a significant trade in rattan and its products in Africa. In particular, Cameroon and Gabon supplied France and its colonies (Hedin 1929, cited in Sunderland 2001). In 1926, Cameroon exported 100 tonnes of raw rattan valued at USD 50 000 to France, and in 1928, USD 50 000 worth of finished cane furniture was exported from Cameroon to Senegal for the expatriate community there (Hedin 1929, cited in Sunderland 2001). Promising avenues for the Central African rattan industry lie in innovations in processing, recently introduced to Cameroon from Malaysia, which add value and durability to the final products.

Fuelwood

FAO (2001) statistics suggest that in 1999, about 90 percent of the 1.75 billion m^3 of wood harvested for fuel and conversion to charcoal was produced and consumed in developing countries. Fuelwood consumption is estimated to account for about 88 percent of the roundwood production in Central Africa (FAO 2001). The International Energy Agency (1996)

estimates that 11 percent of the world's energy consumption comes from biomass, mainly fuelwood. Traditional (non commercial) biomass fuels such as fuelwood, charcoal, dung and straw supply more than 10 percent of total global energy needs and a much higher percentage of energy needs in developing nations, albeit with low levels of efficiency and service quality (WRI 1996-1997).

According to Kowero (1996), fuelwood is a stable source of household energy, and more than 90 percent of all households in developing countries use it for cooking. In Cameroon, 96 percent of the rural and 60 percent of the urban populations depended on fuelwood as a principal cooking fuel in 1987 (Demo 1987, cited in Essama-Nssah and Gockowski 2000). Gabon produced an estimated 2.4 million m^3 of fuelwood in 1995. In the Democratic Republic of the Congo, fuelwood accounts for 80 percent of energy use (IEA 1996). Fuelwood and charcoal also provide the energy needs of small-scale processing enterprises like palm oil production and fish smoking (Okojie 1995). Most plant species are used for fuel especially the dead trees and fallen branches. According to Nasi *et al.* (2002), fuelwood is of major importance to poorer countries and for the poor within those countries. Fuelwood gathering is most prevalent during farming periods when bush is cleared, raked and burnt for farming purposes. Because the major gatherers are women and children, projects dealing with fuelwood scarcity need to explcitly take into account gender issues (Olawoye 1995; Stephanie 1998).

Income

The economic value of forest foods, nuts, bushmeat, vegetables, craft materials and pharmaceutical products has implications for the incomes of rural and periurban community dwellers. For instance, in Central Africa hunters are said to earn between USD 300 and USD 1000 annually from the sale of bushmeat (CARPE 2001). More than 150 NTFPs are reputed to be economically significant to international trade, valued between USD 5 billion and USD 10 billion—and that is in addition to the value of those NTFPs traded at national and local levels. Global trade and subsistence value of rattan and its products is now estimated at USD 6.5

billion (Catriona 1997). In Central Africa, the value of the rattan trade in three urban markets (Douala and Yaoundé, Cameroon; and Kinshasa, Democratic Republic of the Congo) was estimated at USD 287 505 in 2001 (Sunderland 2001).

Ndoye (1995) has highlighted the importance of forests and the contribution of NTFPs to local livelihoods, especially those of the rural women, who constituted 94 percent of active NTFP traders in Cameroon. He found that NTFPs of economic value in the tropical forest zone of Cameroon included *Dacryodes edulis* (USD 244 000), *Cola acuminata* (USD 212 000), *Ricinodendron heudelotti* (USD 460 000) and *Irvingia gabonensis* (USD 302 000).

The importance of NTFPs for the livelihoods of forest dwellers in Central Africa should not be underestimated. In the Takamanda Forest Reserve area of Cameroon, inhabitants depend heavily on NTFPs to stabilise incomes during periods of low demand for farm labour (Sunderland *et al*. 2002). It is estimated that 70 percent of the total population of the area collects forest products for consumption and sale, representing an estimated income of USD 714 286 per annum (Ayeni and Mdaihli, cited in Sunderland *et al*. 2002). This total represents a mean income of USD 271 for each household and 39 percent of the total household income per annum. Recent findings also suggest that most harvested NTFPs are sold in home communities, but 19 percent are transported for sale in Nigeria, and 13 percent are traded in local markets in Cameroon (Schmidt-Soltau 2001). The major NTFPs of the Takamanda Forest Reserve area and their contribution to household incomes are shown in Table 15-4.

Bush mango and eru combined constitute 82.2 percent of household income from NTFPs and are by far the most valuable products to the communities within the Takamanda Forest Reserve area. The retail value per unit of other products, such as chewing sticks, is much higher, yet most communities realise very little from the harvest and sale of these products.

Table 15-4. Use and contribution of NTFPs to household income in Takamanda Forest Reserve

Common name	***Scientific name***	***Plant part used***	***Use***	***Percentage of total cash income***
Bush mango	*Irvingia gabonensis, I. wombolu*	Seed	Condiment, soup thickener	58.9
Eru	*Gnetum africanum, G. buccholzianum*	Leaves	vegetable	23.3
Njansang	*Ricinodendron heudelotii*	Seed	Condiment	6.6
Bush pepper	*Piper guineensis*	Seed, leave	Condiment, leafy vegetable	2.9
Chewing stick	*Garcinia manii*	Wood	Dental hygiene	1.9
Bush onion	*Afrostyrax kamerunensis*	Seed	Condiment	1.5
Bitter kola	*Garcinia kola*	Seed	Stimulant, medicine	1.0
Rafia	*Raphia hookeri*	Leaves	Thatching	0.7
Hausa stick	*Carpolobia lutia, C. alba*	Stems	Cattle stick	0.4
Cola nut	*Cola nitida*	Seed	Stimulant, cultural	0.4
Aligator pepper	*Afromomum* spp.	Seed	Medicinal	0.3
Akpa	*Tetrapleura tetraptera*	Seed pod	Condiment	0.1
Njabe	*Baillonella toxisperma*	Seed	Oil	0.1
Screw pine	*Pandanus candelabrum*	Leaves	Thatching for mats	0.07
Rattan	*Lacosperma* spp., *Eremospatha* spp.	Stems	Weaving	0.07
Ngongo	*Morantaceae*	Leaves	Weaving, wrapping	0.06
Bush plum	*Dacryodes edulis*	Fruits	Food	0.06
Poga	*Poga oleosa*	Seed	Food	0.06

Source: Adapted from Sunderland et al. 2002

According to Ndoye (1995), cross-border trade is an important aspect of the NTFP economy in Cameroon. For example, the value of *Irvingia gabonensis* marketed to Gabon and Equatorial Guinea was about USD 87 000, or 27 percent of the trade in that product in the humid forest zone. CIFOR research has also shown that a half-year sales value of nine NTFPs in 28 markets of the humid forest zone of Cameroon reached USD 1.94 million in 1996 (Ndoye *et al*. 1997).

On a regional scale, there is a high level of border trade in NTFPs in Central and West Africa. At an international level, France and Belgium import annually over 100 tonnes of *Gnetum* spp. worth XAF 20 billion (USD 28.6 million) (Ndoye *et al*. 1999). In 1999 the value of *Prunus africana* in Europe and North America was estimated at more than USD 700 000 to Cameroon and USD 200 million to the pharmaceutical companies. The export value of the bark of *Pausinystalia johimbe*, used as an aphrodisiac in Europe and America, was worth USD 600 000 to the Cameroon economy in 1998 (CARPE 2001).

Other uses and services

Some non-timber trees and shrubs are used for animal feeds, either as browse or cut-and-carry fodder. Most Fulani herdsmen graze their cattle in the southern forests, especially in the dry season (Okojie 1995), and many species are browsed. Even *Gmelina arborea* may be eaten by goats (Adeola 1993). Species commonly used for fodder (especially for small ruminants) in the humid lowlands of West and Central Africa include *Albizia lebbeck, Artocarpus communis, Treculia africana, Baphia nitida, Anthonotha macrophylla, Cajanus cajan, Ceiba pentadra, Daniella oliveri, Ficus* spp., *Gliricidia sepium* and *Leucaena leucocephala* (Okafor and Fernandes 1987). The use of *Gliricidia* and *Leucaena* has been documented in alley farming (Kang *et al*. 1990) and in intensive feed gardens (Atta-Krah and Sumberg 1988, cited by Okojie 1995). Other auxiliary roles played by non-timber forest trees and shrubs include provision of shade and materials for utensils, fences and stakes for yam.

Multipurpose trees in the forest can also be useful as soil improvers. They provide stable environmental conditions on which sustainable food production depends. They improve microclimate, sequester carbon, reduce wind damage, protect soil from erosion, restore productivity, improve water quality and enhance water availability downstream. For instance, a cost-benefit analysis by Ruitenbeek (1992) in the Korup National Park of Cameroon (see Chapter 7 of this volume) showed that the continued exploitation of timber will have a financial benefit of USD 1 million, whereas the benefits associated with the conservation approach were USD 25 million. One of the most important conservation benefits (about USD 7 million) was associated with the protection of watersheds that supported an economically important downstream mangrove fishery sector (Ruitenbeek 1992).

Dynamics of NTFPs

Over the years, increasing population and land scarcity have led to land 'hunger' in most rural and periurban forest communities. These effects, added to logging, grazing and farm clearing, have gradually depleted forest products and had a generally adverse effect on biodiversity. According to Catriona *et al.* (1999), supply shortages are largely due to the overexploitation of NTFPs, a lack of proper management and the conversion of common use areas to protected areas where harvesting is restricted. According to Ebot (2001), cited in Sunderland *et al.* (2002), recent improvements in infrastructure and marketing conditions, coupled with the absence of formal controls, have led to the significant overexploitation of NTFPs in the Takamanda Forest Reserve area of Cameroon.

When resources are depleted and substitutes are unavailable, rural people can suffer considerable loss of income. For example, Thailand's NTFPs export values totalled USD 23 million in 1994, but dropped to USD 18 million in 1996 (Catriona 1999). Another example comes from Amazonia, where in 1980 there were 11 NTFPs whose economic value totalled USD 160.2 million, yet by 1995 this number had decreased to six valued at only

USD 65.4 million (Pastore 1999). These two examples indicate that the long-term sustainability of NTFPs is under threat.

Availability of fuelwood and other NTFPs is affected by changes in the forest ecosystem. As forests near homes are depleted or converted to other uses, women must trek longer distances to find fuelwood and spend more time in its collection (FAO 1990). This both exhausts the women and curtails their income from such activities. Scarcity of fuelwood has also forced people to purchase fuel, putting a strain on family budgets.

Looking towards the future

A few decades ago, overvaluing the monetary worth of timber greatly minimised the spiritual, cultural and socioeconomic value of NTFPs to the local communities. In the process, people lost the opportunity and traditional knowledge to utilise NTFPs for income generation. They also lost their connection with forests and the incentive to protect them. To reverse and revive the interest of forest communities in forest benefits, the ACM research approach (especially the participatory action research) seeks to revalue forest products for multiple socioeconomic and cultural uses as well as capitalise on the options for sustainable resource management.

This is relevant given the ability of NTFPs to significantly enhance the value of forests and the recognition of their true market and livelihood potentials. There is, therefore, a need for a shift of emphasis from just timber exploitation to NTFPs production to ensure that forests remain and can be used by both the present and future generations. Options for future forest use include recreation and ecotourism, sustained timber yields, alternative forms of biomass, NTFP exports, patents on medicinals, carbon credits, and plantation forestry.

Recreation and ecotourism

The World Wide Fund for Nature (WWF) has indicated that sustainable tourism and its associated infrastructure can maintain biological and

cultural diversity, use resources sustainably, and reduce overconsumption and waste. Sustainable nature-based tourism, or 'ecotourism', means responsible travel to natural areas that is determined by local people, sustains their well-being, and conserves the environment (WWF 2000). In summary, WWF believes that sustainable tourism must be planned, managed and undertaken in a way that avoids damage to biodiversity and should be environmentally sustainable, economically viable and socially equitable. The organisation calls upon the tourism industry and other sectors to improve environmental standards, enhance conservation, promote active participation of local stakeholders and share benefits from tourism with them, provide environmental information to tourists, and engage in quality marketing of tourism, based on recommendation IV/7 of the fourth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA.4).

Ecotourism is one of the growing non tangible benefits of the Central African forests. Most countries in the region have well-managed protected areas with great potential for ecotourism, offering many charismatic species—primarily large mammals—but also an overwhelming diversity of plant, bird and fish species and a wide range of beautiful scenery and natural forest landscapes. Some of these protected areas include Lobeke, Korup, Boumba-Bek and Nki national parks in Cameroon; Odzala and Nouabale-Ndoki national parks in the Republic of Congo; Dzanga-Sangha National Park in Central African Republic; Monte Alen National Park in Equatorial Guinea; and Lobe Wildlife Reserve in Gabon. If tourist facilities are properly organised, developed and advertised, many forest estates in Central Africa could provide unparalleled ecotourism services.

Despite poor infrastructure, the Korup National Park attracted 226 tourists in 2005. With modest levels of infrastructure, the Mount Cameroon Ecotourism Organisation and the Dzanga-Sangha National Park drew 885 and 658 tourists, respectively, in 2005. Greater advances in the development of ecotourism have been achieved in other parts of the world, including the mountains of Sikkim, India; the rainforest of western Java, Indonesia; the rainforest of Crater Mountain and the forest

of Lakekamu Basin, Papau New Guinea; and on Makira, Solomon Island (BCN 1997). Each of these examples offers unique obstacles, catalysts, challenges and success stories that can be reviewed and adapted to meet the objectives of sustainable forest ecotourism in Central Africa.

Sustained and sustainable yields

The basic concept of sustained yield, as applied to the management of tropical forests, requires a land capacity classification and a thorough socioeconomic understanding of forest settings. Another way is to manage the forest for multiple products through the controlled low-impact selective logging system. The complementarities between timber and NTFPs production carried out in Tapajos National Forest in Brazil revealed that under different scenarios, NTFPs could contribute 11 to 14 percent of the total income from forest exploitation, and this figure could be higher (Pastore 1999).

Implementing a whole tree utilisation concept and using sawmill waste for reconstituted forest products will reduce the volume of timber required per hectare and hence reduce deforestation. Improved technology in the harvesting and processing of timber will reduce the total volume of wood required for local consumption and export (Okojie 1995; Dykstra 2001; Enters 2001).

Export potential

NTFPs must be developed for exportation. The humid forests have many species used as spices and with potential export values. Value-added products can be processed from *Irvingia* spp., *Gnetum* spp., *Prunus africana* and *Ricinodendron heudelottii* to tap the advantages of the growing market and production potentials in Central Africa.

For instance, a kilogram of *Gnetum* spp. in Cameroon sells for XAF 400, but the value of the same quantity exported increases to XAF 8000 in Britain and XAF 30 000 in the United States (Ngatoum and Bokwe 1994). The processing of other NTFPs, like hides and skins of legally cropped wildlife, will enhance their export values. Certain shrubs, including

Dioscoreophyllum cuminsii, *Synsepalum dulcificum* and *Thaumatococus daniellii,* possess substances that can be processed relatively inexpensively to yield products 1000 times sweeter than sugar (Adeyoju 1981). Other NTFPs with potential export values include resins, honey, beeswax, *Garcinia kola*, seeds and concentrates from forest fruits.

Biomass for alternative fuels

The use of wood energy for heating and processing agricultural products has contributed to high rates of deforestation and forest fragmentation in the tropics. Alternative sources of energy (coal, petroleum products, solar and nuclear energies) must come into increasing use if the economic value of NTFPs is to increase (Okojie 1995). The production and use of efficient cooking stoves will reduce the quantity of wood used by households. There is need to promote the use of sawmill waste products such as sawdust, off-cuts and slabs at the household level, instead of burning them in the open as practised by many sawmill operators in Central African countries.

Patents on medicinals

The patent rights for active ingredients extracted from medicinal plants must be secured. Plants of great pharmaceutical importance in America and Europe that are currently exported from Cameroon include *Prunus africana, Pausinystalia johimbe* and *Ancistroclaudus korupensis*. The raw plant material is processed in western countries and sold without due recognition of the source. Royalties must include large proportions of the turnover value of the overseas pharmaceutical companies (Okojie 1995) and be tailored to the conservation of the resource base. By also granting local people the exclusive right to own and protect the resource, such arrangements may provide a viable option for managing tropical forests on a sustainable basis.

Natural resource accounts for sustainable management

Environmental services such as carbon fixation, biodiversity protection, soil stabilisation and watershed protection, although not marketable, have values that can be fairly estimated. Such estimated values will give policy

makers basic data for comparative analysis with other forms of forestland use. Natural resource accounts are one way to explicitly incorporate environmental and resource information into an accounting framework designed to measure resource stocks and flows. The ultimate goal of these accounts is to improve the economic management of natural resources by facilitating the integration of economic and environmental information—a calculation that can then be presented to decision makers (Okojie 1995).

For example, with much of the original forest in countries such as Nigeria, Côte d'Ivoire and Ghana now gone, there is increasing interest in using shaded, diversified cocoa-fruit-timber agroforests as a tool for reforesting degraded lands. Because of the depleted nutrient status of these lands, inputs such as fertilisers (which are prohibitively expensive for the small-scale farmer) to enhance the establishment of agroforests are required. One way to help farmers with these costs involves the evolving trading negotiations over carbon sinks and carbon emissions. Preliminary calculations indicate that potential monetary returns (measured as discounted net present value) could range from USD 550 to USD 740 ha^{-1} if credits for the carbon sequestered by converting degraded *Chromolaena odorata* bush land to multistrata cocoa agroforests were traded in a carbon market (ASB 1998; Gockowski and Dury 1999). Developing the mechanisms and procedures for the transfer of this global value into the pockets of poor farmers willing to replant their degraded land should be a priority for the national and international community.

Forest plantations for timber production

Plantation forestry has emerged as a spectacular area of interest in recent years because of its promise in meeting the urgent demands for wood while promoting environmental sustainability. The major reason for its superiority over natural forest management is that it is amenable to evolving social, economic, technological, environmental and developmental concerns. The supply of tropical hardwood timber will certainly offer new economic opportunities in the future, since the growth of world demand for quality hardwoods is expected to generate scarcity for the most desirable species.

World consumption of wood and fibre products of all types—sawnwood, panels, papers and paperboards—is projected to exceed feasible economic production from historical areas of supply.

Expansion of plantations is very likely in tropical developing countries that have vast areas of degraded lands (more than 4.5 million ha in Cameroon alone), especially for small-scale plantation schemes, because land for large-scale plantations is becoming scarcer. There is also a greater understanding of the need for small-scale plantations of tree species that furnish timber and non-timber forest products in the light of the synergy between resolution of resource use conflicts and sustainable rural livelihoods and poverty alleviation. Small plantations are becoming more feasible now that land tenure systems are moving towards the freehold system and management is emphasising natural forests for the provision of NTFPs and services.

Conclusions

Rural communities of the Central African rainforest depend much on non-timber forest products for their income, health and well-being. On this note, one can attest that NTFPs are the resource niches of poor rural households. According to FAO (2001), poor people in Africa and other parts of the world obtain the following benefits from forests:

- subsistence goods (fuelwood, medicines, construction wood, ropes, bushmeat, fodder, mushrooms, honey, and edible leaves, roots and fruits);
- goods for sale (all of the above subsistence goods, plus craft materials, timber and other wood products); and
- indirect benefits (land for social and spiritual sites, and environmental services including watershed protection, ecotourism and biodiversity conservation).

Any effort aimed at developing and sustaining NTFPs may therefore contribute to poverty alleviation and sustainable livelihoods, at least at

the local level. However, the growing importance of timber production coupled with poor forest management in Central Africa has reduced forest cover in the region, making the sustainability of NTFPs doubtful. Some immediate implications include poor habitat for wildlife, loss of biodiversity, fuelwood shortages, poor soils, reduced crop yields, loss of edible fruit trees and vegetables, and loss of income for forest-based communities. The future of NTFPs and the forest at large needs further consideration.

To address the situation, research activities and legislative and policy structures for NTFPs must be intensified. The interests of all forest stakeholders have to be taken into account at the policy level, perhaps by creating separate departments of NTFPs within ministries of forests. Illegal logging, which is generally carried out without any respect for the norms of sustainable harvesting techniques, has to be curtailed and low-impact logging practices enforced.

Although NTFPs thrive well in their natural habitats, the current rate of deforestation and habitat destruction also calls for *ex situ* conservation methods to enhance their sustainable production. These may involve special species gardens, botanical gardens, orchards of forest fruit trees, and village woodlots for species used for stakes and fencing. The integration of improved propagules of fruit trees of economic value into farms through agroforestry initiatives may be welcomed by farmers. The first targeted species for the conservation through cultivation programme was *Prunus africana,* a montane tree species whose largest remaining African population is found on Mount Cameroon (Cunningham and Mbenkum 1993). The compound garden will be necessary in rural and periurban communities.

All such efforts can help ensure the integrity of Central Africa's forest ecosystems and the continued survival of tropical species with social, cultural, religious and economic significance to its peoples.

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So'o fishtrap

Chapter 16

Community management of the Lower Guinea Rainforest ornamental fishery

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Since September 2000, the WorldFish Centre has been studying the biogeography and ecology of Lower Guinea Rainforest rivers in southern Cameroon. A comprehensive review of the literature was published by Brummett and Teugels in 2004, and upon that base a series of field research projects have endeavoured to further characterise rainforest streams in terms of biotope and species diversity and abundance.

In partnership with the Organization for the Environment and Sustainable Development (OPED), a local non-governmental organisation, four rainforest communities are being engaged in an effort to improve the efficiency and sustainability of river exploitation and management. The ultimate goal of this work is to establish functional village-based monitoring and management programmes that ensure the sustainability of commercialised and diversified natural resource exploitation. This chapter summarises findings to date and progress on the implementation of a socially, economically and ecologically sound ornamental fishery business and management plan for Lower Guinea Rainforest rivers.

Rainforest rivers

The Lower Guinea Rainforest extends over 500 000 km^2 (Mahé and Olivry 1999) in an arc along the northeastern corner of the Gulf of Guinea from the Cross River in the northwest to just short of the Congo in the southeast. It includes some 50 major and minor rivers.

Unlike the uplifting and rifting that affected Eastern and Southern Africa during the Miocene, the river courses in Central Africa are extremely ancient, having not been substantially disrupted since the Precambrian (Beadle 1981; Peyrot 1991a). The Lower Guinea Ichthyological Province corresponds closely with the extent of humid forest refugia during the last dry phase of the continent, 20 000-15 000 years BP (Maley 1987; Schwartz 1991) and is similar to the distribution pattern of aquatic molluscs in the region (Van Damme 1984). It seems likely that a more broadly distributed group of archaic taxa related to the modern species in the Lower and Upper Guinea provinces were repeatedly and/or progressively isolated

during the several dry phases that reduced the extent of rainforest between 70 000 years BP and the present (Lévêque 1997), creating ideal conditions for both the preservation of archaic taxa and allopatric speciation.

Most Lower Guinea rivers are 'blackwater', with a mean pH between 5 and 6 and electrical conductivity between 20 and 30 µS/cm. Water temperature is always between 20° and 30°C. The water in these rivers is clear and tea-coloured as a result of the low dissolved nutrient concentration, low light (due to narrowness of valleys, canopy cover and often cloudy skies) and the large amount of allochthonous vegetative matter that falls or flushes into the water from the surrounding forest. Most of the larger rivers have a bimodal discharge pattern. In general, the magnitude of fluctuation is greater in the north (up to 8m on the Lower Cross); in the southern most extent of the province, the partially spring-fed Niari and Nyanga exhibit minimal seasonality of flow (Peyrot 1991b).

Fish biodiversity

In a review of West African riverine biodiversity, Hugueny (1989) found a strong correlation between species richness, watershed area and river discharge volume. Using these relationships, one finds that the fish fauna of the Lower Guinea Ichthyological Province's rivers are disproportionately rich in relation to the sizes of the watersheds (Teugels *et al.* 1992). For example, the Cross River, with a watershed of 70 000 km^2, has an estimated 166 species (1 sp/421 km^2), and the Nyong River has a watershed of only 28 000 km^2 and contains 107 species (1 sp/262 km^2). On the other hand, the Niger River, with a watershed of 1 100 000 km^2, has 254 species (1 sp/4331 km^2). The Bandama, a rainforest river in Côte d'Ivoire with a drainage basin of 97 000 km^2 but with a fauna similar to that of the Nilo-Sudan, has only 95 species (1 sp/1021 km^2) (Hugueny and Paugy 1995). Even the Congo River, with a watershed of 3 550 000 km^2 and a very stable flow regime that has existed for at least 3 million years (Beadle 1981), has only 690 species (1 sp/5145 km^2), although that figure is based on very inadequate sampling and will likely be raised upon further exploration.

From the available literature, 23 families, 123 genera and 527 species have been reported from the Lower Guinea Ichthyological Province (M. Stiassny, American Museum of Natural History, pers. comm., April 2005). Apart from the large number of small cyprinodonts (of which 60 percent are from the genus Aphyosemion), the freshwater fauna is dominated by the Siluriformes (7 families, 22 genera, 103 species), the Characiformes (2 families, 18 genera, 52 species), the Cichlidae (20 genera, 73 species), the Cyprinidae (10 genera, 81 species) and the Mormyridae (15 genera, 41 species).

Endemism in rainforest fishes seems to be relatively high (Teugels and Guégan 1994), although it is very difficult from the scanty documentation to determine exactly how many of the single reports for a species are due to endemism, lack of adequate distribution data or simple misidentification (Stiassny 1996). In particular, the Cyprinodontiformes are prone to endemism, with some species occupying only a few hundred square meters of bog or an isolated creek. These small fishes, of which there are 122 described species in the province, account for a substantial portion of the overall species richness.

Some fishes move up and down the river according to their reproductive seasonality. Cyprinids and Citharinids, in particular members of the genera *Labeo* and *Distichodus,* are reported by fishing communities in the Upper Cross and Ntem rivers of Cameroon to undertake spawning runs during the latter part of the long rainy season (October-December), when rivers are swollen and marginal forests are flooded, providing cover and food for larvae and fry (Lowe-McConnell 1975; du Feu 2001). The result is that species diversity measured over the year changes substantially according to which fishes are moving upstream or down at any particular point in time (Lowe-McConnell 1977).

The high fish biodiversity in the Lower Guinea forests is probably the result of three main factors: (1) the relative stability of the hydrological regime in these rivers since the Eocene (compared with the Nilo-Sudan zone); (2) the highly sculpted nature of the watershed (compared with

both the Congo and the Nilo-Sudan zones); and (3) the large number of microhabitats created in rainforest rivers by the forest itself.

Current exploitation

Welcomme (1976) estimated the total number of first-order rainforest streams at more than 4 million, with a combined total length equal to half of all watercourses in Africa, making these the largest single riverine ecosystem on the continent (Figure 16-1).

Of the 8 million people who live in the Lower Guinea forest, 20 percent are more or less full-time fishers and another 70 percent (mostly women and children) fish seasonally. Estimates from Cameroon put the productivity of capture fisheries in forest river basins at 0.5 tonnes/km^2/yr (Mdaihli *et al*. 2003), or 260 000 tonnes for the entire forest. At the local wholesale price for fresh foodfish of approximately USD 2/kg, the cash value of the fishery exceeds USD 500 million per year.

Figure 16-1. Typical first-order stream exploited for ornamental fishes in Kribi-Campo area of southern Cameroon

Fishing in rainforest rivers is severely constrained by the large quantities of wood in the streambed. By far, the most common types of gear are passive set nets, traps and hook lines, which vary greatly in accordance with the diversity of the fish fauna. Also common is a hook-and-line fishery dominated by small children and mainly targeting immature cichlids.

Fishing communities have learned to take advantage of spawning runs by constructing mesh barriers of tree trunks and branches, bound together by vines and held in place by large stones. At the height of the rains, these structures are submerged and gravid adults pass easily over them. After spawning and spending several months upstream, foraging in the flooded forests, the fish head downstream. However, by this time the water levels have declined and the adults find themselves trapped by the barrier. Juveniles apparently pass through the mesh without problem.

In Cameroon, reproductive migrations *(doks)* take place as waters rise in May and October. Doks involving *Labeo batesii* and *Distichodus* spp. have been documented in the Upper Cross and the Ntem, respectively. They typically last no more than a few hours or days. According to du Feu (2001), who interviewed fishers on the Upper Cross River, the village is alerted to the imminence of the spawning event by the upstream movement of fish. Two hours after the fish have passed, the water turns white with milt, at which time the villagers set nets to block the return of spent adults on their return downstream. Men do the fishing with cast nets or even clubs, while women clean and smoke the catch. Spawning sites, when known and sufficiently circumscribed, are generally protected or exposed to only limited exploitation (e.g., restricted access and/or gear).

At least two traditional fisheries are allocated entirely to women. One, the *alok,* involves the construction of small earthen dams across first-order forest streams during the dry seasons (January-April and July-August) to capture small Channids, Clariids and Mastecembelids (van Dijk 1999). As water levels decline, the dams prevent fish from migrating downstream. When the water gets low enough, the women wade in and harvest the remainder, catching the fish by hand or with the help of baskets. This practice is

widespread in both the Lower Guinea and Congo ichthyological provinces and adds substantially to the protein intake of forest communities. Another fishery that is the exclusive domain of women is the use of woven basket traps *(aya)* to catch the freshwater prawn, *Macrobrachium vollenhovenii*.

Perhaps just five exporters currently dominate the limited trade in ornamental fishes coming from Cameroon. In general, the global average retail price for ornamental fishes is around USD 1.8 million per tonne, compared with about USD 15 000 per tonne for foodfish (Tlusty 2002). A small number of middlemen based in the commercial capital, Douala, leave orders for fish with the fishers, who then enlist the assistance of village women and children to fill the orders. Buyers generally provide basic equipment, including plastic bags, for holding. Captured fish are typically held in tanks in Douala for a period of days prior to packing and shipping by air to Europe, where the poor handling they endure often results in mortalities up to 85 percent (C.H. Eon, DVM, Clinique vétérinaire de la Garenne, Langon, France, pers. comm.). Fishers typically negotiate prices individually. Prices realised by the fishers through these *ad hoc* arrangements are low, averaging USD 0.10 per fish, or less than 5 percent of the wholesale price received by the buyers.

There are six principal collecting sites for ornamental fishes in Cameroon: the Munaya River, a tributary of the Cross, fished near Mamfé; Lake Barombi-Mbo, a volcanic crater lake known for its endemic fishes of the family Cichlidae; Muyuka/Moliwe and similar streams on the eastern slopes of Mount Cameroon; the Dja River, part of the upper Congo River basin, near the town of Sangmelima; the Ntem River, fished from the towns of Ebolowa and Campo; and Kribi, where the WorldFish-OPED joint initiative is currently most active. In the Kribi area are four rivers important to the ornamental fish trade within an area of approximately 400 km^2: Kienké, Lokoundji, M'polongué and Lobé.

Access to any of these fisheries is traditionally regulated by village leaders. Such management techniques as protecting spawning areas and the prohibition of certain gears and seasons are traditionally enforced through

the use of magic charms, or *ju-ju.* Members of the village are free to fish as long as they follow the basic regulations. Visiting fishers, of which there are considerable numbers (an estimated 80 percent of fishers on Cameroonian rivers are Malian or Nigerian) must first seek permission from the village leadership and then pay a token fee, normally in the form of palm wine or a percentage of the catch.

Threats to the resource

Increasing population and poverty coupled with low valuations of rainforest biodiversity are leading causes of habitat destruction and overexploitation (Stiassny 1996). Alien species (especially *Oreochromis niloticus, Clarias gariepinus* and *Heterotis niloticus*), introduced for aquaculture and accidentally released into the Nyong River, have contributed to the disappearance of several indigenous species from commercial catches. Careless use of insecticides such as Lindane and Gammelin 20 on the increasing number of small-scale oil palm plantations in the area is causing spills and runoff that, according to fishers, have left some streams devoid of fish for up to 15 years. In addition, the use of these poisons specifically to catch fish has become increasingly frequent. Human deaths have been reported as a result of eating poisoned fish, and on the Ntem River in southern Cameroon, insecticide fishing appears to have disrupted local aquatic ecosystems to the point where the electric catfish, *Malapterurus electricus,* has been able to extend its habitat into small rivers where it was previously not found. Because of the powerful shocks emitted by this fish, women have in some areas been forced to abandon their traditional dam fishing.

The greatest threat, however, comes from irresponsible logging. Cameroon has one of the most thorough forest management laws in Central Africa, but regulations are seldom enforced. The Lower Guinea has already lost an estimated 46 percent of its forest cover to logging and conversion to agriculture, and it continues to lose forested watershed at an average rate of 7 percent per year (Revenga *et al*. 1998). In the process of removing

the valuable timber, these (often illegal) logging operations also expose large amounts of bare earth and alter stream courses, increasing runoff and siltation. Road construction, sawmills and other infrastructure associated with logging attract people into the forest, transforming the ecosystem (Burns 1972; Garman and Moring 1993). Kamdem-Toham and Teugels (1999) list the changes that occur in and around the rainforest rivers in the Ntem River basin as a result of poorly managed logging operations:

- absence of forest canopy above streams;
- heavy siltation;
- abundant primary production (algae);
- uniform watercourse, lacking riffles, with pools the dominant habitat type; and
- no cover or shelter for fish.

In terms of water quality, those changes in habitat have reduced water clarity and dissolved oxygen and raised temperature and conductivity. In undisturbed sites, water was clear brown with a mean temperature of 23.5°C, dissolved oxygen was 2.5 to 4.2 mg/l (measured at noon), and electrical conductivity was 20 to 30 µS/cm. In sites affected by logging, the water was cloudy with a mean temperature of 34°C, dissolved oxygen was less than 1.0 mg/l, and average electrical conductivity was 48 µS/cm (Kamdem-Toham and Teugels 1999). Changes of this magnitude wreak havoc on aquatic life and may last for many years (Growns and Davis 1991).

Currently, fishing communities have limited regulatory authority over the rivers they fish. Some traditional rules apply, but these are easily and often used to create inequalities by absentee leaders who exert their influence through proxies. Logging companies have found easy opportunities to exploit timber without regard for local communities or the integrity of the forest and the associated riverine ecosystem upon which the people depend for their livelihoods.

Socioeconomic and environmental sustainability

Sustainable management systems depend upon users' appreciation of the value of natural resources and willingness and ability to conserve them over the long term (Sheil and Wunder 2002). The will to properly manage the rainforest depends in large part on the degree to which the revenues of forest resource exploitation accrue to local populations, coupled with a sense of ownership and enforcement of a sustainable management plan.

From the point of view of indigenous people, timber may not be the largest potential source of local income (Peters *et al.* 1989), but since timber companies have already made substantial investments in equipment, infrastructure and market development, large-scale tree exploitation offers a comparative advantage in terms of short-term profits. Also, such profits accrue at a level and in a way that make them more accessible to tax collectors. A similar logic applies to large- versus small-scale capture fisheries and, hence, the continued presence of foreign fishing fleets off the coast of Africa at a time when local fishing communities are suffering from extreme poverty and declining catches. In contrast to these large-scale operations, the value of most non-timber forest products and artisanal fisheries accrues locally and in a dispersed manner that makes accounting and taxation virtually impossible (see Chapter 15 of this volume).

However, it has been shown that small businesses can produce wider economic growth and prosperity per dollar invested than larger enterprises. Delgado *et al.* (1998) reviewed results from Burkina Faso, Niger, Senegal and Zambia and found that even small increments to rural incomes that are widely distributed can make large net additions to growth and improve food security. Winklemann (1998) identified interventions that lead to improved incomes at the level of the rural resource manager as having a larger impact on countrywide income than increases in any other sector. Governments interested in fighting rural poverty should seriously consider how smaller-scale investors can be brought to the fore in their natural resource exploitation strategies.

Fisheries for the poor

From the point of view of rural communities, directly confronting the timber and large fishing companies over ownership of resources is an uphill task. For artisanal fishers who are being required to increase mesh sizes and respect closed seasons, watching even small trawlers take several tonnes of fish with a single haul seriously undermines the credibility of regulators, whether local or national and whether the fish stocks are related or not. In fact, rather than struggling to protect remaining resources, local fishing communities confronted with expropriation have often joined in the ravaging of their own resources to capture whatever profit they can before the big companies arrive.

A first step in revaluing forest resources and enforcing sustainable management is the quantification of the biodiversity in question. For fish, several attempts have been made at the generation of a workable index of biotic integrity, such as that used to track changes in temperate zone streams, but parameterisation has been a problem. The best effort to date in Central Africa is that of Kamdem-Toham and Teugels (1999), but gaps remain. Existing datasets on aquatic biodiversity and ecology in Central Africa are weak, at best, and this makes it very difficult to develop quantitative tools (Lévêque 1997).

Coupled with this quantification and valuation exercise should be the development of improved management and exploitation strategies that could actually increase the value of aquatic ecosystems and justify their preservation while improving rural livelihoods. Forest river ecosystems are currently unmanaged and unregulated in any formal sense. A few years ago, the Department of Fisheries in Cameroon did not even have a policy or planned programme of work on riverine ecosystems, except for a few small dams (M.O. Baba, Director of Fisheries, Yaoundé, pers. comm., April 2002). The most widely promoted method of increasing the productivity of aquatic ecosystems in Central Africa is to increase fishing pressure through the introduction of subsidies on motors and other fishing equipment, but this is done without any clear idea of the size of the resource or level of current exploitation.

Although some increased pressure might be warranted in some areas, the upper limit for this strategy is probably already in sight for most places. Careful regulation of fishing gear and seasons based on scientific data might be a more widely applicable strategy for increasing catches of certain species in some rivers. The greatest potential for improving profitability while conserving ecosystems might lie with species of value as ornamental aquarium fishes. These are unusually abundant in African rainforest rivers and wholesale at an average of USD 2.43 per fish. Keeping prices high and availability low is poor organisation of the fishery, which creates scarcity and nullifies any possible economies of scale. Also significant from the point of view of local investors is that the large commercial breeders in Singapore and Florida find it difficult or impossible to get forest river fishes to reproduce, most likely because outside the special and complex rainforest ecosystem, these fishes seldom reach sexual maturity.

To investigate the potential for commercially viable and environmentally sustainable ornamental fisheries, WorldFish and OPED have initiated a series of activities aimed at the development of community-level exploitation and management of ornamental fishes in the Kribi-Campo area of southern Cameroon. Although the initial project is focusing on Cameroon, the results should be immediately relevant to many of the countries in the Lower Guinea forests. In addition, a similar style of commercial exploitation based on additional ecological data collection and monitoring could be adopted in the Congo Basin.

Community-based fisheries management

Adaptive collaborative management (ACM), in which communities take ownership of natural resources and undertake to sustainably manage them, is an emerging concept used in several places (Bennum *et al.* 1995). By transferring management and enforcement to local communities, ACM aims to increase control over natural resources while reducing central government expenditures. ACM of freshwater capture fisheries is currently being tested in some African countries (Khan *et al.* 2004). To date, the track record of community management and conservation interventions is mixed, but new knowledge about how and why they might be made

to work better and the time frames involved is encouraging (Hulme and Murphree 2001).

The typical problem facing small-scale natural resource businesses is competition with unregulated poachers and larger-scale investors once markets are developed and the profitability of a product demonstrated (Sunderland and Ndoye 2004). A recent survey of low-order forest rivers in southwestern Cameroon (Table 16-1) found that the total value of the ornamental fishes in the wild at any of the sites sampled would be insufficient to support a significant expansion of the exploitation rate. Most of these species have very low fecundity and cannot be expected to rapidly repopulate heavily exploited streams (Kamdem-Toham and Teugels 1998). Even if the resource could support a total annual removal or replacement of the stock, only a few pristine sites within Korup National Park could return more than a few hundred dollars in annual revenue to villages.

On the other hand, if capture is augmented with cultured individuals, there may be potential to substantially increase sales without overexploiting the wild stocks. Amongst the genera identified in southern Cameroon, several are of particular interest to the ornamental fish trade, including *Amphilius*, *Aphyosemion, Barbus, Benitochromis, Brienomyrus, Brycinus, Chiloglanis, Doumea, Epiplatys, Isichthys, Kribia, Mastecembelus, Microctenopoma, Microsynodontis, Nanaethiops, Neolebias, Paramormyrops, Parauchenoglanis, Pelvicachromis* and *Procatopus*.

WorldFish-OPED intervention

WorldFish and OPED began their direct intervention in forest river fisheries through a needs assessment. In each river basin, local fishers were identified and contacted through a series of field trips. The principal fishing villages in the area are Bidou on the Mpolongué River, Bissiang on the Kienké River, Ebomé in the Lobé River watershed and Makouré on the Lokoundje River.

Table 16-1. Fish species in eight low-order streams of southwestern Cameroon

	River (stream order)								
	Moliwe (2)	***Koke/ Ekona (1)***	***Limbe (2)***	***Mana (1)***	***Iriba Inene (2.5)***	***Okoto (2)***	***Rengo (1)***	***Rengo (2.5)***	***Akpasang (1)***
Aphyosemion 'akpa-yafe'									8
Aphyosemion splendopleure	15								
Aphyosemion bivittatum				4	2		37	5	5
Awaous lateristriga			2						
Barbus batesii	3			8	38		1		
Barbus callipterus	48			63	39		181	27	17
Barbus camptacanthus	15	75		71	2	175	73	20	26
Barbus trispilomimus	52	11							
Barbus progenys					38				
Benitochromis conjunctus				2			19	23	
Benitochromis nigrodorsalis	35								
Benitochromis ufermanni				20	92		2		20
Brienomyrus brachyistus				3	7		21	5	
Brycinnus longipinnus			21						
Chiloglanis disneyi		16							
Clarias camerounensis		5			8			4	8
Doumea thysi					8		5		24
Eleotris vittata			8						
Epiplatys sexfasciatus	2	182			180	268	143	28	45
Hemichromis elongatus			97						
Labeo batesii					30		5	8	
Malapterurus electricus					3				
Mastecembelus spp.					3		3	3	8

	River (stream order)								
	Moliwe (2)	***Koke/ Ekona (1)***	***Limbe (2)***	***Mana (1)***	***Iriba Inene (2.5)***	***Okoto (2)***	***Rengo (1)***	***Rengo (2.5)***	***Akpasang (1)***
Oreochromis niloticus	2								
Parauchenoglanis spp.						24			
Procatopus KORUP				230	87	225	40	17	
Procatopus similis	37	57							
Pelvicachromis taeniatus	5								
Sarotherodon melanotheron			5						
Tilapia guineensis	1			2	10				
Varicorhinus spp.				3	51				5
Number of species						5			
Shannon Index	1.504	0.769	0.704	1.258	1.057	1.247	1.324	1.523	1.362

Typically, in each village one or two people organise the fishing and serve as the contact point for buyers. The majority of the actual fishers are children between the ages of nine and 14, who receive compensation in the form of food, shelter, school fees and health care. At any given time, there are about 25 children fishing in the four main villages. In the target area as a whole, 63 villages with a total population of approximately 7200 are involved in, or affected to some degree by, ornamental fishing.

The bulk of the fish caught comes from low-order streams, which can be easily waded and fished with hand-held nets manufactured from locally available fine-mesh netting secured to a metal frame. These are scooped or pushed into marginal vegetation, structure or other likely hiding places along the watercourse and lifted to capture the fish.

Reducing mortality rates during holding, local transport and shipping is one objective of the WorldFish-OPED programme. Training courses in gentle fish handling, transport and holding were developed and led by the fishers themselves with guidance from OPED, a Fulbright scholar and the WorldFish senior scientist (Figure 16-2).

Figure 16-2. Discussing management options. Experiential learning may be more practical than formal coursework in developing workable management plans.

In addition, students from the University of Dschang developed a fish food suitable as a dietary supplement during holding.

With the help of a revolving loan scheme set up and managed by OPED, some facility construction equipment (PVC pipes and nylon netting) was made available to the fishers. OPED technicians and the Fulbright scholar developed a training module and supervised pond construction. Such holding stations were thus constructed in each river basin, relatively close to the fishers to avoid long transport times and ensure the preservation of genetic variability amongst natural populations, which is highly appreciated by aquarium enthusiasts. In all, nine such holding stations with a total of 24 ponds have been constructed.

To ensure the preservation of the forest and the natural colours and comportment of the fishes, ponds were small and constructed in such a way as to avoid cutting trees (Figure 16-3 a, b).

(a)

(b)

Figure 16-3. (a) Simple modification of streams with natural materials to improve habitat for ornamental fishes. (b) Excavating small ponds in the forest to hold and reproduce fishes.

By simply modifying natural stream courses with small weirs, diversions and the deepening of certain sections, adequate space was made available for the installation of holding *hapas.* Fish are fed a maintenance diet manufactured from locally available agricultural byproducts. This improved their quality and survivability during transport (Lim *et al*. 2003) and allowed the fishers to maintain the fish in good condition for many weeks. Fish were also stocked outside the *hapas* to allow them to reproduce naturally. Along with the deepening of the streams and the feeding, which increased the fertility of the water, this had the effect of increasing the biomass of fishes living in the stream sections adjacent to the holding facility.

Discussion of the causes of mortality had led to much dispute over when and why the deaths were occurring. The fishers blamed the buyer and vice versa. To resolve the argument and explore the causes of the low survival rates, a recording system was devised that helped fishers keep track of the number of fish stocked and the number that died each day. The system made it abundantly clear that poor handling by the fishers was the main cause and opened the fishers' minds to the need for improved fish handling practices at their end of the value chain.

In addition to the holding stations in each river basin, a project office was established at the Centre Multipartenaire pour la Conservation et le Développement in Kribi where aquaria and holding tanks with aeration were installed to serve as a staging centre for holding and packaging the fish prior to shipment.

The impact of the technological interventions on ease of collection and fish survival during transport was remarkable. Instead of being obliged to fish intensively upon receiving an order and then holding fish for weeks in plastic bags or buckets while the required numbers were being collected, fishers are now able to work when the water is low and easy to fish. When the buyer arrives to place an order, instead of waiting or having to come back to collect the fish), he now simply purchases the desired number of each species from the hapas and goes on his way. The combination of

these effects has raised fish survival during shipment from an average of 20 percent to more than 90 percent.

Common initiatives and public-private partnerships

One of the initial motivations for OPED's interest in ornamental fishes was to address the problem of low prices by helping the fishers organise themselves into collective bargaining units. Although from different areas and ethnicities, with patience and external assistance, 10 fishers representing six villages finally came together and the Groupe d'Initiative Commune Aquariophile (GICA) was legalised in late 2006. Members no longer take orders directly from buyers. Rather, GICA serves as a coordinator, negotiating all orders according to a pricing schedule agreed upon by the members (Table 16-2). In addition to organising the sale of fish, GICA also established a community development fund that channels 15 percent of each transaction into village projects, such as schools and clinics, although to date these have not been realised.

The profits from new orders rose dramatically through this process, but the upwardly revised prices discouraged many buyers. In addition, following the 2006 peace accords in the Democratic Republic of the Congo, the largest exporter (approximately 20 000 fish per month) moved his base of operations from Douala to Lubumbashi. This and other changes in the local ornamental fish exporting business (see below) depressed orders.

It was originally imagined that GICA would be able to take overseas orders and organise its own shipments, further increasing their profits.

Table 16-2. Prices paid to fishers before and after creation of GICA in Kribi (CFA Franc 500 = USD 1.00)

Species	***Old price (FCFA)***	***New price (FCFA)***
Epiplatys sexfasciatus	25	125
Procatopus nototaenia	40	100
Neolebias ansorgei	40	100
Pelvicachromis taeniatus	100	400
(Chrom)aphyosemion	25	125

As the number of orders from the existing buyers declined, OPED sought to build within GICA the skills that members needed to take over the business themselves. Unfortunately, orders from overseas normally require more species than those available in the Kribi area, and without the contacts to collect these, it became clear that another arrangement would have to be made.

In early discussions with buyers and other local stakeholders concerning the management of the ornamental fish business, a young entrepreneur working on his own to collect fish was identified as a possible partner. This person's excellent knowledge of the rivers and ornamental fishes of southern Cameroon provided access to the other main fishing areas, and his understanding of governmental regulations proved invaluable in facilitating the shipment of fish overseas. In 2006, Gulf Aquatics was registered as a legal commercial entity in Cameroon and negotiated a public-private partnership arrangement with GICA that helps members access the international market and pays to the fishers 60 percent of the net profit received, equal to about 13 percent of the wholesale price—up from less than 5 percent previously.

Business planning

Because of the low survival rates, Cameroonian exporters had a very poor reputation in the international trade, and finding importers willing to work with the project proved more difficult than anticipated. In addition, wholesale prices paid by foreign importers are not in the common domain and initially had to be guessed at. When the fishers insisted on maximising their revenues and named inflated prices, several possible deals were cancelled.

By establishing personal contacts with one of the more reliable collectors and exporters in the region and through professional contacts with aquariophiles in Europe, more orders were eventually negotiated. In late 2007, Gulf Aquatics, through which orders are placed and handled, and GICA were exporting an average of 10 boxes per month. A calculation of the profitability of an exclusively export-oriented business plan,

based on the experience to date, shows that a minimum of about three shipments per month of at least 10 boxes per shipment is required (Table 16-3). Although current exporters know that the profits to be made from exporting fishes are less than expected, these calculations, the first to be done in a systematic manner, permit planning.

Rather than rely exclusively on exports, several local entrepreneurs are attempting to develop local markets for aquarium species. Many of the shops that cut and sell glass, for example, also build aquaria. Of the three

Table 16-3. Enterprise budgets for two export ornamental fish business scenarios

Scenario 1: One shipment of 10 boxes per month (current arrangement)					
	Amount	***Unit cost (USD)***	***Total (USD)***	***Amortisation***	***Annual cost (USD)***
Holding facility (120 m^2)					
Rent	1	5 000.00	5 000.00	10	500.00
Tanks	25	100.00	2 500.00	5	500.00
Aquaria	50	50.00	2 500.00	3	833.33
Aeration	10	320.00	3 200.00	3	1 066.67
Electricity (kw)	5 000	0.15	750.00		30.00
Water	1 000	0.80	800.00		800.00
Equipment	1	1 000.00	1 000.00	2	500.00
Feeds	50	60.00	3 000.00		3 000.00
Subtotal			18 750.00		7 230.00
Shipping					
Boxes	150	1.00			150.00
Bags, elastic	600	0.50			300.00
Chemicals	1	100.00			100.00
Taxes, fees	12	200.00			2 400.00
Collecting trips	12	1 200.00			14 400.00
Fish	12	300.00			3 600.00
Labour (person months)	36	150.00			5 400.00
Subtotal					26 350.00
Revenues	12	1 500.00			18 000.00
			Net (w/holding facility)		-8 380.00
			Net (w/o holding facility)		-8 350.00

Scenario 2: One shipment of 10 boxes per week (proposed arrangement)					
	Amount	***Unit cost (USD)***	***Total (USD)***	***Amortisation***	***Annual cost (USD)***
Holding facility (120 m^2)					
Rent	1	5 000.00	5 000.00	10	500.00
Tanks	25	100.00	2 500.00	5	500.00
Aquaria	50	50.00	2 500.00	3	833.33
Aeration	10	320.00	3 200.00	3	1 066.67
Electricity (kw)	5 000	0.15	750.00		30.00
Water	1 000	0.80	800.00		800.00
Equipment	1	1 000.00	1 000.00	2	500.00
Feeds	50	60.00	3 000.00		3 000.00
Subtotal			18 750.00		7 230.00
Shipping					
Boxes	550	1.00			550.00
Bags, elastic	3 000	0.50			1 500.00
Chemicals	4	100.00			400.00
Taxes, fees	52	200.00			10 400.00
Air freight					
Collecting trips	6	1 200.00			7 200.00
Fish	52	300.00			15 600.00
Labour (person months)	36	150.00			5 400.00
Subtotal					41 050.00
Revenues	52	1 500.00			78 000.00
			Net (w/holding facility)		29 720.00
				ROI	0.50

ornamental fish retail outlets in Cameroon, one is a joint venture between Gulf Aquatics and a local partner. The advantage of the local market is that profit margins will be higher margins and shipping costs can be significantly reduced. Most Cameroonian aquarium owners, however, have traditionally preferred the brightly coloured platys and swordtails, goldfish, angelfish and tiger barbs that dominate the global home aquarium market, rather than native ornamental fish (Livengood and Chapman 2007).

Although no statistics are available on the number of Cameroonian households keeping aquarium fishes, anecdotal evidence suggests that the popularity of ornamental fishes is on the rise. Aquarium displays at the annual Cameroonian trade fair attract numerous enquiries, and aquariums are appearing in increasing numbers in restaurants and doctors' offices. The University of Dschang has inaugurated a course in aquariology.

WorldFish has been active in supporting the development of the local aquarium fish market, for two reasons. First, there appear to be significant opportunities for increased investment throughout the value chain (Figure 16-4). A small business producing feed for ornamental fishes was supported by the WorldFish Center. A flyer explaining the care in captivity of indigenous ornamentals was produced, and expositions of local fishes are intended to make the public aware that they need not look overseas for pretty fish to put in their tanks.

The second reason for encouraging the display of local fishes is that, unlike in most of Europe or North America, virtually all of the exotic

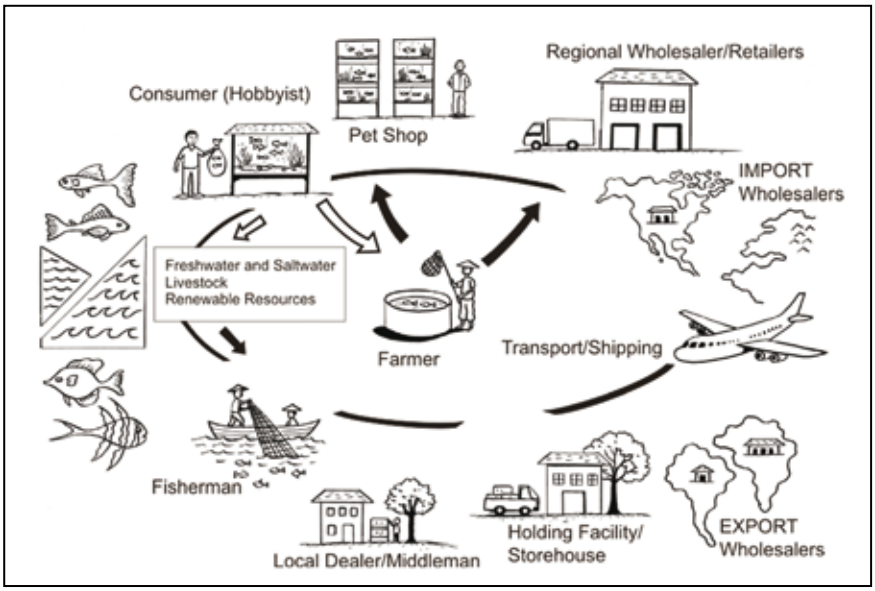

Figure 16-4. The ornamental fish value chain (from Livengood and Chapman 2007)

fishes imported for home aquaria in Cameroon will survive in the wild and could pose a threat to indigenous biodiversity. Feral populations of swordtails and guppies have already established.

Sustainable management

Despite traditional management systems that regulate access and destructive land use practices, overexploitation, particularly in women's traditional fisheries, has become a growing problem in the Kribi area as the human population puts increasing pressure on resources.

Catch per unit of effort (CPUE) is a major indicator of fishing sustainability (Welcomme 2001; Jul-Larsen *et al.* 2003). Each holding station now has a self-monitoring system whereby the fishers record the number by species of all fish captured per fishing day and stocked into ponds and/or *hapas.* This recording system not only permits the fishers to know exactly how many fish they have on hand at any one time, but also enables the calculation of CPUE and the analysis of trends.

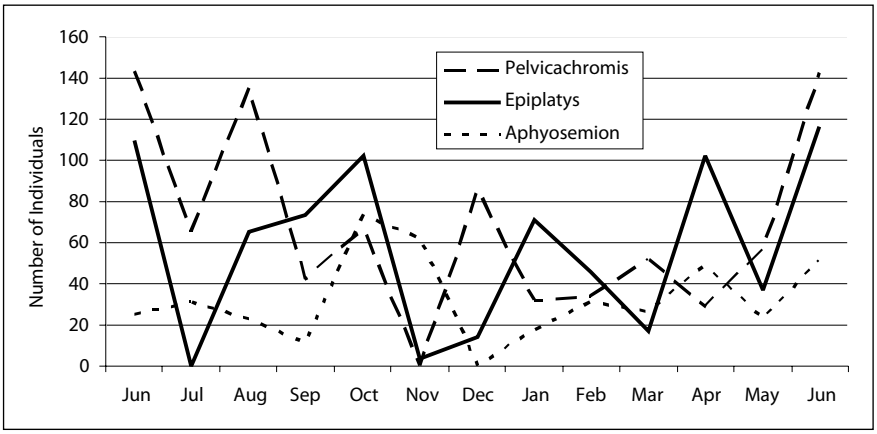

Figure 16-5. Catch per unit of effort of main ornamental fish species marketed from the Kribi area of southern Cameroon

Because of the large amounts of debris and associated refugia in these streams, the capture technique employed by fishers in the Kribi area appears to have little effect on overall fish density. Long-term data on fish harvests for the three most important species in the area indicate seasonal variation between rainy (difficult fishing) and dry periods (easier fishing) but no obvious trends in CPUE, indicating that the fishery is currently sustainable (Figure 16-5).

Not only is the GICA ornamental fish business sustainable in and of itself, GICA members represent a vocal advocacy group for the wise use of forest resources. GICA fishers are particularly active in the fight against the use of pesticides, which they perceive as a direct threat to their business. In addition, some non-GICA fishers still operate in the area and are reportedly still selling poor-quality fish at low prices, undercutting GICA's efforts to improve the sustainability and profitability of the fishery. The government of Cameroon has offered to arrest and prosecute these people (although there is no legal framework under which this might happen), but GICA declined to get involved and instead is attempting to enroll these fishers by tempting them with increased incomes.

Empowering the voices arguing in favour of sustainable use of the natural resource has been a major contributor to increased local interest in conservation of rainforest rivers. Posters have been distributed, local leaders have been informed, and an aquarium was installed by GICA in one of the most frequented hotels in Kribi. Prior to the project, most people did not know that there were beautiful and valuable fishes in their rivers. That has changed.

Lessons for the future

Whether increasing the awareness of ornamental fishes and the profits to be gained by capturing them will be ultimately good or bad for the resource depends to a large extent on the ability of GICA to evolve and of the GICA model to be more widely adopted.

Although most buyers continue to take advantage of the low prices charged by unorganised fishers, the lack of organisation means that they have to pay high costs to collect the fish. In Kribi, a buyer can go to GICA, place an order and then visit the holding facilities to collect healthy fish. A buyer from Douala (two hours by road from Kribi) can make the trip in two days, with one overnight in Kribi. In contrast, a trip to Mamfé or Akonolinga usually takes more than a week, and the fish arrive in Douala stressed and in very poor condition.

Associated with this problem, as well as the high cost of local ground transportation, is the need for adequate holding facilities at the staging site. By increasing the number of fish that can be held, the number of collecting expeditions per year can be significantly reduced (Table 16-3). If the fishers throughout southern Cameroon can be organised in a way similar to those in Kribi, substantial savings would accrue to collectors and exporters, the fish would arrive at market in good condition, and more profits would be had by all.

For certain of the more widely distributed species, the organisation of fishers in the Kribi area has led to increasing levels of exploitation at other collecting sites. A number of contracts have been lost to Nigerians and less scrupulous Cameroonian exporters who, when confronted with higher prices, have shifted their orders to other fishers.

Many individuals of the most important species emanating from the Kribi area are no longer captured exclusively from the wild but are reproduced and grown in the quasi-natural collecting stations. As this transition from capture to culture goes forward, gains in sustainability and profits might be predicted (Pomeroy *et al*. 2006). Investors with more capital and experience would have a clear advantage over the villagers in commercial aquaculture of ornamental fishes and could easily take over the trade. Although this would theoretically reduce pressure on the natural resource, many low-income villagers would suffer reduced incomes, and if aquaculture completely replaces the capture fishery, one could anticipate reduced interest by the fishers in protecting the resource (Tlusty 2002).

It would be wise for development and natural resource management planners to consider this important aspect, which most likely applies to a broad range of non-timber forest products that are currently being developed in culture to replace the wild harvest. Those who depend upon sustainable exploitation of natural resources, if they can make enough money to become truly empowered, have a strong hand in decision making at the village level and are a far more credible voice for conservation than any foreigner.

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Multipurpose handicraft baskets

Chapter 17

Sustainable forest management in Cameroon

Tieguhong Julius Chupezi

The forests of Cameroon constitute a significant portion of the Congo basin, with four major forest types: evergreen rainforest (56 percent), semideciduous moist forest (11 percent), montane forest (1 percent) and mangrove forest (1 percent) (MINEF 2002). The forest resources of Cameroon are grouped into three classes for purposes of management: forests for research and teaching, production forests and protection forests (MINEF 1995).

Forests play an important role in the economy of Cameroon. Wood products are estimated to constitute about 7 percent of the gross national product, 20 percent of the total export revenues (the second-largest category) and 33 000 direct jobs (Eba'a 1998). Cameroon's forests have an estimated total timber stock of 310 million m^3, valued at about 2500 billion FCFA (USD 70 billion) (Essama-Nssah and Gockowski 2000). Estimates of closed-canopy moist tropical forests in Cameroon range from 33 percent to 44 percent of the national territory (Essama-Nssah and Gockowski 2000).

Forest stakeholders in Cameroon are faced with the challenges of sustaining forest values as well as with the environmental concerns of deforestation, forest fragmentation and degradation. The estimated annual rate of deforestation in the 1980s and 1990s ranged from 0.4 to 1.0 percent, and the area of degraded forest is estimated at 4.5 million ha (MINEF 1995). Many other externalities are affecting Cameroon's forests, including changing land use patterns, demographic growth, industrialisation and development. These pressures provoke debates on whether these forests can be sustained, and if so, where, by whom and for whom. For instance, the average area opened for logging each year is 415 000 ha (Eba'a 1998) with total volumes of timber production (logs, sawnwood, veneers and plywood) of 3.542 million m^3 in 1998 and 2.873 million m^3 in 1999 (Michael 2000).

The question now is, can this production trend be sustained over time under the current utilisation, management and conservation scenarios? How can Cameroon achieve sustainable timber production? Specifically,

the questions are related to the length of logging cycles, the breeding system of trees, successional processes and natural forest management issues (inventory, reforestation, and infrastructural development) as well as conservation of biodiversity.

In addition, we have technical questions about government control of logging operations (felling girth limits, stump height) and the legal and fiscal issues (forest exploitation and concession rights, forest taxation system) that affect the management and exploitation of forest resources in Cameroon. Allied to these are socioeconomic factors having to do with ownership patterns, access to resources, conflict resolution and participatory decision-making processes. These controls and procedures are fairly well enshrined in the forestry policy document of Cameroon and its law of implementation (MINEF 1994, 1995). A reflection on these pressures for forest products and services and on the resultant shrinkage of forestlands draws attention to whether the products and services can be met in perpetuity.

Since the creation of the Ministry of Environment and Forests in 1992, government efforts have been directed at achieving sustainable forest management. Sustainable forest management brings into focus the following: multiplicity of natural resources in the forests, renewability of those resources with the aid of management competence based on dynamic training, applied research and policy shifts. However, some notable efforts seem uncoordinated and conducted in the absence of thorough needs assessments. As a result their impacts have been small or disappointing. As Essama-Nssah and Gockowski (2000) have written, 'while Cameroon's forest policy is well codified in documents, it is poorly implemented'.

What has been lacking in the past is a cohesive strategy for improving forest management tools through a well-conceived and multistakeholder approach, guided by well-informed people with a multidisciplinary approach to problem solving. This chapter examines the concept of sustainable forest management and the roles of stakeholders involved in forestry, while emphasising possible pitfalls and the prerequisites for improving the tools of sustainable forestry in Cameroon.

Concept of sustainable forest management

The concept of sustainable forestry is not new to forest stakeholders in Cameroon. It has been acknowledged as the most important guiding concept of our time for the management of Cameroon's forests (Bikie *et al* 2000). Sustainability means managing forest resources in such a way as to provide timber, fuelwood, non-timber forest products and services for the sustenance of human welfare for the present generation, and without compromising the ability of future generations from enjoying the same. It is incumbent on our generation to manage our resource base such that the average quality of life we ensure ourselves is potentially shared by all future generations (WCED 1987). The situation in which people live generally reflects their quality of life. Extending the requirement of sustainability to future generations yields the following definition of sustainable development: development is sustainable if it involves a non decreasing quality of life (WCED 1987; Vanclay 1996), and therefore, our generation's management of the resource base is sustainable if it allows development options for future generations, constituting a vital part of sustainable development (WCED 1987).

Regional and international initiatives

Concern over Cameroon's forests and their capacity to maintain environmental values while producing timber and non-timber products in perpetuity has been manifested by increasing international policy initiatives and regional organisations and funding agencies.

The *United Nations Conference on Human Environment,* held in Stockholm in 1972, was the first international forum that recognised environmental issues and introduced the idea of sustainable development as a way of looking at environmental dilemmas facing the world.

In 1987, the *World Commission on Environment and Development* published *Our Common Future,* often called the Brundtland Report. This report called for the development of new ways to measure and to assess progress towards sustainable development. In many ways, this report set the scene for the Earth Summit in 1992.

The *World Bank 1991 Forest Strategy for Cameroon* sought to address the alarming rate of deforestation, especially of tropical moist forests, and inadequate planting of new trees to meet the rapidly growing demand for wood products. Enshrined in the document were four strategies for forest development including: protecting forests, policies to meet the basic needs for forest products and services, strengthening forest institutions and the role of the international community. Allied to these were five principles of policy involving a multi-sector approach, international cooperation, policy/institutional reform, preservation of natural forests and the expansion of forest resources. The World Bank's strategy, therefore, promised to promote conservation of natural forests and the sustainable development of managed forest resources. Poverty alleviation, improvement in forest zoning and regulation, private incentives and increased public investments were key considerations in the strategy.

The *United Nations Conference on Environment and Development (UNCED),* held in Rio de Janeiro in 1992, provided a forum for the international community to focus on and make commitments to the sustainable management of the world's forests. This conference, also known as the Earth Summit, resulted in the publication of five non binding documents indicating international recognition of a wide range of environmental issues and the need for sustainable development: (1) the Rio Declaration on Environment and Development; (2) a statement of principles to guide the management, conservation and sustainable development of all types of forests; (3) Agenda 21; (4) the United Nations Framework Convention on Climate Change; and (5) the Convention on Biological Diversity. Although all five documents have relevance to sustainable development, the most important for sustainable forestry is the Statement of Principles on Forests. Approximately 170 countries, including Cameroon, ratified this document, which introduced the concept of developing criteria and

indictors (C&I) as a way of measuring and achieving sustainable forest management.

The *Intergovernmental Panel on Forests* was established in 1995 by the United Nations Commission on Sustainable Development to follow up the UNCED recommendations on sustainable forest management. This panel facilitated global discussions, activities and recommendations on sustainable forest management involving international organisations, national governments, NGOs and the private sector. One particular recommendation was a call for the development of voluntary codes of practice for management activities, including timber harvesting. Following the UN General Assembly Special Session (UNGASS) in 1997, the *Intergovernmental Forum on Forests* was formed as a successor.

The *International Tropical Timber Organization (ITTO)* produced the multifaceted 'Year 2000 Objective', which promotes conservation and sustainable management of tropical forests. It called for all internationally traded tropical timber to be sourced from sustainably managed forests by the year 2000. Initiatives include 'Sustainable Management of Natural Tropical Forests', which set criteria for the measurement of sustainable tropical forest management, and 'Guidelines on the Conservation of Biological Diversity in Tropical Production Forests'. In the Congo basin, ITTO's producer member countries are Cameroon, Gabon, Central African Republic, the Republic of Congo and the Democratic Republic of the Congo.

The *Food and Agriculture Organization (FAO)* of the United Nations is a neutral (apolitical) forum within the United Nations system, with a mandate for conducting policy and technical dialogue on issues regarding sustainable management of the world's forests. FAO can advance sustainable forest management by offering opportunities for governments, NGOs and private industry to discuss environmental, economic and social forestry issues. The agency has an important role as a provider of information, such as its periodic Forest Resources Assessment and the State of the World's Forests reports and technical publications. As a provider of technical

assistance, FAO covers most dimensions of sustainable forest management through field projects and assists countries in developing subregional and national criteria and indicators.

The mission of the *Center for International Forestry Research (CIFOR)* is to contribute to the sustained well-being of people in developing countries, particularly in the tropics, through collaborative, strategic and applied research in forest ecosystems (CIFOR 2001). In Cameroon, CIFOR works in collaboration with national research institutes, universities, national and international non-governmental organisations and ministries in charge of forestry and the environment. All efforts are geared towards sustainable livelihoods. In Cameroon, CIFOR is very active in interlocking and mutually reinforcing research foci on environmental services and livelihoods, and it is becoming engaged in a governance programme. Together, these initiatives seek to reconcile forest conservation objectives with the needs and aspirations of forest-dependent peoples, and to ensure policy shifts in favour of collaborative decision making in forestry.

The development of international standards for environmental management systems and environmental auditing, certification and ecolabelling through organisations such as the *International Standards Office,* the *Forest Stewardship Council,* and other international and national organisations are growing. For example, the Forest Stewardship Council was formed in 1993 with the goal of providing a credible international labelling scheme that would guarantee that a forest product comes from a well-managed forest (Gullison *et al*. 2001).

The *African Timber Organization* is a regional intergovernmental organisation that at present has 14 member states (ITTC 2002), with headquarters in Libreville, Gabon. It aims to help member countries achieve improved management and conservation of forests and is strongly oriented towards the development of the industrial sector. It is a partner to ITTO in several activities in the Congo basin. It collaborates with ITTO and CIFOR in developing criteria and indicators for sustainable forest management in the region.

The *Yaoundé Environmental Summit* of Central African countries was held on 17 March 1999. This summit reflected the influence of the environmental movement and signified the commitment of the governments to the sustainable management of their forests. The main objective was to discuss the creation of new cross-border forest protected areas and ensure that sustainable forest management and independent timber certification would become a reality. The summit concluded with the signing of the Yaoundé Declaration, which outlined the steps to ensure the integrity of forest ecosystems in Central Africa.

The *Conference on the Central African Moist Forest Ecosystems (CEFDHAC)* and the *Central African Forests Commission (COMIFAC)* are regional initiatives by Central African states to demonstrate their commitment to the resolutions of the Yaoundé Declaration. For instance, during the fourth CEFDHAC meeting (10-13 June 2002) in Kinshasa, 10 recommendations were made to ensure the sustainable management of the Central African forests for the sustainable provision of goods and services for sustainable livelihoods and poverty alleviation (IUCN 2002). During the second meeting of COMIFAC, held in Yaoundé on 27-28 June 2002, a 'plan of convergence' was established and a 'priority action plan' was approved. The Plan of Convergence is a framework of priority actions and programmes identified by participating countries (Cameroon, Gabon, Equatorial Guinea, Central Africa Republic, Republic of Congo and Chad) at the national and subregional levels to advance sustainable forest management. The priority action plan comprises actions in the Plan of Convergence whose implementation is considered urgent during 2003-2005 (Ze Meka 2002). CEFDHAC is best seen as a broad stakeholder forum for promoting wider understanding and collaboration on forest issues in the region; COMIFAC is an intergovernmental decision-making body that will be responsible for subregional actions needed to implement the action plan (ITTC 2002).

The *Network of Parliamentarians for the Sustainable Management of Central African Forest Ecosystems (REPAR)* is an off-shoot of the Yaoundé Declaration created within CEFDHAC in April 2001 at Libreville, Gabon, with the

goal of ensuring good governance within Central African sustainable forest management. The network's action plan involves addressing transboundary crimes, ensuring coherence between policy and reality, promoting equity and governance, improving the quality of information flows and ensuring the sustainability of management activities. The network's first international conference was held in Yaoundé in 2006 and drew more than 400 parliamentarians and civil society experts. The conference focussed on good forest governance, poverty alleviation, enhancement of COMIFAC's role and subregional parliaments in sustainable forestry.

The *Worldwide Fund for Nature (WWF)* is very active in Cameroon and other countries in the Congo basin. It has registered pioneering efforts in all facets of protected areas establishment and management in Cameroon. Particular attention is being given to its transboundary national parks programme. The objects of intercountry collaboration in the Yaoundé Process are Sangha Tri-National Park in the frontiers of the Republic of Congo, Central African Republic and Cameroon; and the Odzala, Minkebe and Dja Tri-National Park on the borders of western Congo, northern Gabon and southern Cameroon.

The *Central African Regional Programme for the Environment* is an initiative of the U.S. Agency for International Development. This funding facility maintains nationally managed offices in the countries in the Congo basin and has a secretariat in Washington, D.C. It provides grant assistance to local environmental initiatives, most of them associated with forest conservation. It has provided valuable resources to local NGOs, universities and other research, information and conservation initiatives in the region. It has catalysed the emergence of many local groups and continues to make valuable contributions to the emergence of civil society organisations (ITTC 2002).

Global Forest Watch and *Global Witness* are civil society groups in forested countries that provide independent information on the extent, condition and trends in forest resources. They serve as public watchdogs, uncover corrupt practices and bring information to the public, thereby

promoting transparency in the forest sector. Global Witness is active only in Cameroon, but Global Forest Watch, an initiative of World Resource Institute in Washington, is active in all Central African countries.

The list of actors in the forest sector of Cameroon seems endless, but what is evident from the few mentioned is that during the past few decades, regional and international NGOs and initiatives have emerged in Cameroon as important institutional arrangements in the process of sustainable forest management and conservation. Collectively, they have channelled impressive amounts of money and employed many experts in forest research, policy formulation and the implementation of sustainable forest management principles and criteria. This became evident from the 1980s into the early 1990s, when the public sector faced an economic crisis. The result was an increasingly tight squeeze on public finances by the World Bank and the International Monetary Fund, which instituted structural adjustment programmes in Cameroon. In the face of these pressures and consequential reduction in public sector funding, the Cameroon government relied on international NGOs and bilateral agencies as major players in filling the gaps in financing conservation and sustainable forest management initiatives. However, economic recovery in Cameroon did not bring a renewal of government's interest in funding sustainable forest management and conservation initiatives. To date, the Cameroon government continues to rely heavily on outside intervention to manage a commercial resource that accounts for more than 20 percent of national export revenues. This situation needs some rethinking if Cameroon is to achieve and reap the benefits of sustainable forest management.

Dimensions of sustainable forest management

According to Ero and Koyejo (1995), a systematic and integrated planning of forestland uses seeks to replace the past patterns of piecemeal and fragmented decision making. Three dimensions are now recognised as crucial

for an integrated approach to sustainable forest management because they form the foundation for sustainable development and assist in determining suitable land use zones (FAO 1999): (1) environmental, biological and silvicultural; (2) economic, market and finance considerations; and (3) socioeconomic considerations.

Environmental, biological and silvicultural dimension

Emphasis on the biophysical side of sustainable natural forest management is important because this dimension provides the ecological and technical information on which planning for sustainable management is based (Okali and Fasehun 1995). In this regard, we begin with research on the stock of the entire flora and fauna, the physical features of the land from which forest goods and services flow, and the ecological functions of species in the ecosystem, their conservation status and their potential uses (Hawthorne and Musa 1993).

Knowledge of forest flora and fauna and their distribution provides the background for investigating forest dynamics and how forests regenerate themselves naturally from the gap stage to mature forests. Gap phase dynamics are central to the understanding of regeneration and involve the causes, patterns, sizes, shapes, and seasonality of gaps; studies on the soil seed bank; seed dormancy behaviour; and seed germination and establishment within gaps and elsewhere in the forest (Okali and Fasehun 1995). Therefore, forest management needs to account for the factors that affect forest establishment (Kio and Ola-Adams 1986; Okali and Ola-Adams 1987; Ola-Adams 1995), followed by those that control the dynamics of the resulting populations in the post establishment phase and those that control the growth rate of trees.

The rationale for studies on gap phase dynamics has been that understanding how a forest regenerates itself in nature can inform the design of sustainable management practices. Using the mechanisms of natural regeneration, managers can replace exploited forests with stands of higher economic value without markedly altering the characteristic structure of a natural forest. To address this component, questions to be answered may include the following:

- What is growing and potentially could grow on a particular plot of land, and what land is available for forest management? What significant features or species occur in the area?
- What is the spatial coverage of forests and what is their past management history?
- What ecological constraints limit the sustainability of production from natural tropical forests?
- What information do forest managers need to better plan a sustainable forest management strategy? Possibilities include the density and size-class structure of the plant population or resource stock, and the resource (yield) that the population produces in a given period of time .
- How much is known about the autecology[1] and synecology[2] of species, the response of species to canopy opening, and stand dynamics?
- What data sets are required? For instance, a systematic forest inventory can address the resource stock question, and periodic observations of growth and productivity of marked individuals (growth-and-yield modelling) in permanent or semipermanent sample plots will answer the yield question.
- What techniques—ground surveys, aerial photography, satellite imagery, past records or maps, a combination of sources—would be employed in collecting and analysing data?
- Once the data are collected and analysed, how are they going to be managed? Will there be management information systems and geographical information systems?
- What are the most favourable silvicultural systems for a given forest type? For instance, since 1926, three silvicultural and forest management systems have been tried in Cameroon, at least on an experimental scale (Okali and Fasehun 1995; P.R.O. Kio and B.A. Oguntala, pers. comm.): (1) enrichment planting (Layon method and modified Layon method); (2) regrowth method; and (3) natural regeneration (canopy opening through logging and sapling liberation).

Economic, market and finance dimension

Sustainable financing of forest management initiatives is central. Forestry activities must compete for scarce financial resources, and both the production and environmental functions must be shown to be worthwhile to both users and funding agencies. Therefore, proper valuation of forest resources in both economic and financial terms is emphasised, and the timber, non-timber forest products, carbon stocks, biodiversity values, recreational values, and soil values should be given due consideration (Richter 2001).

The goal of economic analyses is to identify the values and benefits of forest goods and services, considered central to gaining governments' interest in supporting sustainable forest management and investing in forest development. Such values and benefits should be expressed in terms of their relevance in alleviating poverty, ensuring food security, promoting social justice, protecting biodiversity and enhancing general well-being. Questions on the economic dimension of sustainable forestry include the following:

- Where should scarce resources be invested in forest management?
- Which investments in forest management have been most successful?
- Will the particular area yield sufficient returns, in financial terms? Cost-benefits, cost-effectiveness and cost-utility analyses are appropriate here.
- Are there incentives for forest administration, research and human resource development?
- What is the inherent value of the region for biodiversity conservation or other uses?
- How are the forest goods and services going to be commercialised in order to reflect their actual values?
- What are the levels of trade on a local, regional or international scale?

Socioeconomic dimension

According to FAO (1999), the institutional aspect of sustainable forest management falls under the socioeconomic criteria because it involves people and their socioeconomic conditions. The principal reason why the forest sector does not always make its expected contribution to economic development is institutional weakness (Oguntala 1995). FAO (1993) highlighted several common weaknesses that relate to institutional constraints at various levels in Africa: inadequate training to equip the forestry personnel for their new tasks; obsolescence of forest administrative skills and know-how; inappropriate structures of many forestry organisations; and frequent irrelevance of the legal provisions under which the sector operates.

Given the need to strengthen institutional arrangements for sustainable forest management in Cameroon, it is essential to critically examine the current institutional setup. The major questions to answer include the following:

- How adapted and organised is the institutional profile of the forestry sector of Cameroon?
- What is the institutional capacity for planning sustainable forest management and for periodic monitoring, evaluation and feedback on progress? For example, how effective are the institutions responsible for formulating policy and advising state forestry services?
- What about the institutions that coordinate, monitor and supervise state funded projects, and those that coordinate, monitor and manage externally funded projects?
- Do the institutions responsible for forestry research offer sufficient training at technical and subprofessional levels?
- What is the role of universities in manpower training at professional levels?
- Are the forestry curricula meeting the contemporary challenges of sustainable forest management?
- What is the level of linkages amongst and between various forestry institutions, allied ministerial departments and financial establishments?

» What are the roles of international forestry institutions in the management of Cameroon's forests?
» What is the level of cooperation and networking between and amongst the institutions?
» To what extent have international treaties and conventions created political will and action in Cameroon?

The last several questions are very relevant to sustainable forest management because national institutions are responsible for implementing international agreements, and environmental groups depend on national governments to enforce measures to protect the natural world (Keck and Sikkink 2000).

The socioeconomic factor also addresses men and women and their circumstances in relation to forests. In terms of access to and use of forests, are the legal and customary rights of forest communities respected in the management process? What regulatory and legal considerations exist to honour customary laws and ownership patterns, prevent encroachment and protect various biological and environmental features (FAO 1999)? What norms, values, beliefs and livelihood strategies characterise Cameroon's forest-dependent people? What measures would encourage local communities to conserve and manage forests efficiently? What forms of land use, such as community-managed buffer zones with social services and technical assistance provided by governments or national NGOs, best favour forests and people's livelihoods? What are the perceptions, needs and aspirations of forest-dependent people with regards to tree growing and forestlands?

Tools and approaches for sustainable forest management

Adaptive collaborative management (ACM), devolution and decentralisation are amongst the approaches being implemented to ensure sustainable forest management in Cameroon. For details on the ACM approach, see Jum *et al.* and De Koning (Chapters 3 and 8 of this volume).

Decentralisation is the relocation of administrative functions from central government to lower levels and thus differs from the related concept of devolution; the relocation of powers to lower levels (Ribot 1999). The ACM team of CIFOR-Cameroon is a major player in facilitating the implementation of decentralisation and devolution in the administration of forest management in Cameroon, with the goal of ensuring efficient service delivery and community participation for transparency and accountability, with full recognition of the interests of forest communities.

The three dimensions of sustainable forestry can be viewed as three layers or superimposed filters, with a common area defining what is possible, relevant and sustainable to undertake (FAO 1999) (Figure 17-1).

The successful scenario (shown as shaded) is essentially a compromise amongst the three considerations and their associated criteria, which provides forest managers, concessionaires, local forest users, development agencies, research institutions and governments with a sustainable management option for a particular location (FAO 1999). Palmer and Synnott (1991) stated that long-term security of operation and tenure, operational control, a suitable financial environment and adequate information are the major conditions necessary to achieve sustainable management of natural forests. With this in mind, the roles and responsibilities of different forest stakeholders need to be identified, articulated and understood.

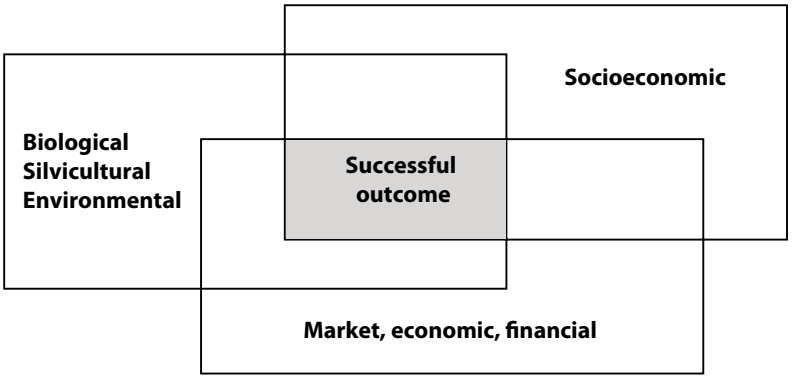

Figure 17-1. Conceptual framework for sustainable forest management
Source: FAO 1999

Stakeholders' roles and obligations

Forest stakeholders have to keep abreast of the issues to ensure successful forest management. The participation and shared understanding of all stakeholders at all stages of the planning and implementation processes, and their responsibility for both the costs and benefits for forest management have to be equitably shared (APFC 2001). Stakeholders' competencies have to be determined and instilled for each management intervention (Dykstra 2001). Training programmes and regular refresher courses for forest agency staff, forest concession employees and, where appropriate, local villagers should be developed and conducted to ensure that all who engage in forest planning, harvesting, monitoring and evaluation are competent to carry out their tasks efficiently (APFC 2001; Dykstra 2001). To this effect, minimum competency standards and a training manual to address skill deficiencies are required. Training courses in Cameroon, however, seem to be uncoordinated and piecemeal, with greater efforts concentrated on personnel directly involved in forest harvesting, such as first-level foresters and technical staff. Other stakeholders, such as middle and senior management personnel, whose functions are seemingly not directly related to activities on the ground but can influence the outcomes, need to be trained in the higher indicators of sustainable forestry. The forest policies they formulate can promote, retard or discourage the application of conservation-oriented practices (APFC 2001). The following sections highlight possible roles and requirements for forest stakeholders.

Government

- Facilitate training and funding for the implementation of sustainable forest management;
- Review curricula for the training of technicians, professionals and forest extension officers to meet the requirements of modern forestry;
- Provide a suitable policy, legal and socioeconomic framework within which sustainable forest management takes form. For instance, deterrent penalties for forest crimes, political and institutional

reforms to make decision-making processes transparent, and clear forest property rights, including the recognition of traditional rights, can enhance sustainable forestry in Cameroon.

Forest industry

» Demonstrate ethical behaviour, respecting agreements and paying required taxes;
» Prepare harvesting plans in consultation with forest owners and/or regulatory authorities;
» Implement effective and safe operations during harvesting, extraction, transportation and processing;
» Optimise the benefits to society and to the company by ensuring that a unit of wood exploited generates at least 75 percent useful product(s) to consumers (Dykstra 2001; Enters 2001);
» Train and employ local community members to enhance local skills;
» Import wood raw materials only from forests that are managed in a sustainable way;
» Introduce information and technologies to implement sustainable production, processing and marketing practices.

Forest managers

» Assist local communities in implementing sustainable forest management principles;
» Help the timber industry employ sound harvesting practices;
» Monitor and evaluate harvesting operations for compliance with the harvesting contracts and the code of practice for forest harvesting; and
» Enforce compliance with legislation and harvesting agreements.

Forest communities

» Use the resource wisely, in a way that will maintain options for future development and so provide long-term benefits;
» Maintain the capacity of the forest resource to supply essential needs;

- Protect neighbouring and downstream resources;
- Monitor operations for compliance with good practices and regeneration with appropriate tree species;
- Develop agroforestry systems;
- Assist in educating and training forest owners, dwellers and users in the wise management of forests;
- Make use of the expertise of local, provincial and divisional government authorities;
- Identify the multiple-use needs of the community; and
- Promote the equitable sharing of benefits from forests.

National NGOs

- Provide communities with education and sound management tools and regulations;
- Help ensure compliance with management, monitoring and auditing procedures;
- Act as catalysts and information sources for governments, donors, NGOs and local communities;
- Contribute to the technical content of policies and participate in the preparation and execution of projects and policies; and
- Expose illegal trade and other forest crimes.

International NGOs and UN agencies

- Provide standards for sustainable forest management through certification, ecolabelling, chain of custody, reduced-impact logging, and management plans;
- Control the produced and exported volumes of wood raw materials from Cameroon;
- Assist in ensuring adherence to signed bilateral conventions and setting up the specified projects;
- Help detect and control illegal timber activities and trade and design systems for more transparent exchange and dissemination of information;
- Support policy formulation and adjustment processes.

Funding agencies

» Provide improved technical and financial support through institution building and restructuring or establishing educational and training facilities relevant to tropical forestry;
» Ensure that the minimum competency levels are available for all projects sponsored;
» Ensure that sponsored projects address the socioeconomic, economic and environmental-silvicultural dimensions of sustainable forest management;
» Subject sponsored projects to strict environmental impact assessments; and
» Assist in forest policy formulation and revisions to ensure ecological, economic and social sustainability of forest functions.

Research institutions

Research—here understood as the totality of the processes involved in the addition to knowledge and technology—is expected to form an integral part of sustainable forest management, based on the hypothesis that scientific knowledge is the foundation for action.

» Evaluate different exploitation and remediation schemes and their impacts on forest biological diversity and livelihoods of forest-dependent peoples;
» Conduct research with local and international conservation organisations as well as timber concessionaires;
» Continue research on the interrelationships between forestry and other sectors of the economy, including the social, economic and political aspects of consumption and management of forest resources;
» Conduct consumer studies to evaluate specific aspects of the price premium on timber managed in a sustainable way and other forest products in order to maximise their marketing potentials;
» Use forestry extension programmes to disseminate the results of research findings, putting into consideration the uniqueness of the challenges of forestry today;

» Develop databases to characterise the extent, status and changes in forest size—information necessary for policy making and networking.

Summary of requirements for sustainable forestry in Cameroon

Sustainable forest management in Cameroon has many facets: forest concessions, enforcement of legal frameworks, development of forest management plans, forest certification, reduced impact logging, selling of environmental services, reforestation of degraded lands, the use of forest residues, adaptive collaborative management, environmental impact assessments and the development of model forests. The status of these aspects is summarised in Table 17-1.

Table 17-1. Indicators and status of sustainable forest management in Cameroon

Indicator	*Status*	*Remark*
Silvicultural, environmental, biological		
Protected areas management	Fairly good; 20% of low-access forest, 13.7% of national territory.	Better management and provision of facilities and manpower are needed, but encroachment and illegal activities abound.
Reforestation, plantation forests	Low, 200 ha/year, with only 10-20% attainment of annual regeneration targets.	Reforestation of 4.5+ million ha of degraded forests in Cameroon is needed.
Management plans	Too slow, only eight management plans approved.	More stringent measures are needed to ensure management plans for all timber concessions.
Model forests	Nonexistent; some efforts may be undertaken, with possible Canadian support.	Canadian approach to model forests can be adapted; training is required.
Inventory	14 million ha inventoried (Information System on the Biodiversity of Cameroon, at www.biocam.net).	Usually preharvest but rarely postharvest inventories. Only certain priority sites are covered; system needs to cover more sites.

Indicator	*Status*	*Remark*
Use of forest residues	Low; most residues are treated as waste to be burnt or allowed to rot, resulting in 33 percent conversion ratio[3].	Use and recycling of logging and mill residues need to be examined.
C&I	Being developed but not yet fully applicable in field.	Need to be adapted to field conditions. African Timber Organization process still in early stages of development and not fully applied anywhere.
Environmental impact assessment	Civil society is concerned with forest exploitation impacts, but no national regulations require assessments.	Environmental impact assessments should be treated as a matter of urgency for all development projects in Cameroon
Reduced-impact logging	Slow, conventional selective logging remains predominant practice.	Method reduces apparent short-term impacts of removing given volume of logs but does not emphasise intensity and frequency of logging.
Synecology and autoecology of species	Poorly understood, in terms of phenology, response to canopy opening, genetic variability, etc.	In-depth research needed for important forest tree species that can be used for enrichment planting and forest plantations in Cameroon.
Forest zoning plan (forest concession areas in permanent forest estates)	As of 1996, 62 000 km^2 was in production forest zones (13% of national territory). 54% of low-access forests are in logging concessions. Maximum length of concession is 15 years; maximum area, 200 000 ha	In principle, 20% of national territory is to be permanent forest estate. Longer concessions of 30+ years are needed. Larger areas—up to 500 000 ha—may help ensure proper selective logging and management by industry.
Socioeconomic		
Forestry institutions	Ministry of Forests and Wildlife, National Forest Management Agency. Active civil society. University of Dschang, Mbalmayo Forestry School.	High professional shortfall in forest agency. Forestry research needs activation. Higher grade professionals need to be trained, than the mid-career students currently produced locally.
Policy and legal framework	1994 Forestry Law and 1995 Decree of implementation.	Good but compliance remains a problem.

Indicator	*Status*	*Remark*
Auditing	Poor.	Audit criteria do not yet cover all aspects of SFM, ineffective monitoring of forestry legislation enforcement.
ACM[4]	Gaining ground.	Needs to be sustained and reinforced
Devolution, decentralisation	Substantial reorganisation of forest agency at provincial and local levels.	Needs to be sustained and reinforced at provincial and local levels.
Partnerships, networking	Gaining ground.	Needs to be sustained and reinforced
Ownership	Primarily state owned; few community forests; no private forests.	Social forestry and private forests needed. Forest tenure arrangements should be reexamined.
Certification	Low impact; National Certification Working Group and African Forest Law Enforcement and Governance are exerting some influence.	Law enforcement, well developed C&I needed. Funds, mobilisation of civil society and capacity development needed to implement certification.
Curbing illegal logging	50% success registered[5]. Forest crimes committed by both illegal and legal operators. Corrupt practices remain the major deterrent to law enforcement.	Law enforcement, well developed C&I needed. Illegal operators are better equipped in terms of facilities. Provision of adequate facilities and building stronger institutions needed.
Private forest development	Nonexistent.	Incentives needed for private investment in forestry.
Management of forests by industry	Nonexistent.	Needs to be examined with longer concession periods >30 years.
Chain of custody, timber tracking	Poor, with discrepancy between export statistics and importing nations' statistics.	Greater fight against illegal timber trade. Work of Central Control Unit, assisted by independent observer needs enforcement.
Economic, financial, marketing		
Level of government funding	Low.	Budgetary allocation has to consider important roles of forestry to other sectors of the economy.

Indicator	*Status*	*Remark*
Level of international funding	Moderate.	Funding needs to be sustained and properly allocated.
Fiscal Decentralisation	Developed.	Poor implementation at local level.
Local markets	Growing, but low level of secondary processed wood products.	Modern furniture equipment and training has to be enforced in policy.
International markets	High for logs and primary processed wood products.	Efficiency in local forest industries needs to be assessed before enforcing log export bans.
Selling of environmental services	Estimated carbon stocks in Cameroon's humid forests available. Ecotourism being developed.	Forest resources of Cameroon need to be properly evaluated to reflect economic and social values.

Forest concessions can be an important mechanism to achieve sustainable forest management in Cameroon, provided the government grants concessions in a transparent manner, enables fair participation of interested parties and possibly gives commercial incentives to concessionaires to ensure long-term security. The concessions must be continuously monitored to ensure compliance with the management plan.

Adaptive collaborative management of forests is an important approach based on the hypothesis that a high level of collaboration and adaptability will improve human well-being and ecological sustainability. ACM uses participatory methodologies and regards communities as the lead actors interacting with other actors to ensure sustainable resource use. Fruitful participation may require training and education of the personnel of forest services, forest industries and related agencies at all levels on the why and how of the evolving challenges of sustainable forest management.

Criteria and indicators are appropriate tools to assess and monitor the implementation of forest management interventions.

Certification is a market-driven approach, based on assessment by an independent external party of standards or quality thresholds for sustainable forest management (Rametsteiner 2001). Certification enables consumers to discriminate against timber products from forests that are not managed in a sustainable way. The certification of forest products from Cameroon's forests needs to be strengthened (Mimbimi 2003).

Illegal logging undermines the incentives for adopting sustainable forest management by those who operate legally, since illegally obtained timber can be purchased at prices much lower than that procured legally. Consequently, one way to curtail illegal logging is to make illegal operations more costly and less profitable. This can be achieved by building stronger institutional frameworks and capacities to enforce forest legislation to increase transparency in the functioning of the forest sector (Rytkönen 2003).

Model forests are demonstration forests where the costs, benefits and environmental and sociocultural aspects of forest management are assessed and promoted by all partners to achieve sustainable forest management (CFS 2002). According to the Canadian Minister of Natural Resources, Herb Dhaliwal, model forests are excellent tools for defining, testing and applying new approaches to sustainable forest management on the ground. They are initiatives built on partnerships at the local, national and international levels to generate new ideas and on-the-ground solutions. The aim is to increase local participation in the development and adoption of sustainable forestry tools, within and outside model forest boundaries (Bala 2002).

Auditing in forestry is an essential element of policy enforcement and implementation because it is a tool for monitoring and verifying progress made by countries and forestry organisations towards the sustainability goal (Nsenkyiere and Markku 2000). Auditing is generally based on specific criteria and indicators, which may be internal or external.

Conclusions

Concerns about the status and use of Cameroon's forests have grown as the consequences of past forest management systems have become apparent. Despite the government's and civil society's commitments to the conservation and sustainable management of these forests, deforestation, forest fragmentation and degradation are continuing at alarming rates. Protected areas are being created as a way to reserve forests but cannot guarantee effective protection. Moreover, sustainable economic gains and improved livelihoods for forest-dependent peoples are questionable under complete protection.

However, many development workers have acknowledged the recent rise of civil society politics, the reawakening of local cultures and the changing roles of traditional decision makers. Successful forest management cannot be separated from the ways in which the entire human society functions, and technology alone, while an indispensable tool, is unable to address the drivers of unsustainable forest management. Sustainability—a complex mixture of social, political, technical, historical and economic factors that must be examined and understood by forest managers—is a process, not an event. It needs time and deliberate effort if it is to achieve long-term benefits. Recognition of the concept has led to calls for a holistic, socially inclusive and cross-sectoral approach that includes in the decision-making process civil society organisations; multilateral, bilateral and quasi-government boards; and commissions, industry and academic institutions. Innovative and more creative ways of working together that place greater emphasis on partnerships amongst forest stakeholders are being developed. This forms the nucleus and heart of the ACM approach in Cameroon.

ACM encourages a broad social consensus, an integrated and well-articulated framework of multidisciplinary stakeholders from the silvicultural, economic and socioeconomic spheres. The continued rate of deforestation and forest degradation is associated with failures in integrating these three factors into the management process. Moreover, the management of many forests in Cameroon has been piecemeal,

with high socioeconomic and/or economic interventions, but weak or unsustainable silvicultural considerations, and vice versa. But sustainable forest management and the sustainable participation of all stakeholders require equitable attention to the three sectors, with the socioeconomic and economic factors playing sustainable supportive—not dominant—roles to the silvicultural considerations.

All forest stakeholders need training in the how and why of sustainable forest management, for proper understanding of the approach and its inherent economic, social and environmental benefits in the short- and long-term. This could demystify the process and reduce the costs associated with implementation—alleged problems that are often cited by some development workers and cut-and-run timber concessionaires. Moreover, with the advent of forest certification and green labelling, the feared additional costs of sustainable forest management are borne by the consumers, since premiums on certified timber in international markets are currently around 15 percent more than for uncertified timber. In fact, many concessionaires are now seeking certificates for their concessions to prove that they are managing their concessions following the social, economic and environmental principles of sustainable forest management.

Endnotes

[1] Study of the ecological relationships of a single species.

[2] Study of the ecological relationships of a community.

[3] Ratio of volume of log input to a sawmill to the volume of output as sawn wood.

[4] Adaptive Collaborative Management.

[5] Estimate according to INDUFOR (2004), impact assessment of the Forest Law Enforcement, Governance and Trade, commissioned by the European Union.

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A forest bridge

Chapter 18

Assembling the ACM mosaic: Reflections and conclusions

Mariteuw Chimère Diaw, Ravi Prabhu and Tony Aseh

If there is one inescapable truth emerging from the empirical evidence presented in this book, it is that we live in a messy world, where bumps in the road frequently throw us off a chosen path, and the process of finding the path is akin to navigating a maze of trees in a rainforest on a moonless night without a torch. The search for sustainable and equitable livelihoods in southern Cameroon's forested landscape is a process challenged by differences in power, gaps in knowledge, competing claims and repeated failure—in short, 'messiness'. And yet, despite seemingly insurmountable odds, people do survive and in some cases even do quite well, without compromising the resources they depend upon. The finding of this book, indeed the central contention through all the chapters, has been that this is most likely to happen where there have been reinforcing relationships between cooperation and adaptation in social groupings. What is the nature of these relationships? Are there tools, approaches and methods that could help ensure that the relationships are positively reinforcing? Whose cooperation is necessary? What trade-offs are required? What processes of social negotiation and mediation allow the emergence of equitable trade-offs, cooperation, learning and adaptation? These are just some of the questions used to help make sense of the situation.

In Chapter 1 Diaw suggests that spontaneous self-organisation may not always result in social systems and implies that when it does occur, the outcomes may not be either equitable or sustainable. He expected that the case studies would reveal that 'deadlocks and deliquescence, or decay, [would be] possible outcomes of a *laissez-faire* strategy'. With this he set up a rationale for intervention and 'intercession', through adaptive collaborative management, at multiple social scales to give the messy processes of interaction in coupled human-ecological systems a higher probability of leading to successful outcomes. Therefore this book is not just concerned about a dispassionate study of interactions in the complex, adaptive system of southern Cameroon's forested landscapes; it is interested in understanding the contributions that socially mediated and negotiated interventions can make to improve local people's situations. Where necessary, the vertical and horizontal processes of stakeholder interactions, i.e., linking local policy making to policy making at higher scales (vertical)

and iterations of collective action and learning in groups (horizontal), would focus on ensuring the rights of the weakest members of those social groupings, as the yardstick for equity. Interventions of this nature are framed within adaptive collaborative management (ACM), defined as

> an 'engine' for adaptation and innovation. It is a quality-adding approach to forest management and governance, whereby the people or groups who use, control or in some way have interests in a forest, engage in a process of effective social interaction in which they develop a negotiated vision for the forest' (Prabhu *et al*. 2007 p. 17).

ACM in Cameroon was built on this basis, essentially around two pillars—the general philosophy and investigative principles of the ACM Group, and the specific requirements of action-oriented research in the Cameroon policy context. This twin legacy shaped all aspects of the ACM research design and intervention.

ACM entry

Three distinct policy angles influenced ACM's research entry in Cameroon. The first is a general analysis of decentralisation policies and their roles and shortcomings in 'levelling the playing field' of forest management; the second relates to the relevance of research to social change and to policy actors; the third brings us back to the very definition of *policy* sketched in the introduction to this volume. We identify five markers of that process and briefly examine their scientific and practical implications.

New thinking on national policy and decentralisation

Cameroon's forestry reform, beginning in 1994, faced a myriad implementation problems. Six years into the original reform, there were no fully constituted community forests or municipal forests and many signs of stress and conflict among communities, local elites, mayors, NGOs, administrative officials and private operators. This situation extended to

protected areas, logging concessions and state-managed reserves where issues of access, rights, power and benefit sharing pitted forest actors against one another. The preceding chapters addressed aspects of these issues from an ACM perspective.

The difficulties were in no way peculiar to Cameroon's decentralisation efforts. The previous decades had seen sweeping changes in the policy framework for local forest management around the globe. Decentralisation, devolution, community-based and collaborative forest management and community conservation had been brought to the fore, discussed and tried in multiple forms and variants. However, genuine local participation and decision making were proving difficult to achieve. By 1998, at a time when the thinking about ACM was starting, disappointment over the results had become widespread (e.g., Gilmore and Fischer 1997; Sarin *et al*. 1998; Sarin 2001; Agrawal and Gibson 1999; Agrawal and Ribot 1999). Although community forestry was initially very successful in Nepal, it had begun to stagnate after a few years (Gilmore, pers. comm., 2000). There were a few successful cases in India, China and the Philippines, but even there, devolution policies tended to exclude local people by marginalising their preexisting institutions or by forcing bureaucratic goals and interests on local processes (Edmunds and Wollenberg 2001; Edmunds *et al*. 2003). Kumar and Kant's (2005) structural equation modelling of data provided by joint forest managers in India confirms this; their data showed 'bipolarity' between the 'participatory ethos' of joint forest management and 'the value systems of bureaucratic forest departments'. Above all, there seemed to be no identifiable mechanism for learning from these difficulties and for adjusting accordingly.

Because of the ACM research's action orientation and its explicit focus on ways to improve collaborative forest management, researchers had to first understand the policy context of decentralisation. In most countries, researchers used one-time 'context studies' to prepare the participatory action research (PAR) component. In Cameroon, the context studies were complemented by a multiyear decentralisation

research developed in partnership with the World Research Institute (Ribot 2002; Bigombe-Logo 2003; Etoungou 2003; Oyono 2004; Oyono *et al.* 2007). In this book, Chapters 4 (by Assembe and Sangkwa) and 8 (by De Koning) illustrate the intertwining of findings between the decentralisation studies and ACM and PAR in Cameroon. As we discuss below, they also show the practical challenge within a team to combine publication-oriented conventional research with the demand for systematic learning and action required by a PAR framework.

Framing research to be 'policy relevant'

For decades, development sociologists and anthropologists have anguished and argued about the reasons why they were divorced from the policy-making process (Scott and Shore 1979; Cernea 1995) and about the relevance or irrelevance of development studies to the lives of the people they studied (Edwards 1989). This self-critical line of inquiry resonated with the ACM Group; it fed into the change paradigm and the need to understand the patterns of influence and change that could link the production of knowledge to the making of policy (Diaw and Kusumanto 2005). In Cameroon, we translated this into a simple question: what could get policy makers interested in the kind of research that ACM did? We felt that our core concern with learning, adaptation and collaboration, however essential, would not be enough.

In the context of the Cameroon forest reform, this meant research that addressed the reform's 'implementation gap' and the many conflicts and collaborative failures that surrounded it. Based on the context studies, including a site selection study, the ACM team identified five policy 'domains' corresponding to critical problem areas in the country's forest policy. Akwah (Chapter 2) briefly describes these policy domains, and Table 18-1 presents as a matrix their link to the universe of other ACM research themes.

Table 18-1. ACM Cameroon's thematic matrix

ACM research theme	*Elements of research theme*
Core theme: Adaptation, collaboration and change questions	
Transversal science themes	Forest cultures and indigenous C&I
	Ecological C&I
	Local institutions and governance
	Local representation and accountability
	Forest tenure and customary institutions
	Forest-agriculture interfaces
	Indigenous people
	Gender
	Collective action
Policy domains (site-based policy topics)	Forest management units (state reserves and private concessions)
	Biodiversity conservation
	Fiscal decentralisation
	Municipal forests
	Community forests
	Agroforest mosaics
Transversal action themes	Participatory action research
	Collaborative monitoring
	Interactive methods for understanding, analysis and facilitation

Scales in policy making: Locality, supralocality and 'site'

The second policy consideration that guided a midlevel entry for ACM sites comes from our generic definition of policy making, which we presented in the book's introduction. Recognising that policies are made at multiple scales and by central as well as peripheral actors, the question for us was to identify the level at which local policies—that is, the local discourses, practices and arrangements that shape people's positions on public problems—are made. The sites selected for ACM intervention were all large management areas: a reserve or a park and/or forest concessions or forested watersheds surrounded by a relatively large number of communities (15 to more than 100). Thus, the critical level at which the relevant local decisions were made went beyond a single community or

a single management unit. Notions of 'locality' and 'site' were too fluid or polysemic to differentiate the 'upper' local level from what happened 'below'. We thus resorted to a micro-meso (village-landscape) distinction and to a concept of 'supra-locality' to capture the higher syncretic level where stakeholder interests intersected in a way significant enough to influence the local policy process. Tiani *et al.*'s presentation (Chapter 11) of the development of simplified C&I at these different social scales, including a higher microlevel, shows how tensions and the need for facilitation increase with the increase in scale and social differentiation.

Scales in stakeholder analysis: User groups and social agency

The notion of supralocality and the meso entry for ACM were supported by the results of the stakeholder analyses conducted before and during the ACM research. Basically, stakeholder analysis is the identification of the social or interest groups that have a stake in a problem, a resource, a territory, a project, a policy or any other significant problem context. Because of these varied departure points, the outcomes of stakeholder analyses can be different even when applied to similar people and situations. The identification of stakeholders and the assessment of their interests, powers or positions are influenced by the question asked as much as the objective situation. In natural resource management situations, most stakeholder analyses tend to yield a social map of user groups and user interests; this has been the case for most ACM country teams and is congruent with the community-level entry point that has been the preferred strategy for the ACM Group. In Cameroon, for reasons that were not immediately clear to the ACM team, the results of our participatory stakeholder analyses consistently yielded big groups of actors—Bantu communities, Baka and Bagyeli Pygmies, logging companies, park managers, NGOs, and state officials—rather than user groups. This may have been partly related to the underlying social and policy themes that guided our questions. Our approach focussed not on non-timber forest products or any particular resource (as was the case in Zimbabwe, for instance: Mutimukuru-Maravanyika *et al.* 2008) but on the broader set of issues surrounding parks, forest reserves or municipal and community forests. Stakes related

to land and resource access, rights and benefits were pervasive throughout the sites and, indeed, the Cameroon rainforest; they constituted a powerful magnet around which lines were drawn and interests coalesced. Even in the more socially homogeneous landscape mosaics, stakeholders identified themselves primarily in social terms through their clans or lineages; this is related to the determining role of kin groups in land use and land allocation decisions at the landscape level. There were therefore mutually reinforcing biases among forest policy issues, our approach of supralocality and the social agency in our stakeholder analysis. This is not to say that an agency or a user group approach of stakeholder analysis is wrong or does not reflect reality. In fact, both reflect realities that are embedded within each other; a user group is generally part of a bigger stakeholder group. The big difference between the two lies with their different implications for action research. An entry through policy and agency is more encompassing but also less practical and slower to implement. However, it did fit well with ACM Cameroon's focus on social negotiation and mediation, as shown by De Koning (Chapter 8).

Partnerships: Adding value to existing relations

Building on partnerships was a primary strategy of the entire ACM Group. This came not only from our understanding of the role of cooperation in unlocking dormant social capital but also from the definition of ACM intervention as a value-adding or quality-adding process (Prabhu *et al.* 2007). This combination of factors, theoretical and institutional, strengthened the acute sense in our midst that our facilitating role, however useful, was to remain limited and respectful of the legitimate roles of others. This position was to be challenged many times in the course of doing ACM, in Cameroon as in other countries.

The ACM teams took partnership seriously and were genuine in offering to partner or collaborate with others. In Cameroon, the identification of the stakeholders and institutions we needed as partners to address the problems in each policy domain was an integral part of our context studies. We came up with three types of potential partners: local stakeholder groups, formal managing organisations and NGOs, and centrally relevant actors and institutions. In practice, we developed significant collaborative

linkages with all three groups but were able to formalise those links only with the second group. This took the form of memoranda of understanding (with institutions such as the state forestry agency, ONADEF, and the Municipality of Dimako[1]) as well joint project proposals (with Dimako), joint studies (with the Campo-Ma'an project) and contractual agreements (with NGOs in Ottotomo and Campo-Ma'an). As described or implied by several contributors, ACM intervention started in all sites with an offer of collaboration to the leading managing agency and with a stakeholder forum that laid bare the conflict and resentment that existed amongst local actors. In the more homogeneous landscape mosaics domain, this took the form of two open-door, more peaceful forums.

Rationale for intervention

Akwah (Chapter 2), who notes that 'natural resources management at the local level often suffers from inefficiency, inequity, underrepresentation, unbalanced power relations and lack of transparency in the sharing of rights, responsibilities and benefits of forest management', presents a possible framework for collaborative planning and monitoring; this, he contends, can serve as a platform for agreement between multiple interests and conflicting approaches in the management of forested landscapes in southern Cameroon. Although he bases his conclusion on a thorough analysis of the 'messiness' of the situation, he can present only a theoretical argument for the utility of his proposed interventions as a means to reducing messiness. If the proof of the pudding is in its metaphoric eating, then as we end Chapter 2, all we have is an interesting recipe. Empirical evidence that the type of interventionist logic espoused in this book might indeed be of use in southern Cameroon begins to appear in Chapter 3, by Jum *et al.*, who show that a participatory action research approach of the type considered intrinsic to ACM improves the basis for cooperation with forest authorities; there is indeed evidence that this led to adaptation in decision-making processes. However, other than possible gains for the authorities and possibly for forest resources—fewer illegal activities, less encroachment—the case study provides no evidence of improvements of any kind in livelihoods or equity. Nevertheless, on the whole, Jum *et al.* seem to suggest that Awah's framework may be more than just a recipe.

The problems with an interventionist logic that is not suitably embedded in processes of social mediation and negotiation, when analysed from an ACM frame, show in Chapter 4, by Assembe and Sangkwa, who discuss the opportunities and shortcomings of council forests. In Chapter 8, De Koning's reference to the unsuccessful attempt by the team in Dimako to facilitate land tenure negotiation between the municipality and communities (Assembe and Oyono 2004) complements the picture. We are nonetheless reminded of Diaw's (Chapter 1) metaphor of a pebble thrown into a pond for the purpose of learning. Clearly, this policy intervention—like those described by Mbile *et al.* (Chapter 7), Ngobo (Chapter 14), Brummet and Kemajou Syapze (Chapter 16) and Chupezi (Chapter 17)—was intended to improve the situation, but it included no conscious design to study, learn and improve upon the intervention by watching the ripples. Thus, even when these interventions included a social mediation and negotiation frame, there was no sustained effort to support learning and iterative improvement. This was explicit in the conventional design of these pieces of research, as described above for the Cameroon decentralisation research. The ACM frame was missing as an action platform. And yet all these case studies reveal elements of trial-and-error learning and possible opportunities to set in motion a more benign, cooperative and adaptive interventionist logic.

In all those cases, local authorities were considered mere extensions of central government. This consideration partly explains tensions between local actors and 'decentralised' forest administration. Zoa (Chapter 5) mentions the issue of power monopoly by the elite group within the community itself, which results in inequity in the management of revenue from forest exploitation and irresponsible use of shared benefits. Throughout, this book provides evidence that each stakeholder, local or external, is important and can make significant contributions to sustainable forest management, local livelihoods and ecosystem protection. The interventionist logic of the state in supporting pluralism and decentralisation had its basis in the UN Conference on Economic Development (UNCED) in Rio de Janeiro in 1992. The 1994 Forest Law then provided for decentralisation, bringing more actors to the forest management table and making it necessary to seek common ground. In effect, however, the state viewed change as an

event that could be ushered in by the mere promulgation of a new law or policy.

Five main actors are involved in forest management in Cameroon: forest administrators, local people, logging companies, civil society organisations and conservation agencies. The 1994 law introduced community and council forests (Chapters 4 and 5) and decentralised taxation (Chapter 2) to bolster local development, democracy and good governance. Chapter 4 argues that the Forest Law needs to be adapted to local realities if the management of council forests is to significantly improve. Local communities have little knowledge of the many legal instruments involved in the creation of council forests. Also, the administrative process for the allocation of a council forest is long and expensive, as it is for community forests. Poor forest revenue management and unbalanced power relations (Chapters 8, 9 and 10) are major issues. This book clearly shows the forgone opportunities when change processes are not contingent on socially mediated and negotiated processes. At the same time, the case studies reveal how the aims of both UNCED and the reforms it inspired in Cameroon can still be achieved, albeit now at a higher cost. And yet without the intervention of the state, we might still be suffering the deadlocks and decay that characterised much of the social-ecological system in southern Cameroon prior to 1994. Indeed, it can be argued that it is only the process of casting the pebble that has opened this space. Fisher *et al*. (2007) and Mandondo *et al*. (2008) make similar arguments for case studies in Asia and Zimbabwe, respectively.

Lessons

It is important at this point to address the process questions described in the Introduction. This summary organises the lessons on ACM that we learnt in Cameroon around two analytical blocks: (1) the conditions for collaboration and adaptation and their relation or lack of relation to ACM, and (2) the lessons on 'doing ACM' and on self-sustaining ACM arrangements.

Conditions for collaboration and adaptation

Gathering evidence on adaptation, collaboration and the ACM facilitation hypothesis required observing and analysing (a) the forest management changes independent of ACM action, and (b) the responses to ACM intervention. The lessons we draw in that regard are based on comparative analysis of the five sites in which the main ACM work was conducted. Three systemic conditions independent of ACM influenced the capacity of stakeholders to collaborate and to adapt to the challenges they faced. These conditions correspond to three types of sites and provide context for analysing the local responses to ACM and evidence on the facilitation hypothesis.

Type 1. In the agro-forest mosaics, which are dealt with in Chapters 13 and 14, stakeholders were not constrained by state-sponsored entities (parks or concessions) competing for the same lands and resources. No dominant stakeholder held decision-making powers; rather, decision-making centres were spread out amongst the households and lineages who controlled forestland (Robiglio, Chapter 13) and the farmer groups who influenced land uses. The main problems were related to stakeholders' need for more capacity to produce, innovate and turn their resource endowments into food and service entitlements. Because of this, stakeholders were eager to learn and to adapt and did not necessarily need facilitation. ACM intervention was useful and well received, particularly with regard to its strategic and analytical inputs into the more technical contributions of its R&D partners. These inputs seemed to enhance the long-term adaptive vision of the stakeholders[2]. However, the scientific and technical expertise of the researchers mattered more than their facilitation of collaboration.

Type 2. In community forests and municipal (council) forests, described in Chapters 4 and 5, different conditions obtained. Issues of benefit capture, asymmetrical information, accountability, and limited knowledge and financial resources dominated in those sites, in addition to the local development issues shared by all three site types. These factors of conflict raised the collaborative and adaptive stakes in the sites and made ACM-type facilitation relevant. Thus, in 2001-2002, our late colleague Samuel

Efoua was called upon to facilitate resolution of a conflict over resource sharing between two communities in the Eschiambor-Malen community forest. This led to an informal agreement that protected each community's interests while respecting their legal statutes. In Dimako (Chapter 4), ACM partners from the Forêts et Terroir project worked in 2000-2001 to create a consultative management committee that would better represent the interests of rural constituencies in the council forest. This committee, however, had a strictly advisory role and, it would later appear, little power to influence management decisions or benefit-sharing arrangements. A later effort by the ACM team to negotiate more equitable tenure arrangements for one of the Dimako ethnic communities failed with Dimako council and had to compensated by an intervillage arrangement (Assembe and Oyono 2004; Chapters 8 and 4 of this volume); this indicates a lower level of tolerance to land-related conflicts in council forests than in community forests or agroforest mosaics.

Type 3. In forest reserves and national parks, as described in Chapters 3, 6 and 7, the territory under management was off-limits to the local population. The 'hard boundary' reduced room for accommodation and drastically constrained the negotiation framework. Whereas in the other sites the conflict was between an inner circle of legitimate claimants over resources and benefits, in this case a large group of potential claimants was legally excluded from access to the land, its resources and its benefits. Paradoxically, this is where ACM facilitation resulted in the most contrasted outcomes. We therefore use it to look more closely at the facilitation hypothesis and the conditions for adaptation and collaboration.

Basically, the ACM process questions (in Chapter 1) were about conditions for adaptive collaborative management; to address conditions one must observe the relevant behaviours and find ways of measuring them. This is what we did, and the following account reflects the lessons learnt.

We found that not all stakeholders had the same interest and ability to adapt and learn collaboratively. Powerful stakeholders had collaborative abilities or disabilities driven by different types of incentives. The attitudes

of those whose mandate and position depended on external authority were driven by external policy incentives. This yielded two opposite collaborative situations. In Ottotomo, the state forestry agency, ONADEF, actively sought to collaborate and to find ways to comanage the reserve with the communities but did not know how to do it and wanted ACM researchers to help. In Campo-Ma'an, the project had the opposite attitude. As described by Akwah *et al*. (Chapter 6), 'it had a tokenistic position on collaboration, bad relations with local actors (communities, administration officials, and logging companies) and failed to follow through with five major collaborative and learning opportunities freely offered by ACM'. The objective situation of these two actors was similar; both managed type 3 sites and were driven by external incentives. The difference between the two was in their mental models. The Campo-Ma'an Project was focused on its funders (World Bank, government), did not believe its position depended on local stakeholders (and was proved wrong when it lost the site to another conservation agency) and regarded facilitation with mistrust. ONADEF believed, to the contrary, that facilitated comanagement was the only way to save the Ottotomo site from the type of encroachments and degradation that threatened forest reserves elsewhere in the country.

Other powerful actors (logging companies, the council forest municipal leaders) had external incentives but also business interests strongly tied to local conditions. In those cases, collaboration was conditional. When there were issues of common interest—for example, when loggers joined with communities in Campo to force the reopening of a road through the park—alliances took shape without the need for facilitation. When interests collided, collaboration depended on the actual or anticipated level of conflict (the *rapport de force*) and on appropriate facilitation. This is why the Dimako municipality, for instance, agreed to form a consultative committee and, after initially looking at ACM with distrust, to develop a joint agreement and a joint project for ACM facilitation. At the same time, it rejected any attempt to touch the tenure entitlement it had got from the state.

By contrast, less powerful stakeholders whose position depended on decisions taken by others had learning and collaborative attitudes that

were dictated by the attitudes of other stakeholders and by the search for empowering alliances (as was the case of community actors in all the ACM sites). They embraced social learning and external facilitation as a means to reduce powerlessness. When the level of antagonism was high, as in Campo-Ma'an, there were attempts to capture external facilitation and turn it into a separate alliance against powerful stakeholders.

These insights on stakeholders' incentive to collaborate indicate that all stakeholders are not equally important, or not important in the same way for collaborative forest management. Powerful stakeholders have disproportionate influence because their behaviour conditions the behaviours of other actors; at the same time, they are constrained in type 2 and 3 sites by the 'power of non cooperation' that weaker stakeholders have over the resources they are supposed to steward. As shown by Tiani and Noubissie (Chapter 9), the stakeholders in type 2 and 3 sites were able, through ACM facilitation, to assess their respective rights, means and roles in management as essentially unequal and to identify this inequality as a 'management handicap', including for the actors in power. Through the facilitation, powerful actors agreed that it was in their interest to give away some power in exchange for legitimacy and cooperation from less powerful actors. This was an important result at the outset of ACM facilitation; but it was only a beginning. The previous insights on stakeholder collaboration show that appropriate policy incentives from central actors (higher management, government and funders), though hardly sufficient, are equally critical to the active cooperation of 'big' institutional actors.

In general, we found that cooperative and non cooperative behaviours were mutually reinforcing and strongly influenced by perception biases. Thus, at the beginning of the facilitation, collaboration was rated as 'bad' in type 3 sites and 'fair' in type 2 cases. More remarkable, however, 62 percent of stakeholder perceptions of one another were cross, particularly in type 3 sites, with the actor in control rating the collaboration higher than the weaker actor (Diaw and Kusumanto 2005). In all cases, the facilitation interface modified these perceptions and created ground for better collaboration (Chapters 9 and 10).

Our observations of stakeholders' behaviour gave us new insights about the nature of collaboration itself. Collaboration, to start with, is not univocal; it is a dynamic chemistry of cooperative and non cooperative behaviours. It is also not static; it has a timeframe (some collaborate at one time and not at another); it has depth (some collaborate more than others); it has width (some groups or individuals collaborate and others do not). Finally, we distinguish two possible collaborative states. In the first, collaboration is a behaviour, a set of attitudes, and a move from non collaboration to collaboration, or the reverse, depends only on one actor at a time. In the second, collaboration is assessed not as a behaviour but as an interaction or a state of things, and it requires at least two actors collaborating. By the end of the formal ACM Programme, the overall balance was toward more collaboration (depth, width and interaction) in Ottotomo, Dimako and Akok and more polarisation in Campo-Ma'an between the main actor (who did not join the collaborative framework) and all the other actors (whose cooperative interactions were getting deeper and wider). There was a relative degradation in Lomié, where the main supporter of community forests (an international NGO) was moving out of the site, thus weakening an initially higher collaborative capital. This, again, bears important lessons for ACM conditions, which we examine below.

Our insights on adaptation and the facilitation of adaptation complement the previous analysis in several significant ways. Adaptation, the process by which an organism adjusts its behaviour to changes in its environment, took two main forms in the social context of our research: actors adapting to each other and actors adapting to their larger environment. Our critical finding is that adaptation to 'the other' was the first and most crucial step toward stakeholder adaptation to the larger environment. This, naturally, requires some qualification.

» Adaptation to the others does not always mean collaboration; in one instance, a group of actors adjusted its behaviour to compete more favourably against another actor. Thus, Campo-Ma'an community representatives used the presence and style of work of the ACM facilitators to ally with local government officials and project field implementers; they also used the language of sustainable forest

management to challenge the project's ' criteria and indicators' and ask whether it was really bringing development to the locality;

» Adaptation can be used to accommodate another actor. In Campo, we saw an intercommunity conflict between an Iyassa (Bantu) community and its Bagyeli Pygmy neighbours. The case was resolved through ACM facilitation (J. Nguiebouri) when Bantu villagers accepted the residential rights of the Bagyeli (Chapter 6). In that case, adaptation was more one-sided than reciprocal because of historical imbalances between the two groups;

» Adaptation can be reciprocal and become the basis for enhanced collaboration, as in Ottotomo and the Eschiambor and Malen communities in Lomié.

In other words, adaptation in pluralist settings can happen without real collaboration; effective collaboration becomes possible when there is mutual adaptation.

In addition, we identified three types of adaptive pressures in stakeholder relations: assimilation (negation of self, dissolution into another one's project); compromise (give-and-take; I lose one thing but gain something else in return); and consensus (win-win; nobody has to give up anything). Our experience shows that attempts to assimilate others, the first stance of most stakeholders, was always rejected and that consensus was difficult to achieve or transitory. Compromise was the only durable option. It sometimes happened as a by-product of heightened conflicts (the Campo road and the Ottotomo reserve); sometimes, it didn't happen at all (the Kongo community forest in Lomié, suspended by the forest service for unauthorised timber exploitation'; see Zoa, Chapter 5). When there was effective conflict mediation (the stakeholder workshops, the Eschiambor-Malen and Iyassa-Bagyeli conflicts), compromise always occurred and the stakeholders were in a better position to address other problems. In other words, conflict creates favourable conditions for adaptive collaboration when combined with effective facilitation; adaptation to the other creates favourable conditions for addressing other adaptive challenges.

We also found that social learning, the learning that takes place when social actors interact, is the key to adaptation. Adaptive attitudes were closely associated with situations of social learning in multistakeholder as well as single-stakeholder settings. For example, the Akok and Makak communities (type 1 sites) questioned the R&D plan they had just drawn up with our agricultural research partners after realising from role plays and historical transects (see Chapter 10) the forest degradation that would result from it. Social learning enhances the capacities of the learners and translates more easily than anticipated into local ownership of concepts and approaches (see also Chapter 12). It does not automatically result in ownership of the policy process, but it gives the learner more capacity to assess and influence it (as in the rhetorical use of C&I in Campo). In some cases, these enhanced capacities tend to reduce stakeholders' conflicts (e.g., Ottotomo); in others (e.g., Campo) they tend to increase it. Social learning is not necessarily related to enhanced collaboration (see also Kusumanto *et al.* 2005 p. 107). The facilitation of social learning can also provoke a backlash from the actors in power. In Campo the project filed a complaint with CIFOR's management against the ACM team after a collaborating journalist published an article in *CIFOR News* featuring interviews of local people who saw the work of the two organisations in a contrasted light. Jum *et al.* (Chapter 3) document a situation where a backlash following an ACM-facilitated stakeholder workshop in Ottotomo was avoided only through sheer luck and the collaborative bias of ONADEF's central authorities.

However, in all the cases where independent facilitation was allowed to take place, stakeholders' learning, adaptation and collaboration were enhanced and recognised. When facilitation was done in the absence of a major stakeholder (e.g., in the Campo workshop), evidence of social learning and adaptation did not translate into a fully inclusive collaborative action framework. Effective facilitation enables social learning and adaptation but requires other collaborative incentives to translate into effective collaborative frameworks. Overall, our experience indicates that adaptive management in multistakeholder forest situations is not likely without effective stakeholder collaboration and that collaboration will be

limited without appropriate policy incentives and effective independent facilitation.

This brings us back to a basic premise set out earlier in this book and this chapter: the need for positive reinforcement between cooperation and adaptation in the process of wringing positive outcomes from messy situations. Despite being only at the beginning of what Jum *et al*. acknowledge is a long action research process, it was possible in Ottotomo to facilitate collaborative monitoring of 'slow and fast' variables. As a consequence, the intervention led to improved communication and collaboration between state administrators and local communities. Chapter 4 and the chapters dealing with tools and methods (most notably Bonis-Charancle *et al.*, Chapter 12) defend action research as a good intervention tool in complex contexts because the learning-by-doing method can accommodate new and unpredicted factors. Mbile (Chapter 7) provides support for the value of facilitation in solving problems that arise from the 'exclusionary' protected area management model. He writes,

> Managing change in landscapes is an essentially anthropogenic process; it requires flexible and open institutions that allow for dynamic learning and actions through information generation, communication and feedback. It is by mastering such knowledge and information generation and flows that different parts of a landscape can communicate with each other, so to speak.

Thus we begin to understand that such processes of facilitation are the basis for the social mediation and negotiation that are required, along with collaboration and adaptation, to transform 'messiness' into sustainable and equitable outcomes in coupled social-ecological systems.

'Doing ACM' and self-sustaining arrangements

One of the core objectives of the CIFOR ACM Programme was to draw generalisable lessons on the approach itself. Several authors (Chapters 2-3, 8-13) describe the range of approaches and methods used by the ACM teams and some of their results. Other ACM contributions cited in

the book describe similar work in other countries. In this short summary of the lessons learnt from Cameroon, we focus instead on the broader discussion about 'doing ACM', with our eyes on both the road ahead and the 'rearview mirror'. What worked and what did not work in our assumptions and ways of doing it and why? What were the unexpected conditions and surprises, good and bad, and what do they tell us about the approach and, more fundamentally, about the possibility of self-improving systems of forest management in the tropical South?

What seems to have worked in the Cameroon ACM experience is the facilitation of stakeholder learning and collaboration and the development of policy connections. In practice, we used conventional surveys as well as a wide range of participatory, interactive and prospective methods in focus groups, stakeholder forums and workshop formats. We also made important progress in developing simplified criteria and indicators for local people to use as monitoring tools (Chapter 9; Nasi *et al*. 2001) but never had the time for real collaborative monitoring (unlike the ACM work in Zimbabwe, Nepal or Indonesia, for instance). Facilitation works when based on such methods and joint analysis; stakeholders as well as facilitators learn more and can reconcile their differences. Linking participation with science increases the quality and effectiveness of facilitation. Bonis-Charancle *et al*. (Chapter 12), in testing tools to improve local analytical capacity in central and southern Cameroon, found that the processes of facilitating the use of such tools also led to improvements in adaptation and cooperation among groups. Similar results were obtained by Tiani and Noubissie (Chapter 9), Tiani *et al*. (Chapter 11) and Nguiebouri (Chapter 10). De Koning (Chapter 8) sums this up as follows:

> During ACM interventions in Cameroon, researchers experimented with conflict mediation and negotiation techniques that led to some remarkable resolutions … Besides the direct benefits of such solutions, local stakeholders gained negotiation, visioning and decision-making capacities. Thus far, participating community groups continue to organise and negotiate natural resource rights, internally and externally, under the informal configurations formed at the time of ACM research.

To structure our institutional alliance and influence policies, we concluded institutional as well as informal village agreements and organised a 15-member policy monitoring and advisory group composed of forestry experts, NGO and farmer confederation representatives, scientists and high-level policy officials, including a ranking ministry secretary, a forest adviser to the president and the head of a donor representation in Cameroon. This group met one to three times a year with ACM researchers and partners and gave substantive science and policy feedbacks based on the researchers' activity reports. It was a major conduit for ACM results into institutions of the forest sector. Some members of this group played a role in a post-ACM 2003 study that resulted in a national participatory monitoring and evaluation proposal by the ministry; a leading official described the proposal as their 'compass' into the Forests and Environment Sector Programme then being negotiated with international donors.

The benefits of working to embed change approaches into the policy process also showed with the support of central policy actors to the post-ACM initiative on model forests. This experience is not documented in this book, so we will briefly elaborate on its relation to ACM. Model forests are large, multifunctional landscapes governed by a voluntary partnership representing all the important stakeholder interests and values within that landscape. Model forests have existed since 1992 and are organised into an International Model Forests Network coordinated by a secretariat based in Ottawa (Besseau *et al*. 2007). We discovered model forests in late 2002 as we were struggling with the end of the formal ACM Programme and the lessons of the Cameroon work. Asked to investigate the subject, one of the ACM researchers came back with his assessment: 'This is ACM'. And he was right. Without necessarily using the range of sophisticated ACM learning, facilitation and action research techniques, which we can think of as 'ACM software', model forests share ACM's essential governance and sustainable forest management principles. They also have something that eluded us during the test of the approach: a vehicle owned and governed by the actors themselves to achieve long-term management and development aims, beyond the usual life of any single project. The model forest concept, we came to realise, was 'ACM hardware'. In Cameroon, the initiative was supported by a consortium that included the main Congo

basin policy institutions and the government. Two model forest pilot sites were established after winning a national competition based on guidelines validated in a participatory workshop and reflecting broad local buy-in and collaborative principles. The aim of the competition was to instill amongst the stakeholders the sense that this was not just 'another project' but a product of their own effort and worth and something they owned. The government also had ownership; a director in the ministry presided over the field evaluation and a dozen meetings; the government sponsored the sites' membership into the international network and expressed its support through three successive ministers of forests and the prime minister.

The conduct of this process, though based on the general operating principles of the model forests network, was directly informed by ACM's philosophy, methods and lessons. Three requirements stand out:

» Broad-based local ownership of the collaborative platform. This enabled more equitable stakeholder ownership of and representation in the model forest boards and helped reduce the risks of collaboration failure;

» Policy feedback loops. We had policy connections and influence during the formal ACM phase, but this did not go as far as the 'loops' hypothesised at the beginning of the research. With the model forest initiative, we learnt that such loops can be achieved through a deliberate process that makes policy makers the co-owners of a local process relevant to national concerns (e.g., the integration of several components of the Forests and Environment Sector Programme);

» Long-lasting change vehicles that can outlive any single project, absorb the shocks of erratic funding fashions and invest in the long-term development of the community. Evidence from ACM proves that the current structure of R&D and environmental projects is inadequate. The major institutional actors have since pulled out from all the former ACM sites—the Campo-Ma'an project, the Forêts Terroir project in Dimako, ONADEF in Ottotomo, the leading international community forest NGO in Lomié, and CIFOR in all the sites—illustrating this fundamental vulnerability. On the other hand, the two winners of the model forest competition, Campo-

> Ma'an and Dja and Mpomo (the larger Lomié area), were both former ACM sites. This may lend credence to the ripple analogy (or hypothesis) and encourage a more optimistic view of the capacity of local stakeholders to build on opportunities and use the lessons learnt for their long-term benefits.

Here at last we start to see evidence that supports an interventionist logic, framed by ACM, that can increase the likelihood that communities *will* operate independently and proactively to establish sustainable development agendas—programmes that they themselves will manage without being dependent on either First World or elite developing country facilitators. Brummett and Kemajou (Chapter 16) add the insight that asset building amongst those who depend on sustainable use of natural resources leads to empowerment, which has a strong, positive effect on results of decision making at the village level. This in turn gives conservation a much more credible voice than that of any outsider. But this kind of empowerment can be attained only through significant capacity building, examples of which, in these case studies, were predicated on facilitated co-development of analytical and collaborative monitoring tools.

This book's focus on the development of tools must therefore be understood as the search for entry points for facilitation of social mediation and negotiation. Thus the interventionist logic might be restated as follows: in any given coupled social-ecological system, primacy for action and change must be left to the actors and stakeholders. Yet left to themselves in the kinds of situations that obtain in the forested landscapes of southern Cameroon, processes of self-organisation would probably lead only to deadlock and possibly decay. For external interventions to succeed, they must be facilitative and, with the proper policy incentives, work at multiple interconnected levels through social mediation and negotiation. This might best be achieved by building local capacity to support analysis, monitoring, collaboration and adaptation. In other words, the tools that promote empowerment could 'liberate dormant social capital and catalyse the information feedbacks necessary to turn the odds in favour of successful "path adaptations" of the concerned systems' (Diaw, in Chapter

1) as well as increase option space for adaptive solutions that are grounded in collective action. Tools, in the context of this book, are therefore not magic wands manufactured at remote locations and delivered to ignorant locals; rather, they are co-developed portals for learning, adaptation, mediation and negotiation that can be used to explore the options for addressing messiness. Indeed, this messiness characterises all coupled human-ecological systems, so the insights apply globally, not just to the forests of southern Cameroon.

Conclusions

We conclude with a few additional observations and comparisons about what works in the field, and what does not. We will briefly address three points: Should the collaboration of all stakeholders be sought at all cost? What is the comparative value of structured and less structured learning? How best to deal with tenure?

Despite the initial stakeholder conflict and mistrust documented by various ACM country teams, evidence of outright collaboration failure is rare in the global ACM experience. The Campo-Ma'an case is thus important to our general lessons on ACM. It raises a question about possible courses of action when an important actor does not cooperate. The ACM team in Malinau, Indonesia (Wollenberg *et al.* 2007), also faced this situation, once because of lack of interest from powerful agents, another time because a community development service was too weak to be responsive to villagers' requests for enhanced resource use. There, the researchers decided to shift toward 'separate programmes of work among communities and local government' (Wollenberg *et al.* 2007). In Campo-Ma'an, this step was resisted. Some members of the research team wanted to shift gears and work more directly with communities to strengthen their position and power. Others felt that a change of direction would undercut the need to learn from the situation and would move us toward advocacy, compromising our strict middle-ground stance of facilitation and mediation. Even in hindsight it is difficult to pass judgment on which

might have been the better course. In Malinau, the researchers' decision triggered new ways of thinking about 'going with the flow', focussing on fewer villages and breaking new working grounds with 'spontaneous orders of cooperation'. In Cameroon, the decision protected the team's collaborative capital, political reputation and convening power, which proved critical to scaling up its work into the policy process and model forests. In both cases, interestingly, the teams became more flexible as a result, which may reflect intrinsic capacity for learning built into the ACM paradigm and practice.

Throughout our research, and particularly at the beginning[3], there was tension in the ACM approach between our adaptive, flexible orientation and the search for scientific rigor and structured learning. This came in part from ACM's theory of structured reflexive learning cycles (see, e.g., Jum *et al.*, Chapter 3) but also, we believe, from a desire to demonstrate ACM's scientific credentials to skeptical-reductionist views of science in our institutions. We thus went out of our way to build hypotheses and establish lists of systematic variables, internal systems for organising field diaries and, in Cameroon, prototype information management software with functionalities for thematic research and comparative analysis. This worked well in some cases and not in others[4]; Prabhu *et al.* (2002) and Colfer (2005) showed the usefulness of such tools to comparative analyses of ACM. In Zimbabwe, the emphasis was on a structured learning design, 'which offers more opportunity for retaining institutional memory and allows for iterative cycles of shared learning' (Prabhu and Matose 2008 p. 6). Drawing a contrast between Mafungautsi, where there was 'a conscious effort to follow the classical participatory action research cycle', and two other Zimbabwe case studies, Mandondo and Matose (2008 p. 120) argue that the latter were based on mostly 'ad hoc action, without commensurate formal and structured reflection'. Of the three, they think, 'only the Mafungautsi case bears broad resemblance to designs typifying formal ACM regimes'.

The team in Malinau went the other way. They argue that 'spontaneous orders of cooperation can have advantages over designed cooperation'

and that 'existing models of adaptive collaborative management or other simple platforms for collaboration … are unlikely to work in places like Malinau, at least not with socially just and long-term outcomes' (Wollenberg *et al*. 2007 p. 8). There are actually two different arguments here: the comparative advantages of structured and unstructured learning and the likelihood that collaboration platforms can work in places like Malinau. We have already described the diverging facilitation paths that the ACM teams took in Malinau and Campo-Ma'an and the fact that, in the latter case, it was possible to build collaborative platforms through the twists and turns of real-life processes. We would further argue, without being in a position to judge, that the disabling conditions mentioned for Malinau—'lack of trust and communication, weak civil society and state, and lack of institutions for deliberation, agreements, checks and balances, and managing conflict'—are similar to those that preceded the ACM research in Cameroon.

The disagreement over the workability of collaborative platforms does not take away the insights from Malinau about spontaneous orders. It may be that in the face of unexpected situations, all the ACM teams have had to muddle through their own conditions of ignorance (Ngo Youmba-Batana 2007), particularly in Zimbabwe, where the orgy of violence and economic meltdown put the whole ACM work in jeopardy. Instead of having to choose between formally structured 'ACM regimes' or radically unstructured learning, we will thus argue for less structured learning that takes into account the necessity of guideposts (Prabhu *et al*. 2007) in ACM as well as a need underlined by Wollenberg and her colleagues, 'to learn to work with spontaneous orders of cooperation'.

This conversation extends to the contentious issue of tenure in forest management. Tenure shaped much of the discussion and negotiation in the ACM country sites, and our collective experience holds lessons that can be used to inform change processes. In Cameroon, it was a central underlying theme in all sites, including those of type 1. It was also a prominent feature of the facilitation interface (as shown by the successful Lomié and Campo cases described earlier, and as illustrated by Tiani and

Noubissie in Chapter 9). Tenure was an aspect of the failure of community participation in district land use planning in Malinau (Wollenberg *et al*. 2007) and a hot issue in Zimbabwe, marked by the invasion of the Mafungautsi reserve by war veterans and the merger of the land problem with the political frenzy in the country (Mutimukuru-Maravanyika *et al*. 2008). This, combined with the conditions of the land negotiation failure in Dimako, confirms our understanding of land tenure as a critical system boundary in the types of forests where the ACM teams worked. How we dealt with the issue and how well it worked or did not work are important to assessing ACM approaches.

There are mainly three ways of dealing with tenure in the field: ignore it, transcend it or try to change it. The first two imply work within existing tenure boundaries, and the third[5] aims at changing the boundaries. Most of the ACM effort seems to have been based on the second, a 'soft' approach that fits with the interest-based, expandable-pie, relational conflict resolution approaches described in Chapter 1. In Malinau, it was part of the shift towards spontaneous cooperation:

> Watching the plethora of deal making around us, we realised that officials and villagers were able to cooperate easily enough with one another to exploit timber, and found this more interesting than our efforts to support formal land use planning (Wollenberg *et al*. 2007 p. 6).

This followed village boundary mediation efforts as well an unsuccessful search for institutions that could 'secure legal recognition of claims to land'. In Mafungautsi, the negotiation of land use and livelihood alternatives (thatch grass and other non-timber forest products) was framed from the start within existing land tenure structures (and inequities), which facilitated support of the Zimbabwe Forestry Commission to the collaborative management of these resources by local people. When the whole land issue blew up, the researchers had to step aside. In Cameroon, including when we facilitated intervillage agreement after the failed attempt at Dimako, we concentrated on transforming conflict over the rights and means to manage forests into an understanding of how this

conflict prevented stakeholders from pursuing and achieving their more pressing goals. This approach of negotiating meanings and capabilities was quite effective, as Tiani and Noubissie illustrate, and contributed to softening our earlier views on the strictures of tenure relations. Without diminishing the interest of more direct ways of addressing tenure, the ACM experience thus indicates the value of soft, accommodative approaches that can bypass frontal confrontation and free stakeholders to address other landscape-level issues collaboratively.

Landscapes are essentially conceptual entities. Chapters 7 and 14-17 explore different threads of utilisation that run through these landscapes, from value chains around non-timber forest products and forest fallows to fisheries, traditional forestry and national parks. In each of these case studies, the process of change and innovation is highlighted, and the potential for social mediation, negotiation, learning, collaboration and adaptation framed as an ACM intervention is explored. This has led to the call for a socially inclusive approach that broadens decision making to include civil society, multilateral, bilateral and quasi-government organs, industry and academic institutions.

Throughout this book, we have emphasised the importance of facilitating iterative feedback loops between research, local experience and policy adjustments as a means for strengthening positive interactions between cooperation and adaptation. The case studies have given us glimpses of these processes, but given the brief instant when the curtains were open and the vastness of the rooms that lie beyond, our insights are imperfect. Yet because we were able to pull back so many different curtains simultaneously, we are encouraged to believe that it is worth pursuing the course set out in this book: in the messy situations that characterise dynamic complex-adaptive systems, adaptive collaborative management holds out the promise of facilitated self-organisation that can cope with the messiness of our environment.

Endnotes

[1] A comprehensive memorandum of understanding was developed with the Campo-Ma'an Project but was not signed in the end.

[2] 'We were advancing [into the forest], but did not know that we were advancing' said one of the farmer groups, reacting to a 50-year historical transect of landscape they had drawn with the ACM team.

[3] This question cropped up again later during a fascinating email discussion (13-26 June 2005) between Hermant Ojha and Ravi Prabhu on mental models, structured learning, empiricism and confirmation bias, and whether focus on experiment and hypothesis limited the scope of learning in ACM.

[4] In Cameroon, for instance, the researchers did not fully engage in the prototype software development, which they found too constraining, and only two field researchers regularly updated and turned in their field diaries.

[5] At a political level, tenure transformation strategies such as top-down tenure privatisation reforms, 'land restitution policies' (as in South Africa and Zimbabwe) and grass-roots indigenous land movements (e.g., in Latin America) can be construed as 'hard' approaches to the tenure issue.

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In the late 1990s, as we were coaching the first 'Co-management learning network' in the Congo Basin, we could have hardly hoped that—barely a decade later—the region would host a variety of sites, actors, facilitators and researchers dedicated to both 'learning by doing' and 'learning for doing' on Adaptive Collaborative Management. This book, recounting their experiences and insights and rigorously drawing from those a message for meaningful action, is, for me, nothing less than a dream come true. The readers of this book will discover how knowledge and power are intertwined and made explicit in the Congo Basin's forest environment. Some will be intrigued by the complexities of specific cases and the tales of process and impact the book brings to light. Others will resonate with concepts, philosophies and analyses of change that place adaptive resilience, mutual collaboration and the capacity to learn at the heart of social intelligence and humanity. Still others will be encouraged by understanding the importance of 'process conditions'—first among all the presence of facilitators and resources to assist local actors in learning from the past, reflecting on the present, imagining alternative futures, communicating among themselves and developing common solutions to common problems. All, I am sure, will marvel at how 'policy' can be meaningfully re-appropriated as *de facto* daily decision making (a large part of what I also understand as 'governance'). There is no more important research challenge, today, than discerning how society can foster a more effective self-organisation of our staggering plurality of actors, abundance of needs, and variety of clashing perspectives and wants. The authors of this volume have taken up the challenge with brilliance and gusto. Their product will remain a milestone for all interested in understanding—and improving—governance of natural resources in Cameroon and beyond.

—***Grazia Borrini-Feyerabend , IUCN, Gland, Switzerland***—

With this book, Diaw and his colleagues have provided us with an in depth look at the complex and challenging process of Adaptive Collaborative Management. It highlights the multifaceted insights of an extensive research programme in Cameroon which has broader applicability for all who are concerned with management of commons resources. It is a 'must read' for researchers and practitioners alike.

—***Carolyn Peach Brown, University of Guelph, Ontario, CANADA***—

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