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The IUCN/WWF Forest Conservation Newsletter

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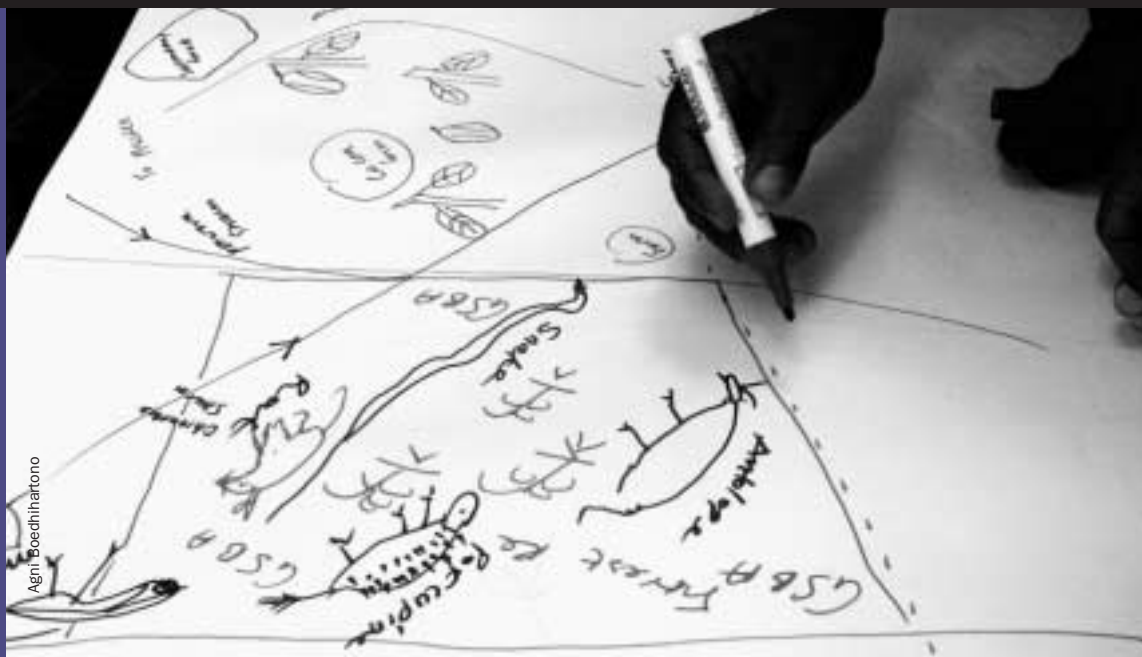
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IUCN
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Agri Boedihartono

Tools for forest conservation

In this issue of *arborvitæ* we look at the recent emergence of various tools designed to assist forest conservation activities. We have chosen to focus on those tools that offer conservation professionals a methodology or technology of practical use in their work. The methodology-based tools may provide, for example, analytical frameworks for planning or monitoring conservation efforts, or participatory processes for exploring local perceptions of forest use. Technology-based tools (such as computer modelling or remote sensing techniques) may enable the simulation of alternative conservation options or the mapping of species distribution or land-use patterns. With the focus on these 'field' tools, we are not covering regulatory or economic tools such as forest certification or Payment for Environmental Services, as these are quite different instruments.

Many of these tools have been around for some time. Nonetheless, there has been something of a boom over the last five years or so, as new tools have been developed and old ones adapted for forest conservation applications. The feature article, written by Jeff Sayer, asks whether these tools really make a difference to forest conservation, and looks at the strengths and weaknesses of each type of tool. According to Jeff, while the tools can offer valuable help, their users need to equip themselves with a good dose of common sense to avoid becoming so caught up with the techniques and technologies that they lose touch with the realities on the ground.

This 35th issue of *arborvitæ* is also the last one to be produced jointly by IUCN and WWF. Future issues will be produced by IUCN in close collaboration with IUCN members around the world, including WWF. The style and content of the newsletter will remain unchanged, and contributions from outside IUCN's network of members will still be very welcome.

Rod Taylor, WWF, and Stewart Maginnis, IUCN

Participatory mapping can help explore local views on forest use

Monitoring forests from space: getting a bigger, clearer picture



Image courtesy of The Woods Hole Research Center.

Section of the image mosaic showing agricultural expansion into forest areas

A new remote sensing tool is being used to provide an accurate image of forest loss in the Amazon.

Scientists in the US have produced a first-of-its-kind, large-scale, high resolution image mosaic for a portion of the Amazon basin, spanning some 400,000 square kilometres. The image was produced by researchers at the Woods Hole Research Center (WHRC), using the latest remote sensing technologies, including a new Japanese radar sensor, PALSAR, carried on board the Advanced Land Observing Satellite (ALOS).

The Center's Dr Josef Kellndorfer, who officially unveiled the new image mosaic in November, explained the great potential offered by the sensor for accurate monitoring of deforestation. The radar imaging sensor can pick up details of vegetation structure and is capable of producing clear images even through dense cloud cover and precipitation. In addition, the images produced are based on data acquired over a relatively short period of time (six weeks), giving a true 'snapshot' of deforestation activities and making the results potentially valuable for forest monitoring programmes associated with Reducing Emissions from Deforestation and Degradation (REDD) activities (see *arborvitæ* 34).

"The area that is mapped with the mosaic of images centres on the headwaters of the Xingu River, one of the Amazon's mighty tributaries. The indigenous groups, soy farmers, smallholders, and ranchers that live in this region are top candidates to receive payments for reducing their carbon emissions. Where this has previously taken us several

months to prepare, this new mosaic took only a few days, a turnaround window that carries real significance," said Daniel Nepstad, senior scientist at the WHRC.

The ALOS observation strategy has been designed to continue delivering pan-tropical images several times a year for some years to come and the data provided will go a long way in reducing current uncertainties associated with quantifying forest loss across the tropics.

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news in brief

Upwardly mobile tigers: Forest loss in India is forcing its endangered tigers to move to higher ground including mountainous areas to which they are not adapted. With forests in the foothills being cleared for farming and development, tigers are increasingly moving into high altitude forests in India's northeast and west and even into the lower Himalayan range in neighbouring Bhutan. "There needs to be a special study done to find how they are doing and to learn about the extent of disturbance in the habitat below that forced them to move up," said Valmik Thapar, a leading tiger expert.

Source: www.planetark.com, December 18, 2007.

Chile's forest law: Following 15 years of negotiation, Chile's Native Forest Law was finally approved by parliament in December. The law creates an initial annual fund of US\$8 million for forest conservation, recovery and sustainable management projects. The law will also protect water sources by banning the felling of native forests located near springs, rivers, glaciers, wetlands and lands with steep slopes. According to a press release from the Chilean Ministry of Agriculture, the law is likely to allow 500,000 hectares of native forest to be preserved over the next 15 years.

Source: www.scidev.net, December 31, 2007.

Let them eat spinach? A new report by TRAFFIC has revealed the extent to which refugees in northern Tanzania rely on wildlife poaching for their nutritional needs – and for income generation. The wild meat, traded covertly after dark, is termed 'night time spinach' in Swahili. The large-scale poaching is decimating wildlife populations around the camps and affecting local non-refugee communities that traditionally supplement their diet and income with wild foods. "The scale of wild meat consumption in refugee camps has helped the international community to conceal its failure of meeting basic refugee needs," said Dr George Jambiya, the main author of the "Night Time Spinach" report. "Relief agencies are turning a blind eye to the real cause of the poaching and illegal trade: a lack of meat protein in refugees' rations."

Source: http://assets.panda.org/downloads/traffic_pub_gen16_1_.pdf

Tools to track effectiveness of Protected Areas

Alexander Belokurov of WWF describes several tools that are helping measure and improve the management effectiveness of protected areas.

A participant at a RAPPAM workshop in Mongolia

Protected areas cover over 10 percent of the world's land surface and managing such a huge estate is an enormous challenge. Management effectiveness of protected areas has been a priority issue for the international conservation community since 2004, when the Convention on Biological Diversity's Programme of Work on Protected Areas was adopted. WWF has partnered with many organizations including IUCN's World Commission on Protected Areas, the World Bank, TNC, UNEP-WCMC, UNESCO, CBD, GEF and many others to develop appropriate tools and promote their use to improve the Protected Area (PA) system worldwide.

One of the tools, the **Rapid Assessment and Prioritization of Protected Area Management (RAPPAM)** methodology, enables protected area agencies to obtain a country-wide overview of the effectiveness of their PA system, and the threats, vulnerabilities and degradation at work. To date, WWF has helped over 40 governments to assess their protected areas and formulate follow-up recommendations to make their protected areas more efficient and effective.

Another widely used tool is the **Management Effectiveness Tracking Tool (METT)** which aims to provide a quick and simple picture of effectiveness in individual protected areas, ideally through repeated application in the same sites over time. The METT has been tested over the past five years in hundreds of PAs and a revised version applicable to all terrestrial protected areas (including wetlands) has been prepared.

A report summarising the results of the METT application by WWF and the World Bank has been recently published. It covers about 330 PAs in 51 countries, making it the largest multi-national repeat survey of protected areas' management effectiveness using a single methodology. Within WWF, the results have helped identify a set of minimum management standards to apply in its PA projects.

The 330 PAs which WWF has assessed using these tools still remain a small sample of the total number of protected areas (well over 100,000 sites globally). WWF is urging national governments and their development partners to support efforts to measure management effectiveness and to track changes in this over time. A larger database of assessments, completed in different years, would allow development of adaptive management approaches over a large scale and measurement of the extent to which the CBD target on PA



effectiveness is being achieved. Efforts are underway to make this global database available through UNEP-WCMC and the first results are expected in time for the next CBD COP in May 2008.

For more information about the tools and the report, see www.panda.org/parkassessment

Contact: Alexander Belokurov, abelokurov@wwfint.org

news in brief

Pandas to learn self defence: Scientists in China may use a police dog to teach pandas fighting skills, after the first artificially bred panda released into the wild was killed earlier this year, most likely following a fight with wild pandas. Reserve officials at the Wolong giant panda breeding centre plan to have four pandas raised in captivity live with a specially trained police dog or other animals, according to the Chengdu Daily newspaper. The pandas would learn how to protect themselves by observing the dog, increasing their chances of survival when they were eventually released into the wild.

Source: www.planetark.com, December 24, 2007.

Chimps' remedies may help humans: A team of Ugandan and French scientists has been observing how chimps in Uganda's Kibale Forest National Park self medicate themselves for specific ailments. The results, it is hoped, may aid the discovery of promising new medicine for humans. The researchers run tests on the faeces left under chimps' nests and observe what plants the chimps turn to when they get sick. One weak and feverish chimp, for example, was seen to eat only *Trichillia rubescens* leaves for a whole day. Molecules from these tree leaves, later isolated by the scientists in a laboratory, were found to be effective against malaria. Around 100 different kinds of plants have already been sampled in Kibale since the start of the year.

Source: www.thetimes.co.za, December 29, 2007.



Forest day in Bali

Forest Day included discussions of the issues associated with Reducing Emissions from Deforestation and forest Degradation (REDD)

One of the major events at this year's UNFCCC COP 13 in Bali was the first-ever 'Forest Day', organized by CIFOR, IUCN, and other partner organizations within the Collaborative Partnership on Forests (CPF). More than 800 people participated in Forest Day, including scientists, members of national delegations, and representatives from intergovernmental and non-governmental organizations.

The Opening Plenary featured a welcome from M. S. Kaban, Indonesia's Minister of Forestry, standing in for President Susilo Bambang Yudhoyono, followed by a video message from Nobel Peace Prize Laureate Wangari Mathaai. Participants then heard brief perspectives on the challenges of integrating forests into the climate change adaptation and mitigation agendas from Kathy Sierra of the World Bank, Victoria Tauli-Corpuz of the UN Permanent Forum on Indigenous Issues, Rudy Rabbinge of Wageningen University, and Ernesta Ballard of the Weyerhaeuser Company.

A major feature of Forest Day was four parallel panel discussions focusing on cross-cutting themes related to forests and climate change. These well-attended discussions examined such issues as setting baselines and estimating forest carbon, markets and governance challenges associated

with Reducing Emissions from Deforestation and forest Degradation (REDD), adaptation to climate change, and equity-efficiency trade-offs. IUCN was particularly engaged with the last of these, with Stewart Maginnis playing the role of facilitator.

Forest Day also featured 25 side events at which a wide range of organizations presented their work and fostered further discussion on issues ranging from biofuels to biodiversity to the business perspective on forests and climate change. IUCN contributed to a session on "Making REDD Work for the Poor" in collaboration with the Poverty and Environment Partnership.

In addition, dozens of poster presentations and exhibitions at the Forest Day venue showcased the results of research and action around the world on such topics as carbon monitoring systems, REDD options and risks, case studies of forests and adaptation, and the challenge of managing peat forests.

CIFOR Director General Frances Seymour read out a "Forest Day Summary" compiled by a CPF drafting committee based on the Opening Plenary and the cross-cutting panel discussion sessions. Areas of consensus emerging from the discussions included the following:

- While there are significant methodological challenges to be surmounted, current methods are 'good enough' to proceed with the design of mechanisms for reducing emissions from both deforestation and degradation.
- Governance-related challenges pose the greatest risks for both international investors and local stakeholders in the context of new mechanisms.
- Mechanisms should be simple, and should not repeat the mistakes of the Clean Development Mechanism.
- The success of any REDD mechanism will depend on the political will to address the drivers of deforestation, including drivers that originate beyond the forestry sector.
- Adaptation efforts need to shift from responsive to anticipatory, and should be focused on the most vulnerable, including forest-dependent people.

A number of areas in need of further consensus-building and research were also identified.

Yvo de Boer of the UNFCCC Secretariat was on hand to receive the Forest Day outcomes, and stated in his remarks that the summary would provide useful input to negotiators the following week. The Closing Plenary also featured remarks from Emmanuel Ze Meka of the ITTO, Don Ko Lee of IUFOR, and Boen Purnama of the Indonesian Ministry of Forestry.

The Forest Day Summary read out at the Closing Plenary can be found at www.cifor.cgiar.org/publications/pdf_files/cop/FORESTDAYSUMMARYFINAL.pdf.

The Forest Day Bulletin prepared by IISD Reporting Services can be found at www.cifor.cgiar.org/publications/pdf_files/cop/WSC_Minutes_050607.pdf.

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Bird species as indicators of forest health

Veronika Ferdinandova of BirdLife Bulgaria outlines some of the issues discussed at a recent workshop on forest biodiversity indicators.

The development and assessment of forest policy in Europe requires practical tools to measure the ecological status of natural and semi-natural forests, in order to reveal the key trends and driving factors behind the observed changes to Europe's forest ecosystems. Since it is impossible to assess and monitor all the elements of an ecosystem, we need to select indicators that can reveal something about the overall state of the ecosystem. To this end, a seminar devoted to forest ecological indicators was organized in October this year in Bialowieza, Poland by BirdLife's European Forest Task Force.

Birds are easy to census, ubiquitous, and popular with the public. Regular monitoring of many bird species throughout Europe provides us with exceptionally long-term records of their population trends. Therefore birds, while not ideal in all respects, are certainly worth considering as forest biodiversity indicators. A set of bird indicator species (the Common Bird Index (CBI)) has already proven to be an effective tool for measuring farmland environment quality and has been adopted by the EU as an official sustainable development and structural indicator. The CBI is based on the Common Birds Monitoring organized by BirdLife International, the European Bird Census Council and Statistics Netherlands.

An analogous index for forests is being developed. However, due to the complexity and fragmentation of forests in Europe, a forest bird indicator must be carefully tested for ecological robustness. How do particular bird species react to various driving factors that induce quantitative and qualitative changes in forest habitat? For example, the transformation of a large semi-natural forest ecosystem to a mosaic of monoculture plantations with some residues of old growth will result in a decrease in hole-breeding Crested Tits and an increase in ground-breeding Tree Pipits. It is therefore a real challenge to find a single universal indicator that is capable of promptly responding to habitat changes, represents a wide spectrum of forest components, has a strong scientific footing, is easy to use, and sends a convincing message to the target audience.

Black Stork and Capercaillie are both considered good indicators of high quality natural forest habitats. Nevertheless, they also should be used with caution, as forest habitat

quality might not be the only factor to be reflected by their population trends. It seems that a 'basket' of indicator species sensitive to different ecological changes is a better option than using single species. Ideally, indicator species would be particular to their region, would not be affected by changes to their wintering grounds (or would be sedentary), and would be sensitive to changes in natural forest conditions such as fragmentation of habitat, loss of dead trees, and simplification of forest structure. These are the factors affecting a range of other taxa as well. Relatively common, sedentary birds may be used as surrogate indicators for rarer species; while they may not be as sensitive to environmental changes as other specialist species, their populations should do notably better in natural forests than in commercial ones.

Research is needed and currently being conducted by BirdLife on the forest indicator issue including statistical analysis of regional lists of potential indicator species from the Common Bird Monitoring Scheme and the BirdLife FINE initiative (Forest Indicators for Europe) aimed at testing the performance of selected forest biodiversity indicators, and assessing the correlation between commoner forest birds and forest structure and between the presence of indicator birds and other species groups such as beetles and plants.

More information on the workshop can be found at www.birdlife.org/action/change/europe/forest_task_force/TF_annual_workshop_2007.html

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Capercaillie, one indicator of high quality natural forest



The poverty-forests toolkit



Gill Shepherd

Gill Shepherd of IUCN's Livelihoods and Landscapes Initiative describes a toolkit designed to get local people's views on the links between forests and poverty.

A group of men in a Tanzanian village discuss their income sources, during an application of the toolkit

Despite considerable research on the capacity of forests to support the poor, the poverty case for the forest sector has scarcely begun to be made to national governments, and so the sector is not generally viewed as a priority for poverty reduction. A group of institutions (CIFOR, IUCN, ODI and Winrock International), funded by the World Bank's Programme on Forests (PROFOR), decided to remedy this by producing the poverty-forests toolkit. The first draft of the toolkit was produced in April this year, based on field applications in Indonesian Papua and Tanzania. An 18-month testing and evaluation period is now underway through the World Bank in Uganda, Ghana, Madagascar and Cameroon and through IUCN more widely, to help fine-tune the toolkit before applying it on a broader scale. The final results of these tests will be available in mid-2008.

What does the toolkit do?

The toolkit relies on quick 'snapshot' methods for assessing people's dependence on forests, generating

and collating data from small-scale, forest-focused Participatory Poverty Assessments. It combines the rich data often associated with informal focus group discussion with some of the interactive, transparent and visual qualities of Participatory Rural Appraisal. At the same time, the toolkit refines the quality of the data gathered under both these methods, and delivers data on topics impossible to access quickly through orthodox quantitative methods.

Issues addressed

The toolkit sessions, which give every participant a voice, encourage groups to reflect on the demographic, political and other processes by which today's forest landscape has come into being. They tease out the level and nature of current forest dependence and the main forest resources relied on. And they encourage participants to critique forest laws, policies and programmes and their impacts on local livelihoods; to highlight priority problems in accessing or marketing forest resources, and to make a start on addressing these problems.

For the national level

A household's annual livelihood, as we explain it in the field to participants, comes from all the non-cash and all the cash sources which enable the household to get through the year successfully. It includes:

1. the items grown on farm or gathered from forests (including timber) or other off-farm natural resources, and sold;
2. the items grown on farm and consumed;
3. money received in wages or in remittances from other family members living and working outside the community; and
4. the items gathered from forests (including timber) or other off-farm natural resources, and consumed or used at home without being sold.

National household budget surveys include the first three of these elements but universally overlook the value of the fourth, even though this often contributes 20-40 percent of the household's total annual income. Toolkit data enable researchers to target the key national bodies responsible for forest sector monitoring, national budgetary processes and household budget surveys with this 'missing' information, as well as many other useful findings.

Villagers and facilitators enjoy the toolkit process, and local data generated have already been used successfully in making arguments to the national level in Indonesia, Tanzania and Ghana.

Contact: Gill Shepherd, gillshepherd@compuserve.com. The toolkit manual can be downloaded – and feedback provided on how it can be strengthened – at www.profor.info/content/livelihood_poverty.html.



Landscape visioning techniques

Agni Boedhihartono of IUCN's Forest Conservation Programme describes a visualization tool for understanding and communicating landscape values.

Visioning is a tool that helps us to better understand the important elements in a landscape, as local people visualize the current landscape and the changes they would like to see in the future. This is one of the tools that is being used in IUCN's Livelihoods and Landscapes Initiative.

This tool is very useful in comparing different visions of desirable landscapes, as seen by different sections of the community (e.g. male-female, elder-younger generations) and between different ethnic groups. It is also useful in enabling all key stakeholder groups (including minorities and the marginalized) to explore different scenarios and participate in decision-making regarding changes to the landscape.

This technique is most effective when used by several small groups, to understand their different visions of the

landscape. Once they produce their landscape 'maps', the groups can come together for a discussion and an exchange of views. This collaboration with different stakeholders in a landscape is essential for us to prevent 'experts' or 'technicians' arriving with a 'ready-made' agenda for the landscape.

An output of one application of this tool, illustrated here, shows a desired scenario for a large landscape in Ghana, as seen by elders and the traditional chief of the area. Compared to the present situation, the participants added a market, a health centre, and more intensive cocoa farms mixed with other crops and agroforestry as a way to increase local incomes. At the same time, they have left unchanged the forest reserves and sacred forests. Several other scenarios were made and then used as the basis for discussions on the future of such a mosaic landscape. The next step would then be to prepare a two-tier plan, including a short-term work plan for changes that the community members can do themselves, and a long-term plan that would involve help from outsiders.

Contact: Agni Boedhihartono, agni.boedhihartono@iucn.org.

A drawing showing a desired scenario for a large landscape in Ghana



Agni Boechi/harsono

Forest conservation tools: the science of muddling through

Jeffrey Sayer, Senior Scientific Adviser for IUCN's Forest Conservation Programme, takes a critical look at forest conservation tools.

A women's group using a visual tool in Sudan

Conservation advocates are fond of inventing new tools that will revolutionize our capacity to achieve better conservation outcomes. Very often these are just old wine in new bottles – inventing new jargon for things that competent field practitioners have done for decades. Good field conservationists have always used state-of-the-art remote sensing technologies and have always shown respect for local communities and involved them in their programmes. The invention of GIS technologies and new tricks for better participatory processes are just some of the numerous technical skills that enable us to achieve marginal improvements in our capacity. So are there any really innovative technologies that need to be more widely known and that can make a difference to our ability to achieve conservation?

The answer is a cautious yes. Some innovative modelling techniques (see for example the article by Marieke Sandker

in this issue) do have good potential to help us sort out the complexity of conservation and development trade-offs. But in most cases the secret of success is that conservation practitioners need to have a range of skills and competencies that they can draw upon as appropriate to deal with the situations that they confront in their work. All of these skills and competencies must be under-pinned by a set of basic professional skills. So what are the basic skill sets for a forest conservation practitioner?

- **Knowledge of the resource:** Running a forest conservation programme at any scale requires knowledge of the resources that we are managing. What are their values and to whom? How will these resources respond to management?
- **Knowledge of laws and institutions:** Conservation practitioners need to know and apply the laws, institutions and regulations that society has established

to secure good forest management. This includes understanding local institutions and customs.

- **Humility and learning:** We need to be respectful of local resource users and their knowledge of the resource – it will often be greater than ours. Good resource managers are constantly listening and learning.
- **Observing and adapting:** It is not possible to manage forests on the basis of cookie cutter methods – we can never have a check sheet with boxes to tick that will tell us how to manage a forest. Good managers have always observed, analyzed and adapted their management practices on the basis of their learning.

So assuming that we have that basic set of professional skills, what are the innovative tools that we can now deploy? Here are some of the main ones on offer and a brief, personal commentary on their strengths and weaknesses.

GIS and remote sensing. Our capacity to measure almost everything on the ground from aircraft or space has increased enormously in recent years. The problem is that this has led to the emergence of a generation of technical wizards who see no need to actually go to the field to check the realities. Remote sensed images can now be ‘jazzed up’ and made to look very compelling – but far too much power lies in the hands of the person interpreting the image. Remote sensing in the wrong hands can create ‘realities’ that are quite different to those of people on the ground.

Models. Once you get to larger spatial scales such as landscapes, the complexity of the environmental, economic and social interactions is so great that the human mind has trouble dealing with them – and certainly has trouble communicating understanding of them to other people. Models are being used increasingly to simulate the flows of environmental and livelihood benefits from different configurations of conservation and production landscapes. Models can allow the exploration of scenarios and are valuable tools for negotiation in multi-stakeholder settings. But models also carry dangers – they can become black boxes whose inner workings are only understood by the professional modeller. That is why organizations such as IUCN and WWF prefer to use simple models that can be built with the participation of local stakeholders.

Visualization. Many expert tools confuse or provoke suspicion amongst local stakeholders – especially amongst marginalized or minority groups. An excellent way to engage them in a discussion of conservation and development options is to encourage them to draw the landscape as they see it today and as they would like it to be in the future. This drawing allows even those with very little power to express an opinion of what is, and is not, important. Visualization avoids the problems of many other tools in being acceptable to local people and not intimidating them with technology.

Historical trends. A really good way of engaging a group of diverse local stakeholders in a discussion about change processes in their forest landscapes is to ask them to list historical events that have impacted their area. We usually

take a long strip of paper – up to two or three metres – and ask people to place, in chronological order, the main things that have had an influence on the forest landscape. At first they may have few ideas. But often, after a little time, an animated conversation will ensue and all sorts of ideas and disagreements will emerge. This can be very valuable in bringing out different perspectives on what has changed and why. A large part of the value of this work on historical trends is that so much planning and decision-making focuses on short-term phenomena. When people are asked to think longer-term, they begin to realize that the things dominating their concerns today may in fact be quite minor ‘noise’ and the really big drivers of change are often much more deeply rooted and often of a non-local character. A well conducted analysis of historical trends will almost always lead to a much better understanding of contemporary drivers of change and this can help extend the discussion to explore future scenarios.

Participatory outcomes assessment. Too many projects are based on an outside expert’s view of what a desirable future for an area might be. It is surprising how often we still fail to really listen to local people in designing our activities. It is still too often the case that we design a project and ‘they’ – the local stakeholders – are invited to participate in ‘our’ project. Working with local people to negotiate a set of desired outcomes is a fundamental tool for any successful forest conservation project. And it is just as important that these local stakeholders get to judge progress – so a good monitoring process should let the local beneficiaries measure how well ‘we’, the conservation practitioners, are doing in meeting those local expectations.

So to summarize, tools are fine and are getting more powerful and sophisticated all the time. But they will only be useful if their users have the judgment and professional skills to employ them properly. This means listening to and respecting local people. The successful field practitioner of conservation should be more like a general practitioner than a brain surgeon. Another good analogy is that the conservationist should be like the leader of a jazz band, constantly communicating, listening, adapting and improvising. The band leader has to notice when someone is ‘out of tune’ – a corrupt official not acting in the collective interest – and address that problem forcefully. Success is achieved when the actors are all playing in harmony and striving to produce outcomes that meet the needs of all those most directly concerned.

In 1959 the economist Charles Lindblom published an article entitled *The Science of Muddling Through*. This thesis on how public administrators make decisions was destined to become a classic and muddling through is now accepted as what happens in much public policy work. Conservationists also need to muddle through – adapt, learn, negotiate, do deals etc. Our ability to do this well will be greatly enhanced if we master the types of tools outlined in this issue of *arborvitæ*. But these tools in the wrong hands or applied arbitrarily will achieve nothing.

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When distribution model 'mistakes' reveal new species: thinking outside the box in Madagascar



Christopher Raxworthy of the American Museum of Natural History describes a recently developed method for discovering new species and new areas of endemism.

Male Parson's chameleon (*Calumma parsonii*), endemic to Madagascar

Locally endemic species pose a particular challenge for conservation as their often-small distributions mean they are frequently the most vulnerable to extinction. Ironically, these are also the species most easily missed by biological surveys or historical collecting. While opportunistic collections and surveys may detect areas of local endemism, these methods may well suffer from sampling gaps, particularly in remote regions. Recently, a novel method has been proposed to help detect unrecognized areas of endemism using species ecological niche models.

Species ecological niche modeling

By combining known localities of a species (for example based on collected museum specimens or well documented

observations) with environmental layers such as climate variables (as used by GIS), it is possible to map regions with conditions similar to the species localities. These models, often termed ecological niche models, can also provide a good guide to actual species' distributions.

Recent work in Madagascar has been using this approach to model distributions for rare species such as chameleons. Madagascar includes about two-thirds of the world's chameleon species, most of which are regionally endemic with poorly known distributions. Chameleon ecological niche models have proven effective at predicting species distributions, but unexpectedly, model error in the form of over-prediction (predicting occurrence in areas where the species does not exist) has also proven useful.

Over-prediction: when error is good

For some chameleon species, the ecological niche models predicted areas with suitable environmental conditions that were isolated (disjunct) from the main distribution, and which did not harbour the species. These 'error' areas of over-prediction were also shared between some species. Subsequent surveys and investigation are now revealing that these isolated areas actually represent other regions of local endemism, which in some cases are actually occupied by other closely related species. It thus appears that these ecological niche models are finding pockets of localized environmental conditions, which because of their isolation, tend to have their own locally endemic species.

Accelerating the discovery of new species and new areas of endemism

One of the exciting consequences of this discovery is that identifying areas of disjunct model over-prediction can also lead to the recognition of previously unknown areas of endemism. New biological surveys can be readily targeted to these regions of model over-prediction, and in some cases, this will then directly lead to the discovery of new locally endemic species. In Madagascar, new species of chameleon and geckos have already been discovered using this method and it seems likely that this approach could be beneficial to other tropical countries with incompletely known regional endemism.

For more information on this research, see the following sources:

Raxworthy, C. J., E. Martínez-Meyer, N. Horning, R. A. Nussbaum, G. E. Schneider, M. A. Ortega-Huerta, and A. T. Peterson. 2003. Predicting distributions of known and unknown reptile species in Madagascar. *Nature* 426: 837-841.

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www.earthobservatory.nasa.gov/Study/Chameleons/

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A new tool for conserving Congo's forests

Matthew Steil of the World Resources Institute reports on an interactive, computer map-based tool designed to support conservation and sustainable management of Congo's forests.

The first version of the *Interactive Forestry Atlas of Congo* was officially launched in November this year by the Republic of Congo's Ministry of Forest Economy and Environment (MEFE), which praised the atlas as an important tool in sustainable forest management decision-making.

The atlas contains much of the relevant spatial data for forest management and governance in the Republic of Congo, including updated information on forest concession and protected area boundaries. Through a computer map-based interface, users can create personalized maps, query information, zoom in on areas of interest and download underlying spatial data.

The atlas has been four years in the making and was produced through a collaborative process between the World Resources Institute (WRI), the MEFE and Congo's specialized agency, the Center for Forest and Fauna Inventory and Management (CNIAF).

The atlas allows stakeholders in the Congolese forest sector to access, for the first time, accurate and up-to-date information on forestry operations. Previously, nearly all data on forest titles, wood production and operators was paper-based and often not consistent from one province to the next or between the private and government entities. Now, all parties are able to work off the same officially-verified digital, spatially referenced and publicly-available base of information.

This tool also enables logging companies to identify their forest concession boundaries accurately and strengthens the government's ability to effectively monitor logging activities in concessions. The Minister of Forests has issued an official order stating that only those forest titles and associated geographic information verified through the forest atlas project are to be considered official. Further, the atlas includes the first satellite imagery-derived forest road network for Congo. Using GIS and remote sensing software, WRI trained technicians within the MEFE and CNIAF to construct the national database.



Matthew Steil

In a country with scant infrastructure in the forested interior and a lack of government capacity to sufficiently monitor active logging, the ability to track logging activity remotely could be a significant boon to advancing a more lawful forestry sector.

While the training of government staff and partners on the Interactive Forestry Atlas of Congo is a significant accomplishment, the job is far from being finished. Presently, WRI and MEFE are involved in further training workshops in the interior. Agents in the field are trained on the application of the atlas to their work, as well as how to gather and enter new information into the atlas to keep it up-to-date and relevant.

This tool and the accompanying report are available at: www.wri.org/publication/atlas-forestier-interactif-du-congo-interactive-forest-atlas-congo-version-1-0#. At present, both the report and atlas are only available in French. Funding for production of this tool was provided by ITTO and USAID's Central Africa Regional Program for the Environment (CARPE).

Similar forest-mapping resources are available for Cameroon and WRI is currently working with the governments of the Central African Republic, the Democratic Republic of Congo and Gabon, as well as Indonesia. Forest atlases for these countries are scheduled to be released soon and will be made publicly available at WRI's Global Forest Watch website: www.globalforestwatch.org

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The computer-based atlas provides up-to-date information on forest concession and protected area boundaries in the Republic of Congo

The STELLA model: visualizing tradeoffs

Marieke Sandker of CIFOR describes how forest landscape changes can be modelled for informed decision-making.



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The STELLA model has been used to simulate the impacts of forest conversion to oil palm plantations in Indonesia

Biodiversity-rich forests in developing countries are often home to people living in great poverty. Lifting those people out of poverty often comes with environmental costs (e.g. forest clearance for agriculture or unsustainable commercialization of bushmeat), while forest conservation often comes with costs for local communities (e.g. anti-poaching initiatives or reduced access). The Centre for International Forestry Research (CIFOR), together with the World Conservation Union (IUCN) and WWF, has developed an approach to explore these kinds of tradeoffs and is applying the approach in various high biodiversity landscapes.

The visioning approach is based on participatory modelling, using STELLA software to look at stocks (such as forest area, land area and household possessions), flows (e.g. change from forest to agriculture or flows of income to households from different activities) and “taps” that moderate these flows (including laws, traditions and price variations). Values for stocks, flows and estimates of the influence of the taps are all entered into models by local participants and the models can then be run to simulate future change in the stocks and flows.

The models draw out the major components of the conservation landscapes and define how they interact. The values for variables are based on expert judgment, prior studies or relevant literature. Simulations are run with the model producing trends over time. Changing some key input variables corresponds with different interventions, thus allowing the exploration of the consequences of the different interventions. By plotting the values of conservation and development indicators calculated by the model on a graph, the tradeoffs can be visualized. For example, gazetted a forest as a national park can reduce hunting pressure on antelopes by X% but the simulation might reveal average household income of people near the park will drop by Y% from lost bushmeat income. Accordingly, alternative interventions can be explored. We have used the models to explore ecotourism and payments for environmental services, in the hope that tradeoffs can be turned into synergies. By visualizing and quantifying the tradeoffs between conservation and development, and exploring alternative development pathways, the model stimulates negotiation and information exchange between conservationists, development actors and government authorities so that well-informed choices can be made.

An example of the model's use is in Indonesia's East Kalimantan district of Malinau. Though the area is still almost entirely covered with pristine rainforest, there is a real threat of widespread forest loss, if not for palm oil, then for timber extraction under the guise of oil palm development. Other plantation developments are likely in the longer term. CIFOR and IUCN simulated the conversion of 500,000 ha of forest into oil palm plantations over the next 40 years. The model showed that large-scale oil palm investments could yield significant financial benefits to local authorities and the local economy. However, such development would induce massive employment-driven migration with wide-ranging consequences for social and political conditions, and there will undoubtedly be “losers”. Discussions with the district head and his officials on the scenario outcomes centred on in-migration and alternative scenarios where carbon payments might generate income without encouraging in-migration. As a result, the district head has become very interested in carbon payments.

Other landscapes where the visioning approach is being used include amongst others Ghana, Vietnam, Uganda and Cameroon.

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A conservation planning tool for commercial forestry

Douglas van Zyl of Mondi describes a tool the company is developing to plan its conservation management.

Mondi's South African landholdings make it one of the largest private landowners in South Africa with over 400,000 hectares owned or under lease, primarily in the Mphumalanga and KwaZulu Natal provinces. Forty percent of these landholdings is unplanted or 'open' land, primarily grassland, much of which is in ecologically important areas.

Early recognition of the conservation value of the open areas and the potentially negative impacts of afforestation on the maintenance of biodiversity and ecological processes led to the development of the Mondi Conservation Planning Tool to identify areas of conservation value and focus land optimization, management and monitoring.

This tool is a product of systematic conservation planning using existing data and conservation targets in a transparent and defensible process to identify and classify priority areas for conservation management and monitoring. The tool combines GIS coverage at national, provincial and farm levels and an associated database, to identify and score unplanted areas in terms of high, medium, or low conservation value using the concepts of conservation status and vulnerability.

Primary spatial layers utilized in the tool are the national vegetation types of South Africa, a catchment sensitivity layer, species data and buffer zones and corridors derived from conservation planning products produced by the respective provincial conservation authorities. Secondary data sets fundamental to the tool are Mondi cadastral and management boundaries and land cover data.

The first step in the production of the tool was integration of these national and provincial data sets with the Mondi spatial layers. Additional layers were then created to identify and selectively weight open areas within two kilometres of protected areas or areas of conservation significance. These layers, overlaid on the product of the first step, then classified each open area in terms of its conservation value.

The tool is now automated so that updated versions can be generated whenever new farms are acquired or management boundaries change, and has provided an



efficient means of identifying areas of high conservation value utilizing hierarchical layers of information (national, provincial and farm level).

The current phase of development of the tool is to incorporate the concepts of High Conservation Value Areas (HCVA) to focus management on areas of high conservation value, identify priority corridors and linkages and thereby enhance and build ecologically sustainable networks both within and between Mondi landholdings through improved land optimization. The tool will be used to guide and inform the process of withdrawing marginal planted areas to extend or buffer high conservation value areas and to link them with adjoining or adjacent protected areas through stewardship agreements to fully expand the ecological network associated with Mondi landholdings.

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research in brief

Worms killing pandas? A recent study of giant panda post mortem results has revealed that increasing numbers of the animals are dying from a parasitic disease. The study, led by the US-based Consortium for Conservation Medicine, examined records of wild panda post-mortems between 1971 and 2006 and found that from 1990 onwards, the proportion of deaths that was linked to a parasitic disease rose from less than 10 percent to 50 percent. The results suggest that this disease was caused by a parasitic worm, *Baylisascaris schroederi*. The researchers say that the results are typical of a population that is becoming denser, because of habitat loss, and therefore more vulnerable to disease. According to Peter Daszak, Executive Director of the Consortium, the emerging panda parasite is most likely carried by another animal which has been brought closer to pandas by the forest loss. The animal 'reservoir' could be a domestic animal or a small carnivore such as fox that tends to live around humans.

Source: www.newscientist.com, 7 December, 2007



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LOAM: looking at landscape-level change

Mark Aldrich of WWF describes a tool for monitoring outcomes at the landscape level.

Conservation and development agencies, including WWF, IUCN and the World Bank, are increasingly focusing their efforts on a landscape level (sometimes described as priority conservation areas). One of the biggest challenges of working at the level of a landscape is identifying key values or functions of the landscape as a whole, as well as measuring and monitoring outcomes of development programmes in terms of biodiversity, livelihoods and environmental services.

In response to these challenges, the Forest Programme of WWF is piloting and testing the LOAM – Landscape Outcome Assessment Methodology. This approach aims to measure, monitor and communicate the nature and extent to which a landscape is changing over time with respect to a small number of agreed conservation and livelihood outcomes. This tool facilitates a process that can help build common understanding between different stakeholders within and beyond the landscape in which it is applied.

What is it?

LOAM is based upon assessing the capital assets of the people who inhabit a landscape. It follows Carney et al. (1998) but applies their approach at a much larger spatial scale. The tool involves the use of participatory processes to establish indicators for the five types of assets that cover the range of things that projects usually try to improve – natural, human, physical (or built), social, and financial (or economic) capitals. Stakeholders agree upon a representative set of locally appropriate indicators grouped under each of the five asset types. A scoring system is then applied to measure, monitor and communicate the nature and extent to which the balance of these assets is changing within the landscape over time. The underlying logic is that the achievement of conservation in the long-term may require that some natural capital is sacrificed in order to improve the other capital assets. Sustainable development is the process of getting an appropriate balance between the different assets.

Where is it being used?

The most developed use of the LOAM to date is in the Congo Basin where annual workshops focused around the Tri-National de la Sangha landscape have taken place since 2004. These have been held in Cameroon (2004 and 2006), the Central African Republic (2005), and the Republic of Congo (in June this year). In addition, workshops have taken place and follow-up work is ongoing in Kenya and Tanzania, and scoping workshops

have been held in Morocco and Cambodia. Future workshop locations being planned include the Fandriana-Marolambo landscape in Madagascar.

The LOAM approach is also of interest to private sector companies who own or manage plantations, most notably those committed to improving biodiversity conservation and socio-economic values of their plantations in the broader landscape, including in landscapes where new plantations are being planned. Scoping workshops have taken place for specific landscapes in collaboration with companies in Portugal and South Africa, with another under discussion for Uruguay.

LOAM is also generating interest with other partners – WWF is facilitating a number of workshops jointly with CIFOR – the Center for International Forestry Research – with funding from MacArthur Foundation, and other work is in progress with IUCN and Ecoagriculture Partners.

What have we learned?

There are already clear signs that the LOAM process can help WWF and other stakeholders to understand better how conservation projects can have an impact at a landscape scale. As such, it can provide an important basis for deciding on adaptive management interventions. Furthermore, the very process of bringing the different stakeholders together to discuss and debate their views and aspirations for the future of their landscape can quickly help build a shared understanding of each other's values and needs from the landscape, as well as a common interest in developing ways of sustainably managing and regularly monitoring the condition of the key assets.

Carney D. et al. (1998) *Sustainable rural livelihoods: what contribution can we make?* Department for International Development, London, UK.

For more information on the LOAM methodology, see www.panda.org/about_wwf/what_we_do/forests/publications/index.cfm?uNewsID=120980

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WWF news in brief

New paper toolkit: WWF launched its new Guide to Buying Paper in November. This and WWF's Paper Scorecard which assesses the environmental footprint of numerous paper products, provide useful insights and practical tips on minimizing the negative environmental and social impacts of paper production. Visit www.panda.org/paper.

New Generation Plantations Project: WWF has launched this new project to identify and promote best practices for forest plantation management based on real world learning. It brings together companies and governments including China's State Forest Administration, UK Forestry Commission, major paper producers Mondi, Portucel, Stora Enso and UPM-Kymmene.

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The CRiSTAL tool for 'climate proofing' development

Béatrice Riché of IUCN describes a new tool that will help development projects strengthen local resilience to climate change.



Béatrice Riché

As acknowledged in the IPCC Fourth Assessment Report (2007), climate change will have the most severe impacts on poor communities with low adaptive capacity, and might hinder the

achievement of development and poverty-reduction goals. Climate change must therefore be integrated into international, national and local development planning. 'Climate-proofing' of development interventions also requires new tools, strategies, and partnerships. One tool, CRiSTAL (Community-Based Risk Screening Tool – Adaptation and Livelihoods), has been developed by four organizations: The World Conservation Union (IUCN), the International Institute for Sustainable Development (IISD), the Stockholm Environment Institute in Boston (SEI-US) and Intercooperation.

CRiSTAL is a project planning and management tool which helps stakeholders to:

1. understand the links between local livelihoods and climate;
2. assess a project's impact on community-level adaptive capacity; and
3. make adjustments to improve a project's impact on local adaptive capacity.

CRiSTAL promotes the development of adaptation strategies based on local conditions, strengths and needs. The tool was field-tested during 2004-2006 in Mali, Bangladesh, Tanzania, Nicaragua and Sri Lanka, before being applied for the first time in March-April this year, as part of a Finland-funded IUCN climate change adaptation project in Zambia.

The CRiSTAL analysis in Zambia provided information on climate hazards, the impacts of those hazards on local communities, and current coping strategies. In addition, managers and implementing teams of four ongoing development projects in Zambia have been trained in the use of the tool.

The process involved community consultations at seven sites, covering four provinces and 3 agro-ecological zones of Zambia. The analysis revealed a rise in the frequency and severity of extreme events, including droughts, floods and high temperatures, and a decrease in the length of the rainy season in many parts of the country. The rise in extreme climatic events is negatively affecting the natural, physical, financial, and human resources that are crucial for people's livelihoods, and is leading to increased food insecurity and health issues. When facing climate hazards, small-scale farmers, who are negatively affected by disruption of their normal farming cycles, rely heavily on access to alternative natural resources from forests and wetlands.

The information gathered and analyzed during these applications of CRiSTAL has been communicated to national stakeholders and decision makers and will be especially valuable for the completion and implementation of Zambia's National Adaptation Programme of Action.

During the next three years, CRiSTAL will be used as part of a broader IUCN climate change adaptation project in Zambia, Tanzania and Mozambique, to help strengthen local and national resilience to climate variability and change.

CRiSTAL training workshops have been run by IUCN members and partners – IISD and CARE International – in Mozambique and Ghana in 2007, and a third one is planned for francophone Africa in 2008.

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A community consultation in Zambia during a CRiSTAL application

IUCN news in brief

New staff: The IUCN global forest programme continues to grow. Ricardo Furman, a Peruvian/Argentinean citizen, joined us in November to work on planning, monitoring and evaluations for the IUCN Livelihoods and Landscapes (LLS) Initiative. Ricardo will be based at IUCN headquarters in Gland, Switzerland. In addition, Lucy Emerton is joining the LLS team in April 2008 to work on our markets and incentives theme. Lucy is currently Head of IUCN's global economics & the environment programme and has been with IUCN since 1999.

Reviews in brief



arborvitæ

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The next issue of arborvitæ will be produced in May 2008 (copy deadline early April) and will focus on rights-based approaches to forest management. If you have any material to send or comments please contact:

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Back issues of arborvitæ can be found on:
www.iucn.org/forest/av

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The editors and authors are responsible for their own articles. Their opinions do not necessarily represent the views of IUCN and WWF.

ITTO – 20 years and counting

Available in English, French and Spanish from
www.itto.or.jp/live/PageDisplayHandler?pageId=193

The International Tropical Timber Organization (ITTO) has produced a report that looks back on its achievements and forward to its future. The publication, *Making Sustainable Forest Management work: ITTO's first twenty years*, is a highly readable and informative account of the first two decades of operations of ITTO, which was established in Yokohama, Japan, in 1987. ITTO was initially greeted with suspicion by part of the forestry establishment as well as environmental and human rights NGOs, but has made tangible contributions to furthering sustainable forest management throughout the tropics ever since. After a brief introduction summarizing the content of the various International Tropical Timber Agreements (ITTA) and the functioning of its organs, the main text is devoted to the experience gained from a selection of ITTO's US\$300 million project portfolio, covering the subjects planning; criteria & indicators; community involvement; fire; legality; trans-boundary conservation; mangroves; forest restoration; management for timber and for non-timber forest products; economic development and poverty alleviation; certification; capacity building; statistics and fellowships. The direct quotes from project participants included in the project descriptions make for an engaging read and give first-hand evidence of the ITTO's positive impact. Despite the generally positive tone of the book, the organization recognises that sustainable forest management, although widespread, covers only a fraction of the tropical forests where timber is harvested and that much remains to be done. The fact that under the new ITTA 2006, which is expected to come into force in 2008 or 2009, tropical timber producer countries have agreed to contribute 20 percent funding to certain project activities, is illustrative of how ITTO has been able to build trust across the traditional North-South divide that is still reducing the effectiveness of so many international organizations.

Recommended reading not just for forestry professionals, but also for those involved with cocoa, coffee and rubber, to name but a few commodities the International Agreements of which have done little to promote sustainability in or outside the forest.

Power-sharing treatise

Available from: www.earthscan.co.uk

This weighty volume, entitled *Sharing Power, a global guide to collaborative management of natural resources*, contains much that is of practical value for those actively involved in stimulating collective action to improve natural resource management at the local level, and in changing the national-level policies and institutions that are unfortunately still constraining such action in many parts of the world. The case studies used to illustrate the guidance provided hail not just from the developing world but also from Europe, North America, Australia and New Zealand, a useful reminder both of the valuable lessons learned there and the many resource management challenges still facing the rich countries.

The book clearly illustrates how collaborative management of natural resources (or co-management for short) cannot work without true sharing of power, and provides detailed guidance for how to facilitate negotiation of management roles, rights and responsibilities of the different actors involved – whether local, national or international.

As is often the case with such large volumes, the quality of the case study descriptions is somewhat uneven. In addition, the real impact of the co-management interventions discussed often remains frustratingly unclear, even where they have been ongoing for decades. This is no doubt in part due to the lack of attention conservation and development organizations have paid to the outcomes of their interventions until quite recently. Another shortcoming is the fact that the bibliographic references do not go beyond 2004, so that recent findings on the subject from for example the Centre for International Forestry Research, Forest Trends and the International Forestry Resources and Institutions programme are not included.

Sharing Power was first published in 2004 by the International Institute for Environment and Development (IIED) and The World Conservation Union (IUCN), with a slightly different sub-title, "learning-by-doing in co-management of natural resources throughout the world". Publication by a commercial publisher will hopefully guarantee the wider distribution the book deserves. For those unable to fork out £50, the earlier version can still be downloaded chapter by chapter from www.iucn.org/themes/ceesp/Publications/sharingpower.htm#download.

Two toolkits on stats

A recent poverty monitoring manual, produced jointly by the district government of Kutai Barat, Indonesia and a CIFOR/BMZ project, offers detailed practical guidance on statistical data collection and analysis. *Assessing Household Poverty and Wellbeing: A manual with examples from Kutai Barat, Indonesia* is the result of a three-year participatory learning process and highlights the benefits of locally relevant poverty assessments, as complements to central government monitoring systems.

The manual includes step-by-step guidelines on, for example, selecting respondents, interview techniques, indicators and questionnaires, using a computer software package for data processing, and calculating poverty indices. While the guidance has been tailored to the poverty monitoring work in this particular district of Indonesia, it will be of use to local governments, NGOs and researchers in other parts of the world. This manual is available at: www.cifor.cgiar.org/publications/pdf_files/Books/BCahyat0701.pdf

A revised textbook on forest mensuration has been published ten years after the first edition – with updates on the use of tools such as remote sensing, aerial photographs and satellite imagery. *Forest Mensuration* assumes no advanced knowledge of statistical methods and includes guidance on a range of modern statistical methods for measuring individual trees and tree stands. The new version includes numerous worked examples to assist readers wanting to process their own data. The book is available at: www.springer.com/life+sci/forestry/book/978-1-4020-5990-2